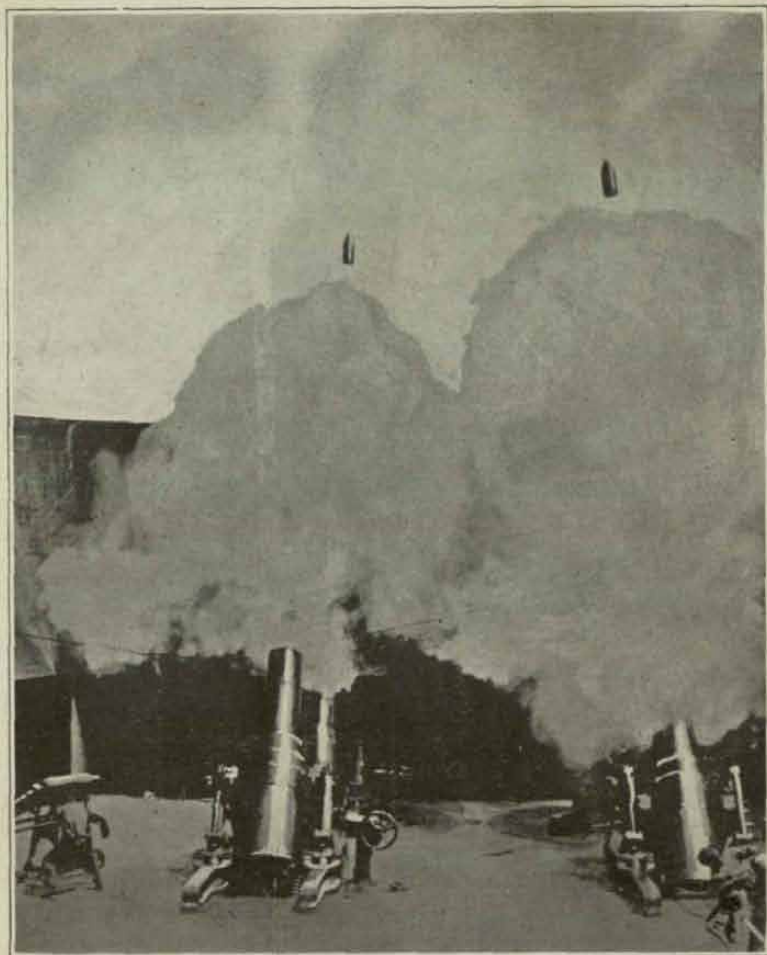


COAST ARTILLERY JOURNAL



JULY - AUGUST, 1931

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE AUG 1931		2. REPORT TYPE		3. DATES COVERED 00-07-1931 to 00-08-1931	
4. TITLE AND SUBTITLE The Coast Artillery Journal. Volume 74, Number 5, July-August 1931				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Coast Artillery Training Center,Coast Artillery Journal,Fort Monroe,VA,23651				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 82	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

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Member Affiliated Military Magazines

Published as the Journal U. S. Artillery from 1892 to 1922

MAJ. STEWART S. GIFFIN, C. A. C., Editor

EDWIN H. CROUCH, Business Manager

Volume 74

JULY-AUGUST, 1931

Number 5

Publication Date: August 1, 1931

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The COAST ARTILLERY JOURNAL pays for original articles upon publication.

Published bi-monthly under the supervision of the United States Coast Artillery Association for the information of the Coast Artillery personnel of the Regular Army, National Guard and Organized Reserve.

Publication Offices, Telegraph Press Building, Cameron and Kelker Sts., Harrisburg, Pa.; Editorial Offices, 1115 17th Street, N. W., Washington, D. C.

Terms: \$4.00 per year. (Coast Artillery Association members, \$3.00 per year). Single copies, 75 cents.

Entered as second class matter at Harrisburg, Pa., Feb. 12, 1931, under the Act of March 3, 1879, for mailing at special rate of postage provided for in Section 412, Act of October 3, 1917.

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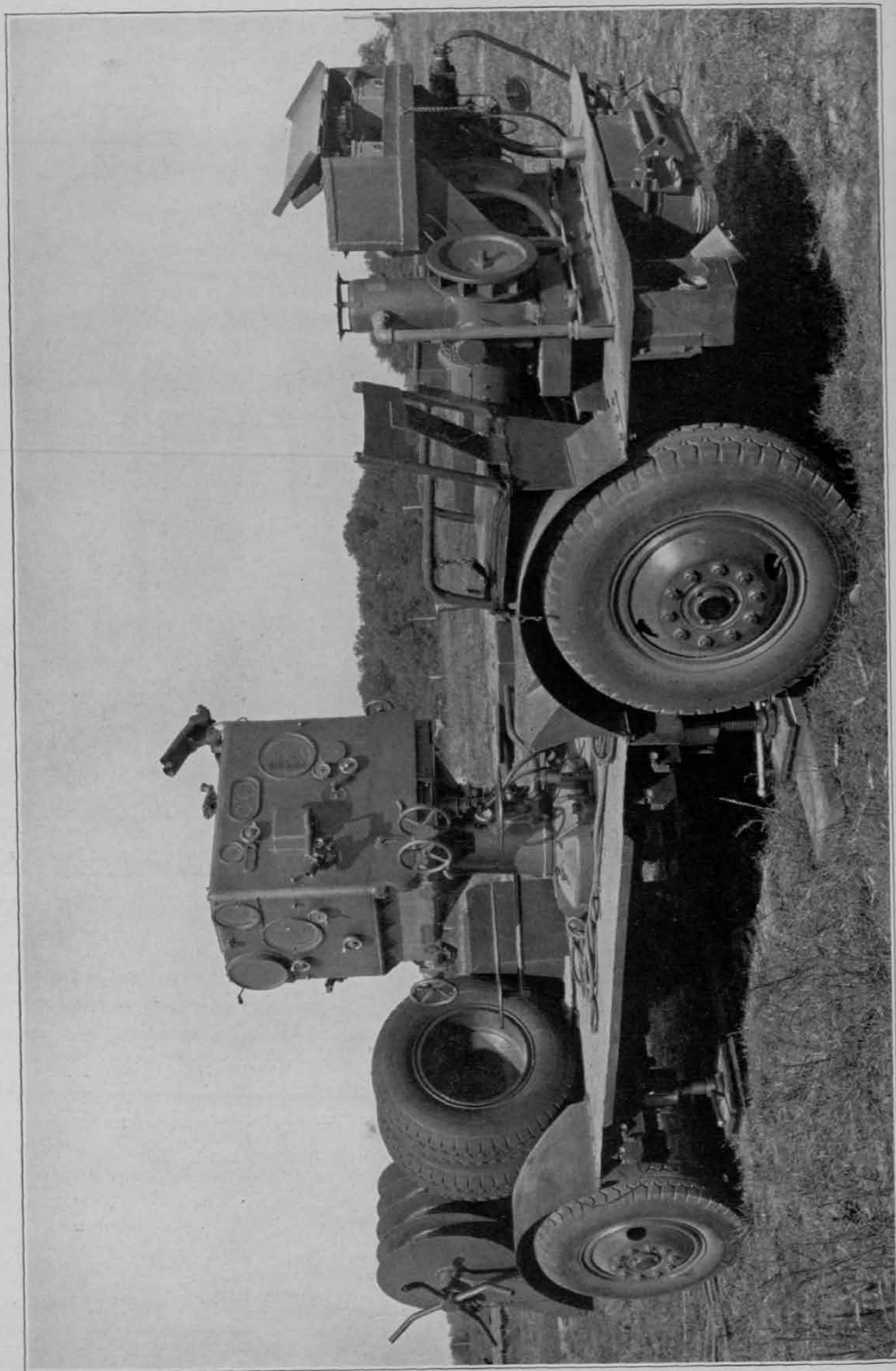
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Fire Control, Major Caliber Long Range Guns

By Captain James T. Campbell, C. A. C.

Foreword

As possible attacking weapons increase in range so must defensive measures extend their zone of influence. The long range experimental firings conducted with the 16-inch guns in the Harbor Defenses of Balboa in May, 1930, demonstrated the efficiency and importance of these recent additions to our seacoast armaments. The target-towing vessel was required to change direction on each course to impose probable battle conditions. The fire was directed entirely by airplane observation, the position of the target and the fall of the shots being determined by the airplane observer. The necessity for and the great value of airplane observation to locate targets and spot shots in long range firings was amply demonstrated. There were frequent periods during these firings in which the airplane and the target were obscured from shore stations. The airplane observer, however, was able to locate the target at all times and the firing could have been continued against an enemy ship. These firings were highly satisfactory and the guns developed a very small probable error.

The following article by Captain James T. Campbell, 4th Coast Artillery Corps, who prepared the official reports of the long range experimental firings is believed to be of great interest to the service. Subsequent to the experimental firings this officer, with his battery at target practice and employing normal fire control methods and equipment, successfully demonstrated the efficiency of the 14-inch railway battery by an excellent practice at ranges in excess of 23 miles.

ANDREW MOSES,
Brigadier General, U. S. A.

NOW that the Coast Artillery is equipped with a few guns capable of firing at ranges in excess of forty thousand yards, numerous questions concerning fire control at such distances are unavoidable. In the search for the answers to these questions, many new ideas have sprung up and have not been fully evaluated and sorted; new and progressive views have been offered on subjects that for a long time have been considered as settled; and until a great deal of data has been collected and many hours devoted to its analysis there can be no definite statement of knowledge to take the place of the present conjectures. The pursuit of this knowledge will certainly react favorably upon our conception of the fire control problem as a whole, opening the way for improvement in all our methods wherever improvement is possible.

During the past year the Coast Artillery troops stationed in Panama, especially those on the Pacific

side, have had exceptional opportunities to gain experience in long range firing. First there was the extensive development project fired with six-inch guns at Fort Amador and sixteen-inch guns at Fort Bruja, work that occupied a period of two months exclusive of the time used in preliminary study and analysis of results. Later there was the annual record practice fired by the battery assigned to the fourteen-inch railway guns at Fort Grant. Before these firings, ranges greater than forty thousand yards seemed awe-inspiring; now they seem commonplace. Yet even with this background of experiences, there are none here who would presume to speak with authority concerning long range fire control methods, separating the good from the bad, or offering more than elementary precepts for future guidance.

A combination of circumstances makes the Harbor Defenses of Balboa an excellent place to hold long range firings. Long baselines are available to cover



a large area seldom used by shipping; the baseline most frequently used has a length of about 15,470 yards and the course requires about one hour and twenty minutes to tow. The elevations of the various stations used range from slightly less than 200 to slightly more than 1000 feet. The most modern long range guns are installed in a position that is favorable with respect to the positions of the stations. During certain seasons of the year there are periods in which the atmosphere is so clear that there seems to be no limit to the range of visibility, high refraction being the rule on clear days. France Field is comparatively near so that co-ordination with the Air Corps is easily accomplished. And finally, with becoming modesty, we assert that the necessary high standards in artillery work are maintained by the organizations stationed in these Defenses, as witness the fact that the battery selected to fire the long range exercises has twice won the Knox Trophy, once in 1917 as the 73rd Company

and again in 1929 under the present designation of Battery "I," 4th Coast Artillery.

There is no certainty that any battery will ever be justified in opening fire upon an enemy at a range greater than forty thousand yards, but as long as our weapons are able to reach that distance it would be folly to neglect the possibilities that their increased power offers. Certainly, in the event of hostilities, there will be times when long range fire will be desired, if not for decisive effect, at least for its influence upon morale and to prevent the strengthening of a distant threat. It must be assumed that the enemy's warships can menace our defenses from great ranges, even when visibility is low, for we must credit him



involved, the observer and the firing battery. The battery is responsible for the calculation of firing data and adjustment of fire, receiving no information whatever except that sent to it by the observer in the plane. The observer reports target location, using the best system available to transmit this data, the direction in which the target is moving, its speed, and the clock time of his observation. He is not required to fly in any predetermined manner, and the choice of methods he is to use to obtain the required information is left entirely to him. Having given the initial data he stands by to spot deviations and report changes in the movement of the target. With this division of responsibilities, the battery can function with a minimum of additional equipment and training; the observer is already fully equipped and trained. With a minimum of pre-arrangement, all of which has to do with inter-communication and can easily be standardized well in advance, battery and observer are ready to cooperate. In the tests fired here in Panama this division was recognized from the start, and the results were both satisfactory and beneficial to both parties. When the observer found that full reliance was placed upon the information reported by him, he responded by giving a performance that fully justified this confidence as well as the personal pride that he took in his accomplishments. The battery was able to concentrate its attention upon the plotting board and the guns.

A valuable suggestion advanced by the aviators engaged in this work may be taken as an example of what may be expected if full responsibility for observation is given to the Corps that does this work, giving them an opportunity to solve their own problems in their own way. This suggestion has to do with the use of a tri-motored transport plane equipped as a flying battleship to carry the observer. Armed with enough machine guns or one-pounders to fight off

with ingenuity at least equal to our own and we know that all potential enemies are improving their armament. The accuracy of fire at forty thousand yards has proven unexpectedly high and gives ample basis for the expectation that in the near future we will think no more of that range than we did of twenty thousand yards a few years ago. The development of fire control methods capable of application without regard to the magnitude of the range is not only justified; it is necessary. And just as surely as development and expansion in the past have produced radical changes in systems already existing, the development of these new methods will broaden our outlook upon our present problems and will show us possibilities of improvement where none are suspected now.

When it comes time to use airplane controlled fire in actual combat, simplicity is the one requirement that will stand out above all others. Reliable communications will probably stand next in order of importance, but this consideration is itself rooted deeply in the controlling necessity for simplicity. There will be no time to confer over details, no opportunity to perfect an elaborate scheme, nor can it be hoped that both observer and firing battery will, at this critical moment, be sufficiently drilled in the operation of any but the simplest plan. Simplicity of operation will be a matter of major importance to the observer, who will probably begin this task after an exhausting period of reconnaissance and who must fight to maintain his position in the air.

The first step toward simplicity is the clear division of duties and responsibilities between the two parties



raiders, this plane probably could maintain its position against any opposition likely to be met. Of course, these guns would be manned by gunners, and the radio equipment by a radio operator, so that the observer would be left free to devote his whole attention to his work. With his charts arranged in a convenient manner and protected from strong air currents, mounted on a comparatively smooth-flying base.

he should be able to turn out very creditable results. Add to this a little bit of pure speculation; assume that directional radio could be made operative in this plane, and, with properly located shore stations sending out strong signals, the application of this very promising device to our present problem would be much simplified.

In the operations carried on locally the methods used by the observers were based on the resection principle. Flying to seaward of the target and beyond effective antiaircraft range from it, he would search for two landmarks by which to establish a line that ran through or close to the target. When these two landmarks were found a line would be drawn through them on his chart and extended toward the target. A second and, if possible, a third line would be determined in the same way and their intersection taken as the target position. The direction of movement would be determined by noting some landmark toward which the target was traveling, or, if this was not possible, by reference to the pilot's compass. Speed could only be estimated. This method was highly satisfactory, but there is some doubt as to whether it can be applied generally since there are many localities in which it is difficult to find the necessary landmarks. Target location was transmitted to the battery by the use of rectangular co-ordinates that permitted location to the nearest thousand yards.

The method of target location outlined above depends to a certain extent upon good visibility conditions. Certainly the limitations imposed upon aerial observation are very much less than those imposed upon terrestrial stations, but they do exist. In the local firings there was never an occasion on days selected for firing when the aerial observer was not able to proceed with his part of the work, but these practices were sometimes delayed for several days while waiting for conditions that would permit the terrestrial observers to track the towing vessel, a procedure necessary for its safety. Nevertheless, there were times when visibility from the plane was not all that might be desired, and since the days chosen for firing were those on which conditions were generally promising, it is only fair to assume that this method could not be applied on just any day in the year. Thirty miles is a long distance to an observer who depends upon unaided vision. All of which brings up the consideration of directional radio as a resource that requires examination.

In connection with the local firings, an attempt was made to operate directional radio sets in making the initial location of the target. Three sets were installed at widely separated points and, operating on signals sent out by the plane, located its position by intersection of rays representing the directions determined by each of the three sets. Minor difficulties were introduced by the necessity for synchronizing the readings, but they were as nothing compared with the problem of determining the location of the target with reference to the plane. The aviators suggested a bomb sight to determine the distance of the plane from the target, and a scheme of flying and signals to give the

direction from plane to target. Upon this basis a rather complex plan of operations was constructed. There were three principal causes for the failure of these operations: the direction finding sets were not built to withstand tropical dampness; the antennae on the planes were not especially constructed for this purpose; and the principle of simplicity was violated.

When the initial location of the target was received in the plotting room it was converted from the rectangular co-ordinates used in transmission into range and azimuth from the gun. Ballistic corrections were applied to this range and azimuth and the result was plotted on the plotting board. A circle, graduated in degrees and oriented so as to read Air Corps azimuth, had been placed on the board beforehand, and from this circle the direction of the course, as reported by the observer, was transferred to the point plotted initially. The transfer of azimuth from the oriented circle and the drawing of the directed line through the initial point was done by the use of parallel rulers. Figuring that the first shot would be fired at a certain future time, the travel of the target between the time of its location and the time of the first splash would be computed in yards, the speed used being that re-



ported by the observer. This distance was plotted along the reported course of the target, measuring from the initial point described above. Since the point reached in this manner, the point corresponding to a future position of the target, was derived from one that had been corrected ballistically, its range was applied directly to the range drum of the gun and its azimuth directly to the azimuth scale. In every practice fired the first shot fell close enough to the target to permit reasonably accurate spotting, thus bringing the first phase to a close.

The second phase of the shoot begins when the first spotting data is received and the adjustment of fire commences. In our standard methods of fire control we generally think of adding to or subtracting from the true range in order to place the center of impact on the target, the adding or subtracting being partly for ballistic corrections and partly arbitrary. In following the adjustment of fire by methods now under discussion a great deal of difficulty will be avoided if all thought of true range is eliminated and the attention is centered on the steps necessary to

make the range developed by the gun agree with that existing in the field, the gun being used as its own range finder. The range drum and the azimuth scale of the gun are considered simply as scales bearing reference marks, these scales bearing a relationship to the range and azimuth of the point of impact that requires careful attention. The reading on the range drum is not, in general, the range to the point most likely to be hit, but is the best approximation to it that can be made under average conditions. Two readings separated by a short distance will not differ from developed ranges by the same amount, but the closer the two readings are together the less will be the variation. Over the portion of the range scale used in a target practice this variation may be neglected, so that the scale may be thought of as one on which a correction applied in yards will produce a response of an equal number of yards by the gun. Similar remarks apply to the azimuth scale except that drift is always present so that the reading on the scale will differ from the azimuth at which the shot is to be expected by an amount depending on the range. Corrections applied in degrees or other units are assumed to produce equal response in the gun.



If a gun is fired with certain range and azimuth settings and a given deviation results, it is easy to calculate the range and azimuth settings that would have made that shot a hit, assuming only that the gun would respond to the changes made in its laying. If a series of shots is fired, and for each shot we compute the settings that would have been required to make that shot a hit, we acquire data upon which we can predict a future setting providing that the time element is properly taken into account. The following assumptions have been made: (1) that the passage of time between shots is properly accounted for; (2) that for each shot the laying of the gun is known in terms of range and azimuth settings; (3) that each deviation is determined; and (4) that the gun will respond to changes in laying. To provide for the first two is simply a matter of procedure; to make the last two assumptions valid it is necessary to keep the deviations reasonably small. Otherwise there are no restrictions whatever.

The calculations and predictions referred to in the preceding paragraph were carried out on the plotting

board. Since each point on this board corresponds to a definite laying of the gun, both in range and in azimuth, the calculation, from the data used and deviation reported, of the data that would have brought the shot close to the target, can be made graphically. The magnitude of the deviation is plotted to the scale of the board, measuring from the point that corresponds to the data used in firing, the direction of the line along which this measurement is made being the reverse of the direction reported. For lack of a better name we call the point determined in this way a "ballistic point" and a series of such points the "ballistic course" of the target. This "ballistic course" includes the movement of the target plus all corrections required. In the early stages of the adjustment, prediction is made along a line parallel to the reported course of the target, this line being shifted so as to pass through the center of the ballistic points plotted, but when the ballistic course becomes well established the reported course is abandoned in favor of the one deduced from the fall of shots. Detailed discussion of the rules for adjustment of fire does not fall within the scope of this article. This phase of the subject alone warrants a great deal of investigation and offers material for several articles of this length.

The firing conducted by Battery G, 4th C.A. of the 14-inch railway battery at target practice in November, 1931, at an average range of 41,180 yards is of interest in that it demonstrated the possibility of using normal methods and equipment at this great range when visibility permits. The hit made in this practice, dead on for range and thirty-five yards ahead of the pyramidal target, is probably the one of greatest range ever obtained.

As an example of the principles discussed in the foregoing paragraphs, one of the practices fired in the long range development project will be given together with enough of the background to make it intelligible.

Since the final firing was to be from Battery Murray (16-inch guns) with the plotting room of Battery Haan available for the use of the safety section, Battery Birney (6-inch guns) was chosen for the preliminary practices with the plotting room of Battery Smith available to simulate the service set-up. By a fortunate coincidence, the observation stations that could be used simulated closely the stations available for the final firing, and even the azimuths transmitted to the guns were about the same in both batteries. The drill of the range section was conducted at Battery Birney and that of the safety section at Battery Smith. It was the function of the safety section to compute the data necessary to hit the towing vessel and to make the firing battery suspend fire when its laying was too close to this data. It was found that with small additional effort this section could control a drill for the benefit of the plotter, the only kind of drill available to the range section of a battery assumed to be "blindfolded." As a normal part of its work the safety section predicted and plotted on its board a point corresponding to the laying that would presumably have hit the tug. By measuring back

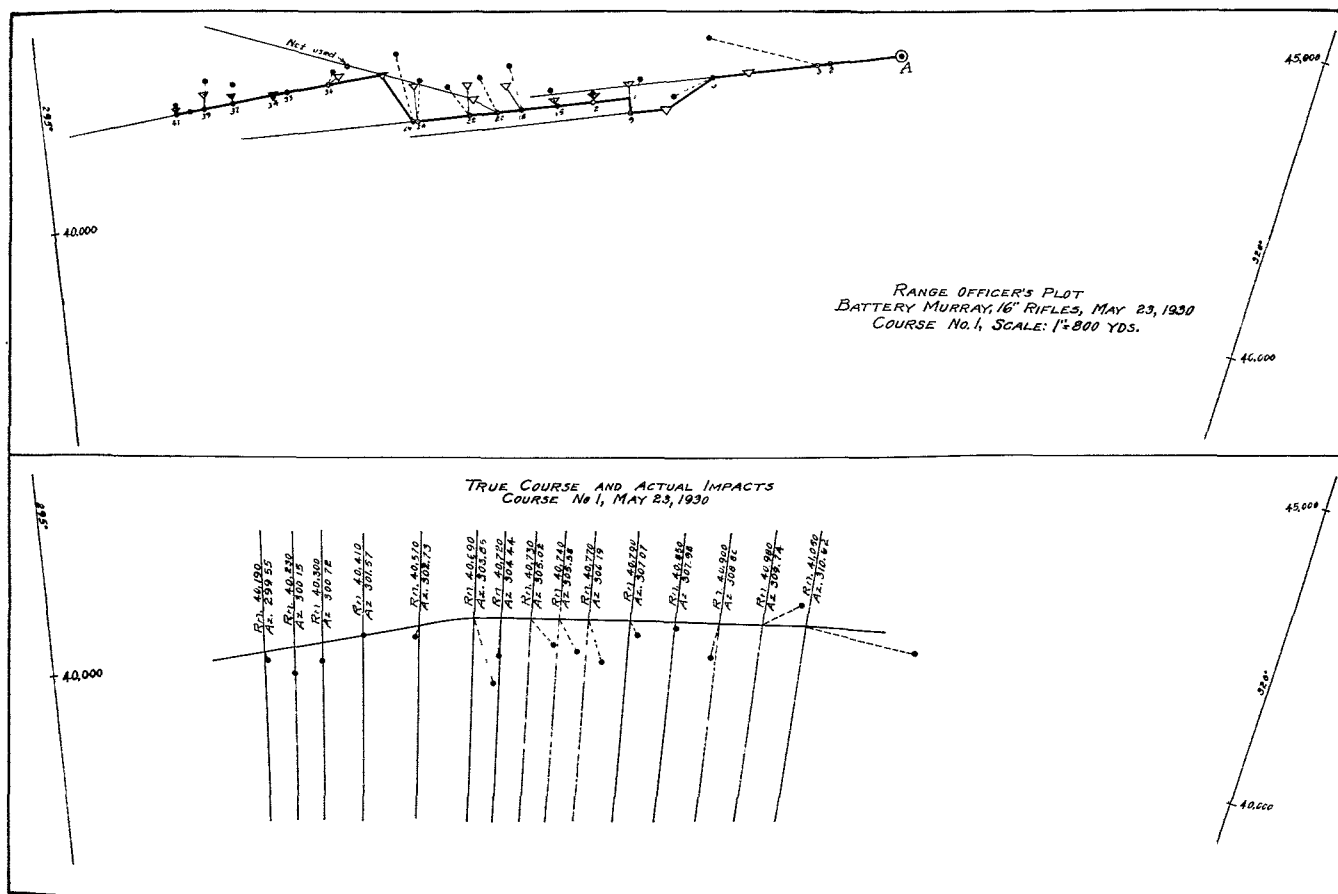
along the course by a distance equal to the length of the towline a similar point was easily found for the target, and comparison of this point with the point that represented the laying of the battery gave a deviation that could be "spotted." Of course, hitbag dispersion was introduced. After a lapse of time equal to the time of flight this spotting was transmitted to the firing battery by a buzzer installed to simulate radio from the plane. If such a drill was not started by a real location received from a plane it would commence with a message from the safety section, in code and transmitted by buzzer, the data being incorrect so as to require adjustment.

In the communications system installed there were

a remote control of the sending set a considerable distance away.

The long range practice selected as an example is that fired on May 23, 1930, first course. The Range Officer's report is quoted in full with a copy of his plot. The Range Officer's Plot proper occupies the upper part of the paper and is an exact reproduction of the data that appeared on the plotting board at the time of firing, with the addition of one item of information explained below. The true course of the target is derived from plotting of horizontal base readings taken at the time of firing but not available to anyone in the firing battery at that time.

The course of events which accompanied the plot-



three principal points of interest; the data check system, the firing signals, and the radio installation. Firing data was transmitted to the guns by telephone in the usual way. It was also transmitted to the safety section, by telephone, for determination of its relation to the towing vessel. The azimuth, if found safe, was repeated to the emplacement where it was compared with the azimuth received from the plotting room, and fire was suspended if it failed to check. The firing signal was operated by the safety section on a circuit that also contained a switch installed in the plotting room of the firing battery. This permitted either the range section or the safety section to suspend firing. A radio receiving set was installed in the plotting room of the firing battery, the operator stationed there being in direct communication with the plane through

by the range officer is recounted by him in his narrative report. In general, lettered points were used to indicate the initial location of the target as made by the aerial observer and corrected ballistically before plotting. Lines joined these lettered points to numbered points, the latter indicating set-forward points that did not require further correction because of their derivation. This line of predictions was at first the direction reported by the observer as the course of the target, and the distance between predictions was determined by the reported speed and elapsed time. The number on each numbered point indicates the time in the T.I. system, one minute intervals, on which the range and azimuth taken from this point was good for firing. The lines joining the various points are made heavy over those parts of

the course used in predicting and are reduced to light lines when shift was made to predictions along a new line. Heavy lines join the old course to the new to assist the reader in following the course of predictions.

Triangles indicate the "ballistic points" derived from spotting and available to the plotter at the time of firing. Black dots on the Range Officer's Plot proper mark the ballistic points derived from plotting camera records and available for analysis only. Comparison of the two shows graphically the total spotting error; observation, transmission, and application. On the plot of the actual course of the target, shown on the lower part of the paper, actual positions of the target at the various instants of impact are marked by the drawing of a battery-target line across the course. Each of these positions is connected to a black dot that indicates the actual point of impact. It will be noted that each line showing an actual deviation is equal in length but opposite in direction to that used in deriving the true "ballistic point."

Range Officer's Narrative Report

May 23, 1930, 1st Course

"At 11:32 A.M. the plane was asked to locate moving target east of Taboguilla. At 11:37 A.M. the plane reported mine layer coordinate 64 AL 14 11:37 proceeding azimuth 35 (Air Corps) at 6 miles per hour. This message was interpreted, corrected ballistically, and plotted at point "A." Prediction was made and time 2 being reported safe, the gun was loaded and fired at time 3. The plane reported this shot at 6 o'clock—1000 yards. This was directly behind the target and a full correction was made in azimuth alone, and the next shot fired at time 6. Shot 2 was reported 5 o'clock—800 yards. A full correction in azimuth and range was made, and shot 3 fired at time 9, being reported at 9 o'clock—400 yards. As this deviation was not considered excessive in range and was correct in azimuth, one-half correction was made in range, shot 4 being fired at time 12. This shot was reported as 9 o'clock—50 yards. No correction was made and the 5th shot was fired at time 15, being reported 8 o'clock—100 yards. No correction was made and the 6th shot was fired at time 18. Before the sixth shot had struck it was decided to try the feasibility of firing every two minutes instead of every three minutes so a prediction was made for time 20 and sent to the safety section just as the spot for the sixth shot was coming in, which was 8 o'clock—400 yards. The seventh shot was fired at time 20 and before this was spotted the prediction for time 22 was set to the safety section, the speed of the target having been increased to 7 miles per hour as the shots were falling behind the target. The 7th shot was reported 7 o'clock—400 yards, and a prediction made for time 24, making a correction in azimuth. In the meantime, shot 8 was fired at time 22 and reported

at 9 o'clock—400 yards. This was an error in transmission or reception and should have been 7 o'clock—400 yards, thus backing up the evidence of the previous shot. The plotter had expected that shot 8 would fall behind the target, and when it did not the plotter was somewhat mystified. However, a prediction was made for time 26 falling just beyond the prediction for time 24. Shot 9 was fired at time 24 and no prediction made for shot 11 until the fall of this shot. This shot was reported 9 o'clock—500 yards justifying the large azimuth correction. A hasty survey of the fall of the shots indicated that the direction had changed and the large azimuth correction should have been included in the prediction for time 26, therefore "relay" was given but too late to stop shot 10 which was fired on time 26. No prediction was made pending the fall of shot 10 which was reported 8 o'clock—800 yards, target turning course 20 (Air Corps). New courses were laid out based on the fall of previous shots and the aviator's new direction. It was decided to use the information from the plane, and so shot 11 was fired on time 30 being reported 11 o'clock—100 yards. No correction was made and a prediction was made for time 33 which was lost by the safety section. Shot 12 was fired on time 34 and reported target by the plane. NOTE:—This shot actually ripped the canvas from the target, range 40,410 yards. No correction was made and shot 13 was fired on time 37. The speed of firing was again increased and prediction made for time 39. Shot 13 was reported 9 o'clock—100 yards and no correction was made predicting for time 41. Shot 14 was fired on time 39 and reported 9 o'clock—100 yards. Shot 15 was fired at time 41 and reported 9 o'clock—50 yards. Cease firing was given by the Harbor Defense Commander. The course was apparently adjusted."

Comments

At first glance it might appear that the plotter was hasty in starting his successive approximations on a reported deviation of eight hundred yards, but it must be remembered that the report of nine o'clock on the next shot corroborated the magnitude of the previous deviation which was at five o'clock, and he had crossed the target. However, too many shots were permitted to fall with deviations in the same sense. This was largely the result of experimenting with an increased rate of fire. Certainly there should be a good indication that fire is actually adjusted before speed is attempted, and here three successive shots in the same sense contradicted that presumption.

The change in direction of towing was reported correctly and promptly. The plotter acted correctly in making full correction before changing the direction of his course. While the twelfth shot was a direct hit, the course cannot be called adjusted as none of the last five shots are over and the trend of the ballistic course is outward.

The 51st Crosses Hampton Roads

By Captain L. C. Mitchell, C. A. C.

THE 51st Coast Artillery, Tractor Drawn, was ordered to leave Fort Monroe May 13, 1931, and to take position at Fort Story for the conduct of two battery target practices for the officers of the Coast Artillery School, one battle practice, the filming of a 155 mm. battery training film, and joint Army and Navy exercises.

For the forty mile journey it was decided to divide the regiment, now reduced to two 155 mm. G. P. F. firing batteries and a headquarters battery, into two columns, a heavy and a light. The light column presented no particular problems for the relatively short distance involved. The convoy pulled out of Fort Monroe at 7.30 a. m. on a commercial ferry plying between Old Point and Willoughby Spit. As it meandered along the scenic shore road to Cape Henry,



Navy Barge—Light Materiel.

The loaded barge pulls out with the light vehicles.

camera cranks turned and one of the scenes of the training film was recorded. Returning to the home station, Fort Story was cleared at 4:00 a. m. on May 30 and a detour of the return route increased the distance to the ferry by over ten miles.

The heavy column had to cross Hampton Roads also and the heavy pieces of this command could not be considered proper cargo for a commercial ferry boat. Of course some of the lighter vehicles might have cheated, crossed commercially, and then awaited the arrival of their bulkier comrades at the designated dock. But no one seemed anxious to take this undue advantage. When the roll was called the following lined up for the voyage:

- | | |
|------------------------------------|---------|
| 4 155 mm. G.P.F. guns | (a & b) |
| 8 10-ton Holt caterpillar tractors | (7a-8b) |
| 3 Gasoline trucks | |
| 1 10-ton cargo trailer | |
| 1 5-ton cargo trailer | (b) |
| 2 Plotting trailers | |
| 1 Rolling kitchen | |
| 1 Water trailer | |
| 3 Passenger cars | (1a) |
| 2 75 mm. guns | (b) |
| 1 Motorcycle with side car | (a) |

- 1 Machine gun trailer with two mounted machine guns
- 4 F.W.D. trucks
- 1 G.M.C. truck

Note: Transported on wooden barge.

(a) Outgoing trip

(b) Return trip

All other vehicles carried on steel barge.

For such a formidable array two barges of approximately the same size and dimensions were assigned. One was a 350 ton capacity wooden Army lighter with a deck house on one end. The other was a 500 ton steel Navy barge with sides. Both were open. The wooden lighter was chosen to bear the brunt of the guns and tractors. This choice was made not because of loyalty but because the wooden barge had been used successfully before and it was believed the chocking and securing of the heavy material could better be accomplished on a wooden surface than a steel flooring. The total load was not expected to exceed 150 tons. The Navy barge was designated to convey the remaining vehicles. The Quartermaster tugs "Pence" and "Reno" were assigned to the Army and Navy barges respectively.

The equipment listed below proved to be adequate for all conditions of loading and unloading:

- 100 feet of rope—diameter 2 inch or 3 inch
- 1 10-ton tractor with winch for hauling
- 1 10-ton tractor for securing
- 2 Channel irons with characteristics as follows:
12 feet long, track 24 inches wide, 5 inch flanges, metal $\frac{3}{8}$ inches in thickness. Beams were notched to engage guard rail of barge and under flanges tapered on ends to fit flooring. (See diagram of improved channel iron.)
- 1 Snatch block for three inch rope
- 4 Chock blocks for guns, part of regular equipment.

Lumber for cribbing as follows (Oak suggested):

- | | |
|-----------|-------------------------------------|
| 20 pieces | 12' x 10" x 3" |
| 15 " | 12' x 8" x 2" |
| 10 " | 12' x 10" x 1" |
| 10 " | 6' x 12" x 3" |
| 10 " | 6' x 8" x 2" |
| 32 " | 18" x 12" x 12" (for chock blocks.) |



The Loaded Barge Leaving the Army Base.

- | | |
|-------------------------|-------------------------------|
| 4 155 mm. G. P. F. guns | 8 10-ton caterpillar tractors |
| 2 75 mm. guns | 1 5-ton cargo trailer |

Several factors governed the time of the start of the loading and consequently the problem of the tide at Fort Monroe was relegated to the background.

(1) It was not desired to remain overnight at the Army Base.



This Picture Illustrates the General Method of Loading the Guns.

floor of the barge was about four feet above the level of the dock. For lessons in the solution of the problem, the student officers of the Coast Artillery School were ordered to attend the embarkation and were present with mimeographed questionnaires. It was obvious that the tide was not ideal for loading but action was expected. The situation demanded an attack.

No particular difficulties were encountered in either the loading or the unloading of the steel barge. Most of the vehicles were moved on and off under their own power. A tractor was employed for the dead weights. The construction of the barge necessitated end loading. Heavy side stanchions of steel, closely spaced, prevented any other possibility. Wooden runways with

(2) A filming of the moving convoy was scheduled. This required favorable light and scenic conditions.

(3) It was desired to stop for the night before reaching Fort Story so that the journey could be continued and the guns emplaced with ease the following morning without blocking the roads. Such a favorable

DIAGRAM OF LOADING ARMY BASE

Unloaded from this side

Material	Tractors	155mm G. P. F. Guns	Tractors & Trailer
HOUSE	No 9 No 7	No 2 No 1	No 13 Trailer No 5
	No 10 No 8	No 11 75mm Guns No 12	57 No 14 No 15 No 6
Material			
HOUSE			

Points of loading

Loaded from this side

DIAGRAM OF LOADING FORT MONROE

Unloaded from this side

Material	Tractors	155mm G. P. F. Guns	Tractors*
HOUSE	No 7 No 5	No 4 No 3	No 13 No 10 No 9
	No 8 No 6	No 1 No 2	Passenger Car Material Motor Cycle
Rolling Kitchen	No 11		No 14 No 12

Points of loading

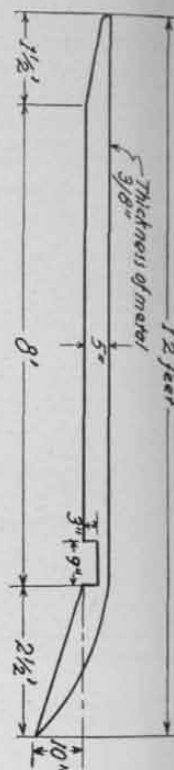
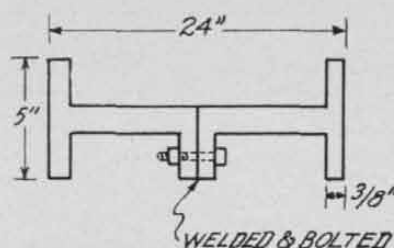
Loaded from this side

Numbers indicate order of loading

parking space was found just before reaching Virginia Beach.

When the loading details reached the main wharf at Old Point shortly after 5:00 a. m., the tide was nearly high, high water being at 6:00 o'clock. The

METAL RAMP Made from I beams

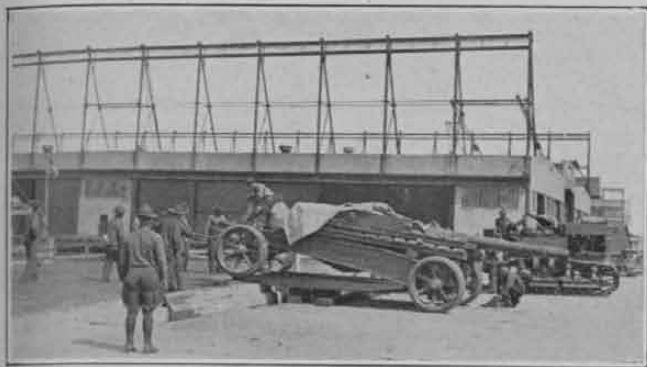


proper cribbing provided the ramp. Once set for loading or unloading it was not necessary to move the barge or the ramp. Though it took about as long to load the steel barge with the light materiel, the problems involved were not particularly serious and the remainder of this discussion will be confined to the heavy pieces and the wooden Army barge.

Regardless of several objections it was decided to use side loading onto the wooden barge for the guns and tractors. The heavy pieces seemed to fit better in this manner. The width of the barge was slightly more than the length of the gun and twice the length of two tractors in column. But, at Fort Monroe, for each gun it was necessary for the tug to move the barge. The continual shifting not only consumed time but it was inconvenient. Moreover, there was but one place on the side of the Old Point dock from which loading or unloading could be conducted properly. The tractors required but two points of loading and were able to move about fairly well on their own

power. The odd pieces did not require much attention.

The channel irons used for the ramp were broad enough to take the track shoes of the tractors. These irons were I beams welded together with the resulting upper center flanges removed. The ends were shaped



Showing Need for Longer Channel Irons.

The rear ends of the irons about to engage the gun wheels.

to fit the flooring. Sufficient blocking was used to distribute the strain on the beams, to fill in between the dock and the barge, and to ease the grade both on the dock and the barge. This arrangement worked very well. However, the channel irons could have been about two feet longer so as to more than straddle the wheel base of the gun and limber. As another possibility they might have been bent on the barge

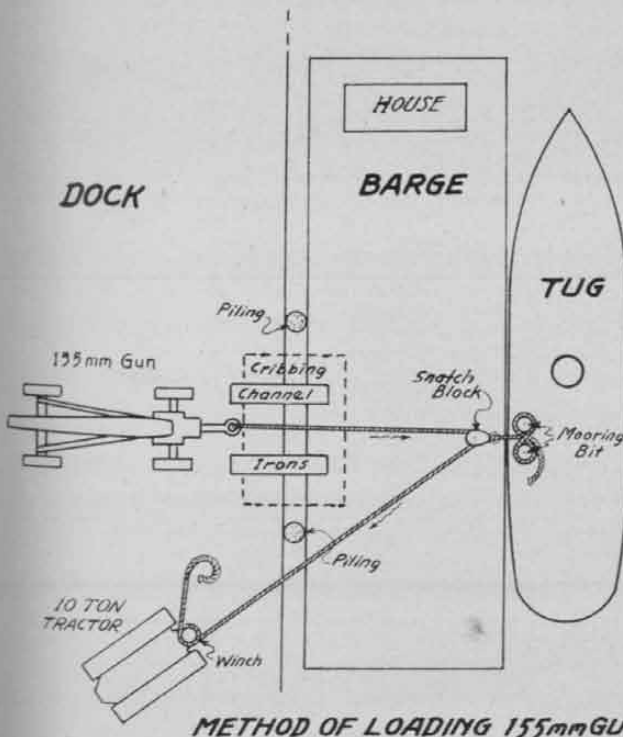
this difficulty). The steel treads of the tractors slipped on the steel beams. One inch boards were laid on the beams to provide a proper bearing surface. In the unloading at Fort Monroe we tried to short change one tractor by giving it but one board. It refused to be slighted and we had to call a free tractor to encourage its mate to dismount.

On at least one former occasion it had been found that the capstan of the mine planter was efficient in hauling the guns aboard the barge. It was concluded the winch of the "Pence" was capable of a similar performance. When the complete "Pence" set-up was made and power applied nothing happened. Thus repulsed, a shift was made. A hawser was passed from the gun limber through a snatch block attached to the tug and thence to the capstan of the tractor. Again power was applied. Gun No. 1 majestically mounted the ramp, quivered at the critical moment as if undetermined, and then soon reposed peacefully on the barge.

The unloading procedure was quite simple. The tractors could escape easily under their own power.



Showing General Method of Unloading. Note the Use of Two Tractors, the Ramp, and the Blocking.



METHOD OF LOADING 155mm GUN

ends, as shown in the diagram, so as to eliminate the need for cribbing at this point. One student officer suggested hooks on the irons to engage into the guard rail of the barge. Several times one end of the beam jumped up unceremoniously to grab the gun wheel at an inconvenient time. (See the photograph showing

The guns were pulled off by chains attached to the limber and moving tractor. The odd pieces were drawn aboard by hand or winch and withdrawn by tractor.

The conditions for loading and unloading at the Army Base were most favorable. The barge could dock nearly flush with the landing. The piling prevented this contact at Fort Monroe and always left an awkward gap of a foot or more which had to be bridged. At the Base the level of the wharf was approximately that of the floor of the barge. Channel irons were not found necessary, though they were employed in the loading as a matter of convenience. The barge did not have to be shifted—simply the ramp.

Much can be accomplished in tipping the barges by shifting loaded weights. In end loading particularly the level of the loading end of the barge was jockeyed with one or more tractors. In side loading the floor level could have been brought more in line with that of the dock by employing free tractors. Without cargo the barge flooring was about four feet above the dock

when loading began at Fort Monroe. When loaded, this discrepancy had been reduced to about a foot and a half, the tide accounting for one foot of the drop. At the Army Base the barge was eighteen inches above the dock at the start and ended six inches below. The tide was responsible for a drop of six inches. In each case the freight made a difference of about eighteen inches. A general observation can be made: at Fort Monroe a low tide is most desirable in both loading and unloading; at the Army Base the tide does not play a prominent rôle.

It was discovered that the tug was not able to keep the barge close to the landing, especially in the unloading. At the instant the unloaded piece lost contact with its former footing, the barge would rebound and the blocking between the barge and the pier would drop into the water. To prevent this effect, a tractor on the dock kept a tight line on the barge at all times thus eliminating the backlash.

For a comparative analysis all times were recorded, the most important of which are included herein. In their study, proper consideration should be given to these pertinent conditions:

(a) The general disadvantages in either loading or unloading at Fort Monroe, especially that requiring a shifting of the barge.

(b) The high tide of the Fort Monroe loading.

(c) The inexperience of some of the personnel.

(d) The fatigue of the personnel on the return. The heavy column left Fort Story at 10:50 p.m., May 29, and travelled all night after a severe three-day Army and Navy maneuver.

(e) A heavier load was transported on the return.

LOADING

Operation	Fort Monroe	Army Base
Arranging blocking	55 min.*	10 min.
Loading guns	1 hr. 38 min.	43 min.
Loading tractors	30 min.	23 min.
Loading miscellaneous	12 min.	4 min.
Total loading time	2 hr. 20 min.	1 hr. 10 min.
Total time	3 hr. 15 min.	1 hr. 20 min.

*Includes experimentation.

UNLOADING

Operation	Army Base	Fort Monroe
Arranging blocking	5 min.	10 min.
Unloading guns	20 min.	41 min.
Unloading tractors	5 min.	18 min.
Unloading miscellaneous	5 min.	9 min.
Total unloading time	30 min.	1 hr. 8 min.
Total time	35 min.	1 hr. 18 min.

TOTAL ELAPSED TIME

From unloaded at Fort Monroe to unloaded at Army Base, 6 hr. 10 min. (including trip across Hampton Roads).

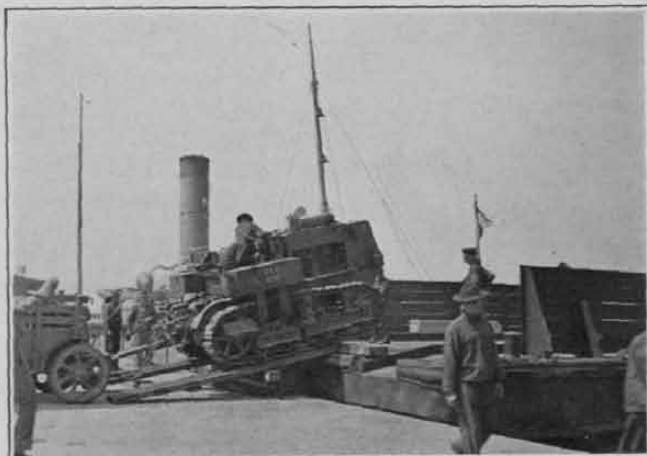
From unloaded at Army Base to unloaded at Fort Monroe, 4 hr. 21 min. (including trip across Hampton Roads).

Left Fort Monroe 8:40 a. m., *Arrived Fort Story 10:30 a. m., May 13.

Left Fort Story, 10:50 p. m., Completed unloading at Fort Monroe, 1:36 p. m., May 30.

*Includes overnight stop near Virginia Beach.

Now that the entire Fort Story movement of 1931 has become a matter of history, one can reflect on some of the lessons arising therefrom. The problem was most interesting and instructive to all concerned. The results were gratifying. The flooring of the dock and the lighter withstood the strain of the heavy weights. There were no casualties. But the equipment, the methods, the time, can be improved. However, under normal conditions, the loading at Fort Monroe can hardly "be accomplished easily—in a half hour," as one bystander suggested after watching the procedure.



The 10-Ton Cargo Trailer Being Pulled Aboard the Navy Barge by a 10-Ton Tractor.

The Zeebrugge Raid

By Major S. S. Winslow, Coast Artillery Corps

THE British blocking raid at Zeebrugge was one of the most interesting incidents of the World War. It shows clearly what can be accomplished against almost impregnable defenses if operations are planned carefully and carried out with sufficient dash and energy.

In the latter part of 1917 and the early part of 1918 the Allied front extended from Nieuport along the Yser Canal to the east. The Germans controlled the coast of Europe from Nieuport to the southern boundary of Holland and again from the northern boundary of Holland to Denmark. Zeebrugge is on the Belgian coast, directly across the English Channel from England, and only 72 miles from Dover.

It was the period of greatest German submarine activity. The Germans were trying to starve England by sinking all inbound commerce, most of which came to ports on the south and west of England. The British were greatly inconvenienced and were seeking more effective methods of combatting the submarines.

The Germans had two possible bases of operation; one in the vicinity of Zeebrugge and Ostend, and one near Helgoland. Submarines have very definite limitations in their activities. They can carry fuel and supplies for only a certain limited mileage. They wish to stay on the hunting grounds as long as possible, yet they must start back in time to reach port with a reasonable margin of fuel in their tanks. In order to keep their storage batteries charged they have to be on the surface, with engine running, about two hours for every hour of running submerged. Every mile of unnecessary running to and from their bases is a dead loss to be avoided. As Helgoland is some 300 miles north of Dover—about a day's surface run in each direction through the well patrolled English Channel, the importance of the bases on the Belgian coast is apparent.

The main German submarine base was at Bruges, an artificial port constructed about eight miles inland. There were ship canals to Zeebrugge and Ostend, but the Ostend Canal was too shallow to be used by the larger boats, and was not so important. During the early part of 1918, an average of about 18 submarines and 25 destroyers were actually at Bruges every day, well inshore and safe from attack. Concrete bomb-proof shelters had been constructed to protect the submarines. Bruges was a very important base to the Germans, and a successful blocking of the Zeebrugge Canal would render it useless.

The Germans appreciated its importance and had built up a very complete set of defenses which, with the natural difficulties of approach, were very formidable.

The local defenses consisted, first, of the mole, or

breakwater, which made an artificial harbor at the mouth of the canal. This mole was more than one and one-half miles long. At the shore end it began with a stone railway pier, 250 yards long. Then came an iron-piled viaduct 350 yards long. Then came the mole, proper, 81 yards wide and 1875 yards long. Beyond this was an extension 260 yards long and 15 feet wide, terminating in a lighthouse. The floor of the mole proper was nine feet above high water, and on the inner side it was fitted with a pier where ships could dock and discharge freight. The Germans had established an airplane base there. On the outer side, the wall was built up 20 feet above the level of the mole proper to keep out the waves. This brought the top of the wall to a height of 29 feet above high water level and 44 feet above low water level. This wall was ten feet thick at the top. Inside and four feet below the top was a path nine feet wide with a rail on the inner side. A few flights of stairs led down from this path to the wharf level of the mole, 16 feet below. These stairways could not be seen from the outside.

On the extension of the mole was a battery of six or seven six-inch guns. On the beach, on each side of the canal entrance, were batteries of guns, four to twelve inches in caliber; trenches; barbed wire entanglements; and machine guns; also there were booms that could be used to close the mouth of the canal against enemy vessels. There were also three six-inch guns on the inside of the end of the mole proper, as well as torpedo tubes which could be brought to bear as soon as a vessel came by the end of the mole. Barbed wire entanglements and machine guns made a strong point on the mole, which was garrisoned by more than a thousand men. Also, on the stretch of coast three miles west of Ostend to six miles east of Zeebrugge, a total of 21 miles, were 225 fixed guns, 136 of which were heavy guns of from six to fifteen-inch caliber. Many of these were turret guns.

Besides all of this an attacking force would be faced with the difficulties of navigation. The coast in this vicinity is flat, the water is shallow, with strong tides, and many frequently changing bars. It is a dangerous coast in fair weather and daylight. At night, in fog, either natural or artificial, with no aids to navigation except those placed by the Germans and understood only by them, and German mine fields of unknown locations, it looked almost hopeless. It is believed that the Germans also had a subaqueous sound ranging system, but it is not known how effective this was.

Attempts to block channels have never been successful. In the Spanish-American War an attempt was made to sink the Merrimac in the entrance of the

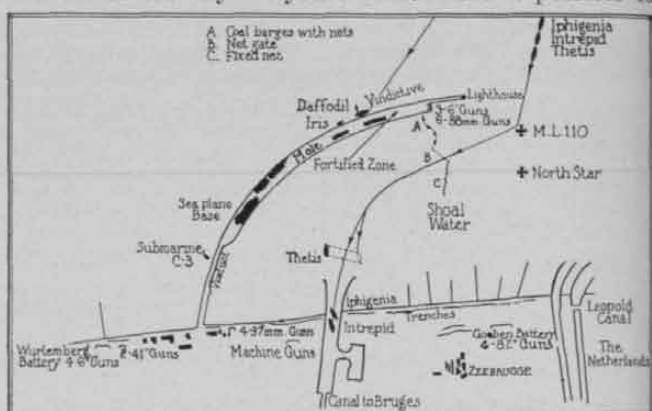
harbor at Santiago. The ship was sunk but not in position to prevent the Spanish fleet from coming out. During the Russo-Japanese War, the Japanese made repeated attempts to block the harbor of Port Arthur by sinking stone barges in the channel. All of their efforts were futile and the Russian fleet came and went at will. In the World War, a German light cruiser took refuge up one of the small rivers of South Africa. The Germans knew that the British fleet would attempt to destroy the vessel and they tried to block the channel. This effort was made under practically peace-time conditions, with no English ships present. But it was not successful. The difficulty lies in the fact that there is always a strong tide in a narrow harbor entrance. Even if the vessel is moored both bow and stern, as soon as it begins to sink the cable slackens and the ship swings out of the desired position.

The British, however, felt that they had to break up that base, so they developed plans to block the channel by sinking vessels in the mouths of the canals at Ostend and Zeebrugge. Let us follow the attack at Zeebrugge.

The British had first to find Zeebrugge. This they planned to do by sending boats ahead to learn the hydrography and mine fields. These boats would find their way in under cover of darkness and plant buoys at certain designated spots just a few moments before the fleet arrived. Next, they must have fog or smoke producers, which would produce fog when and

Unless the attack was a complete surprise, the chance for success was very slight. The approach and get-away had to be made under cover of darkness, and the smooth 44-foot outer wall of the mole made it necessary that the attack be made almost exactly at high water. The requirements of proper tide and darkness could occur only on about three nights in each month, and weather and wind conditions on those nights must be perfect if the attack was to be successful.

It was also necessary to block the channel so that it would stay blocked. Modern salvage practice and the use of the oxy-acetylene flame make it possible to



Sketch No. 2.

remove ordinary wrecks almost as fast as they can be put ashore, under conditions of shoal water and smooth sea such as would obtain at the mouth of the canal.

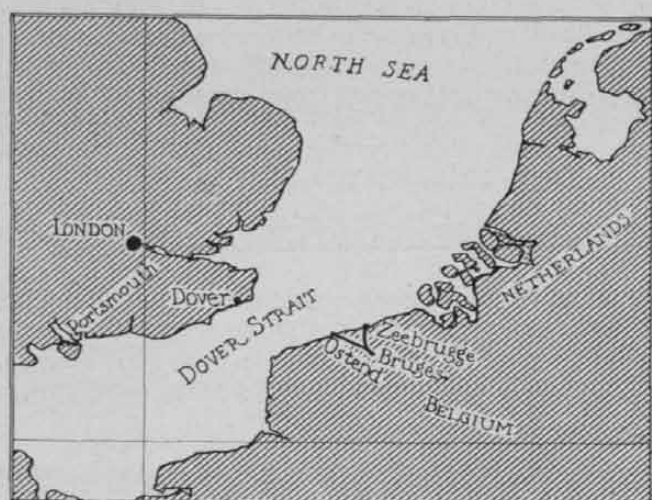
In general, it was planned to run the old British cruiser *Vindictive* alongside the outer face of the mole, pushing her up against its face with two ferryboats butted against her sides until she could be secured by grappling hooks to the top of the wall. The ferryboats were then to run alongside the wall themselves.

All three ships, by means of specially constructed gangways running from the deck of the ships to the top of the wall, were to put landing parties ashore to attack the personnel on the pier and do all possible damage. These parties, once on top of the wall, had a 16-foot drop to the main pier below, and had to get back over that wall with their wounded on their return after the attack.

In addition to the attack on the mole proper, two old submarines loaded with explosives were to run under the railroad viaduct until they stuck. They were then to be exploded, blowing up the viaduct and prevent reinforcements and all further communication with the mole, except by boat, until it was repaired.

Twenty minutes after the ships went alongside the mole, three blocking ships, the old cruisers *Iphigenia*, *Intrepid*, and *Thetis*, were to run up into the canal, swing sidewise until they blocked the channel, blow out their bottoms and sink. Their crews were to be taken off under cover of artificial fog by power cutters.

Finally, about one and one-half hours after the ships first went alongside the mole, upon whistle and searchlight signal from the *Vindictive*, the landing forces were to be recalled, and the whole expedition was to withdraw and return to England.



Sketch No. 1.

where wanted to protect the attacking force from enemy observation and close range fire. Next, they must have diversions, so that the enemy would be so stirred up that he would not know what was planned and would use up his energy stopping the diversions while the main effort, the blocking of the canal, went through. These diversions were to take the form of an air bombing attack, a long-range bombardment, an actual attack on the mole designed to draw fire, occupy the Germans, and do all possible damage, and the destruction of the railroad viaduct to prevent reinforcement of the mole; all in addition to the actual blocking of the canal by sinking ships in its mouth.

Actual detailed plans were to begin about December 1, 1917, and all was ready to make the first attempt some time in March. A great deal of special equipment had to be arranged and fitted, and very detailed plans and orders had to be issued. Military orders involving elaborate details to a large number of elements are difficult to write and execute, and in this instance there were some 80 vessels and boats of various types engaged in the expedition.

All was ready early in March, and the first attempt was made some time in that month. The expedition moved across the English Channel and was almost ready to begin the attack when the wind suddenly changed, rendering smoke screens useless, and the attack was called off. Apparently the Germans did not discover that a general attack was intended. A couple of days later a second start was made and again the attack was called off. The remaining few days in March when the attack could have been made passed with unfavorable weather, and the expedition settled down to await the April period, worrying all of the time about the chance of discovery.

The fleet of ships that made up the expedition had to move across the English Channel, visible to friendly, neutral, and less than neutral ships, as well as to possible German submarines. The vessels of the expedition, with their special trappings, could not fail to attract attention. It seemed impossible to have this expedition make two trips across the English Channel without the Germans getting wind of it; and unless the trip was a complete surprise there was no chance of success.

Finally on April 22, high tide came at the proper time, weather conditions appeared suitable, and orders for the start were again issued. The expedition started out at noon and mobilized at a designated point in the English Channel. It then moved to a second point where the extra crews not actually needed for the attack proper were taken off, and the force then set out for the actual attack. The two ferryboats and two submarines had to be towed most of the way as they could not maintain the necessary speed or carry sufficient fuel convenient to the boilers for the round trip.

At the second rendezvous point the fleet formed in the proper order and moved to the attack. At about this time it began to rain hard, reducing visibility and rendering the air bombing attack impossible. It also slowed up the bombarding fleet in getting into position and delayed the beginning of the long-range bombardment. No data on the success of this bombardment are available.

The remainder of the expedition carried on. The *Vindictive* got to within 300 yards of the mole before it was discovered. The six-gun at the end of the mole immediately opened fire and for five minutes the *Vindictive* was under heavy fire at ranges of from 250 to 30 yards. At this range the guns could not miss, and the Germans fired as fast as they could at the general mass of the ship without deliberate aim at the more vulnerable parts. As a result, most of the shots were high, and while serious damage was done to the ship

and personnel there was none to the ship's engines, boilers, or underwater body. Upper works and funnels were badly shot up, and only four of the specially constructed gangways were left. The *Vindictive* was hit at least 60 times in this part of the attack, and suffered heavy loss in personnel.

The *Vindictive* slid along the mole, and after about five minutes' delay the ferryboat *Daffodil* appeared, rammed her nose against the *Vindictive* and pushed her alongside the mole so that the two forward gangways would reach. These were the only ones that could be used. Unfortunately, the *Vindictive* was

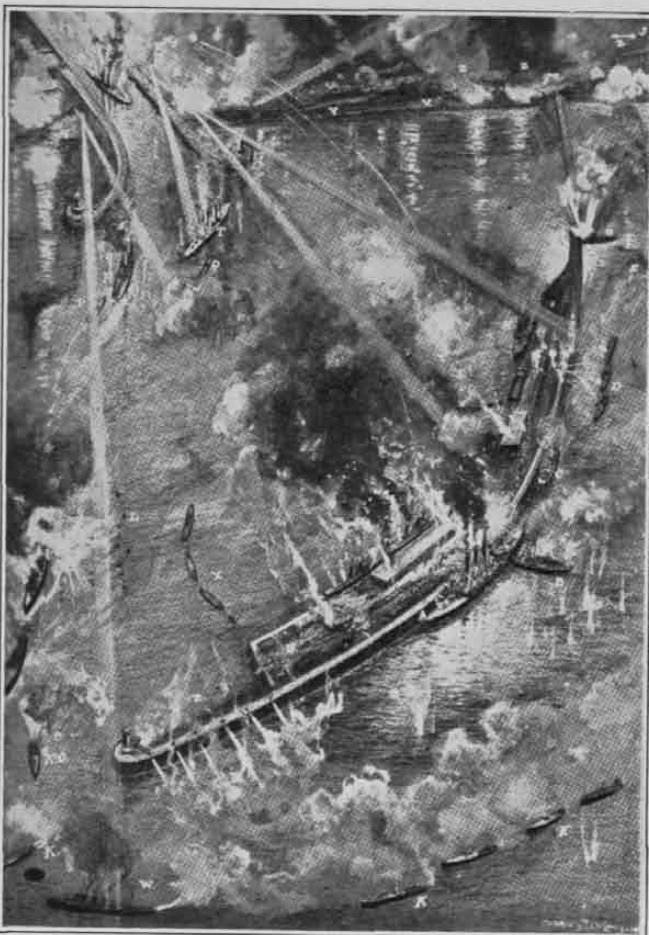
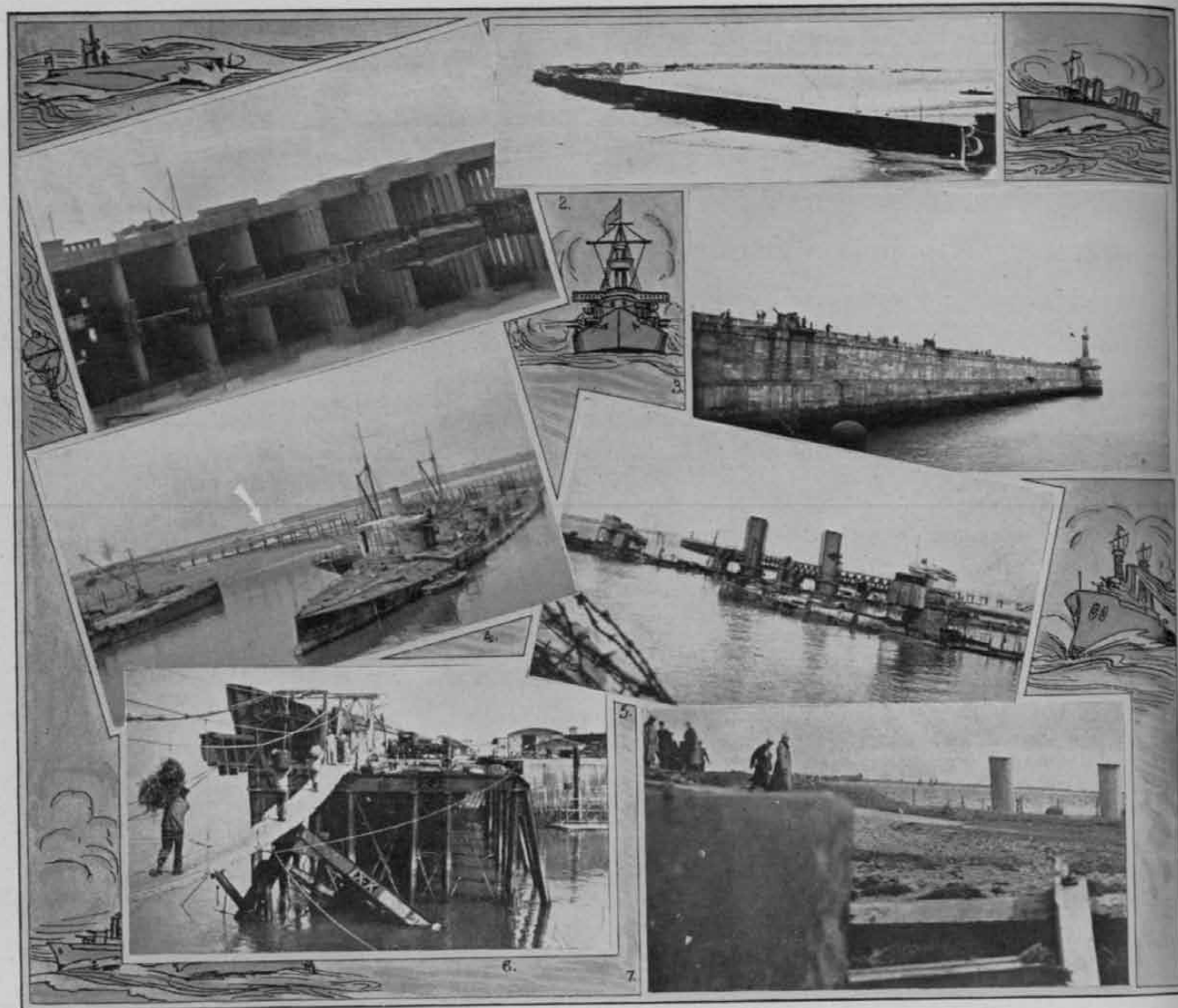


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Diagrammatic Sketch of the Attack.

- | | |
|------------------------------|--------------------------------|
| A—H. M. S. <i>Vindictive</i> | O—Position of approach channel |
| B—H. M. S. <i>Daffodil</i> | P—Rescue craft |
| C—H. M. S. <i>Iris</i> | Q—Rescue craft |
| D—Coastal Motor Boats | R—H. M. S. <i>Iphigenia</i> |
| E—Steam pinnace | S—H. M. S. <i>Intrepid</i> |
| F—Motor dinghey | T—H. M. S. <i>Thetis</i> |
| G—Submarine C3 | U—Trenches on Mole |
| H—S. S. <i>Brussels</i> | V—Trenches ashore |
| I—German destroyers | W—H. M. S. <i>Warwick</i> |
| J—To Blankenberghe | X—The barge boom |
| K—Motor launches | Y—The Canal |
| L—Entanglement net boom | Z—German batteries |
| M—H. M. S. <i>Phoebe</i> | |
| N—H. M. S. <i>North Star</i> | |

finally secured about 300 yards farther along the mole than was planned, which landed the men outside of the fortified area. The *Iris* also appeared, ran alongside the mole, and landed her party. It was originally



1. Bomb Proof Concrete Shelters for Submarines at Bruges.
2. General View of the Mole.
3. The End of the Mole Showing Guns and Lighthouse.
4. Arrow Points to Gap in Viaduct caused by Submarine Explosion.

- 4 and 5. Block Ships Sunk at Entrance to Canal.
6. Temporary Suspension Bridge Over Gap in Railroad Viaduct after the Attack.
7. Kaiser Wilhelm Views the Remains the Day after the Attack.

planned to hold the *Vindictive* against the wall by heavy grappling irons, but it was found that these could not be used, and it was necessary for the *Dafodil* to maintain her position with bow against the *Vindictive*, pushing her against the wall throughout the attack. A few of her landing party went over her bows and over the *Vindictive* to land on the wall.

Meanwhile one of the submarines came in and ran in between the piles of the viaduct until she jammed solid. The crew took to the boats and, although under heavy fire, managed to explode the charges and get away without the loss of a man. The propeller was broken on the launch, and the crew had to paddle away as best they could under heavy machine gun fire. The other submarine had parted her tow-line on the way across and no stop was made to pick her up. She came in later under her own power but found the

Vindictive withdrawing, and so took no part in the attack.

Some twenty minutes after the *Vindictive* went alongside the mole, the three block ships came in, in order *Thetis*, *Intrepid*, *Iphigenia*. The *Thetis* got close in before coming under fire and then was fired at by the guns on the mole extension only. Apparently the guns on the inside of the end of the mole were not manned. She passed quickly around the end of the mole, where the tide caught her and rushed her over into the net entanglement. Her momentum carried her through, but her propellers were fouled, stopping the engines; and she grounded. She was under heavy fire from the shore batteries. When the other block ships had passed, as it was impossible to move her and she appeared to be partially blocking the channel her bottom was blown out and she was sunk in position.

The *Intrepid* came in next, passed the mole without difficulty, entered the canal, reached the position assigned, turned sideways to block the channel, blew out her bottom, and sank. The *Iphigenia* also came in without difficulty, ran in close to the *Intrepid*, turned sideways in the channel, blew out her bottom, and sank. The crews of the block ships took to their boats and were picked up by patrol boats. They were under heavy fire but were partially protected by smoke. All three ships passed through an artillery barrage on the way in.

In the meantime, the Germans were shelling the boats alongside the mole with every gun that could be brought to bear. At 12:50 P. M., 50 minutes after the ships went alongside the mole, it was decided that everything possible had been done and that retirement was in order. This was to be done on siren and search-light signals from the *Vindictive*. Her sirens had been shot away and her search-lights were out of action. Word was passed to the *Daffodil* to sound her sirens; they had not been blown recently and were full of water, but they finally got out a noise loud enough to be heard. The British waited fifteen minutes, still under heavy fire, until no further men from the landing parties were in sight returning. Then all three ships cast loose and withdrew as rapidly as possible under cover of heavy smoke producers.

The claims of results obtained from this operation vary widely. According to the British commander of the *Vindictive*, Captain A. F. B. Carpenter, it was a complete success. He states that the *Intrepid* and the

Iphigenia were sunk exactly in the position selected, effectively blocking the channels, and that it was five months later before submarines or torpedo boats could enter or leave the canal except at high water. He states that 12 submarines and 23 torpedo boats were bottled up and not available for a considerable time, and that it was not until January, 1921, that the block ships were moved sufficiently to allow the ships to enter and leave the channel freely.

Admiral von Scheer, in his book, dismisses the operation in one short paragraph, stating that it was a daring raid, which caused only slight inconvenience at a cost of very heavy casualties.

The truth probably lies somewhere between these two statements. Airplane photographs taken soon after the raid show the ships sunk in the mouth of the channel, apparently closing it very completely. However, there is a sixteen foot rise and fall of tide there, and the soil is sandy and probably easily dredged. It is reasonable to suppose that by cutting away the upper works and hulls of these ships above low water, and by dredging around them, it would be possible for destroyers and submarines to move by them after a few days' delay. Admiral Bacon, who had commanded the British Dover Patrol, and had a different plan for the operation, and also Admiral Jellicoe, both admit that the results were not particularly satisfactory. There was no sudden drop in the number of merchant ships sunk by submarines. It would appear that the raid was a tactical success, but that the net results did not justify the cost.



Looking Down the Line of Barracks at Fort Amador, C. Z.

With the Mechanized Force on Maneuvers

By Captain Arthur R. Wilson, Field Artillery

THE May-June issue of this Journal contained a discussion of the present organization and equipment of the Mechanized Force, which under War Department orders will soon be reorganized as a reinforced mechanized cavalry regiment. Although the missions of the reinforced mechanized cavalry regiment have not yet been announced, it may be assumed that they will closely parallel those of the present Mechanized Force, and that the internal tactics that have been developed so far within the Force will be carried over into the new unit.

The primary mission of the Mechanized Force, as laid down by the War Department is, "To provide higher commanders with a powerful weapon of tactical and strategic opportunity, where the mission indicates the desirability of employing a force whose characteristics are high tactical and strategic mobility, hard hitting power, high mobile defensive power, limited holding power, and one which is capable of sustained independent action."

The effective employment of the Force, the War Department points out in a discussion of its tactical role, "is limited by certain terrain features. Careful consideration of the proper tactical missions to be assigned to it and to be assigned to neighboring troops, is, therefore, constantly necessary. * * * It is believed that its principal role will be the execution of those tactical missions presenting an opportunity for a force capable of high tactical and strategic mobility, and hard, quick, striking power. * * * Its ability to crush its way forward over highly organized ground in the face of stabilized resistance is secondary."

This conception of a mechanized force is based on its being provided with modern equipment which will give it great strategical mobility and considerable tactical mobility on favorable terrain. The present equipment of the Force, most of which will probably be included in the new regiment, leaves much to be desired; many of the vehicles, for example 1917 tanks, tank carriers, and Model 1919 self-propelled guns, are obsolete and unsuited for the purpose for which they must be used. But any unit, whether it is the Mechanized Force or a reinforced mechanized cavalry regiment will have to act as a field laboratory for the development of weapons and vehicles suited to its use. Tactical doctrine should not be predicated on vehicles available; rather the place that mechanized forces will have in the Army and in the general scheme of national defense should first be decided upon, and then vehicles and weapons developed and built with which the unit can satisfactorily fulfill its given missions. Furthermore, any type of organization that is set up will undoubtedly have to be changed from time to time to meet

the requirements of changed conditions brought about by improvements in motor vehicles and in weapons.

Mechanization has been defined as, "The application of mechanics directly to the combat soldier on the battlefield." But it is more than that; for in addition to applying mechanics it applies armor. It might be said then, that mechanization, from the military standpoint, is the combining of armor protection, fire power, and mechanically propelled mobility, to the combat soldier on the battlefield. A mechanized force or a reinforced mechanized cavalry regiment is an organization that combines those qualities. Such a force is mainly offensive. Its principal value lies in its *mobility*. Its success depends upon *shock*, which is secured by its speed and armor, and upon *fire power*, given by its large number of automatic weapons and its artillery.

To constitute a mobile unit in the hands of an army or a corps commander, the force must have strategic and tactical mobility. Strategic mobility includes the ability to cover long distances on roads; therefore the present vehicles of the force that are not built for high road speeds are transported on carriers equipped, whenever possible, with pneumatic tires. Tactical mobility is the ability to maintain the power of maneuver in battle and on ground leading up to the battlefield. For a mechanized force it must contemplate cross-country movements over trenches, ditches, small streams, broken ground and artificial obstacles. The Force has caterpillar vehicles and light cars which are capable of such movement.

With these facts in mind it may be interesting to follow the Mechanized Force on a strategical and tactical march and see how its elements are used in an attack. The most interesting of the many maneuvers held so far was one that demonstrated the ability of the Force to cover long distances on a strategical and tactical march, and to go into combat at the end of the tactical march. The two-day problem of June 16 and 17 is the most extended that has been undertaken: it took the Force on the 16th on a march from Fort Eustis to Camp Lee, near Petersburg, Va., and on the 17th from Camp Lee to Yorktown where it went into combat.

The Strategical March

The march from Fort Eustis to Camp Lee, via Richmond, was a purely strategical march to place the command in army reserve; it covered a distance of about 90 miles. For marches not in the presence of the enemy the Force uses a marching formation which has been adopted for ease of control in marching and for maximum flexibility in order that the best speeds may be secured and the concentration of vehicles on the road may be reduced to a minimum. The usual

convoy rules which have been practiced and adopted in motorized elements of our Army are followed. In this formation the Force marches in the following order:

(a) The *light group* consisting of the Armored Car Troop and the Machine Gun Company, with a traffic control section of one officer and three enlisted men all mounted on motorcycles, attached.

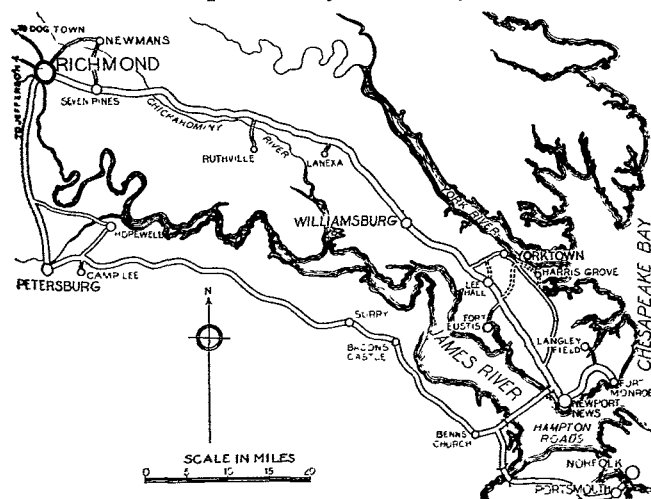
(b) The forward echelon of Force Headquarters cruises in the interval between the light and heavy group.

(c) The *heavy group*, which follows the light group at a distance of from zero to one hour, and comprises the Engineer Company and the Tank Company.

(d) The *gun group* follows at a distance of from zero to ten minutes and consists of the Field Artillery Battery, Chemical Detachment, and Antiaircraft Platoon.

(e) The *Trains* follow at a distance of from zero to ten minutes. They include the rear echelons of Force headquarters and of all combat troops, the Ordnance Company, and the Medical Section. A radio truck from Force headquarters is attached to the Ordnance Company in order that the Force commander may be apprised of any serious accident or forced elimination of a vehicle from the column.

Within groups the senior line officer of the group commands; and he can specify a general distance for his vehicles as about so many yards or so many telegraph poles between vehicles. When the groups halt at concentration points they habitually close into ser-



General Map.

tions of five or six vehicles with half a vehicle length between trucks, and 20 to 30 yards between sections. A halt is made at the end of one hour and thereafter every two hours. No halts are for more than 15 minutes. The Force commander orders concentrations at particular points or at specified hours; and he may specify the rate of march or it may be regulated by the leading group, usually the latter. In restricted areas the convoys are usually closed to one truck length to facilitate marching. Efforts are always made to have

state or city motorcycle police escort the Force through cities. Contact between groups is the responsibility of the group in rear, and this is maintained by radio and by motorcycle messenger.

In all of our formations on the road we deal in distance in units of time rather than in miles. It is more appropriate for the Force and easier for the organization commanders to know that they are to march at a certain rate of speed and at intervals of so many minutes than it is to say that they should be separated by so many yards or miles.

The Force left Fort Eustis at 7:00 A. M. and at 11:00 A. M. had concentrated on the outskirts of Richmond, where it halted for 45 minutes for a motorcycle escort. At 1:30 P. M. it arrived at Camp Lee and the units were assigned bivouacs in a wooded area. Most of the march was made in a very heavy and continuous rain, but there were no accidents and all vehicles reached Camp Lee under their own power. The distance marched was 91 miles in an elapsed time of six and one-half hours, or an average of 14 miles per hour. The total actual running time was five hours, or an average speed of about 18 miles per hour.

The General Situation

Having arrived in the area designated for the army reserve of the Blue army, the Force concealed its vehicles and bivouac from possible air reconnaissance. In the problem, Virginia (Blue) was at war with Maryland (Red). The Virginia army had suffered reverses and withdrawn south of the Chickahominy and James Rivers, where it held the line Ruthville-Richmond-Jefferson. The invading Maryland army was stopped on the line Lanexa-Newmans-Dogtown. Large Blue installations, including a mobile air base (at Langley Field) were on the lower Virginia Peninsula; and these were to be moved to the south side of the James River under cover of a reinforced Blue brigade which was holding a line through Lee Hall and had its headquarters at Fort Eustis. The Virginians had air supremacy and the Blue navy controlled Chesapeake Bay.

Late on the afternoon of June 16th the Blue army commander, who had his headquarters in Petersburg, received information that a Red division was moving south through Williamsburg with a view of capturing the installations on the Lower Peninsula, which he had expected to be able to move to the south of the James River by June 20th. At 2:30 A. M., June 17th, the army commander informed the commanding officer of the Mechanized Force that the Red division would doubtless attack the Blue brigade at daybreak. He expected to be able to move to the south of the James River Bridge, to reinforce the Blue brigade to enable it to make a counter-offensive and drive the enemy back to Williamsburg. At 3:00 A. M., a warning order was published directing that the reconnoitering detachment be ready to march at 3:45 A. M., the main body at 4:00 A. M., and the trains to await orders.

The Tactical March

At 3:30 A. M. Colonel Van Vorhis issued a field order giving the general situation and directing that

the Force march at once via Virginia Highway No. 10-Benns Church-James River Bridge on Yorktown to reinforce the 1st Blue Brigade in a counter-offensive. He directed the reconnoitering detachment rapidly to gain the north bank of the James River and reconnoiter all routes to the line, Yorktown-Halstead's Point-Lee Hall, and connect with the 1st Brigade; the main body to march at a rate of 15 miles per hour, and the trains to await orders at Camp Lee.

At 3:45 A. M. the reconnoitering detachment left Camp Lee under lights, followed by the main body at 4:00 A. M., just as day was breaking. The Force took up its tactical march formation, which is used when operating in the presence of an enemy and is designed for security and to facilitate the entry of the Force into action. In this formation the elements are disposed as follows:

(a) The *reconnoitering detachment*, consisting of the Armored Car Troop, less one platoon, and an engineer reconnaissance section in light cars.

(b) Then follows the *advance guard* consisting of the Machine Gun Company, (less one platoon), and one platoon of armored cars. In this particular case the advance guard left immediately after the Armored Car Troop, but allowed the reconnoitering detachment to gain distance on it. In some cases, the reconnoitering detachment may precede the advance guard by from two to five hours. If it is considered necessary an engineer reconnaissance detachment is also attached to the advance guard. This may be desirable if the armored cars precedes the advance guard by several hours, as the condition of bridges, roads, and the like, may change as a result of the enemy's air activities. If the elements have to pass through congested areas a small traffic control section is attached to the advance guard.

(c) Next comes the *Force Commander's group*, consisting of the commanding officer, S-2, S-3, the Signal Officer, and the message center section of the signal platoon. This section, all in passenger cars, usually moves in the interval between the advance guard and the main body, but may go forward with the advance guard when action is imminent and the Force commander desires to get first-hand information of the enemy.

(d) The *main body*, under command of the executive officer, is distant from the advance guard from ten to 30 minutes. It marches in three sections, with intervals of from one to five minutes between sections. The first section consists of the forward echelon of Force Headquarters (less the Force Commander's group), one antiaircraft squad, the Tank Company, and the Engineer Company, less such reconnaissance detachments as may be with the reconnoitering detachment and the advance guard. The second section, or gun group, consists of one antiaircraft squad, the Field Artillery Battery, the Chemical Detachment, and one machine gun platoon. This machine gun platoon may be used as a flank or a rear guard.

The third section, which is the *Combat Train* comprises one antiaircraft squad, one platoon of the Ord-

nance Company and the Medical Detachment. If necessary, a detachment of the Supply Platoon of Headquarters Company, with only such vehicles as are necessary for the specific mission, is attached to this section. The Ordnance Officer and a trouble man ride in the interval between the second and third sections to diagnose the trouble on any vehicle that may have been forced from the moving column. The time interval between these sections is simply to facilitate marching.

(e) At the operating base in the *Base Group* which includes: the rear echelon of Force Headquarters (S-1, S-4, and the Supply Officer), the rear echelons of all combat units, the Ordnance Company (less one platoon), the Headquarters company (less detachments) and the supply vehicles of all other organizations. Since this march the Quartermaster Motor Maintenance Section of one officer and fourteen men has joined the Force. It will take its place with the Base Group and will march at the tail of the column in Formation A.

For brevity the tactical road formation is known as "Formation A" and the strategical formation as "Formation B." The most vital thing in the force is control of the various units. The feature of control can be improved by having normal formations which will cut down the necessity for actual means of control. Signal Plan A, which disposes the various radio vehicles with various units, goes with Formation A; and Signal Plan B normally goes with Formation B. As we progress in tactical development, the normal tactical formations of the Force will probably also be designated as set formations.

From a comparison of the strategical and tactical marching formations it can be seen that there is very little maneuvering necessary in changing from one formation to the other. If from a strategical formation it is desired to take up the tactical march formation, the Armored Car Company moves to the front and splits, three platoons going to the reconnoitering detachment and one to the advance guard; the Machine Gun Company sends one platoon to the gun group; the three accompanying self-propelled guns from the Field Artillery Battery go to their respective tank platoons; the Engineer Company sends whatever reconnaissance detachments are called for; the Antiaircraft Platoon splits into squads, one going to the head of each section of the main body; the Ordnance Company splits between the tail of the main body and the base; and the Medical Detachment moves up to the end of the combat group.

Tactical Uses of Various Units

Before going into the approach march and attack of the Force it will be well to summarize the missions and tactical uses of the various elements.

The armored cars provide the ground reconnaissance element for the Force, and their missions include distant reconnaissance and counter reconnaissance, security, liaison, battle reconnaissance by developing the flanks and determining the enemy's position, ex-

exploitation of the success of the Force, and covering rallying and withdrawal. It is assumed that the Force will normally have air observation to supplement the work of the armored cars. The planes can tell the armored cars where the enemy is, but cannot keep contact with the enemy or keep him under surveillance; and it is the duty of the armored cars to confirm and supplement this information, and to keep contact. There must be the closest cooperation between the two, and this can be kept up not only by direct communication between the armored cars and the planes, but between the air unit and the Force Headquarters, and thence to the armored cars. When the enemy is located it is the mission of the armored cars to keep contact, determine his flanks, and develop his position. If necessary, they have sufficient fire power to make him deploy.

The Machine Gun Company takes care of the usual missions of an advance guard and provides security when on the march. During the attack it must be prepared to take over conquered ground promptly, hold it, and exploit the success further if possible. A tank is vulnerable when halted in a zone of hostile fire, and a position once taken cannot be held by tanks alone. When the tanks have reached their objective, the machine gun company follows to the limit of the tank attack, takes up the best defensive position, temporarily consolidates it, holds, and covers the reassembly of the tanks for the next thrust. In addition to the power of its own automatic weapons and the protection of its own riflemen, it is supported by the artillery and the chemical detachments, and perhaps by the engineer company which may construct artificial obstacles. If the ground is to be held for any length of time it should be taken over by other units.

The Tank Company is the shock element of the Force; all other units are auxiliaries to it. Its attack is launched at the enemy's key position. It normally goes into action with two platoons of three fighting tanks each in the front line, and one platoon of three fighting tanks and the radio or tank commander's tank in reserve. Each platoon normally attacks in line with intervals of 100 yards between tanks, which gives a front of 500 or 600 yards. With each platoon is one self-propelled 75 mm. accompanying gun from the Field Artillery Battery.

The tractor-drawn portée Field Artillery Battery is used in the normal role of supporting artillery, but at much closer ranges than has been the custom in supporting foot or horsed units. However, the very close artillery support as well as the tactical dispositions of all other units of the Force, have been largely dictated by the limited areas of terrain which have been available for maneuver.

To facilitate command the Chemical Detachment is usually placed near the supporting artillery as a part of the gun group. It may be used to fire smoke to assist the tank attack or to blind antitank weapons, or it may fire high explosive shells.

The Antiaircraft Platoon splits as described above when on the march and pulls out of column to go into

action. When the Force is attacking, it takes up a position to protect the carriers. In addition to the protection offered by this platoon, each vehicle in the Force is to be provided with automatic weapons for defense against low-flying airplanes.

In addition to providing detachments for road reconnaissance and doing the inevitable field engineering that goes with any force, the Engineer Company may be used to provide ground security for the carriers or at the termination of an attack to construct artificial obstacles and put up wire to aid the machine gun company in consolidating and holding a position taken by the tanks.

It is the carriers that tie the hands of the Force commander at the present time. With the present equipment he always has to be thinking in terms of protection of his carriers; he is forced to base his maneuver on the protection of this dead weight in its park. It is similar to the led horses in the Cavalry—the burden increases as the distance between the carriers and the fighting force increases. For this reason the carriers are pushed as far forward as possible before the tanks are detrucked. The detrucking of track-laying vehicles is a great handicap to the mobility of the Force. High mobility implies that there shall be no time lost in deploying. The Force should be able to go directly from its march to its approach and combat formations without loss of time. With carriers, the tanks are delayed in unloading at a critical time between the march and approach formations. They are stationary on the road while unloading, and are very vulnerable at that time to air attack and artillery fire. Not only is there the problem of defense, but the problem of parking is a great one. The large tank carriers take room; it takes 47 feet of radius to turn one. They have practically no cross-country ability, therefore the tanks have to be unloaded near good roads.

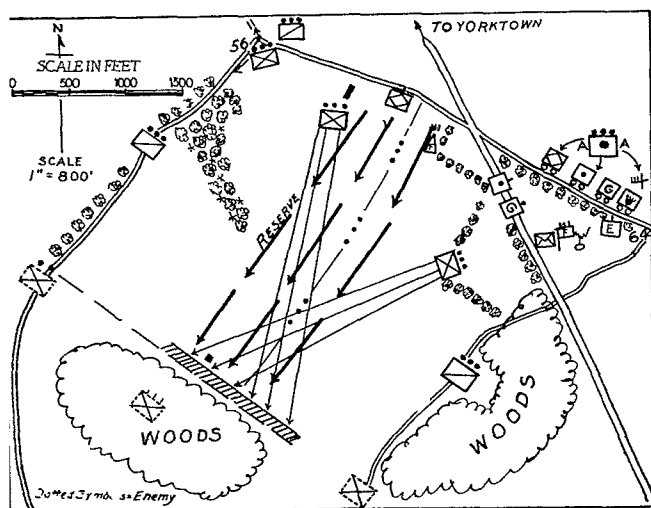
Entry Into Combat

On the march into the maneuver area near Yorktown, the armored cars reconnoitered the road to the James River Bridge and reported by radio a bad stretch of road about 200 yards long six miles west of Surry. The main body was delayed one hour in this stretch of clay which had been recently plowed for road construction and was soft from the rains of the night before. It was necessary to unload all tanks and have them pull the carriers through. All other vehicles except the tank carriers negotiated the bad stretch without trouble.

After crossing the James River Bridge the armored car platoons reconnoitered all roads leading up the Peninsula, located the enemy's outposts, and the troop commander reported to the headquarters of the 1st Blue Brigade at 7:00 A. M. At 8:00 A. M. he was given a situation map showing the enemy's dispositions, and information that the Red division had attacked at daybreak with the main effort directed at Halstead's Point and was evidently trying to envelop the right of the Blue brigade. The brigade commander directed the Mechanized Force to seize Yorktown and

the high ground in that vicinity. An airplane from Langley Field, attached to the Force for the maneuver, looked the map and message from an armored car at Fort Eustis at 8:00 A. M., and by 8:10 A. M. dropped them to the Force Commander. He was directly across the James River from Fort Eustis near Bacon's Castle, moving toward the James River Bridge, but was more than 40 miles away by road. With the situation to date in his hand, the Force Commander radioed the plane at 9:00 A. M. to direct the trains at Camp Lee to march to the James River Bridge. The message was dropped from the plane to the trains.

By 9:40 A. M. the main body had reached the south end of the bridge, and there the Force Commander received additional information of the enemy from the Blue brigade commander, who directed an attack on the enemy's left and rear. The advance guard established a march outpost at the north end of this four and one half mile bridge, and by 10:00 A. M. the



Special Map.

main body had crossed and started its advance on Yorktown. From that time on he received continuous information from his armored cars, both by radio and by motorcycle messenger. The enemy was outlined by dismounted men.

At 10:20 A. M. the advance guard made contact with the armored cars two miles south of Yorktown. The Force Commander, now with the advance guard, received the latest information of the enemy which stated that it was a strong flank guard of a division which was in position prepared to deny the advance of the Blue brigade. He decided to attack at once, and immediately sent word to the main body to concentrate at Harris Grove, prepare for action, and the organization commanders to report to him. Upon

their arrival the Colonel, after giving the situation up at that time, issued his attack order as follows:

The Force deploys to attack at once.
 Preparation for action on that road (pointing to dirt road), carriers remain in place.
 Line of departure: This road (the macadam road) from this point to the west edge of that field (pointing to the enemy outlined).
 Direction of attack: South, pointing.
 Time of attack: At my order.
 First objective: The hostile position at the edge of the woods.
 Main effort: The tank company less one platoon, which will remain in reserve on this road.
 The advance guard will support the attack from its present position until its fire is masked, then load and prepare for forward displacement.
 Battery and Chemical Detachment support the attack from initial positions on that road near the corner of that field (pointing).
 The Engineers in reserve at the carriers and provide ground security for the carriers.
 Antiaircraft provide security for the carriers and for the C. P.
 Service elements at BM 64.
 C. P. in the edge of that woods (pointing). I will remain here.
 Any questions?
 Move out.

The armored cars had developed the enemy's flanks and had a platoon in observation on each side and one north of RJ 56 guarding the approach from Yorktown. The Machine Gun Company had gone into action, two platoons each with a cross fire on a half of the enemy's line, and one platoon covering the north flank of the Force. The tanks attacked at 11:15 A. M., the two platoons striking at the center of the position. When they had nearly reached their objective the reserve platoon was thrown in to extend the line to the right. The tanks, attacking over a stretch of about 1000 yards, were exposed to hostile fire for about three minutes. As soon as the first objective was reached the Force Commander received word by radio-telephone. He then ordered the tanks to reorganize and pursue the enemy through the trees to the back Yorktown road; the machine guns were ordered to take over the ground, and the battery and chemical detachments to displace forward in order to follow the tank attack and be prepared to give close support. He went forward in an armored radio car to the position that was being consolidated. The machine guns were loaded into their carriers, these ran across the field to the former enemy line where the machine guns again went into position. The Field Artillery Battery and the Chemical Detachment followed closely, prepared to go into action again. All objectives having been taken and the enemy dispersed the Commander ordered the tank and artillery carriers to move forward by the road; Yorktown road, RJ 56, back road to Yorktown, and entruck the track laying vehicles for possible further movement.

The Military Situation of Central Europe

A German Point of View Presented by the Editor-in-Chief of the *Militär-Wochenblatt*
(Military Weekly)

By Lieutenant General Constantin von Altröck, German Army¹

FOR more than two thousand years Central Europe has been inhabited mainly by Germans. The German nation, in the heart of Europe, can take advantage of its central location to obtain spiritual and material benefits for it is in a favorable position for the exchange of ideas and materials. Long and intimate relations with peoples in all directions of the compass account for its many-sidedness, its spiritual receptivity, and its speculative as well as productive power. Germany's central location favored international trade, so that during the political upswing she reached great prosperity.

But as Germany never had natural frontiers—and today less so than ever—her insecure central position exposed her to all the convulsions which have shaken Europe during the past two thousand years. Nations with fortunate and secure borders do not at once appreciate the delicacy of such a situation, especially such a country as the United States, which lies between two oceans and cannot be seriously attacked from either sea or from the north or from the south.

As a result of this precarious situation, important parts of the German peoples and of German lands were separated from Germany during the course of centuries. Germany's border today is a torn and separated line of an extremely strange appearance, hardly duplicated by that of any other country. Fragments torn from Germany in the course of history are found today as German minorities in every adjoining country (see Sketch No. 1).

We recall that more than two thousand years ago the Romans made incursions from the south, west, and north, the effects of which were lasting. At the beginning of the Christian era, Rome decided to advance her frontier from the Rhine to the Elbe. But in the year 9 A. D. the most important military leader and statesman of old Germany, Hermann of the Cherusci, Arminius (Armin), annihilated the legions of Varus in the Teutoburg forest, and fiercely and successfully held off the unprecedentedly large armies under the Roman leader Germanicus. This Roman warrior had invaded Germany from the mouths of the rivers of the North Sea, but he was forced back so that the Roman frontier remained at the Rhine.

In the tenth century we see the Hungarian rider peoples under the Hun king, Attila, overrun German districts (*Gauen*) in all directions, leaving behind him a train of ruin and murder. In the final drama of the battle on the Catalaunian fields we note German clans on the side of the Huns, as we also saw them with the Romans.

In the thirteenth century the Mongols from the east reached Silesia where, though victorious, they left the field to the heroic "Dying Franconian Knights."

In the sixteenth and seventeenth centuries the Os-
mans, the Turks, came from Asia and repeatedly appeared before Vienna, which was barely saved.

In the seventeenth century the Thirty Years War brought a mixture of peoples to Germany. Frenchmen, Swedes, and others came and devastated the German land so thoroughly that many regions had to be rebuilt and repopulated after the war. The armies of Louis XIV of France in his predatory wars mercilessly ravaged the German western districts, cities and country, for which King Louis received the title "Le Grand."

Even in the Napoleonic era, at the beginning of the nineteenth century, Frenchmen and a conglomeration of peoples who followed the eagles of the great Corsican, crossed Germany in all directions. In 1812 the gigantic armies of Napoleon marched from the west through Germany against Russia, only to recross the poor land from east to west after the disaster on the ice fields of Russia in 1812, pursued by the Russians and their allied nations.

These events of two thousand years show that a state situated like Germany can live only if it is capable of defense. Since Germany has not always been in this condition, her history is an almost continuous record of suffering, relieved only by periods of development under the protection of arms.

After the terrible period of the interregnum from 1254 to 1273, the Hapsburg family secured the German



General von Altröck.

¹ Translation by Colonel G. M. Blech, Medical Reserve.

imperial crown and held it until 1806. This family could have been destined to work for Germany's salvation if it had maintained itself as German, but its outside interests and the terrible religious wars brought Germany to the verge of ruin. One can recall these historical epochs only with a shudder.



Sketch No. 1.—The German Minorities in Foreign Countries.

It remained for the Hohenzollerns, who had reigned in Brandenburg-Prussia since the beginning of the fifteenth century, through five hundred years of mighty effort, to build the new German Empire. It was an especial favor of fate that the four greatest Hohenzollerns—Frederick William, the Great Kurfuers, King Frederick William I, Frederick the Great, and King William I, later the first German emperor—came in a succession of about 150 years, which left their impress on the empire.

It was particularly King William I who fulfilled the age-old desire of the people for a German kaiser and thus brought to a realization the politics of his ancestors. This rare man, possessed of the experience of three generations, was a great character and one of the sages of the world. He realized that the Prusso-German state would perish if it lacked adequate defensive strength. As advisers he called Bismarck, Roon, and Moltke—world renowned names today—and risked his life and crown by forcing the resisting representatives of the people to provide for the organization of the Prussian army. The danger that threatened Prussia is proven by the wars of 1864, 1866, and 1870-71. These were concluded successfully. The foresight of King William I led the Empire securely through all perils from without. The unerring political sense of the epoch of William I was lost with his successors. Germany remained numerically behind her neighbors. In the World War, having often to fight at a ratio of one to ten, she long held her own with honor against twenty-five nations whose enormous superiority in man power and materiel finally crushed her. The treaty of Versailles forced the German people into helplessness. Only a torso was left of the old German empire.

The effects of that treaty being generally known, there is need here only for a brief sketch. The Ger-

man borders were rent and Germany was transformed into a country without a defensible frontier. Surrounded by nations with compulsory universal military service, Germany has only 100,000 soldiers enlisted on a pay basis for a long period. All European nations except Germany, Austria, Hungary, and Bulgaria, are much better armed than they were before 1914. They can at any time mobilize 10,000,000 trained men exclusive of reserves, against Germany's 100,000, as they lie around Germany in readiness.

Sketch No. 2 shows that in all probability it will be German territory over which the future European wars will be waged. God help a country in such a situation! Even the best prepared country is weak in a struggle of one against a hundred, and especially when all opponents command the modern armament and equipment that is barred to Germany. In addition, France is protected by a double belt of forts, part of which have modern subterranean installations (see Sketch No. 2), while the German demilitarized region of the Rhine is open and exposed to attack.

France, Belgium, Italy, Poland, and Czechoslovakia, even small Lithuania, have built effective nets of roads for a strategical concentration against Germany. The German frontier railroads, on the other hand, have been destroyed.

The German army lacks light and heavy artillery,



Sketch No. 2.—Defenseless Germany.

tanks, flyers, military aviation equipment and preparation, machine guns and ammunition, modern motorization, submarines, and an adequate fleet. Germany has none of her colonies to this day.

The danger from long range hostile fire from the open German frontiers is so great that only four of the larger inland cities can be safe from it. Every other part of German territory is theoretically in the zone of hostile long range fire (see Sketch No. 3).

Germany's critical danger on account of her helplessness in air defense cannot be emphasized enough. The latest day bombers can cover over 300 kilometers in an hour. Berlin is only 175 kilometers from the Polish frontier, 185 kilometers from the Czechoslovakian border, and 300 kilometers from the sea. The capital of Germany is absolutely open to air attack.

There is not a single locality in Germany that cannot be seriously menaced by air (see Sketch No. 4).

After the war Germany was forced to abandon railroad improvement and construction that had been planned west of the Rhine, such as four-tracking of the Cologne-Dueren and Coblenz-Trier lines, and double tracking of the Juenkerath-Losheimergraben, Gerolstein-Lommersweiler, and Bad Muenster am Stein-Odernheim lines. At the same time her neighboring nations improved their railroad nets by a great deal of new construction which has great military importance, calculated especially to improve the conditions for concentration against Germany.

In Belgium the four-track Luttre-Charleroi-Namur line and the local Liège-Chenée line increase the railroad capacity of Liège, which had been very limited. Better connection between the Belgian and German nets was secured by the development of the double track Herbesthal-Raeren and Gouvy-Trois Ponts lines, while the newly constructed Houthaelen-Liège line improved the connection between the north Belgian railroads with the lines towards Germany.

France carried out new railroad construction along her eastern frontier that is no less important from a military point of view. In this belong the four-tracking of the Lunéville-Sarrebourg line, the two-tracking of the Verdun-Metz and Nancy-Bensdorf lines, and the construction of the Lérrouville-Novéaut-Metz line, which improve the connection between the railroads of Lorraine and the older French roads.

Improvement of the connection with Alsace via Mulhouse-Belfort is secured by the construction of the cuts through the Vosges: St. Dié-Saales-Strassburg;



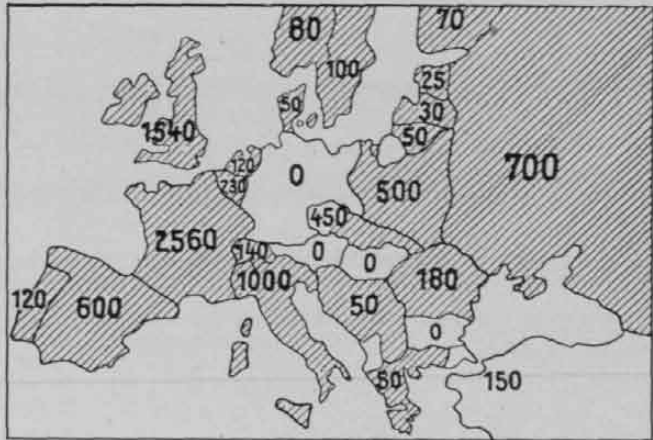
Sketch No. 3

The shaded circles denote the radii of hostile distance fire from the frontiers of Germany's neighbors. This sketch shows better than lengthy descriptions that Germany is "a country without frontiers."

St. Dié-Markirch-Schlettstadt; Epinal-Cornimont-Metzeral-Colmar; and Epinal-St. Maurice-Wesserling-Mulhouse. This construction will facilitate a French concentration on a wide front against the upper Rhine.

Italy's extensive two-tracking of the line from Verona via Bozen in the direction of Innsbruck gives her an essential increase of military protection of the new frontier territory of South Tyrol.

Czechoslovakia's construction of an effective road of communication towards Germany, improved trans-



Sketch No. 4

The numbers show the thousands of manned military aeroplanes which encircle the former Central Powers of Europe.

portation facilities from Carpatho-Russia by the development of the Prague-Pilsen line and the lines of the valley of the Elbe, Prague-Bodenbach and Vstaty-Leitmeritz-Teschen.

Poland has invested vast sums to establish a new north-south connection by building the Kattowitz-Hohensalza-Bromberg-Gdingen line. This is of great importance for her defense. In addition a new road of concentration against Germany was obtained through the construction of a track from Warsaw to Stralkowo, connecting with the existing line to Posen.

Even Lithuania has improved her railroad net by enlarging the line from Dunaburg via Abeli-Schaulen (Shavli) to Tilsit and by constructing the Schaulen-Telschi-Memel line, all of which provide her with greater facilities for transport towards the German frontier.

If one surveys the railroad construction of the above named states since the end of the war, the general view shows that all have much military significance, especially in the improvement of the conditions that would affect a concentration against Germany. These countries have applied a lesson of the World War, that the successful conduct of military operations is possible only with the aid of effective railroads, and they have spared no expense to obtain such facilities on a large scale. On the other hand Germany, through the dictate of Versailles, as well as through financial emergency, is not able to alter her railroad net to meet the new conditions, nor even to satisfy the most pressing demands of national defense.

What the dictate of Versailles and the other treaties have done to Germany, Austria, Hungary, and Bulgaria, has been done to a people but once before in the history of the world when Carthage was disarmed before the third Punic War then—Carthage was destroyed!

Radio at Fort Mills

(1929-1930)

By Captain Creighton Kerr, C. A. C.

THE Harbor Defenses of Manila and Subic Bays, used radio to a greater extent, perhaps, than any other Harbor Defense in the Coast Artillery, during 1929-1930.

Many factors contributed to this, chief of which was the liberal attitude of the Department Signal Officer.

The transmitting station at Fort Mills contained five transmitters a 50-watt set for work in the 8000 band, used chiefly in the Department net; two sets, originally spark transmitters, but converted to use 250 watt tubes and used at frequencies around 500 kilocycles; the fourth set was a 127 type transmitter worked normally at 260 kilocycles while the fifth unit was the latest Navy standard, high frequency, transmitter rated at one kilowatt. This set was practically automatic in its action and was used by the Philippine Department for direct communication with Hawaii, Fort Mason and China. As a usual thing, it was keyed from Manila over a telegraph cable about 30 miles long. In the latter part of 1930, a ten kilowatt amplifier was connected to this unit.

All the transmitters were "remote controlled" for starting, stopping and keying. The starting relays were wound locally but the keying relays were of the standard high speed type.

The main receiving station was in Harbor Defense Headquarters. It contained the telegraph station, connecting with Department Headquarters, two medium wave receivers, and a short wave receiver of local construction. This station worked the boat on the Manila run every half hour, worked Manila by telegraph, handled three daily schedules with Tientsin and worked Fort Wint at the entrance to Subic Bay. No artillery work was handled by this station.

An artillery net station was installed in the building, housing the Artillery Engineer's Office. Each battery in the Harbor Defense, also each Group Station and the Harbor Defense Commander's Station was connected by a special telephone line to a jack set in the fire control switchboard room, by which any or all of the lines could be connected to a line running to the radio operator in the Artillery net station. This operator handled from one to six boats without confusion. All towing vessels transmitted on the same frequency. Most of the operators were Filipinos, trained at Fort Mills. The artillery net station also worked the spotting planes.

When occasion called for it, a receiving station could be installed practically anywhere, the operator, in addition to his receiver, requiring but a telegraph key and a snap switch.

During the 1930 battle practice, three receivers were installed in "C" station to work three spotting planes transmitting on three different frequencies; the boats were controlled from the regular artillery net station, while the main station in the Headquarters building worked the boat on the Manila run, Tientsin, Fort Wint and the telegraph line to Manila, blissfully unconscious of the other radio activities.

During the Army and Navy exercises in 1930, a receiver, installed in the Commanding General's bombproof, handled all messages from the inshore patrol consisting of nine submarines. The messages were sent in the Navy contact code, received and decoded in the bombproof and relayed to "C" station by phone.

Radio service was taken as a matter of course. During the subcaliber season several boats would be towing for different batteries and messages from the various battery commanders were received by the same radio operator actually, but there was no confusion due to the excellent team work of all concerned.

In addition to the radio activities above, there were also three licensed amateur stations operated at Fort Mills, working on daily schedules with the California coast and, to other parts of the world. These stations handle hundreds of messages monthly, and during the Christmas season, thousands.

All of the amateur stations were worked by expert operators and the service rendered was comparable to that of the regular communications. One of the stations received a letter of commendation from Holland's Queen for services rendered to an expedition in northern Borneo.

It should be noted that but one unit, the 127 type transmitter, is familiar to the Coast Artillery at large. The converted spark sets were used normally for artillery and plane work but for long distance transmission, high frequencies were employed and of course, the amateur stations were high frequency.

"Radio" properly installed and efficiently handled gives rapid and reliable service. At times we are prone to look upon it as a "hit and miss" proposition used to control a towing vessel and we are resigned if it fails.

All the apparatus at Fort Mills, including the high frequency type navy transmitter, were installed, maintained and operated by specialists trained at Fort Monroe.

Give the men we train for the work the proper apparatus and incentive, and "Radio" instead of being a necessary evil will furnish reliable communication facilities not used at present in the Coast Artillery.

The Development of War Department Organization and Plans for Industrial Mobilization

By First Lieut. H. S. Bishop, Jr., Corps of Engineers

THE importance of supply to the success of a military operation has long been established and realized. Until recently, however, little attention has been paid to the question of the source of supply or of the effects of a great war on the industrial and commercial life of a nation. It took the World War, with its unprecedented demands, kaleidoscopic changes and far-reaching effects, to focus attention upon these matters. Our experiences therein led us to attempt, by organization and plans, to overcome in future conflicts our difficulties in the past. We seek by legislation and the adoption of sound business principles to better the administration of the army in peace, in planning for war, and in coordinating the needs of our armed forces with those of our civilian population in war.

Under Section 5a of the National Defense Act, as amended by the Act of June 4, 1920, the Assistant Secretary of War is charged with the supervision of the procurement of military supplies and with the "assurance of adequate provision for the mobilization of materiel and industrial organizations essential to war time needs." To this end, "the chiefs of branches (services) of the army charged with procurement of supplies," report directly to the Assistant Secretary in all matters pertaining to procurement. A better understanding of the importance of this act, and what it is intended to accomplish, may be obtained from a review of the steps that have led to the present situation.

The creation on August 7, 1789, of the War Department as an executive department gave us a civilian-controlled agency to administer the military affairs of the nation, administrative, technical, and supply bureaus, militarily controlled, were organized as occasion for their use arose. By virtue of orders of the President, there likewise came into being the office of the Commanding General of the Army. With no particular statutory duties, this officer gradually assumed control over disciplinary and military affairs of the Army. Through the process of absorption, but without specific legislative sanction, the Secretary of War became charged with direct control of the supply bureaus, as to purchases and fiscal affairs. This apparently unintended situation gave rise to frequent conflicts, due to the lack of a proper line of demarcation between the duties of each and to friction between strong personalities. With the exception of the bureau chiefs, there was no general staff or supervising agency to make plans, coordinate activities, or give advice.

¹The general aspects of Industrial Mobilization are discussed in General Mosley's articles that appeared in the *Infantry Journals* for January, February, March, April, May and June, 1931. This discussion is based on the solution of a problem studied in the 1930-31 course, at the Army Industrial College.

The system of procurement by five separate and distinct supply branches (Quartermaster, Engineers, Ordnance, Commissary, and Medical) loosely coordinated by The Adjutant General's Department, became firmly established. Our early wars profited us little in improvement of the system. In the Mexican War, the current attitude toward the problem was reflected in the instructions by the Congress to Generals Scott and Taylor to "make the war pay for itself." This was accomplished in part by the use of local resources. The service of supply of the armies in the field in the Civil War furnishes examples of successful supply which have been studied by the world. Procurement, however, was by the separate branches; the action of these branches was not coordinated; the situation was further complicated because the several States themselves made purchases, and independent action on purchases was authorized and exercised by some of the eight territorial department commanders. The lack of a general staff or other super-control agency, and of plans for the organization of the country's resources as well as for the use of rail and water transportation, so crippled the North that it took two or three years to secure independence of foreign sources of supply.

Despite the opportunities afforded to profit by the experiences of the Civil War, no marked improvement in the supply and procurement system was noticeable in the post-war period. As far as the Army was concerned, this period has been characterized by some writers as one of "dry rot." During this time, the Signal Corps was added as another supply bureau, and the office of the Assistant Secretary of War came into permanent being (1890). This office had been created in 1861, only to be abolished in 1866. None of the present duties attached to the office and the Assistant Secretary performed only such duties as the Secretary of War directed. Another development during this period, with an important bearing on later events, was the gradual ascendancy of the Adjutant General of the Army over the other bureaus.

Precipitated into the Spanish-American War without plans or foresight, the supply bureaus, well entrenched and operating satisfactorily for the supply of an army of 25,000, entered the field of procurement in competition with each other. The resulting inefficiency and great waste are only too well known to students of military history. Such organization as we had, uncontrolled and uncoordinated, broke down under pressure.

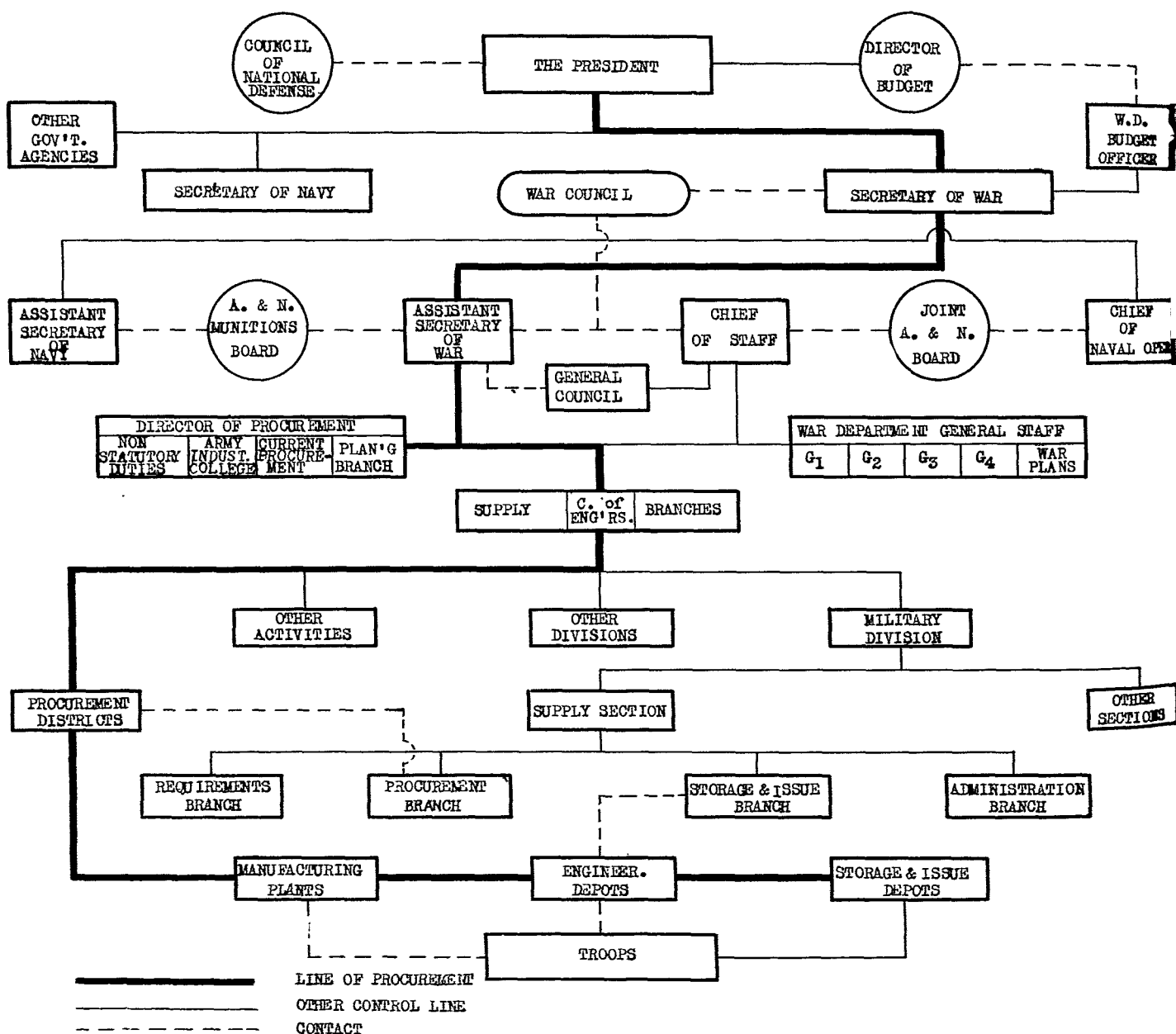
The new century, however, brought some ray of hope. Through the foresight of Mr. Elihu Root, then Secretary of War, a General Staff Corps was created

by the Act of February 14, 1903. The office of the Commanding General of the Army was replaced by that of the Chief of Staff, who was charged under direction of the Secretary of War, with supervision over all troops, staff departments, and supply bureaus. The General Staff Corps, headed by the Chief of Staff, was to combine the duties of making plans for the national defense and the mobilization of the military forces in time of war, with those of furnishing professional advice to the Secretary of War and superior commanders, whose agent it became for informing and coordinating the action of all under their control. No specific reference, as yet, was made to the mobilization

of industry or the material resources of the country. Thus, in part, the existing evils in administrative functions were rectified and corrected. There were still left, however, seeds of contention and sources of inefficiency.

Failure to define or limit the duties of the General Staff Corps resulted in its attempt to assume authority in the actual administration of the separate bureaus. The latter naturally resented such interference and resisted this control. The bureaus, except for the absorption of the Commissary and Pay Departments by the Quartermaster Department in 1912 and the reduction of the influence of the Adjutant General's Department,

CHART OF WAR PROCUREMENT AGENCIES



remained as before and continued to function independently of and in competition with each other. The army carried on with limited appropriations, and reduced numbers, there was no sound military policy with a definite scheme of organization, the General Staff Corps did not plan for or solve the supply problem.

We created a military policy in the National Defense Act of June 3, 1916, and at the same time limited the duties of the General Staff Corps to planning and giving advice. Official recognition was given to the need of coordinating the industrial with the military aspects of war, by charging the General Staff with the preparation of plans for the "mobilization of the manhood of the nation and its material resources in an emergency." Also, the President was given the power to appropriate property for government use in war in return for just compensation, and the Secretary of War was directed to make a survey of plants equipped for or capable of transformation into facilities for the manufacture of arms and ammunition.

The same year, the creation of a Council of National Defense was authorized by Congress for the purpose of the "coordination of industries and resources for the national security and welfare." It was to consist of the heads of the departments of War, Navy, Interior, Agriculture, Commerce, and Labor, and to be assisted by an advisory commission of seven leaders in industry. This latter body became the nucleus of the strong War Industries Board that eventually took over and ran the industrial side of our part in the World War.

The provisions of the National Defense Act were not realized before we were drawn into the World War and forced to expand our still inadequate bureau system in order to meet the demands of the supply problem. Competition with other bureaus and with our allies, congestion of contracts, paralyzation of transportation, high prices, and shortages of materials and labor resulted. Attempts to create order out of chaos brought on, in the winter of 1917-18, Congressional discussion centered around whether to adopt the British scheme of a ministry of munitions or to maintain but rectify the existing system. The latter procedure was adopted. The corrective measures involved the reorganization of the War Industries Board, which had meanwhile evolved from the Advisory Commission, the Munitions Standards Board, and the General Munitions Board; and the reorganization of the General Staff to include the Purchase, Storage and Traffic Division. The latter body became the central agency of the War Department to coordinate the purchasing activities of the supply bureaus. The Overman Act of May 20, 1918, which confirmed the war-time powers of the President by authorizing him "to make such redistribution of functions" as he deemed necessary, greatly facilitated this reorganization. The civilian control of the War Department was further increased by the appointment on August 28, 1918, of Mr. Benedict Crowell, the Assistant Secretary of War, as Director of Munitions to supervise all procurement activities of the army except for aviation. Two other assistant secretaries were in office, one for aviation, and the other charged in part with supervision of welfare

activities. The details of operation, the advantages and disadvantages of the system of procurement set up, are too numerous to be included here; the success of the system is reflected in the final outcome of the war and in the fact that it forms the basis for our present-day activities.

After the war, the steps taken to translate into legislation the lessons learned, revolved around the old conflict between the General Staff Corps and the supply bureaus. The omission from one proposed bill of the clause forbidding the interference of the General Staff in administrative details brought down a storm of protest. The General Staff maintained that no controlling or planning agency other than itself was necessary to handle procurement of supplies. Mr. Crowell proposed setting up a civilian head, trained in business, as Assistant Secretary of War, to coordinate directly the procurement work of the supply bureaus, leaving the General Staff to continue to plan and advise in military matters only. This plan met opposition on the grounds that suitable men for the position were hard to obtain, and that it would be better to leave to the Secretary of War the distribution of tasks to his assistant. Further, it was believed that giving to the Assistant Secretary such powers of control would create too powerful an official, junior to the Secretary and to the President.

The resulting legislation of June 4, 1920, in the form of an amended National Defense Act, gave us the system under which we are now working. The Assistant Secretary of War became supervisor for the procurement of supplies, and business adviser to the Secretary of War. The offices of second and third assistants were abolished. (The second has since been revived as Assistant Secretary of War for Aviation). The Chief of Staff, as military adviser, was charged with the coordination of the bureaus (services and arms) as to military matters. The General Staff Corps was restricted as before to planning and advisory functions. The War Council of December 1917, was given legal standing as an agency for settling the divergent views of the Assistant Secretary of War and the Chief of Staff as to the business and military interests of the army. The recent creation of the General Council furnishes an additional agency promoting coordination and harmony.

The respective duties of the office of the Assistant Secretary of War and of the General Staff, under provision of the new bill, were clarified and promulgated to the services in General Order Number 41, War Department, 1921, as the result of the recommendations of a board headed by General Harbord. There followed the reorganization of the General Staff, and the office of the Assistant Secretary of War as we now have them. The retention in Section 5 of the National Defense Act, either inadvertently or otherwise, of the clause giving the General Staff authority to plan for the mobilization of the "material resources" of the country, leads to the opinion that duplication of authority exists. Without a working agreement such as now is in operation this overlap would be a source of friction.

The organization for carrying out War Department

procurement plans is shown, in part, in the accompanying chart, from which it can be seen that the duties performed are divided along industrial and military lines, each with control and advisory functions. Each of the supply services reports directly to the office of the Assistant Secretary of War on procurement matters, and to the Chief of Staff in those concerning military affairs. The General Staff, through its plans and advice, assists in the furtherance of the work of the Chief of Staff, while the Planning Branch performs the same work for the office of the Assistant Secretary of War.

For war planning, the General Staff furnishes, through its General Mobilization Plan, a directive that provides policies, sequences, and procedure for the mobilization of the Army of the United States, while the office of the Assistant Secretary of War, in the Basic Plan for Procurement of Military Requirements, furnishes a plan for guidance and control in

the procurement of supplies for war. The two plans together form the basis for the separate branch mobilization plans, the corps area and other plans, and for mobilizing the manpower and the material resources of the country.

The war procurement planning program, coordinated with the basic strategic and tactical plans of the General Staff, provides an assurance of reasonable freedom from the evils of unpreparedness of past wars. Progress is being made in the figuring of requirements, standardization of types and specifications, allotment of priorities, and the allocation of facilities in coordination with the Navy. Studies are being made and measures taken to secure the cooperation of industry in war, in the matter of price fixing, conservation of materials, transportation, labor and power, which minimize the possibility of competition, confusion, and inefficiency.

Policy With Reference to Detail in the Ordnance Department

OFFICERS detailed for duty with the Ordnance Department will be procured from the Infantry, Cavalry, Field Artillery and Coast Artillery in number proportionate to the authorized commissioned strength of these arms. Variations from the foregoing are authorized when an arm has not a sufficient number of officers who have expressed a desire for detail in the Ordnance Department. The foregoing shall not be construed to prevent the detail of an officer of the Corps of Engineers, Signal Corps, Air Corps or of any of the services into the Ordnance Department. Such applications as are received from officers of these branches will be favorably acted upon, provided they are not in conflict with laws or regulations, and approval thereon appears to be to the best interests of the service.

North of Sixty-Three

By Frances Stuart Kobbé

GOLD! GOLD!! GOLD!!! When the last boat from Alaska's icebound harbors steamed into San Francisco in the Autumn of 1897, she carried among her passengers sixty worn but triumphant prospectors. To an astonished populace they displayed their little buckskin bags with the irrefutable evidence, the precious, yellow "dust." Immediately a wave of wild excitement, of gold hysteria travelled eastward over the telegraph wires overwhelming the entire nation. "Alaska" was the word on everyone's lips. "Uncle Sam's Icebox" at last had come into its own.

On May 28, 1867, the Senate confirmed the treaty to purchase Alaska from Russia for the sum of \$7,200,000. In spite of the vast extent of the acquisition which is a third greater in area than all the Atlantic states from Maine to Florida, this seemed to the layman a large price to pay for a country whose mineral wealth was only suspected, and whose chief value seemed to be that since it was situated only 150 miles from the Siberian mainland, it could be used in case of war in the Pacific. For thirty years its possibilities lay dormant. From the first, the Army was supposed to be responsible for Alaskan affairs, but without legal standing or the necessary power. In 1884 a shadow of government was granted by Congress when the laws of Oregon were extended to the largest territory of the United States. Regulations were made regarding the seal fisheries, the importation of firearms and the exclusion of intoxicating liquors. Customs, commerce and navigation laws were drawn up. Some judges were appointed, and a marshal and some commissioners, but the territory was so vast and so sparsely settled, and communication was so difficult that the only law in the country was still represented by the small military force maintained there.

With the discovery of gold, 18,000 people rushed to Alaska. They came from all walks of life. Beside the adventurers, there were sober, hard-working citizens who gave up dependable jobs to invest all their savings in the quest for quick riches. There was also the inevitable riff-raff, drawn by the direct communication with the West Coast ports and the freedom from the restraint of law and order. Canada took quick action to protect its section of the goldfields by installing four hundred Northwestern "Mounties." Undesirable characters were forced without ceremony over the border into United States territory. This made a desperate situation of lawlessness, and representations were made to Washington to protect adequately our citizens and property by military control of the Yukon district.

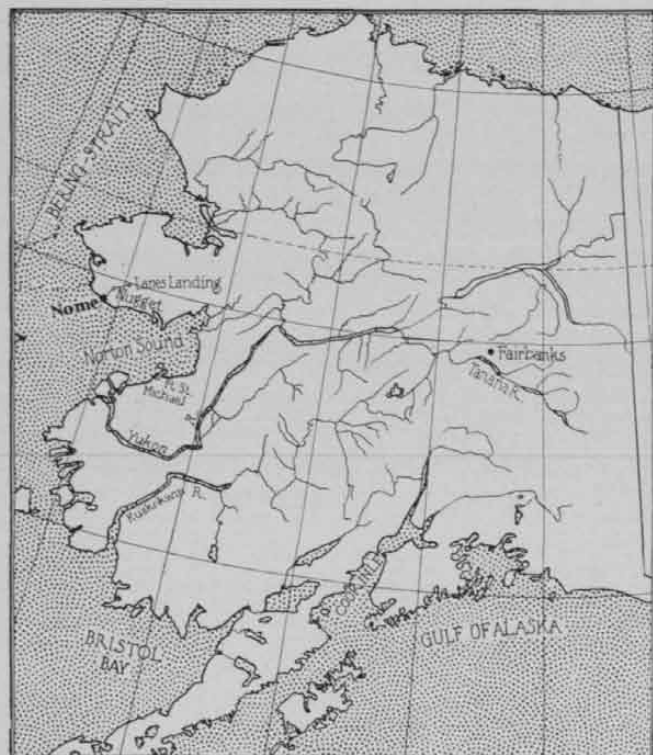
In September, 1897, the Secretary of War tele-

graphed an order for Lieutenant Colonel Randall with two other officers and 25 men of the 8th Infantry to proceed at once to St. Michael for the purpose of preserving order and protecting property. Here Fort St. Michael was established by a War Department order authorizing "the use and occupation of all contiguous lands and waters within 100 miles of the flagstaff of Fort St. Michael on the island of St. Michael, Alaska." It stated further that the soldiers would be responsible "in the absence of other provisions of law and of all local civil officials within the limits of the country surrounding the island of St. Michael and the mouth of the Yukon River, for the security of life and property, the preservation of order and the protection of property and business interests."

It was a barren, wind-swept land in which Colonel Randall and his men found themselves. The island was bleak and treeless with grim outcroppings of rock, facing an equally bleak and treeless mainland. What vegetation there was, was brown and dead-looking. A foot under the surface of the ground, there was ice the year around. The climate was not as severe as might have been expected within the Arctic Circle, but sudden violent storms were frequent. During February, the worst month, the thermometer hovered between 25 and 50 degrees below zero. It was a dry cold however, so deceptive that it was necessary to issue an order forbidding the soldiers to go out of the barracks without full winter clothing lest they should be overcome by numbness before they realized their danger. The glare on the snow, causing snow-blindness, was one of the difficulties to be contended with. The soldiers wore dark glasses in the winter and even a special kind of eye-protector made by the Eskimos which consisted of rounds of thin wood with a narrow slit for vision. They adopted the kind of boots which the Eskimos made, fashioned of reindeer skin with soles of walrus hide. In the winter they travelled with dog-sledges. The sledges were made of wood and skins, without any metal, the parts being bound together by rawhide thongs. The last boat went out of the frozen harbor early in October and there was no further communication with the States by water until the ice went out in one big sheet around the middle of June. Except for the cold, travelling was easier in winter than in summer. The summers were rainy, and after the first of May, the tundra was converted into a huge, semi-frozen swamp which made travel by land impossible.

Colonel Randall found conditions pretty bad. Along the Yukon the old miners and pioneers had been accustomed to settling difficulties by so-called "miners' meetings" which were more or less mob gatherings.

They viewed the advent of the military with suspicion and disfavor. This attitude was deliberately encouraged by the lawless element who had drifted in since the gold strike. Then, too, the rush of miners



Alaska.

to the interior had rendered the food supply inadequate, and starvation faced hundreds of men stranded along the Yukon by the freezing of the river. Large numbers of passengers en route for the upper Yukon were caught at St. Michael due to the loss of some river steamers that were being sent from Pacific ports. Many had no money and no way of leaving St. Michael for the "outside," as going back to the States was called. Prices were exorbitant. Gold seekers in Alaska needed a substantial stake to start on. Lumber for houses was \$200.00 a thousand, and other material and labor was in proportion. Room and board in any sort of tent or shack was five dollars a day. Meals at restaurants were a dollar for the plainest sort of fare.

Back in San Francisco, Battery A of the 3d Artillery received orders in August, 1898, to proceed within a week's time to St. Michael, fully equipped for a year on Arctic service. This would seem to be quite a large order for any commanding officer, but in this case, it fell upon Lieutenant George H. McManus who commanded the battery and who had been in the Army about three years, and his second-in-command, Lieutenant Oliver L. Spaulding, Jr., just commissioned, who had reported for duty three weeks before the order came. Well aware that it was "theirs not to question why," these two young men set about the task of outfitting 200 men for a year in the Arctic with all necessary supplies and clothing, and in addition, 100 tons of extra food for issue to destitute gold-seekers. They embarked at the appointed time

on the "Humboldt," a small coasting steamer, for the ten-day trip to St. Michael, almost 3000 miles north. They were terribly overcrowded and most of them were seasick, but eventually the foggy trip was over and they arrived to reinforce the 8th Infantry detachment which was then under the command of Captain Wilds P. Richardson and Lieutenants E. S. Walker and Edwin Bell. The troops were at once distributed the whole length of the Yukon, Lieutenants Walker and Spaulding with seventy men taking station at St. Michael.

About this time, H. O. Hultburg, a prospector, was blown ashore in his skiff in one of the sudden storms. He landed at Cape Nome at the mouth of the Snake River. There, in the creek-bed, he discovered distinct "color." For some reason however, he did not stay and the first claim in this district was recorded in September of that year. A few weeks later some prospectors brought the news to St. Michael of the opening of the new district at Cape Nome. They were hurrying with dog-teams to reach the harbors of southeastern Alaska which the warm waters of the Japanese Current kept open, so that they could place their orders for supplies which would be shipped up from the States on the first boats to come in the following summer.

All winter long men were coming through St. Michael, some with dog teams, some carrying their own equipment, but all bound for the new district at Cape Nome. Reports began to come in of lawlessness and claim-jumping from the Golovine Bay section. The soldiers at St. Michael had found out already that the greatest difficulty with which they had to contend, was the legality of titles to property. The United States mining laws in Alaska were too loose and liberal. A person was permitted to locate and hold as many tracts of ground as he desired, each not exceeding twenty acres in area, provided: (1) that there be a bona-fide discovery of gold, (2) that the ground be properly staked or marked out, (3) that at least one hundred dollars worth of work be done annually on each claim. It was always a fine



Nome from Lane's Derrick, Snake River.

point as to just how much authority the military should assume for they could not settle titles, but were supposed to supervise the setting of stakes and preserve order.

Lieutenant Spaulding was ordered to the Golovine Bay district with four or five men "to use his good

offices to adjust matters according to law and order, and put an end to illegal claim-jumping and the destruction of locations, notices, stakes, etc." He was to endeavor to induce the miners to readjust local affairs upon a just and businesslike basis to prevent uncertainty and insecurity of land titles, which had



Commanding General and Staff, Dept. of Alaska, Ft. St. Michael, Jan. 17, 1901.

hitherto retarded the development of that country and caused loss and suffering. He was to relieve the necessities of the destitute in the district, and arrest criminals and bring them to St. Michael. Since it was impossible to give full details of instruction to meet all emergencies, Lieutenant Spaulding was ordered to use his own judgment and take such action as he deemed necessary for the cases that came under his observation.

Undismayed by the scope of his orders, Lieutenant Spaulding set out in February, the worst month of the year, with a reindeer caravan and five men, for a district already conspicuous for its lawlessness. The reindeer were in bad condition and some of them had never been broken to harness. It was not only difficult to drive them, but dangerous to harness them, for they struck out savagely with their sharp forefeet whenever the soldiers approached them. The journey was made around the shore under these adverse conditions and the lieutenant thought he was fortunate when he could make 30 miles a day, taking 15 hours to do it. On the way he was passed by a speedier dog-team which took the news of his impending arrival ahead of him to Golovine Bay. When he arrived, he found a case already awaiting his decision.

Two men had deliberately jumped a claim. Knowing that this was really a case for civil authority, they brazenly waited to see what the young lieutenant would do about it. They soon found out, for he promptly placed them under arrest. There was no jail at Golovine Bay, and in the winter it was impossible to send the prisoners to Sitka for trial before the proper civil authorities. A trader gave the young officer the use of a log hut as a guardhouse until they could start back to St. Michael. Finally the caravan set out on the return trip, Lieutenant Spaulding and the soldiers with their reindeer and sledges taking the lead. The prisoners were furnished with a reindeer and a sledge but no supplies. Their orders were to follow. After the first day they needed little guard-

ing, for they were too wise to attempt to escape into the dreary winter wilderness. When the march was completed, the prisoners were held at St. Michael until summer. The case was dropped but they made no effort to make good on their claim-jumping.

All during the winter a camp had been growing up at Anvil City, at the mouth of the Snake River and at the foot of Anvil Mountain, so named because of its peculiar shape. There was no government there at all except a recorder of the mining district, who had been installed as soon as the strike was made in that vicinity. Before summer 2000 claims had been recorded and the area was found to be as rich as the Klondike. Colors were found everywhere. In the creeks they ran from one hundred colors to twelve dollars a pan. Gold was being taken out at the rate of from twelve dollars to two hundred and fifty a day per man, with rockers. It seemed fertile ground for all sorts of disorder, so Captain Walker ordered Lieutenant Spaulding to go to Anvil City, with about a dozen men, to take charge of the situation as he had at Golovine Bay.

As soon as the ice permitted, the lieutenant and his detail set out in a little sternwheel riverboat to cross Norton Sound. It took them twenty-four hours to reach their destination. As they drew near the open beach at Nome Harbor, they could see the tents huddled along the shoreline with the brown, level tundra behind, stretching away to the barren hills. Although the calendar testified that it was summer, not a vestige of green was to be seen, not a tree nor a blade of green grass.

At the beach were scenes of confusion. The population was increasing at the rate of two hundred and fifty a week, with three thousand already encamped there in the district. The ships, coming in, were unable to come near the shore because of the shallowness of the water, so flat-bottomed lighters met the steamers. These would come in still closer and finally the passengers would have to wade ashore carrying their belongings on their shoulders, for at that time



Bartlett Glacier on the Alaskan Railway.

there was not a horse or wagon in the district. There was no provision for guarding the outfits until the owners could get settled, so most of the gold-seekers joined forces with other newcomers, and took turns standing guard over their possessions.

Lieutenant Spaulding's first order was to forbid the

carrying of firearms, and his men were told to confiscate any that were displayed, giving their owners receipts by which they might redeem them when they could show a return ticket for the "outside." He also ordered all saloons to close except those that could show a license from the United States Commissioner. Anvil City was a community of adults, with several thousand men encamped in the town and immediate vicinity. This number was increasing almost daily. Most of the adventurers were men but a few had brought their wives, and there was a sprinkling of dance-hall girls. The main thoroughfare consisted of a long, muddy street, flanked on both sides by shacks, with canvas roofs and sides, that were used for saloons, gambling houses, restaurants and lawyers' offices. Although there was a law against the sale of liquor in Alaska, it had never been enforced, and the first ships to come in carried large cargoes of whiskey. Being midsummer, there were twenty-four hours of daylight, the sun hanging like a red plate in the midnight sky, but Lieutenant Spaulding issued an order that the saloons and gambling houses must close at night, and he set hours for opening and closing. If he expected trouble from this edict, he was pleasantly disappointed for the saloon keepers and gambling-house proprietors obeyed without question, and aided in the preservation of order as much as they could.

As the thousands of gold-seekers poured in, many of the newcomers were unable to find any unstaked claims to locate. This caused discontent which afforded the shyster lawyers who hovered like buzzards over the rush, an opportunity to foment trouble. They advised the disappointed ones to challenge the legality of the mining district's organization, which, it will be remembered, had been hastily installed at the beginning of the strike. Around the Fourth of July, the trouble seemed liable to come to a head. The soldiers were ready to act, but the holiday passed with only a

of men, as some were out settling a disturbance on a distant claim. He took the men he had left, a corporal and five soldiers, and, at the appointed time, he went to the hall. It was a little early and the hall was not filled. He placed his men in the rear of the hall farthest from the door, the only exit. The huge, smoky room was soon filled to overflowing with five



Scene at Cordova Sound.

or six hundred roughly dressed, milling figures. At last the meeting was called to order. A resolution was passed declaring the mining district's organization void. Suddenly above the crowd, Lieutenant Spaulding's uniformed shoulders were seen, as he climbed on a bench. In a clear voice of command, he announced to the crowd that the resolution must be withdrawn. He said he did not wish to break up their meeting, and that after the withdrawal of the resolution, they could go on with any further business, but that if this order was not obeyed immediately, he would give them five minutes in which to clear the hall. The uproar was terrific. Threats of violence flew back and forth, but a few of the more law-abiding element began to drift toward the door. At the end of the allotted time, Lieutenant Spaulding ordered his men to advance in a line with fixed bayonets, pushing the recalcitrant miners ahead of them out of the hall. The milling crowd loitered around the door outside, but the soldiers, refusing to argue, broke up the knots of men. Within an hour or two the revolt was at an end. The bonfires were never lit which had been prepared to signal the waiting conspirators in the hills that the resolution had been passed, and that the time had come to jump in and relocate all claims in defiance of law and order.

The camp at Anvil City became permanent and grew into the city of Nome. Nome was "summer diggings." Bed rock was very shallow and there was a saying that gold began in the grass roots. One of Lieutenant Spaulding's soldiers, when he first arrived, was sitting idly on the beach one day, panning sand in a wash-basin. Suddenly in the bottom of his pan, he found "color." Lieutenant Spaulding, calling upon an old law that land within fifty feet of high-water mark belonged to the Government, declared that the beach was free to all, and allowed no claims to be staked there. The gold on the beach never became "pay dirt" however, although it sometimes ran as



Infantry Right of Way Party Mess.
Valdez-Gulkana Telegraph Line, 1908.

harmless celebration. Rumors came to Lieutenant Spaulding however, that, on the tenth of July, a meeting was to be held at the Northern Saloon which would declare all previous claims void, and then reorganize and restake everything.

When this intended move was reported to Lieutenant Spaulding, he realized that some instant decision on his part must be made. His detachment was short

high as seventy cents a pan. All around Nome it was unnecessary to work the dirt more than once owing to the shallowness of bed rock. Mining went on only during the two summer months of July and August in contrast to the "winter diggings" in the Klondike where the miners worked the year around, thawing and excavating during the winter and washing the "dump" during the summer.

During the summer Lieutenant Wallace Craigie and a detachment of the Seventh Infantry from San Francisco arrived to relieve Lieutenant Spaulding. Before Lieutenant Spaulding left the new officer in charge, they held conferences in his tent and Lieutenant Spaulding passed on to the newcomer the results of his year of experience in the North and much valuable information about the community in general, and all notorious characters in particular. By this time

Lieutenant Spaulding felt like an old-timer, a full fledged "sour dough," and all that had gone into making him this, must have given him a keen appreciation of that part of his commission which reads: "He is therefore carefully and diligently to discharge the duty of second lieutenant by doing and performing *all manner of things* thereunto pertaining."

On September 1, 1900, the military forces at Nome, Rampart, Fort Yukon, and Circle City turned over the control of their districts to the newly organized civil authorities. This met with a protest from many citizens who signed petitions asking for the soldiers' retention, since they knew that the military jurisdiction was honest and impartial, but the time had come for the civil authorities to take charge. So ended the successful experiment of remote control from Washington extended north of Sixty-Three.



Professional Education of National Guard

By Colonel William H. Waldron, Infantry

ONE of the most important activities of the Militia Bureau is the professional education of officers and enlisted men of the National Guard. For this purpose the Regular Army Service Schools have been made available, and special courses adapted to the needs of the citizen-soldier have been provided.

Congress provides the sum of \$375,000.00 per year to cover the expenses of the officers and enlisted men who are selected to take the courses at the army service schools. These expenses include everything from the time the officer or soldier leaves his home for the school until he returns thereto. This amount will allow the attendance of approximately 312 officers and 125 enlisted men.

The main object in providing special courses at the Army Service Schools for the training of officers and enlisted men of the National Guard is to qualify them as instructors for their organizations and units. To this end the Chief of the Militia Bureau is making constant efforts to include only those officers and men in the school details who contemplate remaining in the National Guard for a reasonable length of time after graduation.

It will be interesting to note the per capita cost of the various courses, and they are set forth below:

Officers

School	Duration of Course	Grade of Officers	Average per capita cost
Army War College, Washington, D. C., ..	4 wks	Field	\$ 850 00
Command and General Staff School, Fort Leavenworth, Kan., ..	3 mos	Field	1822.13
Infantry, Field, Ft. Benning, Ga., ...	5 wks	Field	850.00
Infantry, Co. Off., Ft. Benning, Ga., ...	3 mos	Co. Off.	1150 00
Infantry, Tank, Ft. G. Meade, Md., ...	3 mos	Co. Off.	1150 00
Field Artillery, Field, Ft. Sill, Okla., ...	6 wks	Field	830.00
Field Artillery, Btry. Off., Ft. Sill, Okla., ..	3 mos	Btry. Off.	1130.00
Cavalry, Field, Ft. Riley, Kan., ...	6 wks	Field	800 00
Cavalry, Troop Off., Ft. Riley, Kan., ...	3 mos	Troop Off.	1025 00
Coast Artillery, Field, Ft. Monroe, Va., ...	6 wks	Field	850 00
Coast Artillery, Btry. Off., Ft. Monroe, Va., ..	6 wks	Btry. Off.	690 00
Engineer, Co. Off., Ft. Humphreys, Va., ...	3 mos	Co. Off.	914 00
Aviation, Med., Brooks Field, Tex., ...	3 mos	Field	1680 00
Medical, Carlisle, Pa., ..	6 wks	Field	825 00
Signal, Ft. Monmouth, N. J., ...	3 mos	Co. Off.	1018 00
Chemical Warfare, Edgewood Arsenal, Md., ..	5 wks	Unit Off.	840 00
Q. M., Philadelphia, Pa.,	2½ mos	Staff	1569 00

¹ Executive Officer Militia Bureau.

Enlisted Men

School	Duration of Course	Grade of Soldier	Average per capita cost
Inf., Ft. Benning, Ga., ..	4 mos	Any	\$ 490.00
Field Art., Ft. Sill, Okla.,	4 mos	Any	490 00
Cavalry, Ft. Riley, Kan.,	5 mos	Any	580.00
Coast Artillery, Ft. Monroe, Va., ...	11 wks	Any	312.00
Air Corps, various, Chanute Field, Ill., ²	6 wks to 6 mos	NCO's or Specialists	300 00 to 1000 00
Medical Field Service, Carlisle Barracks, Pa.,	2 mos	NCO's.	277.00
Signal School, Ft. Monmouth, N. J., ...	4½ mos	Communications Personnel	439 00

² The courses at the Air Corps Schools include parachute riggers; radio mechanics; engine mechanics; photographic; aircraft armorers; aircraft welders; and crew chiefs. The length of courses vary from six weeks to six months and they are held at various times during the year.

Where an officer or an enlisted man severs his connection with the National Guard and renders little or none of this instructional service, satisfactory returns for the funds devoted to his school training are not received by the National Guard.

The following tabulation shows the situation with respect to the officers of the National Guard who have attended the army service schools.

Number of officers from each State who have been sent to Army Service Schools since 1921, up to and including the fiscal year 1930; also the number of graduates of these schools in the National Guard on July 1, 1930.

State	Sent to Service Schools from 1921-30, incl.	Graduates in National Guard July 1, 1930.	Graduates who have left the Service.	Percent of Graduates in National Guard July 1, 1930.
Ala.	48	27	21	56
Ariz.	17	9	8	53
Ark.	51	35	16	69
Calif.	69	49	20	71
Colo.	46	22	24	48
Conn.	61	45	16	74
Del.	9	5	4	55
D. C.	22	15	7	68
Fla.	41	24	17	59
Ga.	51	26	25	51
T. H.	20	12	8	60
Idaho	23	15	8	66
Ill.	106	69	37	65
Ind.	75	38	37	51
Iowa	52	34	18	65
Kan.	60	31	29	52
Ky.	36	27	9	75
La.	32	20	12	64
Me.	44	28	16	63
Md.	46	26	20	57
Mass.	131	76	55	58
Mich.	65	50	15	71
Minn.	74	44	30	59
Miss.	21	12	9	57
Mo.	71	38	33	53
Mont.	14	10	4	71
Neb.	25	19	6	76
N. H.	13	13		100
N. J.	61	38	23	62

Number of officers from each State—Concluded

State	Sent to Service Schools from 1921-30, incl.	Graduates in National Guard July 1, 1930.	Graduates who have left the Service.	Percent of Graduates in National Guard July 1, 1930.
N. M.	17	11	6	65
N. Y.	177	128	49	73
N. C.	51	27	24	53
N. D.	16	12	4	75
Ohio	109	77	32	71
Okla.	81	48	33	59
Ore.	50	38	12	76
Pa.	148	92	56	62
P. R.	16	13	3	81
R. I.	27	19	8	70
S. C.	38	17	21	45
S. D.	22	17	5	77
Tenn.	40	19	21	47
Tex.	127	83	44	65
Utah	33	17	16	51
Vt.	26	18	8	69
Va.	54	29	25	54
Wash.	61	32	29	52
W. Va.	21	14	7	67
Wis.	80	36	44	45
Wyo.	9	5	4	56
Totals	2,587	1,609	978	62.2

Of the 2,587 officers who have attended the schools, there were on July 1, 1930, 1,609 still in the National Guard. This means that 37.8 per cent. of those who have attended the schools have severed their connection with the National Guard. This percentage considered over a period of ten years is an average of 3.78 per cent. per year. The annual officer turnover in the National Guard is approximately 14.6 per cent. This indicates that the school graduates are staying in the service and form a valuable asset to the national defense.

Army War College Course.

Officers for the course at the Army War College are selected from the whole body of general and field officers of the National Guard—men of high standing in the National Guard, with a broad general education and having sufficient military knowledge to enable them to pursue the course with profit to the Government. In general, the age limits imposed upon members of the Regular Army detailed for the course are adhered to. The G-1 and G-2 Courses are open to officers of the National Guard, and the course extends over a period of one month. An officer who desires to take these courses submits his application to the Chief of the Militia Bureau through the Adjutant General of his State, and it is from the applications on file that the Chief makes the selections. The list of names of officers who are to be detailed for the courses, which are held during the last three months of the calendar year, must be in the hands of the Adjutant General of the Army at least three months and 15 days before the opening of the course. Officers who desire the fall courses should initiate their applications during the month of May previous.

Command and General Staff School Course.

Officers for the Command and General Staff School course at Fort Leavenworth are selected from the whole body of field officers of the National Guard. A

complete record of officers who have attended this school is on file in the office of the Chief of the Militia Bureau. Among other things, it shows the number of officers from each State who have attended the course, and it is of assistance in making subsequent selections.

At the proper time, months in advance of the opening of the courses, the Chief of the Militia Bureau goes over this list and determines upon the States to which the vacancies for the next course should be allotted. In order to keep these coveted assignments as evenly balanced as possible, his decision is based upon the officer strength of the several States and the number of officers they have sent to the schools. The allotment is made to the States which, according to the record, are entitled to the vacancies, and they are asked to accept or to reject the allotment before a specified date. The time limit is placed so that if a State to which a vacancy has been allotted has no officer available, it may be passed on to another State.

In order to secure the detail to the Command and General Staff School an officer must possess the following qualifications:

1. He must have completed Subcourses 1, 2, 3 and 4 of the Command and General Staff Extension Course before the date of entering the school. If these subcourses have not been completed prior to date of his application a statement must be included to the effect that they will be completed before the opening date of the course. As soon as the four subcourses are completed the officer is required to submit a certificate to that effect to the Militia Bureau for consideration in the final selection of candidates.

Some officers have the idea that this is an undue and unnecessary requirement. They arrive at that conclusion without a knowledge of all the facts. The school authorities at Fort Leavenworth over a period of years have found that national guard officers who come to the school without completing these subcourses labor under a great handicap at the school. They are not prepared to go ahead with the courses that the school has to offer, and consequently can not derive the benefits from this opportunity for professional training.

2. The applicant must be of field grade and under 45 years of age. Under very exceptional circumstances this age limit may be waived, but in no case will an officer be detailed for the course who is over 50 years old.

3. He must be physically qualified for the arduous duties that he will find included in the course. To this end officers are required to undergo a thorough physical examination at their home station before going to Leavenworth, and a copy of MB Form No. 63 is required to accompany the application for the detail.

4. He must not be on the Emergency Officers Retired List. The Militia Bureau must spend the funds available for the professional education of officers who are going to be future assets to the

National Guard. An officer on the Emergency Officers Retired List has certain definite disabilities and consequently certain definite limitations to active service, and the limited funds available can not be devoted to them.

Applications to take the course should be forwarded through the established chain of command and be in the Militia Bureau prior to October 15. This chain of command means through the State Adjutant General and the Corps Area Commander. The application must include the following:

Rank, name and assignment.
Permanent address.
Age.
Number of dependents.
Prior commissioned service — years, — months, — days.
Number of miles from residence to school.
Progress in completion of the Command and General Staff Extension Course.
Statement of whether or not applicant is on the Emergency Officers' Retired List, and whether or not he is receiving any compensation for physical disability from the Government.

The course at this school begins about the middle of March and extends through to the date of graduation of the regular second year class, which comes about the middle of June.

Special Service Schools.

The following courses have been established at the special service schools for national guard personnel, and the Chief of the Militia Bureau authorizes the attendance of the number of selected officers and enlisted men that the funds available will provide for:

<i>School and Course</i>	<i>Approximate Date Course Commences</i>	<i>Length of Course</i>
INFANTRY, Fort Benning, Ga.		
Field Off.	1st wk. in Jan.	6 wks.
Co. Off.	3d wk. in Feb.	3 mos.
Communications (Enl. Men)	2d wk. in Feb.	4 mos.
(See Note A)		
TANK SCHOOL, Ft. Meade, Md.		
Co. Off.	1st wk. in Mar.	3 mos.
FIELD ARTILLERY, Ft. Sill, Okla.		
Field Off.	1st wk. in Jan.	6 wks.
Btry. Off.		
Fall	2d wk. in Sept.	3 mos.
Spring	3d wk. in Jan.	3 mos.
(See Note B)		
Communications (Enlisted Men)	1st wk. in Feb.	4 mos.
CAVALRY, Ft. Riley, Kansas		
Field Off.	Last wk. in Apr.	6 wks.
Tr. Off.	2d wk. in Mar.	3 mos.
NCO'S.	1st wk. in Jan.	3 mos.
(See Note C)		
COAST ARTILLERY, Ft. Monroe, Va.		
Field Off.	2d wk. in Sept.	6 wks.
Btry. Off.	2d wk. in Sept.	6 wks.
Enl. Spec.	2d wk. in Sept.	2½ mos.
MEDICAL, Carlisle Barracks, Pa.		
Field Off.	1st wk. in Sept.	6 wks.
(See Note D)		
NCO'S.	1st wk. in Oct.	2 mos.
ENGINEER, Ft. Humphreys, Va.		
Co. Off.	1st wk. in Mar.	3 mos.

<i>School and Course</i>	<i>Approximate Date Course Commences</i>	<i>Length of Course</i>
SIGNAL, Ft. Monmouth, N. J.		
N. G. & Res. Co. Off.	2d wk. in Mar.	3 mos.
QUARTERMASTER, Philadelphia, Pa.		
Special Course (Officers')	2d wk. in Jan.	2½ mos.
AIR CORPS, Chanute Field, Ill.		
Capts. or Lts.		
Communications	1st wk. in Apr.	3 mos.
Photographic	1st wk. in Mar.	3 mos.
Armament	1st wk. in Apr.	3 mos.
Enl. Men		
Airplane mechanics	1st Mon. in July, Sept., Nov., Jan., Mar. and May	24 wks.
Aircraft armorers	1st Mon. in Aug., Oct., Dec., Feb., Apr. and June	24 wks.
Crew chiefs	Same as Aircraft Armorers	
Engine mechanics	Same as Airplane Mechanics	
General mechanics, aircraft welders	1st Mon. in July, Sept., Nov., Jan., Mar. and May	32 wks.
Photographers	1st Mon. in each mo.	24 wks.
Parachute riggers'	1st Mon. in July, Sept., Nov., Jan., Mar. and May	6 wks.

Note A: The Communications Course at the Infantry School is for non-commissioned officers, preferably capable sergeants, belonging to infantry headquarters units. They should have at least the equivalent of an eighth grade education and be of the type that can be used as instructors upon their return from the course.

Note B: It is preferred to detail captains to this course. Lieutenants with less than two years' service should not be selected. Officers detailed should be conversant with the subject covered in the Battery Officers' Course of the Army Correspondence Courses, especially with those subcourses dealing with the observation and conduct of fire.

Note C: Students should have at least two years service in the National Guard. They should be able to ride a horse at all cavalry gaits and have a working knowledge of cavalry weapons, rifle, pistol and saber. They should have some knowledge of how to read and use the ordinary military map. Some knowledge of machine rifles, machine guns, animal management and horseshoeing would also be desirable.

Those students who successfully complete the course should be well qualified for consideration as 2d lieutenants in national guard cavalry; consequently noncommissioned officers for this course should be selected from men who are promising officer material.

Note D: Qualifications: Not over forty-five years of age, of any grade with at least one year's service which includes two weeks summer training.

An allotment to the States of officers (except field officers) and enlisted men for the courses is made annually. The allotment represents the numbers for which it is definitely known that funds are available. Applications for the places included in an allotment are considered as "principals," and officers and enlisted men in that category will be authorized to attend if they are otherwise eligible and qualified. It has been found that a few men designated as principals each year find that they will be unable to attend the school; so, in order to provide full classes, the state authorities are urged to send to the Militia Bureau an additional list of applicants. These are designated as "alternates" and they are available to take the place of those who drop out for one cause or an-

other. Those States which do not have an allotment for a particular course may also send in a list of "alternates" to the Militia Bureau. In case any State having a "principal" allotment does not fill it, the "alternate" thus recommended will have a chance to go to the school. All applications duly passed on and approved by state authorities should be in the Militia Bureau at least a month and five days before the date set for the opening of the course. The roster of each class is made up one month prior to the opening of the course.

No definite allotment to States is made for field officers' courses. The applications of those who desire to attend such courses are considered from the National Guard as a whole.

In view of the importance of the courses and the large number of officers and enlisted men who desire to obtain these details, precautions are taken to insure that those selected will reflect credit on the National Guard, that they have the mental and physical qualifications to pursue the course with profit, both to themselves and to the Government; and that they contemplate remaining in the National Guard for such a period of time after graduation that they will be able to render service commensurate with the funds devoted to their military education.

Officers and enlisted men who accept the details at army service schools should do so with the understanding that there are no accommodations at the school available for their families or dependents; that transportation at government expense of families or dependents is not to be provided; that they must time

their arrival at the school on the date specified for reporting, and not arrive ahead of time because accommodations may not be ready, nor a day late (because the course starts right off and there is no opportunity to make up lost time); that officers are entitled to pay and allowances of their rank, including base pay, longevity pay and subsistence allowance, and to rental allowance where the course does not exceed four months or when the course does exceed four months, if the officer has dependents and no accommodations are available for them; enlisted men are entitled to the pay of their rank, subsistence in kind, and quarters for themselves in barracks or tents; and that officers should provide themselves with bedding rolls and sufficient field equipment for short maneuver periods.

All enlisted men who go to school should arrive there with complete outfits of uniform clothing sufficient in quantity and quality to see them through the course. The issue of clothing to them at the school entails an enormous amount of paper work and administrative transactions.

Enlisted men must expect to remain in the exact grade they held when they were originally recommended for the course. The Militia Bureau places no limitation on the grades, except that they must be appropriate to the course being pursued at the school. In order to keep a check on the funds available and determine the number of men who can take the courses, it cannot have a man recommended in the grade of corporal and then have him show up at the school in the grade of technical or master sergeant with a payroll of three to four times the amount contemplated.

Change in Location of Fishing Limit Lines in Lower Chesapeake Bay, Virginia

AT the request of the fishermen concerned, the Secretary of War has approved the recommendation of the Chief of Engineers, Major General Lytle Brown, that the existing limit line within which fish nets may be placed between Fisherman's Inlet and Plantation Light in Lower Chesapeake Bay be extended channelward so as to include the area between the eastern shore and a straight line drawn from Fisherman's Inlet north to a point $\frac{3}{4}$ of a mile south of old Plantation Light.

The existing limit line which was established by revised regulations February 21, 1927, follows the 18-foot contour along the eastern shore between Fisherman's Inlet and Plantation Light.

An Antiaircraft Burst Plotter

By Tech. Sgt. John W. Nelson, C. A. C.

EDITOR'S NOTE—One of the most laborious duties connected with antiaircraft artillery firings is the plotting of the shots for analysis. Any device which facilitates this work is of interest to all Coast Artillery units. The Nelson AA Burst Plotter, devised and described below by Technical Sergeant John W. Nelson (Artillery), C. A. C., 62d Coast Artillery (AA), was used extensively by the 62d CA(AA) during the summer of 1930 and is considered by the officers of the regiment superior to any aid to plotting so far devised. Its main advantages are simplicity, accuracy and speed. The plotter can be made locally at practically no expense; the board used by the 62d CA(AA) was made by Technical Sergeant Nelson.

THE device is used for making a plot of the horizontal and vertical projections of bursts using mil deviations. Scale of plot 1"—50 yards.

Identification List

Number	Name of part.
1	Normal line of board
2	Disc
3	Disc mil scale
4	Paper holders
5	Range scale
6	Mil sheaf
7	Conversion scale
8	Index
9	Mask hypothetical target

Description

The board is made of 1" white pine and overall is 23" x 31". Expansion battens are screwed to the underside.

The normal line of the board is perpendicular to the left edge 11½" from the top and passes thru both 1600 mil graduation on the disc.

The disc has a radius of 9" and rotates in a cutout in the board. Its center is located 11½" from the top and 21" from the left edge of the board. It is supported by and rides on a circular batten and a strip across the center, having a metal pivot, screwed to the under side of the board. A mil scale was drawn on the disc from 0 to 3200 mils each way. The least graduation is 10 mils. Paper holders, similar to those used on plane tables, were countersunk in the disc to permit smooth movement of a T-square blade over the board. The holders were placed to receive a sheet 8" x 10½". The upper pair 8" apart on a line 5¼" above the normal line and the lower pair 8" apart on a line 5¼" below the normal line. Both right holders are on a line perpendicular to the normal and 2" right of the disc center. This position of the paper, for the plot, is designed to be used when O₂ is to the right of O₁. When O₂ is on the left the holders can be placed so that both left holders are on a line perpendicular to the normal and 2" left of the disc center.

The range scale starts ½" from the left edge of the board and extends along the normal line from 0 to 10,000 yards to the scale 1"—1000 yards. The least graduation is 100 yards.

The mil sheaf is a fan of mil rays drawn from the

same origin as the range scale and extends to the 10,000 yard range line. The sheaf extends 30 mils on both sides of the normal line. The least graduation is 1 mil.

The conversion scale is drawn on the 10,000 yard range line and is graduated by the termination of the mil rays in that line. Its scale is 1"—50 yards. The least graduation is 5 yards.

The index is placed on the board opposite zero on the disc mil scale.

The mask of the hypothetical target is of xylonite. The plinth and cylinder of the target are cut out and the end projection lines a stencil cutout to permit the insertion of a pencil point so that the hypothetical target can be drawn on the plot. A longitudinal axis etched on the under side aids in adjusting the mask on the angular heights line. On the edge of the mask is a scale of yards (1"—50 yds) etched on the under side and graduated from 0 to 50 each way.

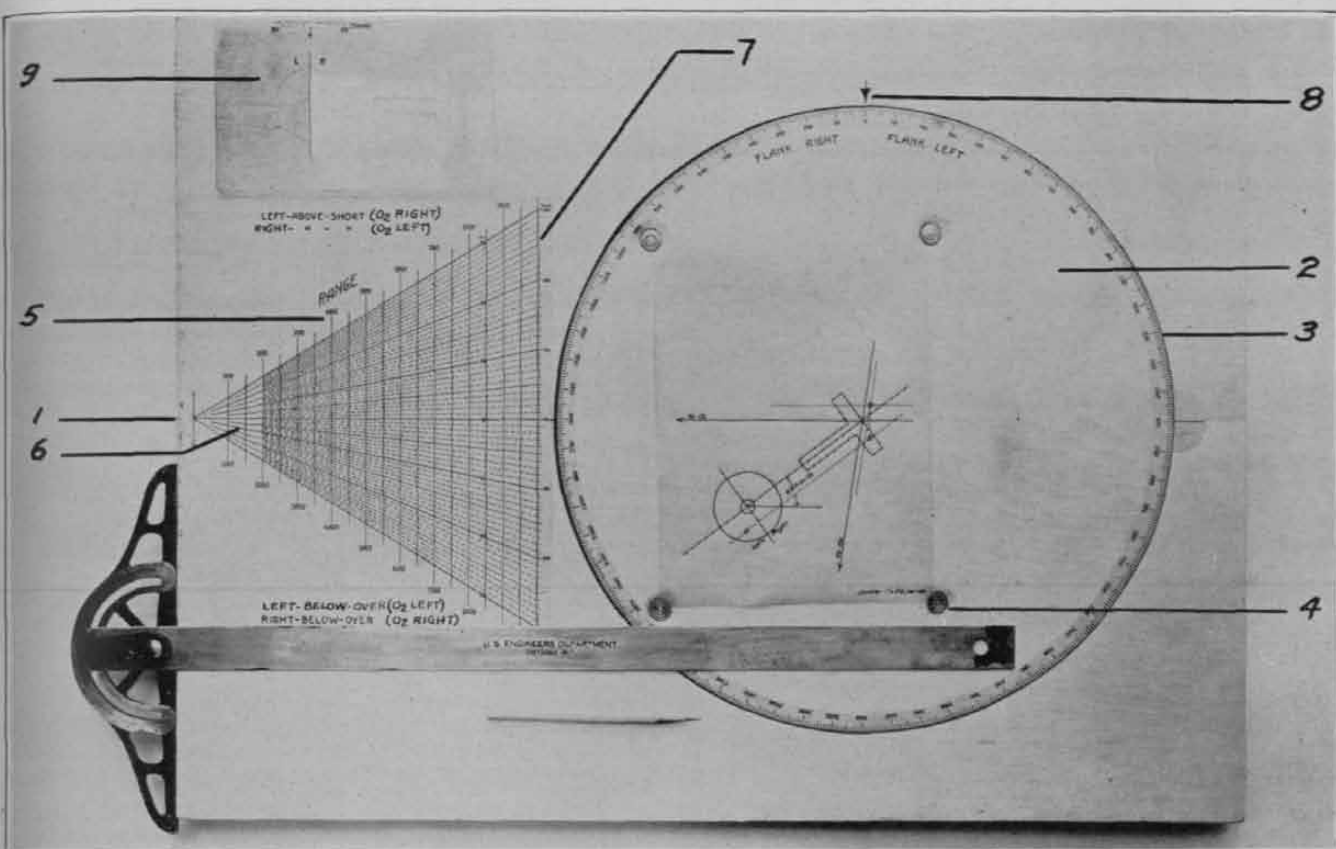
Operation

With the average angle gun-target-flank, average angular height and the mil deviations from battery and flank observation stations for a group of bursts the horizontal and vertical projections of bursts can be plotted.

To Make the Plot

With paper, upon which plot is to be made, attached to disc turn disc until disc mil scale reads zero at the index. Slide T-square to normal line of the board and draw a line across the paper. This line is the O₁-target line. With disc in this position move T-square to intersection of slant-range line and mil deviation ray for the first burst in the group being plotted and draw a line giving it the number of the burst. Record the deviation in yards taken from the conversion scale for each burst. In a like manner draw in rays for remaining bursts in the group and record the deviations in yards for each burst.

Turn disc until the reading on the disc mil scale equal to the average angle gun-target-flank for the group is opposite the index. Slide T-square to normal line of the board and draw a line. This line is the O₂-target line and its intersection with the O₁ line is the horizontal projection of the target. Move T-square to intersection of slant range and mil deviation ray from O₂ and draw a line. Give this line the number



An Antiaircraft Burst Plotter.

of the burst. The intersection of this ray with the ray from O_1 having the same burst number is the horizontal projection of that burst. Proceed in like manner for remaining bursts in the group.

Turn disc until the reading on the disc mil scale equal to the average angular height for the group is opposite the index and with the T-square at the normal draw a line. This line is the angular height line and passes through the target in a vertical plane. With the disc in this position move the T-square to the intersection of the slant-range line and deviation line above or below from O_1 and draw a ray. Give this ray the number of the burst. Draw in rays for remaining bursts in the group giving them proper burst numbers.

To project from the horizontal to the vertical plane turn disc until the zero on the disc mil scale is at the normal line and slide T-square to each horizontal projection of bursts and draw projecting rays to their

respective rays in the vertical plane. Give these intersections proper burst numbers. They are the vertical projections of the bursts.

Place the mask on the vertical projection making its longitudinal axis coincide with the angular height line and the base of the plinth at the projection of the target. Inspect the vertical projection of the group of bursts through the plinth and cylinder cut-out in the mask. Bursts appearing in the plinth must appear in the end projection of the plinth to be a hit. Likewise bursts appearing in the cylinder must appear in the end projection of the cylinder to be a hit. To plot bursts in the end projection of the hypothetical target, refer to the record of deviations from O_1 converted to yards (the rights and lefts) and placing zero of the scale, on the edge of the mask, on the line through the center of the end projection perpendicular to the angular height line, locate rights and lefts of bursts on their respective rays.



A Typical Fight in Open Warfare

By Captain A. von Schell, German Army

IT was about September 20, 1915. From a westerly direction a German battalion had been marching for some days, ever deeper into Russia. The roads were very bad. Sometimes there was a very hot sun, and then again it poured rain. About the middle of September the Germans had had heavy fighting for several days against the Russians in the vicinity of Vilna. Now they were marching eastward again. For several days they had seen no enemy.

The marches were very tiring. They had now come into a land of swamps. Forest, sand, swamp; between them a few villages. Whether they were marching as a part of the division or of the regiment they did not know and did not care. That is, however, always true in wartime. In peace soldiers learn that even the last private should be acquainted with the situation, but in war no one knows anything about it, and generally has no desire to. This last seems to be one of the main reasons for lack of knowledge of the situation. The soldier is satisfied if things go well with him. He has so much to do to look after himself; he must march, sleep, eat, and when he meets the enemy he fights. Whether the entire division is attacking, or only the battalion, is generally a matter of complete indifference to him. Such was the case here. The soldiers marched and marched, slept and ate. Where they were marching, or what they should do, was a matter of total indifference to them. Their higher commanders could make all the strategical plans they wanted, the soldiers marched. It is true that they discussed frequently among themselves what the mission could be. Then someone would say, "We are marching to Moscow." Then there was a laugh and the subject changed.

On one of those sunny autumn days this battalion turned suddenly toward the south at about ten o'clock in the morning. A couple of messengers galloped up and then left. Something must be wrong. The battalion was marching on narrow forest paths, often cross country. The battalion commander had ridden in advance. Suddenly he returned: "The Russians have attacked our cavalry with strong forces and pressed them back. We are to assist them. About two kilometers in front of us is a river which we are to defend."

Soon they reached the river. It was about 40 yards wide, but very deep. On the farther bank was a village. On this side the woods and fields lay in an irregular pattern. Not a shot could be heard, no Russians could be seen, nor was there any German cavalry visible. The battalion commander was the only one who had a map. He said to his company commanders: "Over there on the right about 500 meters away is a farm; a battalion of the X Regiment will be there.

We will defend from this edge of the wood to the left. The 9th, 10th, 11th Companies in front, each with a sector 300 meters wide; the 12th Company in reserve behind the middle of the battalion. To the left of our battalion is cavalry. We have no artillery for the time being. Send patrols across the river. I will get in touch with the cavalry."

Let us go with the 9th Company which was on the right flank. The young company commander let his company bivouac about 200 meters from the river in the wood, and advanced with a few men to the river so as to look the situation over and see the real lay of the ground. Before he left his company he sent a patrol to the right to make contact with the battalion at the farm.

All was quiet at the river. The story about the Russians which the battalion commander had told did not seem to be as bad as he had painted it. The terrain was very unfavorable. All about were patches of woods, some small, some large, so that one could see only about 100 meters in any direction.

This company was about 80 to 90 men strong. The company commander decided to use two platoons in the front line on the river and to hold back the third as a reserve. He therefore issued such an order. His platoon commanders were corporals, but were men on whom he could rely. They returned to their platoons. He himself sought a boat along the river so as to reach the farther bank. He wanted to see what it looked like on the other side, but I must also admit that his principal reason was to see if he could find something to eat in the village across the river. Finally he found a boat. Then he looked back and saw his platoons coming forward from the wood. All was running smoothly. Suddenly a rifle shot rang out over to the right. He thought that someone of the other battalion over at the farm was killing a pig for the field kitchen. Now another shot. He said to himself: "Ah ha! A bad shot. The man certainly ought to have been able to kill the pig with his first shot." More firing; two, four, seven shots. Can there be a fight over there? Heavier firing—and then, more quickly than it can be told, a flood of events, thoughts, and decisions.

The young officer's first thought was: "The neighboring battalion has located and driven back a Russian patrol. The firing, however, seems to be too strong for a mere patrol fight." He had in the meantime, however, climbed out of the boat. His patrol would certainly bring him information. Suddenly a few rifle bullets whistled over his head, coming from the right rear. By the sound he knew that the bullets came from Russian rifles. The situation suddenly became quite clear to him. "The neighboring battalion could not be there, or the bullets could not

have come from the right rear. The Russians had crossed the river and were at the farm."

What should he do? The battalion commander was not there, he must make his own decision, and act. His train of thought was perhaps as follows: "Mission: defense of the river. The situation is changed. The Russians are across the river. Therefore, the decision is to attack quickly with as strong a force as possible."

He ran back with his runners to his reserve platoon. On the way he gave an order to a runner in whom he had entire confidence: "The left platoon will immediately retire into the wood and will then follow me in an attack on the farm. The right platoon will defend the entire company sector. Then report this decision to the battalion."

The company commander was soon with his reserve platoon. It had taken position with its front to the farm, which, however, was not visible. In that direction the firing was still going on. Without halting a moment, he yelled: "The whole platoon will attack in double time in the direction of the farm." And then they all plunged into the wood as quickly as possible.

The Germans must attack the Russians quickly before they could get across the river in dense masses. Now a messenger came running up from the patrol breathing hard: "The Russians are across the river near the farm. The patrol is lying down along a little road which leads north from the farm. The Russians are trying to get around us." A new situation had now arisen.

Since the first decision of the company commander scarcely ten minutes had passed. His thoughts were perhaps about as follows: "Has the situation changed? Do I now have to make a new decision? Is it possible to continue to attack? Are not the Russians already across the river in too strong force?" He had only 30 men with him. He decided to attack. We do not want to try to decide whether this decision was right or not. We only want to state it.

He continued to advance through the wood with the platoon. Now it became lighter. There was the edge of the wood. Just beyond was another wood, and the road leading to the north. Russians were on this road. "Lie down, fire, range 400 meters." That was the only order given, and then the Germans' fire broke loose. For a moment it was quiet on the enemy's side, but then a storm of bullets came down on the men. There certainly must be a mass of Russians concealed over there. At this moment came a runner from the 2d Platoon: "The 2d Platoon is 200 meters in rear of us." Again the young company commander had to make a decision. Should he continue the attack? No time was available for thinking long on this matter. He called out: "I am attacking with the 2d Platoon on the right. This platoon will keep up the fire and then join the attack." He ran back to the 2d Platoon and then led it forward through the wood towards the right. As they ran he gave the order: "There are Russians across the river near the farm. We are attacking." In a very brief time they reached

the edge of the wood. As they came out of it they received very heavy fire from the right flank, which forced them to lie down. The Russians were already much farther across the river than they had believed possible. The situation had changed again. What should this company commander do? Would he have to make a new decision? At this moment a runner came from the battalion: "The Russians have broken through our cavalry"—his last words as he sank to the ground with a bullet through his head. Again the situation had changed. What should the poor officer do? Would he have to make a new decision?

Naturally the situation was not as clear to him as I tell it here. He did not have a map. He stood in the midst of combat. In every fight the impressions are tremendously strong, even when one has been at war for a long time. One thing seemed clear to him—to carry on the attack alone with 50 or 60 men would lead to failure. But what should he do? There were only two possibilities—to hold where he was, or to withdraw.

Defense could be advantageous only if fresh German troops were available which could drive the Russians back across the river. You will perhaps remember that of this battalion, the 12th Company was still in reserve. But the 9th Company had neither seen nor heard anything of it. The company commander therefore believed that it had probably been used on the left flank of the battalion where the cavalry had retired. Still another body of troops which might be able to help was the battalion which should have been at the farm. It was not there. When would it arrive? Would it come at all? He did not know.

The situation was therefore that the 9th Company could hold its own if it received support immediately. If no support was coming it was high time to retire. To remain where it was fighting, without prospect for immediate support, was equivalent to destruction. The company commander decided to retire. We do not want to try to determine here whether his course was right or wrong. We want to make clear that this decision had rather to be felt than arrived at through logical thinking. We might recall again, that the young officer had these thoughts in neither such clear form nor in so much time as it takes us to tell them here. He felt rather than thought.

They retired slowly. By afternoon they had gained touch again with their battalion. The cavalry was there too; then another battalion arrived, and a few batteries of light artillery. They had survived the crisis. They organized a defensive position on a little ridge in the middle of swamp and forest.

In the next few days they repulsed with heavy loss all attacks of the Russians, but themselves suffered many casualties. I want to tell a little incident of this fighting because it shows how one often has to operate in war with the most unique methods.

The German line was very thin in this defensive position; the men were much dispersed. The battalion had a reserve of only 30 men, which had to help in repulsing every Russian attack. The battalion lay in the swamp without trenches and without wire. In

the terrain in front they could only see a short distance. Everywhere there were small bushes, small woods, so that they never could get a general view. Therefore, it was often very difficult to determine when the Russians were going to attack. They generally saw them for the first time when they were very close. They had also too few men to send out strong outguards. How could they help themselves in this situation? Then a corporal made a very simple but very good suggestion. About 500 meters behind the lines there was a village in which there was a large number of cows. The corporal went to this village and drove all these cows in front of the position, where they could quietly graze. When the Russians approached the cows became uneasy and came toward the lines, and in this manner the Germans avoided surprise. These cows were the best and most valuable outpost ever seen in war.

Now, what can we learn from this little fight?

1. We saw in this fight complete lack of intelligence of the enemy and knowledge about the situation. Although in this case the German cavalry had been in contact with the enemy and therefore was probably in a position to bring information, still this source failed. Suddenly the Russians were across the river, their strength was completely unknown. Certainly the approach of the Russians in a future war would perhaps have been determined by aviators—I say perhaps. But it is my personal belief—I do not, of course, know whether this opinion will prove to be correct—that in the future we may not expect too much from our aviators.

In the first place, both sides will have aviators at their disposal who will fight each other. And before aviators can obtain good reconnaissance they must first beat the mass of the enemy's aviation. If the enemy is victorious in the air, we could naturally never hope for good information. Further, aviators in open warfare prior to combat will obtain principally intelligence of the large units of the enemy; marching columns, direction of march, and the like. This information will reach the higher staffs in the rear. What we at the front want to know about the enemy is where the machine guns and the centers of resistance are. Our fliers can rarely tell us, and then generally too late to do us any good.

Finally, we will constantly try to conceal ourselves from aviators by marching at night or by splitting our forces into small groups. If we expect these measures to be successful, we must assume that the enemy's similar measures will be equally successful.

I believe, therefore, that in the war of the future we shall have to make decisions without satisfactory knowledge of the enemy. It is therefore important to practice this in peace, and constantly remember that one can do in war only what one has learned in peace.

2. This fight brought with it a very difficult situation which changed like lightning and demanded instantaneous decisions. How shall we solve difficult situations in war if we have not learned to do so in peace? If we read military history, everything seems

simple and clear because we can always see the entire situation, because generally we can obtain no glimpse of the minute details. We must get used to the fact in peace; we must teach ourselves and our men that in war we constantly come face to face with difficult situations. Good tennis or football players can be developed only by practice. What you are not able to do in practice you cannot do in a game, and what we soldiers do not learn in peace we cannot do in war.

3. I believe that this example shows clearly that difficult situations can be solved only by simple decisions and simple orders. The more difficult the situation the less time you have to issue a long order, and the less time your men have to understand a long order. If the situation is difficult all your men will be considerably excited. Only the simplest things can then be executed. We saw that this situation developed slowly and simply for a time. Then the difficulties came quick and fast. When I look back on the war, this was the condition in almost all situations. I believe we can draw the following lessons about issuing orders. The first order for the fight can generally be given without hurry. It must therefore contain everything that is necessary, above all the mission and the information at hand; but we should not expect that during the combat we can issue new, long orders, either written or verbal. They should be short, but as clear as possible.

4. And now the last point, which seems to me the most difficult of all. Our map problems generally close as follows: "It is now such and such an hour. Required, the decision." We know the situation, we have all the information, and we have to make a decision. I believe that the story of this fight has shown us very clearly that the most difficult thing is, to know the *moment* when we have to make a decision. The information comes in by degrees. We never know whether the next minute will not give us further information. Shall we now make a decision, or should we wait still longer? In other words, to find the moment for making a decision is usually more difficult than the decision itself. Therefore, go out with your platoon commanders, your section and squad leaders, in the terrain. Tell them that they are marching with their platoons here on this road. When you then reach a selected point, give to the leader a bit of information or an impression, then march quietly further. Now give another bit of information. Never ask, however, for a decision, and you will see how terribly difficult it is to determine the time to make a decision.

We must learn all of these things in peace, and learn them in our first days in the Service. But we must not know these things in only a general way, we must know them thoroughly. We can do in war only what we have learned to do in peace.

I want to close with a word of General von Seeckt's:

"Knowledge of a trade is essential, but gaining it is the work of an apprentice. The task of a journeyman is to utilize what he has learned. Only the master knows how to handle all things in every case."

Nothing Is Wrong With the Reserves

By Lieutenant Colonel H. A. Finch, Corps of Engineers

AFTER more than a century of national life without any complete or comprehensive law providing for our defense, our Government for only a little more than a decade has been testing such a law, the National Defense Act, originally enacted in 1916 and revised in 1920. Those who have studied our history and can appreciate how our heritage has affected our attitude toward the military arm, have been astonished, not at the difficulties encountered in applying the provisions of this basic law, but at the successes achieved under it. This statement may best be illustrated by considering the peace time operation of a single provision of the Act, that covering the formation of an officers' reserve corps.

Among our many deficiencies in 1917-18 none was brought home to us more forcibly than the necessity for advance preparation for the future officers of the Army if we were to count on placing forces in the field with speed and efficiency. The Officers' Reserve Corps provision of the National Defense Act was, of course, designed to make possible such advance preparation. Let us consider what has been accomplished in this respect, starting with a brief tabulation of basic statistics:

Total Officers, Reserve Corps enrollment on June 30, 1930	113,273
Deduct National Guard officers with reserve commissions	11,891
Officers holding reserve commissions only	101,382
Reserve officers carried on "unassigned" list ...	21,300
Reserve officers carried on "assigned" list, approximately	80,000

The "unassigned" group members are not eligible for active duty or promotion so long as they occupy that status. Of the 80,000 "assigned" Reservists, approximately 42,000 enroll annually for some form of military training, this total being subdivided as follows:

Active-duty training	22,393
Conference courses (with no active duty)	9,714
Extension courses (with no active duty)	5,270
Conference and extension courses (with no active duty) ¹	4,899
Total	42,276

¹ Includes those who enroll for both the extension and the conference courses. Half of the active-duty group (22,393) enroll also for inactive training.

The annual cost of 14-day active duty training averages \$135.53 per trainee, and the yearly federal appropriation to cover all reservist training now totals around six and one half million dollars.

For instructing reserve officers the War Department furnishes 469 officers and 538 enlisted men from

the permanent establishment. To insure the maintenance of certain standards, the War Department also prescribes limitations as to promotion of reservists and duration of reserve commissions. These are:

a. That commissions shall be issued for periods of five years only, subject to renewal upon evidence that the officer has performed not less than 200 hours of military work during that period.

b. That an individual must serve not less than three years as a second lieutenant, four years as a first lieutenant and five years as a captain before he is eligible for promotion to the next higher grade.

c. That before a reserve officer may be promoted he must either pass an examination or complete satisfactorily a designated series of army extension courses.

While the total enrollment in the "straight" Officers' Reserve Corps (101,382) is quite imposing, the facts that 22,000 are carried on the unassigned list and that only 41 per cent of the full enrollment are active in taking any form of military training have not escaped notice. In fact the situation has disturbed many observers, both among Reservists themselves and in the Regular Army, that organization which is held responsible for the standards of training applied to their brother officers.

A reserve officer writing in a recent number of the *Coast Artillery Journal*² emphasizes his conviction that the ORC is suffering from what might be called inanition. Diagnosing the ailment he, as all good doctors should do, prescribes what he considers to be effective remedies. The subject is seriously treated and the remedies suggested are entitled to respectful inspection. No one familiar with the plan for our country's protection in war can remain indifferent to any deficiency in an organization from which the bulk of officers for war duty must necessarily be drawn.

The writer referred to cites four major causes that, in his opinion, are responsible for the failure of the majority of our Reservists to take any interest whatever in military training.

a. *Length of Service in Grade.* With seven years to serve in the lieutenants' grades and five as a captain, a young reservist, starting at 25 years of age, will be at least 37 years old before he can attain field grade under the present regulations. Consequently, it is argued, to the energetic, impulsive, aggressive young man of the current generation the outlook is discouraging from the very start.

To offset this feeling the remedy proposed by the writer quoted is to remove all time limitations on service in grade and to promote the Reservist as fast as he can qualify for the higher grades before examining boards composed of not less than 50 per cent of

² "What's the Matter With the Reserve?" by Major F. J. Baum, 605th Coast Artillery, in the February, 1931, *Coast Artillery Journal*.

reserve officers. The one restriction imposed would be the stipulation that a vacancy had to exist before the promotion could be made.

With due respect for the evident sincerity behind the suggested procedure, it appears ill advised, to say the least, to promote young officers in the fashion indicated. Since no practical tests in leadership or the management of men can be imposed by the boards referred to, the result would doubtless be the promotion of "book soldiers" who happened to have the time to do the studying required and possessed the intelligence to pass the book tests. One may be permitted to question the soundness of the writer's belief that, "immature and unsatisfactory officers could easily be held back by the board." Evidently he has had limited experience with board "technique"! How could the board function adversely on the "immature" aspirant for a major's leaves if he passed the tests required? How could his immaturity be gauged?

The curious point about this "remedy" is that the reserve officer suggesting it admits that regular officers have to serve much longer periods in the grades indicated and that such service is needed to fit the individual for his increasing responsibilities. But it is nevertheless argued that the Reservist should be promoted anyway because he is *not* a professional and will become impatient if he is not advanced promptly. If it is admitted that an officer's responsibilities in war are heavier than in time of peace, what would happen to us if we went into a war with officers who had been so sketchily prepared for their duty, who had been permitted to attempt to run before they could walk?

b. Life of reserve commission. Another deficiency noted by the writer referred to is the short life of the present reserve commission. To quote, "A reserve officer holds a commission which expires in five years. To enable him to renew it, he must do a certain amount of work. When he begins to drop behind due to extra business activities which directly affect his income, he contemplates the long hours of strenuous work required of him before the date his commission expires, and feels that he can never devote the necessary time to the work. So he shrugs his shoulders and drops all activities. 'What's the use?' he argues, 'I'm bound to lose my commission in another year or two anyway.'"

The "remedy" proposed for this evil is to issue to the Reservist a commission good for life, assuming "decent conduct," and with the proviso that the officer shall pass a physical examination each year and do a certain number of hours in school or extension work annually or pass to an unassigned status. It would also be provided that he could escape from that status by "catching up" on his work.

Beyond any question it will be conceded that the living which the Reservist must make should be placed before any obligation he may have assumed in the field of military work, but an examination of the time involved reveals little basis for the expression "long hours of strenuous work" quoted above. Explicitly, a Reservist, in order to qualify for a renewal of his commission, must perform not less than 200 hours of military work in five years' time, an average of 40

hours per year or less than one per week. Each encampment attendance of two weeks is counted as 100 hours, hence a Reservist has but to attend camp twice in five years to acquire the necessary credits. Or he may (if his branch provides the instruction) solve five map problems (one a month) and attend five meetings of a reserve class each year to receive 40 hours credit annually. A reasonable allotment of time to extension course work by mail, say one hour per week over the autumn, winter and spring months, will also put the Reservist on the right side of the time-credit ledger. Considering these basic figures, it appears that the evil lies not in the fact that the hours are too long but that the duty required is too uninteresting. As a general rule it may be stated that men can nearly always find time to do what they really *want* to do, assuming only that it is within their financial means and mental capacity.

c. Lack of sufficient active duty to hold the reservist's interest. According to the writer quoted herein, it is active duty that has the greatest pulling power with the Reservist, and the statement is advanced that if the average officer gets to camp once in three years with his organization he is lucky. The wide applicability of this statement is open to question, since in a number of branches it has been established that the regiments attend camp every other year, if not each year, and that from 50 to 75 per cent of the trainees are "repeaters" of several years standing because not enough new men will enroll. For the ORC as a whole, 25 per cent of the active-duty trainees are repeaters. One may enthusiastically endorse the contention as to the greater interest carried by active field training as compared with home or classroom study, but how can the latter be eliminated with safety. The reserve officer quoted states that "most of the extension course work, *while very essential*, is dry and uninteresting." Consequently he would merely replace much of it by field training. Granting that the impatient American looking for a "get-trained-quick" military course will find home study work quite uninspiring, the sober fact remains that much theoretical classroom work must precede the practical work if any degree of progress is to be made in the latter.

To correct the situation just described, it is proposed to pay each Reservist "a nominal monthly sum provided he has completed a satisfactory number of hours work in the extension courses, or unit and group schools during the current month." It is further proposed to give each Reservist the opportunity for two weeks' field training each year. These proposals are sound, if the assumption is made that the money will be forthcoming from the public treasury. The fact that the federal Government now pays out upwards of 32 million dollars annually on the support of the National Guard is doubtless the most important single factor in holding the Guard together as an effective force. There is no question but that additional millions added to the millions now expended annually by the taxpayers on Organized Reserve training would have a beneficial effect, but it is also certain that no amount of money compensation can alter the fundamental relationship that should exist between theoret-

ical and practical military training. Considering the nature of this training, together with the non-military tendencies of the average American, it is doubtful, however, if "nominal monthly payments" would add greatly to the number of Reservists who take advantage of the training that is offered; it is more likely that those who already take some training would find time to increase this amount.

Two other contributing causes for reservist indifference are cited by the writer quoted. They are, the tendency to allow "dead wood" to remain assigned to organizations, and the all-pervading talk of permanent peace. The remedies proposed are sound enough. In the first case, discontinue the practice of making such assignments, and in the second, merely recall the history of this nation. In connection with the first of these two points it may be said that, so far as known, there are no cases in which a commander of a reserve unit needs to tolerate "dead wood" among the officers assigned to his organization. A request to the corps area authorities for relief from such encumbrances is usually all that is required to be rid of them.

If a canvass were made it would no doubt disclose a great mixture of motives that underlie the action of upwards of a hundred thousand Americans in enrolling in the Officers' Reserve Corps. Patriotism in some form or other unquestionably plays a part; other incentives probably include the spirit of fellowship, a consideration of the local advantages inherent in membership in some military organizations, and a natural desire for self-improvement or self-aggrandizement. It has been alleged that some reserve officers drop out after a brief commissioned service on the theory that, having once been members of the Reserve, they will receive commissions anyway in the event of war. Clearly such men are animated less by love of country than by hope of gain.

Whatever the motives that underlie reserve membership in the individual cases, it may be said that, taken together, these hundred thousand men represent a fine element in American citizenship. At the same time it may be admitted that many of these officers run true to American form in their impatience with the slow attainment of proficiency in military work under intermittent and inadequate instruction. Refusing to

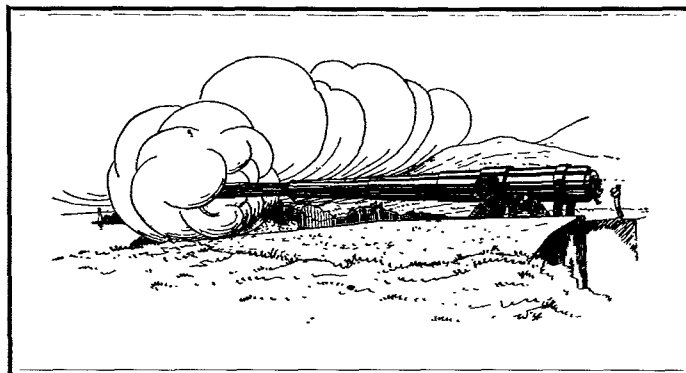
admit that there is no royal road to such proficiency, they cast about for "remedies" and "short cuts." If certain training is uninteresting, however essential it may be, by all means throw it out and bring on something interesting.

The truth appears to be that no system of military training will ever make a wide appeal to our people, and certainly the appeal will lose force to the same extent that the regular, the trainer, does his job in a perfunctory spirit. Inactive training, home study or classroom work, is necessary to make the field training worth while. And the one sure way to make inactive training draw attendance is to organize in all of the larger towns and cities, reservist branch classes for work on map problems that apply to their arms, and for participation in war games prepared by the professional who is guiding the group. Lectures are often so much wasted time; extension courses *are* uninspired; smokers and such semi-social gatherings have no military training value; but class assemblies for working out map problems once a month under competent leadership—these have the necessary pulling power and are worth the effort put into them.

A stern business, this matter of preparing one's self and others for war duty. The regular army man on instructor duty with the civilian elements of our army needs in his equipment something else beside technical proficiency in his branch specialty. He must have the ability to carry classes with enthusiasm through the study of problem after problem; he must compete cheerfully with a multitude of diversions and amusements, not to mention the customary "tired-business-man" inertia; he must cultivate and exercise plenty of patience; he must be willing to devote hours of labor to the work for which he is paid.

Everything considered, the present situation is not so bad. Under the current regulations if a reservist does not report for training he at least costs the country nothing. We have today, thanks to the National Defense Act, a group of 42,000 reserve officers who are receiving some military training each year—and as our instructors become better the number will increase.

There is nothing the matter with the Reserves, generally speaking, except that they are Americans!



Ponderings on Reserve Problems

By Captain Victor Gondos, Jr., 510th C. A. (AA)

ALL Reserve Officers are deeply concerned about the status of the annual active duty tours for that is an absolutely vital essential for the proper functioning of the three-component army.

On December 11 and 12, 1930, a highly interesting battle took place before the "Subcommittee of the House Committee on Appropriations." This subcommittee of Congress was in charge of the 1932 (current) War Department Appropriations Bill.

The War Department was represented at the hearings chiefly by Major R. E. Lee who for two days valiantly bore the brunt of the inquiry by the congressional committee. Major Lee brought forth reams of statistics on the status, past and present and probable future of the Organized Reserve and the Officers' Reserve Corps.

Let us consider some of the figures. According to present calculations of the General Staff we shall require 120,000 active, assignable Reserve Officers as an *absolute minimum* with units in the field. Of these 74,500 should belong to the combat arms and 45,500 to noncombatant services. We have today only 77,000 active Reserve Officers of whom 51,000 are combat and 26,000 noncombatant officers. We are, therefore, now short 43,000 officers or one-third of those immediately essential for mobilization.

While the situation is not the best there is no reason to be excessively alarmed. For one thing it must be borne in mind that the above minimum figure of 120,000 is merely relative as it is based on a maximum emergency. Then again, the trainees at the summer camps have been increasing uninterruptedly since 1924, and so have the congressional appropriations. There is life in the Reserve; our problem is to maintain and slowly increase it. This year is the first exception to the rule of increase, there having been an extremely slight recession of \$5,000 in the appropriations which total \$6,537,785. Below is a table showing the ratios of the various factors in our growth.

Since the Regular Army and the National Guard are today at only one-third of their war strength, and we

of the Reserve Corps have two-thirds of ours, we are (as far as numbers are concerned) really rather well off as compared to the rest of the Army. Our principal weakness is the lack of sufficient training for our personnel.

We, therefore, have simply got to make every reasonable effort not only to ground ourselves well in theory, during the inactive training season, but to work at acquainting our localities and the public of the vital need of adequate appropriations with a particular reference to increasing the attendance on active duty status—be that active duty at the summer camps, at the service schools, or with regular and CMTC units.

The summer camps, we must ever remember, have proved to be the indispensable cement in the fabric of our organization. They attract, hold and enlarge the interest of all officers that have ever taken part in one. The natural corollary is that far from acceding to the War Department's modest intention, due to the appropriations situation, of having an officer attend camp only once in every three years, we must claim as our right as well as duty to be on active service once each year if our affairs permit us to do so. Perhaps it is not generally realized by the majority of reserve officers that this right of attendance is established by the amount and character of his preparation during the inactive training period. Since the government is not paying us for that time, the very least Congress can do is to provide us with adequate facilities to consolidate and refine our training. That is nothing but elementary equity.

Furthermore, it is an interesting point that the hearings before the congressional subcommittee clearly brought out that attitude of mind on the part of the congressmen themselves. Major Lee was going blissfully along at a great rate, explaining to them that whereas the War Department regarded as an absolute minimum the necessity of each officer attending active training once every third year, the present appropriations allowed them only once every fifth year, because there were over 100,000 officers on the rolls

Officers' Reserve Corps Costs and Numbers Trained.

<i>Fiscal year</i>	<i>Total enrollment</i>	<i>Total trained</i>	<i>Per cent trained</i>	<i>Total appropriation</i>	<i>Per Capita cost</i>
1924	76,322	7,434	9.7	\$1,755,000.00	\$22.90
1925	88,898	10,390	10.2	3,280,000.00	36.89
1926	97,125	15,595	16.5	3,674,800.00	35.76
1927	101,563	16,889	16.6	3,721,300.00	36.63
1928	105,059	17,657	16.8	4,158,641.00	39.58
1929	101,926	20,548	20.1	5,453,583.00	53.60
1930	101,382	22,393	22.1	6,335,352.00	63.49

and only some 20,000 could attend annually. This line of argument was soon tripped up by the congressmen when they asked the seemingly innocent question as to how many officers were engaged on the extension courses and conferences of the inactive period. When it came out that only some 30,000 took the inactive duty training they naturally wanted to know why they should even attempt to provide for those who showed no interest whatever, and that they were already providing for active duty on an annual basis for most of those who seemed to be of any military value. There you have it, gentlemen: with all the will in the world and a gallant effort Major Lee was unable to reply effectively to this attack. The only ones that can reply to it are ourselves and we should do so.

However, it should also be pointed out that in view of the fact that most of us can, after all, spend only a limited time and effort on extension school work, we must depend upon and leave it squarely up to the regular personnel in charge of that phase of training to realize our difficulties from our point of view, and thus render every possible assistance in simplifying, condensing, editing, and administering the courses.

Glance again at the tables and you will find that the per capita cost of maintaining the Officers' Reserve Corps has risen from \$22.90 in 1924 to \$63.49 in 1930. This was arrived at by considering all the Reserve officers on the rolls, whether they were in the active or inactive categories and whether they were in the combat or noncombatant or specialist branches. This, of course, actually means that those officers who took some form of training had far more spent on them than the average, and those (like Specialist Reserves) who took none did not really cost a penny to the government.

In other words, such a figuring of unit cost to show a low average cost per man was objected to by the congressional committee, one of them remarking, "Could you not go out and take a civilian who would be a military asset, and count him in the cost of the national defense, too, because he would be just as *active* as one of the Organized Reserve officers who is not doing anything to keep up with that work?" And this from another member, "Would it not give a better average, or would it not be a better way of arriving at the per capita cost, if you used only the men who are actually doing some training?"

These and similar comments from the congressional committee indicates that we are closely checked-up by the authorities having the appropriating powers. Mere talk on our part therefore will not help in maintaining or increasing necessary appropriations. We must continuously prove by our earnestness and concrete interest during the inactive duty season our right to consideration in proper appropriations for active duty assignment. So far as Congress is concerned, it would be far better for us if, when we turned to the published progress charts, we would find fewer of those officers who turn out forty or fifty lessons and a greater number who are working on the lessons of one subcourse.

As "The Reserve Officer" so well remarks, "Each year when the time comes for Congress to consider the Army Appropriation bill one of the difficulties experienced by those Reserve officers in Washington who give their time and energy to this work [in the interest of Reserve appropriations], is the tendency of many officers throughout the country, when asked for help, to complain that the time is insufficient. Sometimes the complaint is accompanied by a virtual demand that hereafter if help is expected all the details must be given well in advance."

The foregoing paragraphs attempt to give a very brief insight into the factors involved in our further advance. May I, therefore, propose the following courses of action to the earnest consideration of every non-active officer within the reach of this writing. Aside from the legislative work done for us by the Reserve Officers' Association each of us can greatly help the situation by:

1. Completing at least one subcourse each season.
2. Inducing at least one other officer who has not previously evinced interest in inactive duty training to enroll in the extension courses and complete at least one subcourse each season.
3. Attending as many conferences as possible.

For those curious souls who may thirst for further figures, a few interesting high lights, gleaned from the congressional report, are added.

1. Adding to the Organized Reserve appropriations the pay, allowances and all other costs of the officers and men of the Regular Army stationed therewith, during the fiscal year 1930, the total cost is increased \$3,624,986 or a total of \$9,960,338 for the cost of the entire Reserve Corps.

2. Of those now on the rolls, 72 per cent are lieutenants, 16 per cent are captains, and 12 per cent are field officers, thus showing that contrary to some opinions the Reserve Corps is not entirely made up of high ranking officers.

3. The figures for the military service and training of officers now in the Reserve Corps show the following proportions in sources: ROTC graduates 35 per cent, World War officers 31 per cent, World War enlisted men 17 per cent, miscellaneous sources 13 per cent, CMTC graduates 1.6 per cent, Regular Army enlisted men 1.2 per cent, former Regular Army officers .8 per cent, flying cadets .3 per cent.

4. This is the first year in which ROTC graduates have outnumbered the ex-World War officers. Significant event.

5. The number of combat officers who have had war experience is 29,851 or 45 per cent.

And finally, let us consider a bit longer and mull over this figure: the present maximum training capacity of the Regular Army, that is to say the facilities, officers and men they can offer us, is just sufficient for 24,000 Reserve Officers per summer. Let us therefore make that figure our present, immediate objective and bend every effort to obtain appropriations for that maximum.

Events Overseas

By Lieut. Col. Herman Beukema, Professor, U. S. Military Academy

War Debts and Reparations

AMERICAN isolation is a thing of the past. It matters nothing whether the American public approves or disapproves. It matters little whether President Hoover's sudden bold stroke of policy in offering generous relief to a debt-burdened world results in complete success or compromise. The fact of his offer, coupled in logical sequence with the presence in 1918 of two million American soldiers in northern France, there to defend American rights, registers inescapably the fact that the dominant economic nation in this world cannot safely stand aside while her friends (and rivals) are slipping into ruin. "It is 1917 repeated," announced one speaker before the British House of Commons on the day following the Hoover offer, asserting further that every international crisis henceforward will find the United States playing its part to the full. In short, the futility of pigeon-holing Europe's news as something detached from American affairs, must be apparent to all.

The picture is clear if we examine briefly the facts which swept to the crisis in late June. Since the inception of the Dawes Plan, it has been evident that national prosperity alone would put Germany in a position to meet the obligations which she had accepted under that instrument. But a world submerged in a depression of unprecedented severity and duration left no room for German solvency, let alone prosperity. To make matters worse, the Right Wing (Nationalists and Hitlerites) and Left Wing (Communists) enemies of the Bruening Government were not at all averse to inviting national disaster if by that means they might secure power.

In May it became apparent that the crisis was at hand. Taxes had been moved up by stages to a limit where a further rise would only have throttled industry and commerce; expenses had been cut until a coalition government would go no further, and yet the national budget failed to balance. Two doors were still open—each leading to disaster. Would Breuning invoke Germany's right to a moratorium on reparations under the Young Plan? It would mean temporary surcease, but only at the almost certain cost of destroying Germany's international credit. And should she thus lose her standing among the capitalistic Great Powers, it would require but a slight slip further to plunge her into Communism. A second way out involved the calling of Hitler's Nazis to power, with their program of repudiation, and the ultimate consequence of turning Germany into the battleground of a new Continental War. There was a third door, but it could be opened only from the outside. If Germany's creditors could be made to see the consequences to themselves of a German breakup, perhaps foreign help

might be forthcoming on such terms as would leave German integrity and sovereignty unimpaired.

At the invitation of Premier MacDonald, Chancellor Breuning and Foreign Minister Curtius went to Chequers June 6, to lay their case before the British. In the meanwhile, our own government had for months past kept a close eye on the situation; and June found Secretary of the Treasury Mellon in England and France, checking the facts which had been gathered. Even as the parleys progressed, a "flight from the mark" was under way. In a single month the Reichsbank lost \$240,000,000 in gold and foreign currency, as foreign financiers withdrew their short term credits and German citizens rushed their movable wealth across the frontier. In sympathy with the situation, commodity and security values on every market in the world were dropping at an accelerated pace.

The situation was at its worst when President Hoover, on June 20, threw wide the door for international cooperation toward German restoration. His proposal, the opening paragraph of which is quoted below, leaves no room for quibble or evasion:

"The American Government proposes the postponement during one year of all payments on intergovernmental debts, reparations and relief debts, both principal and interest, of course not including obligations of Governments held by private parties. Subject to confirmation by Congress, the American Government will postpone all payments upon the debts of foreign Governments to the American Government payable during the fiscal year beginning July 1 next, conditional on a like postponement for one year of all payments on intergovernmental debts owing the important creditor Powers."

Reduced to dollars and cents, we find that acceptance in full by all the Powers involved would relieve the German treasury of an outgo totalling about \$400,000,000 during the fiscal year 1931-32, the bulk of its reparations payments. The United States in turn, would lose an income on war debts accounts amounting to \$246,566,806. Next to us, France would make the heaviest immediate sacrifice, in that she would forego a net balance of \$96,756,840 due under her normal operations in reparations and war debts.

How far was the President's action necessary? We may look to the reaction in the legislative and executive chambers of the Great Powers, to the press, and finally to the world's markets for an answer. In Britain, Laborite, Liberal and Conservative responded with immediate and unqualified approval; in Germany a tottering coalition cabinet regained its seat in the saddle; Italy forgot its domestic political troubles long enough to shout enthusiastic indorsement: Japan

gravely acquiesced. If possible, the press outdid the statesmen in their enthusiasm. Nor was this reaction limited to the countries immediately concerned. In both hemispheres the Hoover offer was hailed as "the dynamite to break the crust of despair which is slowly choking us all," to quote a Swiss editor. The action of the world's markets leaves an even clearer record. So far had confidence in the future forsaken both buyer and seller since the turn of the year that quoted prices were no longer a measure of values—but rather a barometer of hopelessness.

Since the inception of the Dawes Plan in 1929, the average prices of wholesale commodities had fallen by more than a third. The rebound from that bottom was instantaneous, as the cables flashed the news. A broad, vigorous rise followed, suffering no interruption till France began to interpose difficulties to the execution of the plan. In brief, the world was beginning to regain a measure of its lost confidence.

Discordant notes are not lacking in the chorus raised by the President's proposal. France threatened for a fortnight to be a stumbling block. Unfavorable action on her part would probably have given the cue for a similar course on the part of the Little Entente and Poland. The storm in the French Parliament, heightened as always by internal political considerations, brought the usual bitter denunciations of the United States. But for once in a decade the cry of "Shylock" was not hurled at us. Through it all, the opposition in both chambers realized that France must inevitably keep step with the world in this crisis. Otherwise—isolation. At this moment the prolonged negotiations between the representatives of the United States and France seem to have found a middle ground for compromise. In substance, Germany will have her respite. By means of a bookkeeping transaction she will transfer to the Bank for International Settlements, the French share of unconditional payments. That sum is then to be placed to the credit of the Reichsbank and will revert through that intermediary to the German government. Moreover, Germany is given a reasonable period of years in which to make good the 1931-32 payments. The arrangements keep intact the machinery of the Young Plan. Acceptance of the accord, however, still awaits the action of the French Parliament, and of the American Congress.

The German extremist press, both Right and Left, are one with the mouthpieces of Soviet Russia in their vicious attacks on the scheme. Cheated of an issue, they denounce it as an effort of Wall Street to help the speculator. Speaking more soberly, the Soviet-controlled press declares partial fulfillment of its earlier prediction that the capitalistic world would at last pool resources to meet the economic attack of Russia, and that it is now but a short step to the point, where the issue will be joined on the battlefield.

In the final analysis, America's presence as prime mover in the reparations question indicates no reversal of policy. At most it is a change in trend. The American merchant and the American investment dollar have long since made impossible the isolation desired by an influential minority of our citizens. The Presi-

dent's action does no more than openly register the fact that the political and economic well-being of the world is at all times a first concern of the American people.

Disarmament

In the seven weeks preceding President Hoover's debt proposal, the disarmament issue received setbacks so severe that its backers were all but ready to postpone indefinitely the February (1932) Arms Conference, as more apt to lead to war than to prevent it. The "storm over Europe" grew imminent as German bankruptcy apparently became a matter of days. An even greater threat loomed with the realization that Russia's feverish efforts were building a sound industrial foundation for the world's largest military machine. The Continent did not blink the bald facts placed before it by President Hoover in his address to the International Chamber of Commerce. The individual countries simply could see no way of dropping their share of the arms incubus without imperilling their individual safety. Ready to admit the existence of standing armies totalling 5,500,000 men,—70% higher than in 1913, maintained at a cost of five billions of dollars a year, they were yet unwilling to accept the Kellogg Pact as a substitute safeguard.

Germany's announced intention of rearming, in view of the failure of the World War allies to live up to their "disarmament obligations" under the Treaty of Versailles found direct expression at Breslau. There Stahlhelm, German war veterans' organization, assembled for its annual convention. At a given signal the army, 150,000 strong, faced east toward the Polish frontier, a bare thirty miles distant, and voiced its oath to "redeem" the lost territory. Meanwhile, the Franco-Italian naval negotiations remained wedged in the impassé created when the Italians discovered the French replacement joker. A conference in London did no more than keep the door open for further negotiations. The problem has now been passed to the representatives of the three Powers concerned at Geneva. In brief, France insists on getting her rebuilding program under way in mid-1935, 18 months before the expiration of the London Naval Treaty. Under her projected schedule she would attain a superiority over Italy in new ships totalling 225,000 tons before the end of 1936, as compared with a present margin of 170,000 tons. Great Britain has aligned herself with Italy in the rejection of the French plan.

Another difficulty arises from the British realization of the peculiar vulnerability of London to a gas attack from the air. The scaling down of normal national armaments fails to reach this problem. As one government speaker declared before the House of Commons, "any nation with a developed chemical industry has high war potential." In consequence we may look for British insistence that lethal gas be eliminated from war, whatever her expectations as to the good faith of nations in adhering to the principle when faced with the fact of war.

Finally, none of the former Allies feel that the Zollverein-Anschluss-Mittel Europa issue is shelved, in

spite of the efforts towards its entombment in the World Court and the League.

With so many fears and ambitions separating the European peoples, cooperation toward the elimination of armaments was rapidly becoming impossible in the opinion of most European statesmen. The appointment of Arthur Henderson, British Secretary of State for Foreign Affairs, as president of the coming Conference made it clear that all possible channels of conciliation would still be explored. But hopes of success were close to zero. At that juncture, President Hoover's action, calling for international cooperation in matters economic, cleared the atmosphere. Premier MacDonald followed with what is described as the greatest speech of his career, delivered before the House of Commons June 29. In substance, it is a powerful plea to all the Great Powers. He indulged in neither optimism nor pessimism. In particular, he extended the olive branch to France, a necessary gesture in view of that country's growing bitterness over the recent Anglo-German rapprochement. The prospects for the calling of the February conference are linked to the outcome of the postponement in debt payments. The larger question of a successful conference remains an open question.

World Wheat Conference

How to restore the production of bread grains to a profitable basis was the problem confronting the representatives of the great wheat-growing countries in a brief (and abortive) conference at London, May 18. The problem appears in part from the following table (1930 statistics):

<i>Production</i>		<i>Exports</i>	
Russia	1,032	Canada	186
U. S. A.	851	Argentina	151
Canada	398	U. S. A.	140
India	387	Australia	63
Argentina	239	Russia	93
"Little Five"	334*	India	3
Australia	205		
Totals	3,446	Totals	636

* Poland, Hungary, Yugoslavia, Bulgaria and Rumania, 1930 export figures for the "Little Five" are not yet available.

Add to the above the fact that the hungry Chinese, to mention one group in the hundreds of millions of underfed, cannot afford to buy wheat even if the price drops to 25c the bushel, and it appears that no profitable market can be created for the estimated 1931 North American surplus of more than a billion bushels. Acreage reduction was proposed by Samuel R. McKelvie, chief delegate of the United States Federal Farm Board, Russia countered with export quotas, blandly adding that they must be based on 1913 export figures. His object is clear when we realize that:

1. 1913 was the year of an abnormal bumper Russian crop, greatly exceeding all other figures except those of 1930.

2. The United States, Canada, and the Argentine developed their great export wheat markets during Russia's enforced absence from 1914-1929.

"What is dumping?" blandly asked the Russian delegate when the subject arose, knowing that neither a Russian nor anyone else can reduce production cost data for his country to terms of currency. Eventually, a few meaningless resolutions were adopted, a few committees were assigned mission even more meaningless, and the law of supply and demand was left to work out its ultimate surgery.

The British Empire

United Kingdom. Labor paused long enough in its efforts toward a solution of Europe's problems to serve notice on the House of Lords that that body's days are numbered. The Prime Minister reflected Labor's attitude in his words "It (the House of Lords) acts as may a subordinate or subcommittee of Tory Headquarters." He went on to threaten the Upper House with the creation of a sufficient number of new peers to ensure the passage of Labor legislation.

The particular issue developed from the efforts of Mr. Snowden, Chancellor of the Exchequer, to ensure a balanced budget for the new fiscal year. To that end he had proposed his Land Agricultural Utilization Bill, involving a levy of one-half of one per cent on the capital value of land. By a technical maneuver he sought to introduce it as a Finance Bill, therefore not subject to veto by the Lords. Here was a direct drive on the aristocratic land-holding class, "pure socialism unmasked" as one Conservative put it. Both wings of Labor united in support of the measure, in spite of the objections of the Left Wingers that it was not drastic enough. The Conservatives were equally united in opposition, leaving it to the Liberals to use their balance of power in deciding the outcome. To date, Lloyd George had gotten little from his alliance with Labor beyond hope and small comfort. And now to challenge the British land-holder seemed a sure road to the extinction of his party. Eventually, he offered Liberal support for the measure, but only on the adoption of certain emasculatory amendments. The whole preposterous business appears to be vanishing into thin air,—a case of political futility at its worst.

With the army of unemployed holding stubbornly at a 2½ million level, all parties show deep concern over the interim report of a special committee on the dole problem. By reducing the individual allowance in proportion to the drop in the cost of living, and by increasing the payment quotas of employer, employee, and government, it is hoped to restore the pre-war actuarial basis of the unemployment fund. The attainment of that goal depends finally on a substantial reduction in the average unemployment figures. However, even if they should remain at the present level, it is estimated that the annual deficit in that fund would be cut by eighty per cent. Labor, losing steadily in the by-elections, hesitates to support the measure, particularly with its Left Wing radicals ready to leave the reservation on the issue.

The Beaverbrook press has been making merry in the typical Beaverbrook manner with a sensational attack on the League of Nations, denouncing it as a

mere tool of France. From mid-May on, the campaign raged until its very monotony forced a subsidence. If Beaverbrook is to be believed, Downing Street has shown such deference to the army ascendancy of the French system, that she is losing her sovereignty, is no longer the mistress of her own destiny. The French press replied in kind, with the ultimate result that the strain produced in Anglo-French relations by the Anglo-German rapprochement and the British part in the Franco-Italian negotiations has grown more acute. Such embarrassments in the exchanges across the Channel are more or less chronic. The real mischief occurs in the drag they have placed on the government's efforts to prevent Russo-German collaboration—or something more dangerous than collaboration.

In the military sphere there are few developments of importance aside from the stand taken on the use of lethal gas in war, referred to above. Experiments with mechanization continue so far as the budget permits. The attempt to mechanize the Cavalry leaves the horse still in the picture. So long as the use of that arm must envisage the conditions faced by Allenby in Palestine, gasoline will not replace oats. In the meanwhile, the fire power of Cavalry has undergone great development in the reorganization which began in 1928. Armored car protection is afforded to safeguard fully the mobility of the Cavalry units, and to prevent surprise attacks by delaying bodies. Another conclusion of importance appears in the finding that no mechanized unit can hold ground, mop up, or take cover from artillery, with the result that infantry as such still plays its leading rôle in British war plans.

The Dominions. Do we read retaliation and reprisal for the Smoot-Hawley tariff in the recently announced increases in the Canadian tariff? Premier Bennett says no, declaring that his ministry (dominantly Conservative) is merely following its normal policy of furthering the Dominion's best interests without regard to the action of foreign powers. Whatever the object, there can be no doubt of the effects on American exports. Some 200 items are affected, involving Canadian imports totalling \$200,000,000. The heaviest blow falls on our coal mines, which face the loss of exports to the value of \$52,000,000. To put teeth into the measure the Ministry seeks authority for an Order-in-Council which can effectively meet foreign retaliation and dumping by the imposition of further surtaxes as they appear necessary. The American manufacturer, hard hit by many features of the measure, is nimbly jumping the wall by erecting branch factories in Canada. Arrangements for no less than 74 such were completed within a few weeks after the tariff announcement.

The financial difficulties of Newfoundland, unable to float an \$8,000,000 loan, led in May to a widely accepted report that Labrador was for sale. Premier Sir Richard Squires put an end to the flurry by announcing on May 25 that "Labrador is a portion of the sovereignty of his Majesty the King, and under no cir-

cumstances would any negotiations be undertaken contemplating a change of flag, nationality, or allegiance." A further report that Newfoundland was ready to abandon its Dominion status and seek cover under Canada's protecting wing was scouted June 4 by a denial in both capitals.

The hope of resuming the fruitless efforts of the London Imperial Conference of last fall toward reaching a workable trade agreement for the Empire is gone for the time being. Canada, prime mover for such a gathering in Ottawa this summer gave up when New Zealand slammed the door in her face. The latter incensed over Canada's action in shutting out New Zealand's farm products with her new tariff wall, replied with abrogation of their joint trade agreement. It is a poor augury for imperial trade relations in the near future.

The Australian "Navy," a substantial flotilla not long since, has now sunk to two cruisers, a small aeroplane carrier, and one flotilla leader. The bulk of the fleet has been laid up in reserve or presented to the British Navy, as the government cut expenses to the bone. Reorganization of the land forces on a voluntary basis tells a similar story. A small, highly trained permanent nucleus will be maintained for peace administration, and the training of territorials and cadets.

In the nine months ending March 31, the seven Australian governments had registered a deficit of £132,000,000. A further repudiation by New South Wales at the direction of its radical Premier Lang, threw a further load on the Commonwealth. A glimmer of hope appears in the fact that the 1930 wheat crop is all but sold, even though the price has been ruinous.

How utterly divided Australia has become on the subject of its difficulties appears in the formation during the past few months of no less than a dozen organizations, with announced objectives varying all the way from revolution and Communism to military support of the present government. So fraught with danger is the situation that the United States Consulate has seen fit to inform residents of American citizenship that it looks with disfavor on their joining any organization whose objectives might result in the use of arms.

The House of Assembly of the South African Union witnessed a heated scene in connection with a recent debate on the use of native troops for the defense of the country. The Premier closed the debate by calling attention to the fact that any native prisoner caught with arms under the British flag during the Boer war was summarily shot. Of greater importance is the rapid development of the Cairo-Cape Air Route. Twenty-seven main and thirty intermediate stations already mark the course. Radio communications are ample throughout, hotel facilities are being provided, and costs to Central African points have been cut below those of the surface routes from London.

NATIONAL GUARD NOTES

Use of National Guard Troops During a Riot in Georgia

By Captain Frank A. Kopf, 122d Infantry

A CASE of riot well handled by the National Guard troops and another threatened riot prevented by proper use of the National Guard, occurred recently in Georgia.

Four negro suspects were arrested on Monday morning, May 18, at Elberton, Georgia, in connection with a rape case alleged to have occurred on Sunday night. These four negroes were hustled to Atlanta, some 130 miles away, by the Sheriff of Elbert County in order to get them out of reach of a mob that was steadily gathering. The automobile was pursued by irate citizens and several shots were fired at the fleeing car.

Monday afternoon two more suspects were arrested, and one of them was said to have confessed to the crime. They were placed in the county jail at Elberton about three o'clock in the afternoon. The crowd that had never dispersed from the morning's excitement now grew to sizeable proportions. It stormed the jail, which had no protecting wall, and overran the quarters of the warden who lived in the bottom floor of the two-story building. The mob ignored all demands of constituted authority to disperse, and after reaching the cell room it was kept from getting the prisoners only by the huge iron gates and the persuasion of the Baptist minister. The mob then left the jail; apparently its intentions had become peaceable, but the crowd continued to grow and growl. New leaders evidently appeared. Things looked so black that the sheriff requested the governor to send troops to prevent the lynching of the negroes.

Governor L. G. Hardman ordered out Company M and the Headquarters Company, 3d Battalion, 122d Infantry, both of Elberton. He sent Colonel G. P. O'Keeffe and Captain Elbert P. Tuttle both 122nd Infantry, and Capt. Marion Williamson, Assistant U. S. P. & D. O., of Atlanta to take charge.

The Elberton troops were mobilized immediately, and under the command of Major Andrew N. Drake threw a line around the jail that held the crowd off until about six o'clock. At this time Colonel O'Keeffe and Captain Williamson arrived after a hurried automobile trip. One machine gun was placed in the cell room just at the top of the iron stairs. This was the last ditch of the defense, and was very likely to be needed. Other machine guns were placed around the doors and windows of the jail.

Just after six o'clock the mob broke through the line of pickets and swarmed into the yard, and later into the lower rooms again. No shots had been fired by either side, at least not at each other. Eventually the mob reached the iron steps leading to the cell room

and was ordered back by Colonel O'Keeffe. The command was not heeded. As the crowd moved toward the steps several shots were fired by the men in the cell room, all of whom were armed with pistols in order to discourage the movement. One man apparently an innocent bystander, was hit in the leg by one of these shots. It had been previously agreed that the guards on the outer doors were to give way, if it became necessary to shoot, in order to hold the mob, because of the certainty of stopping them on this stairway. Colonel O'Keeffe commanded them to stop and threatened to order the troops to fire. Still they surged forward. The man on the machine gun was given the order to fire. All bluffing had ceased, and a backward pressure from the front ranks of the crowd soon developed.

At this very opportune time Captain Tuttle and Captain Leckie Mattox arrived in front of the jail in a car with a case of tear gas grenades. They hit the ground throwing grenades to windward of the jail and into the lower rooms. The fumes soon cleared the crowd from the jail yard and the people inside the jail hurriedly evacuated. The gas filled the jail and the soldiers and prisoners locked up inside the cell room just cried, and liked it. The picket line was then reestablished. Reinforcements had arrived in the form of the Howitzer Company and the situation was much improved.

Just after the invasion of the jail more troops were called for. They left Atlanta at eight o'clock on three motor busses. Company F, 122d Infantry, and a gas section under the command of the regimental gas officer and equipped with the new masks and CN candles made a total of 80 men in the party.

The fire department now was called into play to disperse the mob around the jail. The crowd was drenched, and the hose was cut, as it invariably is. The crowd recovered the hose and turned it into the broken jail windows, drenching the interior thoroughly. The water was welcomed by the gassed defenders. The crowd spent a couple of hours playing with the water, and this water sport together with the arrival of the reinforcements, changed the spirit of the individuals into one of hilarity. The number diminished gradually until, upon the arrival of the Atlanta troops at 12:30 A. M., only scattered groups totalling perhaps two hundred remained.

The prisoners had been slipped out of the jail when a threat to dynamite the place had been made, and hidden nearby. About 2:30 A. M. everything looked quiet so they were placed in one of the busses with the

troops, and an unmolested journey back to Atlanta was begun. The prisoners were put in the Fulton County jail in Atlanta for safe keeping.

The Trial

Elbert County authorities insisted that the prisoners be tried in Elberton. No change of venue was argued. The sheriff, in consultation with the governor, stated that if the case was to be tried in Elberton he would request 200 troops for protection. The case was set for Tuesday, May 26.

The Governor ordered Colonel O'Keeffe to take 200 men and officers of the 122nd Infantry to Elberton as a guarantee of protection for the prisoners, and to prevent mob violence. A provisional battalion was formed. Each Atlanta unit commander picked 18 of his best men for the job. They were made into four provisional companies, three rifle and one machine gun. Others included a medical detachment of three men, the headquarters company of 11 men with the intelligence section, and a gas section of 16 men equipped with grenades, candles, and gas masks, and under the command of Lieutenant Robert Betts, the 2d Battalion gas officer.

The trial was to begin at nine o'clock. A special train was chartered to arrive in Elberton just at day-break. It arrived on schedule, and unexpected by the populace. The troops were formed in a double column of squads with the prisoners in single file between the columns. Few people were on the streets, and the march of two blocks to the court house was easily accomplished. There the prisoners were put in the prisoners' room. Machine guns were mounted in the court house windows, at the head of the stairs and other strategic places. The block in which the court-house is situated was cleared. Sentinels chosen especially for their fine physique and neat appearance were placed in a cordon across the street, bayonets fixed, and looked very businesslike.

At eight o'clock the crowd began to gather. By nine o'clock a thousand people were standing outside the line of sentinels looking puzzled and baffled. Plain-clothes men belonging to the intelligence section mingled among the crowd and soon discovered that there was no idea of offering violence that day. Such remarks as, "Them there fellers mean business," and "We will get that nigger just like they got the Kaiser," showed that the demonstration of force beforehand had accomplished its purpose.

After all men necessary for the court had been passed through the lines, announcement was made that the public would be admitted to the court room. Those desiring admittance were lined up single file between soldiers with bayonets fixed, and, after being searched, were passed in one at a time. About five hundred were admitted. The remainder stayed outside and looked on. The trial occupied the attention of the crowd all day, but no trouble at all was experienced.

As the time for a verdict approached the problem of getting the negroes out in case of an acquittal had to be considered. The crowd was still bloodthirsty, and would no doubt have caused trouble if the negro was acquitted.

The troops not actually on duty at the moment were drawn up with one company on each side of the walk leading from the courthouse door, and out into the street. The verdict was "guilty" and the negro, John Downer, was sentenced to be electrocuted on June 15. The crowd passed out quietly between the lines of soldiers. After thirty minutes the negroes were brought out surrounded by a special body guard, and squads right and left were quickly executed by the companies on either side of the walk, making a mass formation eight abreast with the negroes in the middle.

With bayonets at a high port and a cadence of 130 per minute the column swung briskly down the street. The pickets and machine gunners had been assembled during the half hour wait, they joined in the rear. The negroes' heads were scarcely discernible among the projecting bayonets and large hats of the soldiers, but an occasional "There he is" from the crowd showed that some sharp eye had seen them. The waiting train was soon reached and all were soon again safely aboard and on the way back to Atlanta. The three negroes to be released were put off the train several miles out of Elberton. The convicted one was again incarcerated in Fulton Tower upon his arrival in Atlanta.

Critique

The Georgia National Guard learned several things from this experience. One was that it is effective but decidedly inconvenient to use tear gas without protection. In the first rush masks were forgotten, or at least the delay needed to get them was thought to be valuable time wasted. Gas saved the day, but the Guardsmen spent many uncomfortable minutes on account of it.

Another thing learned was that home town troops are not as effective as troops from another town. The members of the mob know home troops personally. It would be mighty hard for a home town soldier to be rough with a fellow townsman, for he knows that he will have to live right there with him after the riot was over. Home town troops are all right for immediate use but should be relieved as soon as possible.

The value of surprise and of a demonstration of strength right at the start were also shown. The necessity of someone being hurt before the crowd is brought to its senses was shown in the charge of the mob up the steps followed by its rapid retreat after fire had to be opened.

Members of the National Guard in plain clothes circulating among the crowd learned its intentions and picked up many bits of useful information. A hotel room served as a place where information could be collected and telephoned to the command post. The plain clothes men spotted the leaders of the mob and learned their names. These leaders could have been brought to trial afterwards if unlawful acts had been committed.

The use of a counter attraction to divert the attention of the mob from its purpose was the happy thought of Captain Tuttle. After the water fight began the crowd seemed to forget all about the negroes, and appeared to be tickled to death if it could drench the defenders of the jail.

COAST ARTILLERY BOARD NOTES

Projects Completed During May and June

No. 707. Test of Artillery Lantern M1 and Lantern Mask T1.—This consists of an ordinary farm lantern for which has been made a sheet metal mask with a small slit for use as a night aiming point. This installation has been tested by the Coast Artillery Board and by Coast Artillery organizations under the supervision of the Coast Artillery Board, and has been found unsuitable for the purpose for which intended. The Coast Artillery Board recommended that an ordinary tail light be used as a night aiming post.

No. 829. Instruments for Training of Stereoscopic Observers.—The question of training stereoscopic observers for antiaircraft has received serious consideration from the Coast Artillery Board. There has already been standardized one stereoscopic trainer made by the S. O. M. Company of France. This instrument will probably not be available in quantity, at least for some time. The stereoscopic trainer made by Bauseh and Lomb is to be provided and tested by the Coast Artillery Board. It is intended that instruments will be procured ultimately for use by the Coast Artillery School and by each regiment in service.

No. 833. Progress for Development Work in Long Range Firing Against Naval Targets, Hawaii, Fiscal Year 1932.—Submitted draft of proposed instructions for long range firing against Naval targets, Hawaii, F. Y. 1932.

No. 835. Modification of Director T7 for 3-inch Anti-aircraft Guns.—The question of supplying an emergency fire control system for antiaircraft guns has been under consideration by the Coast Artillery Board. It is desired to construct an emergency system to be attached to the height finder for use as a data computer if, for any reason the regular computer is unable to function. In addition, it is desired to design a fire control system that can be constructed and issued in quantity in time of emergency and which can be supplied units until more computers are available. The instrument recommended for test will necessarily omit many features desired in the ideal type of gun data computer, but should fulfill the requirements of an emergency system.

No. 840. Comparator Controller with Night Glass for Searchlights.—Three designs for mounting tracking telescopes, or field glasses, on searchlight comparator controllers were submitted to the Coast Artillery Board. For a number of years the problem of increasing the range of searchlights, and the system of following the targets has been under consideration; and the use of tracking telescopes on the distant control has also been under consideration. There were two gen-

eral systems considered. In one the glass moved with the searchlight beam and could not be traversed outside of the beam in either elevation or azimuth. In the other system the glass could be used outside the searchlight beam both in azimuth and elevation and its movement indicated on a dial to be installed on the comparator. Thus, in the last system, the light would follow either sound locator data or the tracking telescope by matching pointers. The Coast Artillery Board has recommended that a Goerz Marine Night Glass be mounted on the comparator controller in accordance with the second system.

No. 841. Stereoscopic Fire Director for Use With Antiaircraft Machine Guns.—The systems of fire control tested for use with machine guns have been of three general types: data computers, individual tracer control, and central tracer control. Extensive tests at Aberdeen Proving Ground have shown that any data computer so far devised does not possess the requisite flexibility for machine gun fire control. No data computer has been able to function against a hedge-hopping attack plane, since there is not time enough to place the computer on the target and get a reliable flow of data to the machine guns. Tactical considerations indicate that the vast amount of machine gun fire in time of war will be controlled by the individual gunners. Targets will appear suddenly and can be engaged only for short periods of time. Training in this method of control should, therefore, never be neglected. Extensive tests have shown, however, that such control is not effective beyond ranges of one thousand yards. Furthermore, this method depends for its efficiency on having well trained gunners. In order to increase the effective range of machine guns, to provide a method suitable for use with personnel obtained in an emergency, and to provide a system of controlled fire flexible enough to operate against a hedge-hopping target, a system by which fire from a machine gun platoon by stereoscopic observation was devised and tested during the 1930 exercises at Aberdeen Proving Ground. Tests conducted during these exercises show that the system could engage targets very rapidly and could be operated against a hedge-hopping attack plane. Firings, however, showed that there were certain difficulties in the system that should be remedied. The Coast Artillery Board, in the present project, has recommended certain mechanical changes in the installation and, in addition, it has recommended that an attempt be made to install on the system means for obtaining the proper leads both laterally and vertically. One model is to be constructed for test under the supervision of the Coast Artillery Board.

No. 843. Test of Panama Type Fire Control Switchboard (Experimental).—A 20-line experimental Panama Type Fire Control Switchboard, constructed by the

Fort Monmouth Laboratories, has been under test in the lines of two fixed batteries at Fort Monroe for a period of over two months, part of that time being the May Minor Joint Maneuvers. The board has four jacks for each line as follows: one jack for testing the line, which connects the line to the test apparatus and disconnects the line from the switchboard; one jack for testing the switchboard circuits, which connects the switchboard to the test apparatus and disconnects the line, and two tiejacks which permit cross connection of any phone with any desired number of other phones. Each phone is energized through its own retard coils and is properly supplied with power regardless of the number of phones in parallel. The lines are separated by condenser. A recall light immediately above the vertical row of jacks, provided with a cut-out switch, burns at all times that the line is energized and not in use unless switched off. A relay in series with the recall lamp lights a pilot lamp at the top of panel when any recall lamp of the panel is burning. A supervisory lamp lights when a phone is removed from the hook. Raising and lowering the hook alternately flashes the supervisory and the recall lamp. In addition, a buzzer signal in the pilot lamp circuit operates when the hook is lowered after use. The board is constructed with latest type retard coils and the talking circuit is much more efficient than the old type. Due to the use of two 5-microfarad (magneto) condensers and four 2-microfarad condensers in a pair of lines, the inter-phone ringing circuit is not good, so it is necessary to have the switchboard operator ring a party desired. Recommendations have been made for the improvement of this feature and for the modification of the signalling system. The desirable features of the board are the testing circuits, switchboard operator signalling and flexibility provided by the tiejacks, which permits immediate connection of any two phones by the use of patching cords. It is expected that the final model will be made in standard commercial width with all standard commercial parts.

No. 851. Proposed Modification of Mount, Antiaircraft Machine Gun, Tripod, M1.—It was recommended that a backrest be installed on the Tripod, M1 Mount, and that the legs be shortened about ten inches, and that one model containing these features be constructed for test.

No. 852. Modification of the Antiaircraft Telescope M-1917.—Recommended that gun sights and observing instruments supplied antiaircraft artillery be equipped with a reticle (as shown in blue print) viz, the type which has the two crosslines both of which are interrupted at the center. Interruption of these lines should occur at a distance of two mils from the center.

No. 854. Test of Cords for Type EE-70 Telephone Headset.—A report has been received from the local Harbor Defense Engineer which states that the Signal Corps has replaced depot stocks with suitable cord for use with the Type EE-70 telephone headset. In view of the foregoing, no further action will be taken and this project will be closed.

No. 855. Fire Control Equipment for Antiaircraft machine guns (Hohenthal).—Recommended that no tests be made of the fire control equipment which is the subject of this project.

No. 856. Fundamental Definitions and Symbols Pertaining to Harbor Defense Artillery.—Recommended that the symbols and definitions listed in Exhibit A be adopted as standard for use in official discussions of seacoast fire control.

No. 857. Development of Signal Corps Radio Truck.—Recommended that a Signal Corps radio vehicle as outlined in basic letter and as commented on in this project be constructed and one be obtained for test by the C. A. Board.

No. 861. Apparatus for Training in Gunnery.—Recommended that no steps be taken to construct a model of the device described herein.

Projects Under Consideration

No. 681. Test of Fast Towing Target.—Further tests postponed until tests at Fort Story of T1 Mount and Director M2.

No. 727. Standard Single Conductor Mine System.—A continuing project.

No. 764. Reminder List for Antiaircraft Artillery Target Practice.—Report in preparation.

No. 800. Test of Radio Direction Finders.—Under study.

No. 814. Illuminating Device for 12-inch Barbette Carriage Model 1917.—Awaiting result of test at Fort Hancock.

No. 815. Comments on Target Practice Reports, Fiscal Year 1931.—Comments submitted as reports are received.

No. 817. Time Interval Apparatus for Mobile Artillery (Wallace & Tiernon).—Apparatus returned—undergoing test.

No. 820. Confidential.

No. 824. Trichel Fuze Setter for 3-inch Antiaircraft Guns.—Report in preparation.

No. 827. Temperature Tests of Height Finders.—Under study.

No. 844. Painted Bullets for Identification of Hits on Two Targets.—Under study.

No. 850. Military Characteristics of an Intermediate Caliber Automatic Antiaircraft Cannon.—Under study.

No. 853. Tangential Observation of Antiaircraft Machine Gun Tracers.—Under study.

No. 858. Shelter for Communication Equipment.—Under study.

No. 859. Test of Marine Corps Type of Meat Can Top.—Report in preparation.

No. 860. Test of Air Corps Machine Gun Pedestal Mount, Type A-3.—Awaiting receipt of ammunition.

No. 862. Test of Experimental Message Center Carrying Case, Type C3-42-T1.—Report in preparation.

No. 863. Test of Army Hoisting Vessel, H-1.—Awaiting receipt of vessel.

PROFESSIONAL NOTES

Scanning With Antiaircraft Searchlights

By Capt. A. M. Jackson, C. A. C.

IT is generally accepted as fact that even the most modern searchlight and sound locator equipment falls short of perfection. This is demonstrated by the fact that when "In Action" is given and the shaft of light pierces the darkness, the target is usually not to be found without some searching.

The sources of error are many and the acoustic corrector will only eliminate the bulk of the composite error, leaving a residual error which must be corrected by searching. The training regulations on the subject prescribe a manual searching method which is somewhat difficult of accomplishment.

An attempt has been made to solve the problem mechanically and automatically by constructing a device which will cause the searchlight beam to scan the neighborhood of the direction indicated by the sound locator as corrected by the acoustic corrector. It has been found in practice that the usual azimuth and elevation errors vary according to an approximate formula. Generally speaking, the elevation errors will exceed the azimuth errors at low target elevations. As the target approaches a more nearly overhead position it will be found that the azimuth and elevation errors will be more nearly equal.

If the plane surface be supported by three points at the apices of an equilateral triangle and if these points are alternately raised and lowered thru equal amplitudes harmonically, the normal to this plane will describe a cone. A line intersecting this plane at any other inclination will describe an "elliptical" cone. This principle is utilized in the design of the searchlight oscillator.

This consists of a platform on which there are attached three cam-operated lifting jacks. The jacks are so spaced and the jack-heads are so shaped that the AA Searchlight M VI will rest on the jacks without interference with any other part of the mechanism. The jacks are driven by a motor thru suitable gearing so as to obtain the motion described above, the current being taken off at the light. The starting and stopping of the motor is practically instantaneous and is controllable from a distance. The amplitude of scanning is fixed by the rise and fall of the jacks and the speed is governed by the motor speed and reduction ratio. In the present instance the device causes the searchlight to sweep out an ellipse whose vertical axis is three degrees and whose lateral axis varies from zero at the horizon to three degrees at the zenith. The frequency of scanning is one-half cycle per second.

Changes in Coast Artillery Target Practice Instruction Order

THE following is a resumé of the principal changes announced in Instructions for Target Practice, Fiscal Year 1932 as compared to instructions which governed during the Fiscal Year ending June 30, 1931.

Seacoast Artillery

Salvo fire and pointing by Case III are made optional.

Prescribing during the past two years that firing be by battery salvos using Case III pointing has resulted in extensive training in this type of fire by batteries equipped to employ it and has enabled the accumulation of valuable data for comparison of adjustment methods based on salvo fire. The change in the instructions is intended to allow opportunity for training in Case II fire by those batteries for which direct pointing is appropriate.

The "time out" allowed for adjustment purposes in going into the second zone of the mortar practice is expressed in the new instructions as "not to exceed 90 seconds per gun if firing is actually discontinued for adjustment purposes." The provisions of TR 435-55 to the effect that battery personnel and materiel must have the same relative position on resumption of fire as existed when fire was interrupted does not apply to "time out" allowed for adjustment purposes.

The instructions contain a Table I of probable errors for mortars which is to be used in place of Table I in TR 435-55. The substitute table was prepared by the Coast Artillery Board after study of range armament probable errors developed in service practices during the years 1926-1929. Results of howitzer firings published in Ordnance Technical Notes No. 5 and Proving Ground probable errors for the 16-inch gun at quadrant elevations from 45 to 65 degrees were also considered.

Antiaircraft Artillery

The total ammunition allowances for guns remain the same but the allocation has been changed to provide 100 rounds for each of the three record practices prescribed. This and a provision permitting as few as two guns of the battery to fire per course were instituted in order to lengthen the time during which fire can be maintained on each course and thus afford greater opportunity for adjustment of fire. The development of effective methods of fire adjustment and attaining skill in their use are of prime importance, especially in view of the necessity of training to combat maneuvering targets.

In computing time of action for each course the provisions of Par. 34 (3) and (4), TR 435-55 apply, assuming that the number of guns opening fire (never

less than two) constitute the battery for that course. Time is taken from the command "commence firing" to the last shot fired on the course. If a gun goes out of action due to material failure or for other non-allowable time out cause, that gun must be considered as if it had fired continuously in determining the rate of fire attained.

Allowances of caliber .50 machine gun ammunition have been provided to enable the holding of record practices with this weapon. The greater part of the preliminary training will have to be with the caliber .30 for which allowances have been prescribed in the proportion of two to one. The number of record practices has been reduced from five to four. In order to secure the caliber .50 allowances it was necessary to reduce total machine gun allowances, but that such reduction could be made was indicated by reports of expenditures under the target practice regulations which became effective July 1, 1931. With the minimum S (total number rounds per practice) as 2000 and a limit on number of courses, practices held during the past year usually consumed from 2500 to 3000 rounds and total expenditures fell generally short of the allowances formerly authorized. With the considerable experience that all antiaircraft machine gun units have now had the reduced total allowances should result in little, if any, detriment to training.

The instruction letter prescribes the use of tracer control by individual gunners in two of the four record practices. This provision is not intended to discourage continuation of efforts to improvise fire control systems employing the gun sights. However, the tracer method is considered the most effective means so far developed for bringing fire to bear without delay on the hedge hopping attack plane, a type of target which antiaircraft machine gun units must be prepared to combat.

Seacoast units manning antiaircraft guns or machine guns are required to fire one gun or two machine gun record practices, submitting the prescribed target practice reports. Courses flown for these practices may be rectilinear. These record practices will not enter into determination in the War Department of the Annual Classification of Seacoast Batteries; however, the practices will be rated and data concerning them published in the annual memorandum "Results of Target Practice."

Searchlights

Special instructions applicable to regular antiaircraft searchlight batteries only have been issued for practices to be conducted during the F. Y. 1932. These instructions are in the form of proposed regulations which it is intended will replace the searchlight provisions of TR 435-55 when the training regulation is revised. The new searchlight scoring formula places emphasis on quick pickups at reasonable ranges from the forward lights, with relatively smaller scoring advantage for long carry time than in the present formula. The flick bonus is eliminated. The searchlight changes apply during the F. Y. 1932 to practices of searchlight batteries of Regular Army antiaircraft

regiments only, seacoast units manning searchlights, and National Guard and Organized Reserve units, holding their exercises according to the provisions of TR 435-55.

Qualifications of Reserve Officers to Attend the C and GS School

CONSIDERABLE difficulty is experienced each year in securing fully qualified Reserve officers to attend the special three months course for Reserve officers at the Command and General Staff School, Fort Leavenworth, Kansas, which begins about March 15 of each year. The general requirements stated annually will be much the same each year and are, in part, as follows:

- a. Officers must be of field grade.
- b. Not members of the National Guard.
- c. Not more than 45 years of age—in cases of exceptional qualifications not more than 47 years of age.
- d. Not on Emergency Officers' Retired List nor drawing compensation from the Government for physical disability.
- e. First class physical condition.
- f. Must have successfully completed at least the first four subcourses of the Command and General Staff Extension Course.

Due to the importance of this course Corps Area Commanders are being urged by the War Department to interest suitable Reserve Officers under their jurisdiction to prepare themselves to meet the requirements connected with the extension courses.

Don't Go Off Half Cocked!

IF you do you may be sorry. Before firing your seacoast target practice look up Circular 46, W. D., 1928, and Circular 14, W. D., 1930. There have been several instances of excessive pressure developed during target practice firings. It is more sudden than high blood pressure and equally as dangerous. If you don't know what causes it, take a squint at the above circulars and ask yourself before giving the command "Commence Firing:"

Is the diameter of the charge too large? (The Ordnance has a gadget to measure it.)

Did the ramming detail shove the charge all the way home thinking it was a projectile?

Did any of the powder sections get "cock-eyed" in the powder chamber?

Did the projectile slip back when the mortar was elevated?

Did the weigher have an extra fifty-pound weight on the scales when the charges were weighed?

Did any one go haywire and use the wrong projectile?

Taken in time, excessive pressure is not dangerous. (Taken in time means before "Commence Firing.")

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery
Maj. Gen. John W. Gulick

Executive
Col. W. F. Hase

Personnel Section
Maj. G. F. Moore
Maj. S. S. Giffin

Material and Finance Section
Maj. R. E. Haines
Maj. J. H. Cochran
Capt. F. J. McSherry

Organization and Training Section
Maj. J. B. Crawford
Capt. J. H. Wilson

Plans and Projects Section
Maj. G. R. Meyer
Maj. R. V. Cramer

A Combined Tactical Exercise and Battle Practice for a Seacoast Groupment

By Captain S. R. Mickelson, C. A. C.

THE student officers of the Coast Artillery School manning the elements of the 51st C. A. (155 mm. guns) and the 52d C. A. (8-inch Ry guns) conducted a battle practice on May 23, 1931 in which a practical seacoast artillery tactical and technical exercise was undertaken. The problem and its solution were made possible by the facilities and troops available in the Harbor Defenses of Chesapeake Bay together with the personnel on duty at the Coast Artillery School. It is believed that the details of this practice are valuable if only as a suggested pattern for other battle practices.

The exercise was laid at Fort Story, Va., where a groupment consisting of one group of 155 mm. guns and one group of 8-inch Ry guns were emplaced and a mine group assumed. Each emplaced group consisted of a two 2-gun batteries. Student officers of both the Advanced and Battery Officers' Courses filled the officer manning tables of the groupment, groups and batteries. The situations and procedure were arranged by the Departments of Tactics and Artillery.

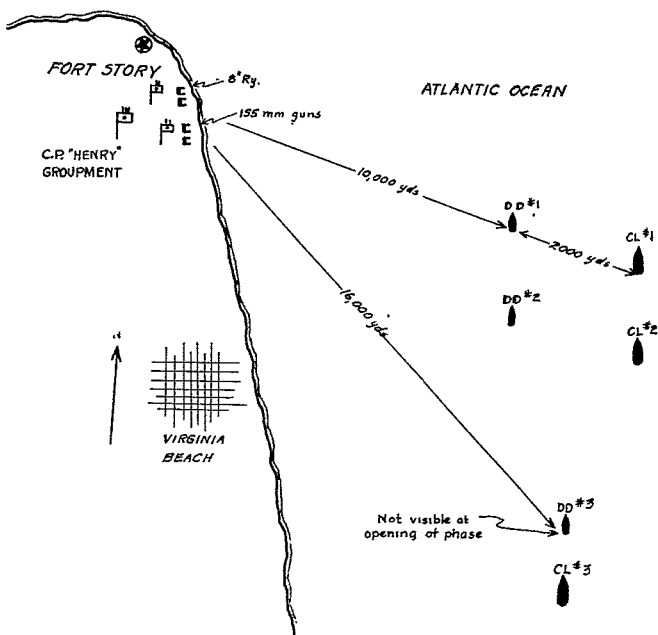
General and Special Situations

The General Situation, issued prior to the practice, indicated that the enemy had temporarily prevented the aid of our naval battle forces, based in the Pacific, by damaging the Panama Canal. The enemy in large force, including all types of vessels, was concentrating within 500 miles of our south Atlantic coast.

Special Situation, May 22, 1931. Enemy cruisers, destroyers and submarines drove in our naval patrols and reconnoitred at a range of 10,000 yards without drawing the fire of our shore batteries. Our air observers reported a large concentration of enemy vessels of all types 200 miles southeast of Cape Henry

moving slowly toward the northwest. At dawn on May 23, the day of the practice, a division of destroyers fired a few shells on the coast south of the town of Virginia Beach and withdrew. Later in the morning three cruiser divisions, three destroyer divisions and submarines were reported 50 miles SSW of Cape Henry.

At 9:45 A. M., May 23, all elements of the group-



ment being manned, the enemy forces were discovered emerging from an assumed smoke screen proceeding NNE. See following sketch for disposition of enemy vessels and shore batteries at the beginning of the practice. At this time information was received that, under the cover of a smoke screen laid by the leading visible destroyers and the fire of the leading destroyers

and cruisers, numerous small boats were heading toward the shore south of Virginia Beach.

The situation made it evident that the enemy was making a landing raid some 10 miles south of Fort Story, covered by the destroyer smoke screen and supported by the fire of the visible destroyers and cruisers. At H hour (9:45 A. M.) the destroyers had lifted their smoke screen.

Operations

At 9:45 A. M., "Henry" Groupment was ordered by the Harbor Defense Commander to neutralize the fire of the leading divisions of destroyers and cruisers.

Action taken: One 8-inch railway battery was assigned to *each* cruiser and directed to fire at half rate. One 155 mm. battery was assigned to each destroyer and directed to fire at half rate. Average time required from "Commence Firing" by the groupment commander to the first shot was 2m 10s.

At 9:54 A. M., the groupment commander was notified of an assumed smoke screen being laid by the destroyers. He was ordered to prevent the smoke screen.

Action taken: All four batteries were assigned to fire at the leading destroyer (DD #1) at maximum rate. Average time required for the change of targets was 2m 57s.

At 9:59 A. M., the leading destroyer was reported sunk and the other three targets again visible. The groupment commander was directed to neutralize the cruiser fire (CL #1 & CL #2) which was becoming damaging to the defenses and at the same time to prevent DD #2 from re-establishing the smoke screen.

Action taken: One 8-inch battery was ordered to fire at half rate on each of the two cruisers. Both 155 mm. batteries were assigned to fire on the second destroyer (DD #2) at maximum rate. Average time required for change of target was 2m 55s.

At 10:02:30 A. M., the second destroyer was declared destroyed and the fire of the cruisers only partially neutralized.

Action taken: One 155 mm. battery was assigned to each cruiser to fire at half rate. (Note: At this time the targets representing CL #1 & CL #2 were being fired at simultaneously by two batteries of 8-inch and two batteries of 155's.) Average time required for change of targets was 3m 25s.

At 10:11 A. M., the leading cruiser (CL #1) was reported disabled and pulling out of line and range. The groupment commander was ordered to destroy the second cruiser (CL #2).

Action taken: All batteries were ordered to fire at the second cruiser at maximum rate. (Note: All four batteries while firing at the same target were able to continue fire adjustment due to the staggered fire of like calibers and ability to distinguish 8-inch from 155 mm. splashes). Average time required for change of target 3m 10s.

At 10:13:30 A. M., the second cruiser (CL #2) was reported destroyed. A destroyer was observed about 7000 yards in the rear of CL #2 laying an assumed smoke screen. The groupment commander was ordered to prevent the smoke screen.

Action taken: All batteries were assigned to fire at this target (DD #3) at maximum rate. Average time required for change to this target was 3m 50s.

At 10:20 A. M., the smoke-laying destroyer was reported destroyed. A cruiser following the destroyer (CL #3) was then visible. This cruiser was engaged in firing on the landing beach and Fort Story. Destruction fire was ordered.

Action taken: All batteries were assigned to this cruiser but the ammunition allowance having been exhausted this target was not fired on.

Method of Firing

In each *group* the time-interval system was so arranged that the batteries fired on alternate buzzes, i. e., the 8-inch railway guns with a normal firing interval of 40 seconds fired as follows: Battery "D" fired at 10:00:00, Battery "F" at 10:00:20, then Battery "D" fired again at 10:00:40, etc. All firing was by Case III and battery salvo.

Method of Spotting

Both terrestrial and airplane spotting were used. Terrestrial spotting was made possible by accurate observance of time of flight. Two airplanes were used for air spotting, one being assigned exclusively to the 8-inch railway batteries and the other to the 155 batteries. Changes of target were transmitted to the two airplanes by radio telephone, both planes being tuned to receive on the same frequency. Spots were transmitted by radio telephone from the planes to the batteries direct. The plane spotting for the 8-inch guns transmitted on 450 kilocycles and the one for the 155's transmitted on 640 kilocycles. The receiving sets at the batteries were previously tuned and marked to receive on the frequency of the assigned spotting plane *only*. This prevented 8-inch batteries from receiving the spots of the 155's and vice versa. The next problem was to ascertain that Battery "A's" spots should not be confused with Battery "B's". To obviate this the observer announced the target on which each salvo was spotted thus identifying the battery which was firing on that target. A report such as "Target No. 2 SCHOFIELD—50 over" indicated that it was the spot of Battery "F", 52d C. A., because battery "D", 52d, was firing on target No. 1 SCHOFIELD. It was found that, when both 8-inch batteries were firing on the same target, the alternating firing of the two batteries together with the rapidity of transmitting sensings and the known time of flight made the matching of a battery with its salvos quite possible. It will be noted that it was necessary for both air and terrestrial spotters to distinguish 8-inch from 155 mm. splashes. After a few ranging shots, in which batteries fired on different targets, observers had no difficulty in distinguishing between the splashes of the two calibers. Had colored splashes been available the complicity of spotting procedure would have become simple. The identification and evaluation of spots for range was quite satisfactory while the simpler problem of spotting for direction was not satisfactory. This was due to insufficient training and less comprehensive preparation. Officers in charge of fire adjustment were able

The Coast Artillery School 1931-1932

Faculty

Commandant: Brig. Gen. S. D. Embick
Asst. Commandant: Colonel P. P. Bishop
Secretary: Major R. L. Tilton
Librarian: Major C. E. Hoeker

Department of Tactics

Maj. T. C. Cook, Director	Maj. C. M. S. Skene
Maj. H. F. Loomis	Maj. H. W. Stark
Maj. D. D. Hinman	Maj. W. C. Foote
Maj. J. N. Caperton, Cav.	Maj. R. H. VanVolkenburgh
Maj. L. L. Boyd, Inf.	1st Lt. J. P. Hodges, A. C.

Department of Artillery

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Department of Engineering

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Dept. of Enlisted Specialists

Maj. K. T. Blood, Director	Capt. G. M. O'Connell
Capt. C. W. Higgins	

Dept. of Extension Courses

Maj. W. S. Phillips, Director	Capt. W. H. Warren
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Students

Advanced Course

Maj. R. M. Carswell	Capt. J. C. Devine
Capt. R. J. VanBuskirk	Capt. A. W. Gower
Capt. N. L. Adams	Capt. D. B. Greenwood
Capt. S. W. Anderson	Capt. F. H. Hastings
Capt. R. W. Argo	Capt. F. H. Koerbel
Capt. P. F. Biehl	Capt. L. C. Mitchell
Capt. W. G. Brey	Capt. J. B. Muir, Jr.
Capt. O. B. Bucher	Capt. H. R. Pierce
Capt. F. L. Christian	Capt. J. B. Powers
Capt. H. W. Cochran	Capt. J. F. Stiley
Capt. B. C. Dailey	Capt. E. W. Timberlake

Advanced Engineering Course

Capt. J. T. deCamp	Capt. D. W. Hickey
1st Lt. F. B. Dodge, Jr.	

Advanced Gunnery Course

1st Lt. W. L. Richardson	1st Lt. R. W. Crichlow, Jr.
1st Lt. M. A. Hatch	

Battery Course

1st Lt. W. L. Barker	1st Lt. W. L. Johnson
1st Lt. S. Berliner	1st Lt. L. S. Kirkpatrick
1st Lt. N. A. Burnell	1st Lt. R. H. Krueger
1st Lt. J. W. Davis	1st Lt. J. A. McComsey
1st Lt. L. A. Denson	1st Lt. F. A. Mitchell
1st Lt. E. A. Dolph	1st Lt. Lief Neprud
1st Lt. E. E. Elliott	1st Lt. Glenn Newman
1st Lt. H. P. Ellis	1st Lt. Grayson Schmidt
1st Lt. E. C. Engelhart	1st Lt. P. C. Sevilla
1st Lt. J. M. England	1st Lt. C. E. Shepherd
1st Lt. G. A. Ford	1st Lt. W. E. Stennis
1st Lt. O. T. Forman	1st Lt. L. D. Vichules
1st Lt. C. W. Gettys	1st Lt. E. B. Thompson
1st Lt. G. G. Gibbs	1st Lt. H. J. Vandersluis
1st Lt. R. I. Glasgow	1st Lt. Vern Walbridge
1st Lt. S. J. Goodman	1st Lt. T. L. Waters
1st Lt. F. K. Gurley	2d Lt. E. C. Franklin
1st Lt. J. L. Hanley	2d Lt. H. H. Harwell
1st Lt. J. E. Harriman	2d Lt. Arthur Roth
1st Lt. John Harry	2d Lt. C. C. Carter

Coast Artillery at Command and General Staff School

Instructors

Col. R. P. Reeder
Lt. Col. L. P. Horsfall
Lt. Col. J. S. Pratt
Lt. Col. H. F. Spurgin
Major K. F. Baldwin
Major H. F. Nichols
Major A. G. Strong
Major E. N. Woodbury

1930-32 Class

Major G. deL. Carrington
Major J. H. Hood
Major Frank Drake
Major W. E. Duvall
Major J. C. Ruddell
Major E. C. Mead
Major J. L. Scott
Major E. C. Seaman
Captain H. F. Grimm
Captain V. W. Hall
Captain William Sackville

1931-33 Class

Major R. M. Levy
Major A. F. Engelhart
Capt. LeR. H. Lohmann
Capt. Benjamin Bowering
Capt. R. V. Ladd
Capt. T. B. Parker
Capt. F. E. Edgecomb
Capt. H. N. Herriek
Capt. Homer Case
Capt. W. F. Marquat
Capt. F. G. Epling

Coast Artillery at Army War College 1931-1932

Instructor

Major C. W. Jenkins

Students

Lt. Col. Earl Biscoe	Maj. F. E. Gross
Maj. J. H. Cunningham	Maj. C. M. Thiele
Maj. C. K. Wing	Maj. C. H. Tenney
Maj. T. A. Terry	Maj. R. S. Atwood

Coast Artillery Special Students 1931-1932

Naval War College	Maj. J. P. Smith
Ecole de Guerre	Maj. E. Villaret
Army Industrial College	Maj. T. M. Chase
Air Corps Tactical School	Maj. R. R. Welshmer
	Maj. G. A. Easterday

Q. M. Motor Trans. School	1st Lt. L. M. Morton
Mass. Inst. Tech.	1st Lt. J. E. McGraw
University of Michigan	1st Lt. A. B. Nicholson
	1st Lt. D. C. Pamplin

Searchlight Exercises at Ft. Humphreys

SEARCHLIGHT exercises will be held at Fort Humphreys, Virginia, during the period August 15—October 1 for the purpose of testing the latest Antiaircraft Searchlight and Sound Locator equipment. These tests will be conducted before the War Department board appointed for this purpose. The following officers are members:

Major R. V. Cramer, C. A. C.
Major H. H. Stickney, Engrs.
Major H. C. Minton, Ord.
Captain W. H. Murphy, S. C.
Captain F. J. McSherry, C. A. C.
Captain G. C. Kenney, A. C.
Captain B. H. Bowley, Jr., Engrs.
1st Lt. Newton Longfellow, A. C.

The exercises will be conducted for the primary purpose of testing the materiel but will include a number of tactical problems. Major G. B. Robison, 69th C. A. (AA), will be in charge of the exercises as the representative of the Chief of Coast Artillery.

Three complete searchlight platoons each consisting of three officers and seventy-five enlisted men will participate. The 69th Coast Artillery will send Battery A with four Mobile Searchlights MVI and four Sound Locators M1 from Fort McClellan. The 12th C. A. (HD) will send the Searchlight Battery with three searchlights and three sound locators from Fort Monroe. The 62nd will participate with eleven searchlights and one sound locator, sending its Battery A from Fort Totten. All movements will be made over land by regimental motor transportation.

Coast Artillery Reserve of New York

THE earnestness with which the 521st, 619th and 908th regiments of Coast Artillery went about their preparation to qualify themselves for training the CMTC in August is remarkable. Their efforts give the greatest assurance that the results obtained will be quite sufficient to dispel the gloom of the most pessimistic among those who are not yet convinced that the Reserve regiments can and do operate in a way to be prepared to fulfill their mission when the occasion arises.

In preparation for this duty a schedule of nine conferences was undertaken covering basic subjects such as school of the soldier, the rifle squad, the rifle platoon, the rifle company, the battalion, ceremonies, instruction with the saber, guard duty, military discipline, first aid, hygiene, display of equipment, rifle marksmanship, service of the piece (6-inch gun) and the gun battery. The officers were required to prepare themselves on the subject prior to the conference.

The 521st, 908th and 619th regiments of Coast Artillery will be at Fort Hancock, N. J., during August, putting into effect the training secured through a very strenuous schedule in preparation for CMTC. The attendance and interest has been very encouraging and there were many more applications for the duty than could be permitted by the money allotted. These regiments know what they are about and are fully confident they can meet their obligation through having been designated for the duty.

The summer training period has been accompanied by a renewed interest on the part of the organizations attending camps. The 621st C. A. at Fort Hancock, N. J., July 5-18, has put into practice in a most encouraging way their very active participation in all Troop Schools and Extension School during the past year. The work of this regiment in camp is an example of what may be accomplished in preparation for active duty, when the members of an organization are properly prepared.

The 62d C.A. (AA), has completed during July at Fort Tilden, N. Y., a very interesting and effective schedule in antiaircraft artillery with the 502d, 910th, 909th and 513th regiments of Coast Artillery. Throughout the troop school year these regiments have been making very material progress in Gunnery with the use of Special Text No. 26, and this has added a great deal to the possibilities in camp.

Upstate Units: Major Joseph C. Haw, C.A.C., Unit Instructor.

513th C.A. (AA), Col. J. P. Young (Ithaca), Comd'g.

514th C.A. (AA), Maj. N. E. Devereux, Jr., (Utica), Comd'g.

522d C.A. (AA), Lt. Col. F. W. Gilchrist (Buffalo), Comd'g.

In May, Colonel Frederick W. Stopford, C.A.C., Executive for Reserve Affairs of the Second Coast Artillery District journeyed to Schenectady and Albion to visit the 514th and 522d Regiment. At Schenectady the Second Annual Dinner of the 514th was a splendid success, with an attendance 50 per cent greater than last year's attendance on this occasion. At Albion the 522d held the largest meeting in its history, 26 being present. This is especially remarkable from the fact that all but four or five of those present had to travel between 35 and 80 miles to get to the meeting.

The outstanding innovations of the past year were the waging of a highly successful recruiting campaign, the institution of weekly Troop School meetings (in addition to monthly meetings) of the 514th in Schenectady, and the inauguration of monthly meetings for the 522d, which in past years had held meetings at sporadic intervals only.

The progress made this year is shown by the table below:

Comparative strengths—Total of all regiments, commissioned and enlisted	Numbers 1929-30 125	Numbers 1930-31 166	Comparison (per cent) (Index Figure 132)
Increase in "Eligible" officers by recruiting alone	(93)	(130)	139
Meetings	20	53	265
Attendance at meetings	254	999	393
Subcourses completed	79	172	209

Harbor Defenses of Manila and Subic Bays

IN this article the series of excellent pictures showing progress at Corregidor is continued. General Kilbourne has initiated many improvements at Corregidor which are depicted in this series of pictures. He states that no attempt has been made to illustrate the efforts of former garrisons or to portray the many beauties of the post.

The work involved has been accomplished without detriment to instruction and morale. Much of the labor has been performed by convicts under supervision of Quartermaster personnel. The troops have participated enthusiastically. The various projects have been carried to completion not grudgingly but with the realization that improved living conditions have resulted with direct benefit to the present garrison as well as those of the future. The ultimate reward of all effort is the pride of accomplishment. Morale suffers only when leadership capable of producing this pride is lacking.

It is regretted that the picture of the Top Side Club (?) appearing in the last *Journal* was incorrectly captioned. This error is obvious to all who have lived at Corregidor but those who have not had that pleasure should be informed that the building shown is one of the barracks and not the club.

It should be borne in mind that the pictures do not show conditions at present. Due to the time which has elapsed since the photographs were taken much of the work has been completed or has reached a more advanced stage than the photographs show.



Improvements Middleside Quarters.

These quarters were intended originally to be of stuccoed wood on a concrete base. After six had been so constructed plans were changed and the balance were made with wooden first floors. Records show that, due to white ants, the occupants of this latter class have been disturbed (due to necessary repairs) about ten times as much as have those fortunate enough to be assigned to a house with a concrete first floor. This year it was decided that, on each necessary overhaul a concrete first floor would be included. This illustration shows the lower floor removed from a building preparatory to the installation of concrete. This is the sixth set to be improved this season with two more in prospect. If the same rate can be maintained all of this type will be completed in three years including those on the terraces above the row 110-127.



Improvements in Front Middleside Quarters.

Middleside Quarters, like Middleside Barracks, were located on improperly terraced ground. In the rainy season water ran under the houses and rubber boots were a necessity to those living in that area. A system of underground drains discharging through the terrace to the front has been installed; concrete surface drains, emptying, some to the front and some to the rear have been constructed and a five foot concrete walk extended along the entire front with narrower walks connecting to road in rear. At the same time the slopes between houses have been terraced with rock retaining walls and graded. This area will be sodded and parked this spring and it is hoped that both the difficulties of communication and the general confusion and unsightliness will be done away with. Several garages are planned for the service of the residents. The drainage system and walks were supervised by Lieutenant Ellis; the grading and beautifying are being accomplished by troops of the 91st C. A. supervised by Lieutenant Speed.



Improvements in Rear Middleside Quarters.

The old vertical bank has been graded back where conditions on higher levels permitted, and a system of ditching on upper slopes installed by which it is hoped to avoid most of the danger and labor caused by slides and falling rocks. Garbage cans and coal bins have been moved across the road so as not to block the passage of visitors arriving by automobile. The road is to be scarified and surfaced with asphalt this spring.



Concrete Walk from Middleside to Commissary.

This is probably the most used thoroughfare on the reservation and one would hesitate to estimate the shoes that have been worn out on the old crushed rock surface. It is under construction by troops of the 91st C. A. supervised by Lieutenant Elias.



Preparing a Park Opposite Herring Field.

This was a dangerous right angle turn. Several old shacks were removed, a service road put in for the houses in the background, the corner of the main road rounded, the surface of the ground lowered an average of two feet by removal of rocks. It is now being prepared for sod, flower beds, hedges and mango trees. Supervision by Captain Cordero.



New Asphalt Road Around Hospital.

Asphalt roads to avoid labor of renewal, clogging of drains, and dust are being installed insofar as funds and grades permit. The hospital area was given first priority.



Lavandera Platform in Lourdes Barrio.

This is the first of four concrete platforms, with water and drainage, for washing clothing in barrios. They will do away with the necessity for lavanderas and seeking running water in the ravines. As they must take their children with them the sanitary conditions in the ravines can be imagined. It is expected that the labor of ravine cleaning to avoid fly pests will be greatly reduced, as well as the labor of the lavanderas themselves.



Doing Away With Hair Pin Turns.

This turn on the Belt Line has been widened by extending the culvert down the ravine from the point occupied by the man with the hose, and filling in. Formerly only a Ford could make this turn without backing; now a large truck can pass. Several of these turns have been improved; unfortunately there are enough left to keep us busy for some years on these lower level roads.

Harbor Defenses of Boston

THOSE who have known these harbor defenses may be interested in the following brief notes of changes.

Both Infantry and Artillery have evacuated Boston, leaving only a small number of caretakers, the greater number of whom are at Fort Banks. From one to three soldiers are stationed at each of the other eight forts. Harbor boat service is now rendered by the "L-52," the larger QMC boats having been sent away.

The Hospital at Fort Banks has been greatly enlarged, and is now considered a Corps Area hospital. The former post exchange and gymnasium has been converted into the medical laboratory. The large barracks near the hospital has been rebuilt inside, and now contains several wards for enlisted patients, and quarters for the medical detachment. All troops, except medical, live in the barracks opposite Headquarters.

The town of Winthrop is now engaged in widening Revere Street, from the Highlands to "Magee's Corner." To accomplish this purpose, a ten-foot strip has been taken from the lawn along the officers' line.

The large acreage in rear of the guns at Fort Ruckman has been leased to the newly formed Nahant Golf Club which has built a fine course. Twelve officers are permitted to be members without payment of fees.

Fort Heath has been completely "done over". All the shacks have been torn down, and a single bungalow of attractive design has been built for the caretaker. The black paint has been removed from Battery Winthrop, and the battery has been "gunited" with cement all over. The fort, formerly an eyesore, is now almost a park. The Coast Guard will soon construct a radio station within the limits of Fort Heath.

First Coast Artillery District

THE Combined Training and Battle Practice which it is planned to hold in the Harbor Defenses of Long Island Sound on August 13, has been arranged in accordance with the recommendation of the Chief of Coast Artillery.

The following are extracts quoted from the Chief's letter:

"It is recommended that two regiments be assembled at Fort H. G. Wright at the same time for field training, 1931, with a view of manning all of the important elements of the Harbor Defenses of Long Island Sound. Such an arrangement would permit the assignment of one National Guard regiment to each groupment and by utilizing the personnel of the 11th Coast Artillery as the headquarters battery and for other purposes, all the searchlights, power plants and other installations could be placed in full operation. Some of the advantages of such an assembly are:

- a. The firing of the more important batteries thus clearly indicating their readiness for service.
- b. The combined training of a more advanced nature could be conducted with special reference to regimental commanders.
- c. No additional expense would be involved for ammunition.
- d. The period of National Guard Training would be reduced."

The personnel of the 11th Coast Artillery, stationed at Fort H. G. Wright, under the direction of Colonel George A. Nugent, Harbor Defense Commander, have been diligently employed this spring in preparing the armament at Forts Wright, Terry and Michie for the combined training. This entailed putting the armament at Forts Terry and Michie (which has been out of service for some years), in condition for firing. Some of the major tasks to be accomplished were the overhaul and testing of armament, fire control installations, communications and accessories. Barracks and utilities at Fort Terry also required much preparation for occupancy. All of this work has been cheerfully accomplished by the 11th Coast Artillery in a spirit of cooperation with the National Guard.

At the time of the proposal by the Chief of Coast Artillery, of the combined training, there was no money allotted for a battle practice. Through the efforts of Brigadier General Alston Hamilton, Commanding the First Coast Artillery District, approximately \$3500.00 was obtained from the Militia Bureau to be expended on ammunition for a battle practice. This money will provide ammunition which it is tentatively planned to utilize as follows:

Fort Wright Groupment, manned by the 241st Coast Artillery, Colonel George M. King, Commanding:

Battery Clinton, 12-inch mortars, 4 rounds;

Battery Butterfield, 12-inch disappearing guns, 4 rounds.

Battery Barlow, 10-inch disappearing guns, 4 rounds;

Battery Dutton, 6-inch disappearing guns, 6 rounds;

Fort Terry Groupment, manned by the 242d Coast Artillery, Lieutenant Colonel Philip Hurley, Commanding:

Battery Stoneman, 12-inch mortars, 3 rounds;

Battery Steele, 10-inch disappearing guns, 4 rounds;

Battery Bradford, 6-inch disappearing guns, 6 rounds; and

Battery Palmer, Fort Michie, 12-inch disappearing guns, 4 rounds.

As recommended by the Chief of Coast Artillery, the 11th Coast Artillery will man harbor defense command stations, power plants, searchlights, and all other necessary installations normally operated by the harbor defense headquarters battery.

In order to add interest and realism to the battle practice the solution of a tactical problem will be included as part of the exercises.

So far as is known this is the first attempt to hold joint training and battle practice using the Regular Army and National Guard components combined. It is believed that this combined training will result in benefits surpassing the initial expectations of the Chief of Coast Artillery as regards maintenance of artillery in an active condition and even improve the already cordial relations existing between the Regular Army and the National Guard.

Colonel King and Colonel Hurley are to be congratulated on the fine spirit of cooperation which has made this plan feasible, and Colonel Nugent for the energy and interest shown in preparing for these exercises.

The 62nd Coast Artillery Fort Totten

FORT Totten boasts a high morale. Morale is best defined as the conviction of excellence, the desire and will to win, and more, the absolute refusal to consider anything else possible. So with that spirit in view, the 62nd sallied forth to face their annual target practices at Fort Tilden, N. Y. During the past year the regiment followed an extensive athletic program with plenty of recreation. This contributed to the esprit carried over to the field training season.

Training in accordance with tentative T. R. 435-211 was held during the months of May and June and by using every available opportunity gunners were brought to a high state of efficiency before the period of service practice. On June 1, the regiment departed from Fort Totten for Fort Tilden near the Far Rockaways, N. Y. The first battalion commanded by Major C. M. Thiele left on the first and the second battalion commanded by Major P. Hogan followed on the succeeding day. The split up was made to avoid any difficulties in traffic regulations that may have resulted from too large a convoy.

Our high hopes were rather dampened in the first two weeks in camp by the continuous rain and overhanging low clouds. No time was lost, however, in firing our preliminary and record practices once the good

weather set in. The United States Coast Guard Detachment stationed at Fort Tilden rendered us invaluable service in clearing the firing areas of small fishing boats.

In the Machine Gun battalion tests were made of two new sights in hopes that a satisfactory new one would be adopted for use under conditions of direct sighting fire. Due to the unfavorable weather conditions not enough time was available to finish these tests. However, an opening was left whereby tests will be made in the future to further develop hoped-for improvements.

On account of the constant presence of small boats in the field of fire it was necessary for the pilot of the towing plane to maneuver, thereby changing his angle of approach without warning so that there would be a clear field of fire. This element of surprise afforded the battery commanders little time during the practices to predict the angle of approach. This simulates war conditions. The *sine qua non* of the success of the machine gun battalion was through the energy and versatility displayed throughout the practice.

The gun batteries, handicapped by not having the cameras, reverted to visual spotting and were very successful, and, it is hoped, will be awarded the big "E". Battery B, using the Vickers DC step-by-step receiver dials for use with the No. 45 instrument, was the first battery to fire Case III with the 1918 anti-aircraft guns. At first, difficulty was had in obtaining correct fuse ranges. The fuse difference pointer upon being advanced or retarded an additional amount equivalent to the fuse difference cam was found to give trouble. This cam was made for a muzzle velocity of 2600 feet per second. As the 1918 guns only develop an M. V. of 2400 a chart of differential curves was plotted on the time fuse cylinder which partially compensated for this error.

Battery C was equipped with an MIAI Vickers using the self synchronous, alternating current transmission system on the 3-inch AA gun and mount, M-1. They accomplished just what was expected of them—a good practice.

During the month of July, Battery A was detailed to move to Mitchel Field to conduct their searchlight practices. They were equipped with the latest Sperry 60-inch anti-aircraft searchlights and sound locators and good results are expected. At the completion of these practices, Battery A will proceed to Fort Humphreys, Virginia, to participate in the searchlight tests and maneuvers that will be held there.

Batteries C and E will remain at Tilden and instruct the Reserves.

On August fifteenth the regiment, less Battery A, will move to Plattsburg, N. Y., for a two weeks convoy. The following itinerary has been proposed:

Leave Fort Totten, August 18. Overnight camps: Hudson, Watervliet (visit to arsenal), Glens Falls, Crown Point (visit to historical sights), Plattsburg (spend a day of rest and sightseeing).

The return will be by the same route. Distance 382 miles each way. Arrive back at Fort Totten September 3.

The 61st Coast Artillery (AA) Fort Sheridan

DURING the latter part of April and the first half of May the trucks of the regiment were engaged in transporting camp equipment between Fort Sheridan and Harvard, Illinois, where a command post exercise was held early in May. In addition, to the trucks, a considerable part of the personnel of the regiment took part in the exercise. The 61st radio section was depended upon almost entirely for communication between airplanes and the ground as it was the only set that was entirely satisfactory and able to send and receive messages at all times.

Immediately after returning from the command post exercise a detachment of the regiment took part in the Jubilee Parade in Chicago on May 11, and the searchlight battery was again required to go to Chicago on May 12 to illuminate during the International Golden Gloves Boxing Bouts at Soldiers' Field.

On May 1 three officers and a small detachment of enlisted men with two Curtis observation planes from the 15th Observation Squadron, Scott Field, Illinois,



Constructing Road to Antiaircraft Firing Point at Fort Sheridan.

arrived for duty with the regiment in its training during its target practice season and summer training camps. These are a great help to the regiment in its training because ordinarily the units have no opportunity to track an aerial target.

Service target practice for the regiment began on June 8. The use of ground for a flank observation station was finally secured and communications laid. Work on the firing point progressed and by the end of May electric lights were installed. A safety tower has been built and the orientation work completed. The access road to the firing point is passable in all weather but requires a great deal more material and much work before it will stand up under heavy loads. A new 1000-inch aerial range has been built adjacent to the service firing point and the machine gun battery was engaged in individual qualification practices and balloon firings during the greater part of May. Conditions were not very good for balloon firing as the prevailing winds are from the east and carry the balloons over the battery. A boat would help in this respect but, strange as it may seem to Coast Artillerymen, we have a great expanse of water at Fort Sheridan

and not even a row boat to float on it. Arrangements have been made to obtain a boat from the Coast Guard Station at Kenosha (nearly 20 miles away) during firing.

Beginning on June 19, the summer training camp period began. The ROTC from the 5th, 6th, and 7th Corps Areas were the first to arrive. On July 5 about 80 Coast Artillery Reserve Officers from the Sixth Corps Area arrived for a two weeks camp and, about the middle of July, the 203d Coast Artillery, Missouri National Guard, will come for their period of active training. The three camps being here at the same time will put quite a strain on the firing point but, if the weather holds good, we believe that all will get as much firing as their ammunition allowance permits. During August, the reserves from the Fifth and Seventh Corps Areas will arrive for training and the end of August will see the last of the training camps at Fort Sheridan during the present year.

Lieut. Col. J. A. Green, recently on duty in Washington with the General Staff, arrived about July 1 to relieve Major J. H. Cunningham in command of the regiment. Major Cunningham will attend the coming session of the Army War College in Washington.

The 69th Coast Artillery (AA)

Fort McClellan, Ala.

THE 69th was at Fort Benning for joint maneuvers during the period April 2—May 11. During this period it was given its first opportunity to meet and serve with the Infantry, Cavalry, and Field Artillery. This contact alone, according to Colonel F. H. Smith, the regimental commander, justified its participation in the maneuvers.

Colonel Smith states that its lack of experience in joint maneuvers was a serious handicap in obtaining the maximum benefit from the maneuvers. While the antiaircraft regiment is a Corps or Army unit and (according to accepted doctrines of our tactical schools) subject to detachment for no units below a division, it is believed that maneuvers of smaller units could be extended to provide participation of the antiaircraft regiment as an element of hypothetical, larger units.

Colonel Smith advocates the setting up of the regimental command post of the antiaircraft regiment, separate and distinct from the Corps Artillery Brigade under the Corps Chief of Artillery.

In his comments he states that the tactical employment of antiaircraft artillery in forward areas could bear considerable study and be further investigated through field exercises. Some difficulty was experienced in this maneuver in maintaining wire for searchlight coordination. The activities of other communications details in tapping the antiaircraft lines for their own use and the passage across the area of tanks, machine gun companies and field artillery was a very realistic substitute for the actual effects of hostile artillery.

The exercises showed that provision should be made

for substitute accessories for firing the gun batteries without using the electrical data transmission system. The maintenance of the data transmission system for early employment after occupation of position was impossible. This condition will probably be improved after the regiment is provided with an instrument trailer. The wear and tear on the installation is considerably magnified by the rough treatment which it necessarily receives.

Some difficulty was experienced through the scarcity of regimental transportation. Many officers, in order to cover the necessary ground in exercising supervision over the units and installations were compelled to use their personal cars.

The 212th Coast Artillery (AA) (N. Y. N. G.)

THE 212th is the only antiaircraft regiment in the National Guard of the State of New York.

The organization of this regiment dates back to the Mexican War. Since then it has had a long and enviable record in the service of the United States and the State of New York. Up to the time of the World War it was known as the 12th New York and served overseas as a unit of the 27th Division, participating in the Meuse-Argonne offensive.

It became Coast Artillery in 1921 and was first equipped with the old 75-mm. antiaircraft guns. In January, 1921, Colonel William Ottmann assumed command of the regiment. Under Colonel Ottmann's guidance it is one of the elite guard regiments of the state.

There are two high points in the National Guard training year. These are the armory inspection and the annual period of field training. The great worry of the regimental commander on these occasions is attendance. In the words of the Chief of the Militia Bureau, "A high percentage of attendance is one of the best indications of the efficiency of an organization." Of course this is not the only measure of the efficiency of an organization but experience has proven that the efficient organization also has a high record of attendance. The 212th broke all its previous records in attendance at the last armory inspection. Colonel Ottmann attributes this high record to the spirit of loyalty which pervades the entire regiment.

The fifteen day period of field training is held at Fort Ontario near Oswego, N. Y. This year the regiment trained at Ontario, as usual, during the period June 28—July 12. The camp is an ideal one on a bluff overlooking Lake Ontario. Kitchens and latrines are of semi-permanent construction. The men and officers are under canvas. The firing point is on the shore of the lake about three and one-half miles east of Fort Ontario. It is ideal for firing. There is practically no interference on account of shipping and the flying field is only six miles south of the firing point. The firing records for the present year are not available at this writing, but there is every reason to assume that the firing will be as usual. It is *always* good.

The 248th Coast Artillery (HD) (Wash. N. G.)

WE are informed by our correspondent that we have been neglecting the accomplishments of the Coast Artillery National Guard of the State of Washington. The 248th C. A. is it since there is only one organization in the State of Washington. Since there is but one Coast Artillery unit it is forced to compete with the units of other arms.

This regiment is really only a battalion. It consists of a Headquarters Battery and Batteries A, D, and K, all under the command of Major Edward C. Dohm.

The Headquarters Detachment, under the command of 1st Lieut. Neil R. McKay, won the *BRIGADIER GENERAL PAUL H. WEYRAUCH TROPHY* in 1930 for maintaining the highest degree of efficiency during the training year from all other units of the Washington National Guard. In awarding this trophy the following is considered: attendance at drill and field training, number of reenlistments, percentage qualified with the rifle, general appearance. This is the most coveted trophy in the State.

Battery D (Olympia), Captain Frank Stocking, has fashioned a dummy gun (without expense to the State) from a 25 foot length of 14-inch water main. They have obtained a dummy projectile with truck, powder tray, rammer, powder charge, and extractor and have developed excellent gun crews. This battery fires Battery Benson at Fort Worden but feels it is suffering under a handicap due to past erratic performances of these guns.

Battery A (Aberdeen), Captain Robert W. Forbes, also has its dummy gun but this one is constructed from wood. The target practices of this battery were rated excellent for 1928 and 1929.

Battery K (Snohomish), Captain Errol R. Hawley, won a rating of "Excellent" and the *GENERAL MAURICE THOMPSON* cup for efficiency in artillery fire during the past training year.

The regiment has a strangle hold on first place for drill attendance among all units of the State. Only once in recent years has it failed to head the monthly list. It ranked one for artillery firing among all Coast

Artillery regiments in the United States for the year 1929.

The record of this regiment, indeed, is worthy of comment and is one in which justifiable pride can be taken. One hundred per cent of its officers were enrolled in last year's extension school courses. One hundred per cent subscribed to the *COAST ARTILLERY JOURNAL*. 1st Lieut. Lee E. Gray is the regular army instructor.

Coast Artillery Reserve Fifth Corps Area

THE thirteen Coast Artillery (AA) regiments authorized for this Corps Area are organized as an Antiaircraft Group. Lieut. Colonel Myron S. Crissy, CAC, is Chief of Staff, and Major Albert H. Warren, CAC, is Acting Adjutant General and in charge of the Branch Extension School. Group Headquarters is located at Fort Hayes, Columbus, Ohio.

Of the thirteen authorized regiments, personnel is at present assigned to only eight. This is due to the present low strength of the Group, which in turn is due to the fact that there is only one Coast Artillery Senior Unit, ROTC, in the Corps Area and no Coast Artillery CMTC is held. However, as some of the other branches are full in the higher grades, many reserve officers, who are qualified for and well deserve promotion, are becoming interested in transfer to the Coast Artillery Corps Reserve, and it is anticipated that an appreciable increase in Coast Artillery personnel will result.

The eight active regiments are assigned territorially as shown below:

Although these regiments are low in strength, their morale is excellent and great interest is taken in active duty training, troop schools, and extension school work.

Active duty training is to be held at Fort Sheridan, Illinois, August 2 to 15, under the tutelage of the 61st C. A. Officers from all regiments attend in one group during this period and in addition to the benefits to be derived from training with up-to-date materiel, a grand old get-together is anticipated.

UNIT	LOCATION	COMMANDING	UNIT INSTRUCTOR
505th	S. W. Ohio	Maj. Frank R. Miller, CA-Res.	Lt. Col. W. W. Merrill, CAC
938th	S. W. Ohio	Maj. Everard H. Boeckh, CA-Res.	Lt. Col. W. W. Merrill, CAC
932nd	Central Ohio	Maj. E. C. Ehrensberger, CA-Res.	Maj. Albert H. Warren, CAC
933rd	N. W. Ohio	Maj. Erle H. Forster, CA-Res.	Maj. Albert H. Warren, CAC
525th	Kentucky	Maj. J. P. Whittinghill, CA-Res.	Maj. W. G. Patterson, CAC
535th	Indiana	Colonel Bowman Elder, CA-Res.	Maj. W. G. Patterson, CAC
511th	N. E. Ohio and Eastern West Va.	Maj. Floyd G. Brightbill, CA-Res.	Capt. John R. Clark, CAC
541st	West Va.	Maj. Robert E. O'Connor, CA-Res.	Capt. John R. Clark, CAC

COAST ARTILLERY ORDERS

Colonel John T. Geary, 6th, Fort Winfield Scott, to Philippines, sailing San Francisco, February 4.

Colonel Percy M. Kessler, from Org. Res., Seattle, to Panama, sailing San Francisco, November 3.

Colonel Earl D'A. Pearce, from the Philippines to 6th, Ft. Winfield Scott.

Colonel Harry L. Steele, from Executive, Office Chief of Coast Artillery, to Hawaii, sailing New York, October 2.

Colonel Joseph P. Tracy, appointed Brigadier General, May 14.

Colonel Samuel C. Vestal, two months leave with permission to visit foreign countries.

Lieut. Col. Robert C. Eddy, ROTC, Mass. Inst. Tech., Cambridge, retired at his own request, September 30.

Lieut. Col. John R. Musgrave, will proceed to his home from Hawaii, June 9, and await retirement.

Lieut. Col. Earl Wentworth Thomson, CA-Res., active duty, office Chief of Coast Artillery, July 19.

Lieut. Col. John P. Terrell, (on leave) relieved from 3d, Fort Rosecrans, to 14th, Fort Worden, sailing New York, July 17.

Major Enrique M. Benitez, student, C. and G. S. School, Ft. Leavenworth, to Panama, sailing New York, August 7. One month fifteen days leave June 20.

Major William P. Cherrington, from ROTC, V. P. I. Blacksburg, Va., to 11th, Ft. H. G. Wright, July 1.

Major Richard Donovan, one month five days leave.

Major Walter K. Dunn, from Panama to 4th, Fort McPherson.

Major George W. Easterday, from student, Army War College, July 9, to Air Corps Tactical School, Maxwell Field, Ala., Sept. 15, as student. Two months leave July 9.

Major Charles R. Finley, detailed to G. S. and to Panama.

Major Avery J. French, from Panama to 63d, Fort MacArthur.

Major Ira B. Hill, to sail from New York for Hawaii September 23 instead of August 12. Two months 20 days leave July 1.

Major Kelley B. Lemmon, 3d, Fort MacArthur to Panama sailing San Francisco, August 29.

Major John H. Lindt, Hq. Seventh Corps Area, Omaha, relieved from detail G. S. to 13th, Fort Barrancas, September 25.

Major George R. Meyer, from 14th, Fort Worden, to Office Chief of Coast Artillery, sailing San Francisco, July 25.

Major Hugo E. Pitz, ROTC, University of New Hampshire, Durham, detailed to QMC, and to Mitchell Field, July 1. Previous orders revoked.

Major Adam E. Potts, from Panama, to 52d, Fort Monroe.

Major Willard K. Richards, orders from instructor, Coast Artillery School, Ft. Monroe, to Panama, sailing New York, July 9, revoked.

Major George Ruhlen, Jr., from instructor, Calif. N. G., San Diego, to Panama sailing San Francisco, Sept. 25.

Major Harold E. Small, from Panama to instructor, Conn. N. G., Bridgeport. One month fifteen days leave.

Major William C. Washington, from student, Command and General Staff School, Ft. Leavenworth, to A. and M. College of Texas, College Station.

Major Robert R. Welshmer, from instructor, Command and General Staff School, Ft. Leavenworth, to Air Corps Tactical School, Maxwell Field, Ala., Sept. 15, as student.

Captain William T. Andrews, resigned.

Captain Marvel G. Armstrong, from student, Coast Artillery School, Ft. Monroe, to instructor, R. I. N. G., Providence.

Captain Thomas J. Betts, from Washington, D. C., to Org. Res., 3d C. A., July 1.

Captain William G. Brey, 6th, Ft. Winfield Scott, to student, C. A. S., Ft. Monroe, sailing San Francisco July 25 instead of as previously ordered.

Captain James T. Campbell, from Panama to 51st, Ft. Monroe.

Captain Henry D. Cassard, from Philippines to 51st, Ft. Monroe.

Captain Joseph M. Cole, from Walter Reed General Hospital to the Philippines, sailing New York, November 4.

Captain Mario Cordero, from Philippines to 11th, Fort H. G. Wright.

Captain Robert E. DeMerritt, from Hawaii to 62d, Fort Totten.

Captain Louis D. Farnsworth, to instructor Oregon N. G., Salem.

Captain Valentine P. Foster, to sail from New York for Hawaii August 12 instead of July 17. Two months seven days leave June 12.

Captain Manly B. Gibson, from Hawaii to 9th, Fort Banks.

Captain L. W. Goeppert, from Philippines to 12th Fort Monroe.

Captain Douglas M. Griggs, from 69th, Fort McClellan, to Panama, sailing New York, October 22.

Captain Norman E. Hartman, from student, University of Michigan, Ann Arbor, to Panama sailing New York, October 22.

Captain Daniel W. Hickey, from Panama to student, Adv. Eng. Course, C. A. S., Fort Monroe.

Captain Lewis A. Hudgins, 62d, Fort Totten, to instr., Del. N. G., Wilmington, September 1.

Captain James P. Jacobs, from Hawaii to 12th, Fort Monroe.

Captain Thomas E. Jeffords, from Panama to 14th, Fort Worden.

Captain Parry W. Lewis, student, University of Michigan, Ann Arbor, to Panama. Two months leave August 22.

Captain James R. Lowder, from the Philippines to 14th, Fort Worden, Wash.

Captain LeRoy Lutes, from 62d, Fort Totten, to Hawaii, sailing New York, July 17.

Captain Samuel L. McCroskey, from Hawaii to C. A. S., Fort Monroe.

Captain Oscar D. McNelly, from Hawaii to 61st, Fort Sheridan.

Captain Erwin A. Manthey, from the Philippines to 13th, Ft. Barrancas.

Captain John G. Murphy, from the Philippines to 62nd, Fort Totten.

Captain Harry E. Pendleton, 51st, Fort Monroe, to Panama, sailing New York, October 22.

Captain Joshua D. Powers, from

Panama to 7th, Fort Hancock, thence to student, C. A. S., Fort Monroe, September 7.

Captain Earl R. Reynolds, 11th, Fort H. G. Wright, to Panama, sailing New York, December 11.

Captain Carroll G. Riggs, from Hawaii, to 8th, Fort Preble.

Captain Kenneth Rowntree, from the Philippines to 14th, Ft. Worden.

Captain Lessley E. Spencer, from 62d, Ft. Totten to instructor, Calif. N. G., San Diego, sailing New York, June 23.

Captain William R. Sprague, CA-Res., to active duty office Chief of Coast Artillery, July 16.

Captain Wilfred H. Steward, from 14th, Fort Casey, to instructor, Ark. N. G., Little Rock, September 1.

1st Lt. George H. Bardsley, CAC, transferred to Ordnance Department, May 12.

1st Lt. Milo G. Cary, from the Philippines to 52d, Ft. Monroe.

1st Lt. Harold J. Conway, transferred to Ordnance Department, May 12.

1st Lt. John C. Delaney, from 3d, Ft. Stevens, to Panama sailing San Francisco, September 25.

1st Lt. Carl R. Dutton, transferred to Ordnance Department, May 12.

1st Lt. John H. Featherston, from instructor, Del. N. G., Wilmington, to 51st, Ft. Monroe, Sept. 1.

1st Lt. Bonner F. Fellers, from the Philippines to the 62d, Ft. Totten.

1st Lt. Harold P. Gard, from Panama, to 10th, Ft. Adams.

1st Lt. James L. Harbaugh, from student, C. A. S., Ft. Monroe, to J. A. G. Dept. and to N. Y. University as student, Sept. 21. Previous orders to Fordham University revoked.

1st Lt. Donald B. Herron, 69th, Ft. McClellan, to ROTC., V. P. I. Blacksburg, July 1.

1st Lt. Robert H. Kreuter, from the Philippines to 63d, Ft. MacArthur.

1st Lt. John A. McComsey, from New York to student, C. A. S., Fort Monroe, Sept. 7.

1st Lt. William C. McFadden, from Ord. Dept. and from student Ord. School, Watertown Ars. to Panama sailing New York, August 28.

1st Lt. Ernest A. Merkle, from student, C. A. S., Fort Monroe, to ROTC., Fordham University, New York, July 23. Previous orders revoked.

1st Lt. Lew M. Morton, from 62d, Ft. Totten, to Q. M. C. Motor Transport School Holabird, Md., Sept. 8, as student.

1st Lt. Arthur B. Nicholson, student, C. A. S., Ft. Monroe, to University of Michigan, Ann Arbor, as student.

1st Lt. Douglas G. Pamplin, student, C. A. S., Ft. Monroe, to Univ. of Michigan, Ann Arbor, as student.

1st Lt. Philip H. Raymond, 13th, Ft. Barrancas, to Panama, sailing New York, December 11.

1st Lt. John E. Reiersen, 63d, Ft. MacArthur to A. and M. College, College Station, Texas, July 1.

1st Lt. Herbert C. Reuter, 14th, Fort Worden, to the Philippines, sailing San Francisco, Sept. 10.

1st Lt. Joseph H. Rousseau, Jr., from Hawaii to 13th, Fort Barrancas.

1st Lt. Andrew P. Sullivan, from Panama to 61st, Fort Sheridan.

1st Lt. George A. Tucker, 62d, Fort Totten, to C. A. S., Fort Monroe, as student, revoked.

1st Lt. Charles W. West, from Panama, to student, George Washington University Law School, Washington, D. C.

1st Lt. Henry K. Williams, Jr., from Ordnance Department, Picatinny Arsenal, New Jersey, to Buffalo, N. Y., June 30.

1st Lt. Charles M. Wolff, one month four days leave, June 15.

2nd Lt. Lawrence A. Bosworth, 63d, Ft. MacArthur, to Panama, sailing San Francisco, August 29.

2nd Lt. Robert G. Butler, Jr., from the Philippines to 11th, Ft. H. G. Wright.

2nd Lt. Norman A. Congdon, from Panama to Fort Monroe, June 29.

2nd Lt. Robert E. Cron, Jr., from Q. M. C., Ft. Monroe, to student, Carnegie Inst. Tech. Pittsburgh, Sept. 10.

2nd Lt. Arthur R. Thomas, from Panama to 52d, Ft. Hancock.

2nd Lt. Theodore J. Dayharsh, from Panama to 52d, Fort Monroe.

2nd Lt. P. B. Denson, promoted to 1st Lieut., June 1.

2nd Lt. Edward C. Franklin, from Ordnance Dept. and student, Ordnance School, Watertown, Arsenal, Watertown, to student, C. A. S., Fort Monroe.

2nd Lt. Allison R. Hartman, from Panama to 63d, Ft. MacArthur.

2nd Lt. Joseph Horridge, from Panama to 52d, Ft. Hancock.

2nd Lt. John H. Kochevar, 13th, Ft.

Barrancas, to Air Corps Primary Flying School, Brooks Field, July 1.

2nd Lt. Leif Neprud, promoted to 1st Lt., May 1.

2nd Lt. Leslie G. Ross, from Panama to 14th, Ft. Worden.

2nd Lt. Paul W. Steinbeck, Jr., from Panama to 64th, Ft. MacArthur.

2nd Lt. Merle R. Thompson, from Hawaii to 62d, Ft. Totten.

Warrant Officer William C. White, band leader 64th, Hawaii, to band leader, 11th, Ft. H. G. Wright.

Master Sgt. Benjamin L. Bingham, 61st, retired, Ft. Sheridan, May 31.

Staff Sgt. William Hecker, 62d, Ft. Totten, retired, June 30.

1st Sgt. Alexander Autotte, 60th, retired, Ft. Mills, May 31.

1st Sgt. William Thompson, 59th, retired, Ft. McDowell, May 31.

Real Target Practice for the Second Bombardment Group

The 2nd Bombardment Group, Langley Field, Va., under the command of Major Herbert A. Dargue, Air Corps, will be afforded an opportunity to indulge in some realistic bombing on August 11, off the Virginia Capes, their target being the steel cargo ship *Mt. Shasta*, which was turned over to the Air Corps by the U. S. Shipping Board for target practice. This vessel, with two decks, 363 feet long and of 7,240 tons dead weight, was built during the War and has been moored on the James River since 1921. It has been dismantled and all the machinery removed therefrom. The Quartermaster's Department has made arrangements to tow this vessel to the scene of the bombing.

The *Mt. Shasta* will be bombarded with projectiles ranging from 25 to 600 pounds. Several attack planes now at Langley Field will first fly over the vessel and drop the smaller sized bombs, and they will be followed by the bombardment planes with the larger bombs. These "pellets" will be dropped from various altitudes, the purpose being bombing practice and to study the destructive effect of the various types of bombs rather than to sink the vessel in the shortest time possible. The floating target will be towed at the end of a 2,000-foot cable by an Army Mine Planter.

Weather permitting, several tugs with special observers aboard, will hover near the scene of the bombing in order to enable them to witness same from as close a range as is consistent with safety.—*From Air Corps New Letter.*

BOOK REVIEWS

NEW WARS: NEW WEAPONS, by Lieutenant Commander The Honorable J. M. Kenworthy, R.N., M.P., formerly The Admiralty Staff, London. Elkin Mathews & Marrot, London; 160 pages, with frontispiece; 3s 6d net; 1930.

The author invites attention to the fact that we are spending more money for weapons and defense each year than before the World War, and he tries to show the way for efficient spending on modern, instead of obsolete weapons.

After a brief recital of the history of the development of weapons, the evolution of naval warfare, the passing of the great battleship, a wastage of the taxpayers' money, a discussion of airplanes versus battleships, the real peril, campaign in three dimensions, the aerial offensive, and the changes the times have brought about, Commander Kenworthy sums up his case in rationalizing, as he sees it, the national defense. His thesis is well taken. There is much to be said for his conclusions, even if one disagrees with some of his arguments. His attitude in the parliamentary debates is indicative of a position, well taken, and seriously interesting to the law-makers of Great Britain.

The author holds that a unified Ministry of Defence, a concentration upon aerial, gas, chemical and mechanical developments, are dictated. Again, there is much to be said for his conclusions.

H. G. Wells, after reading his book, says that the narrative "is altogether admirable. * * * Vivid imagination with real knowledge and experience. * * * Extraordinarily convincing."

Rationalization of armaments, policies, mutual international agreements, disarmament treaties and actual demonstrations of performance for peace are necessary on all side for complete cooperation toward peace. Preparedness for war, must, therefore, come economically with the newest and most efficient weapons for the next or newest wars.

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THE AMERICAN BLACK CHAMBER, by Herbert O. Yardley. Bobbs-Merrill Co., Indianapolis, 1931. 370 pages, illustrated. \$3.50.

A book you will enjoy. The achievements of the Cryptographic Section of the Military Intelligence Division of the War Department General Staff during the World War are told in a most interesting and absorbing way in Major Yardley's book.

It will come as a distinct shock to Americans to learn that the most secret and confidential code cablegrams and messages of the United States were easily decoded and probably read by our Allies as well as by enemy and neutral countries. False security is the dangerous state in which we lived. Thousands of lives were needlessly sacrificed through the breakdown of our com-

bat codes; and, conversely, thousands of lives were saved through the ability of our cryptographers to break down speedily the constantly changing codes of our enemies.

We can't all be cryptographers, but we can and should know enough of the subject to realize the power of a skilled cryptographer to understand our most secret radio, cable, and wire communications.

In diplomacy as well as in warfare the cryptographer plays a major role—defensively as well as offensively. The nation that can maintain secrecy for its communications and read the cablegrams and radiograms of other nations is often in a position to gain its legitimate ends without being forced to go to war. The ethics of the case may be debatable, but Stephen Decatur's memorable words persist in recurring to this reviewer.

Aside from the purely military lessons to be learned from *The American Black Chamber*, the book is heartily recommended to the average reader for its illuminating discussions of secret inks, analytical solution of codes and cyphers, the workings of MI-8, the operations of foreign powers in cryptography, the intrigue and espionage incident to the war, and the vital part played by the cryptanalysis during the Peace Conference and the Washington Disarmament Conference as well as during the World War.

The book is more interesting and intriguing than a first class detective story, for it possesses not only the dramatic suspense of such stories, but it bears the unquestionable stamp of absolute authenticity. It is recommended to our readers as an outstanding work of military and national interest. If you love mystery, intrigue, dramatic suspense; if you enjoy a peek—many peeks—behind the scenes, *The American Black Chamber* will more than satisfy you.

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LOYALTIES—MESOPOTAMIA, 1914-1917, by Lieut. Col. Sir Arnold T. Wilson; 340 pages. Oxford University Press, London, 1930. Price \$10.00.

The author, who held the position of Acting Civil Commissioner in Mesopotamia, recounts his experiences in the legendary Garden of Eden from the outbreak of the World War to the death of General Maude. The interesting narrative covers both the military and non-military phases of the Mesopotamia campaign. The author depicts the difficulties of terrain, vagaries of the weather, and extremes of climate that tested the endurance of all ranks. He details the serious problems of supply complicated by long and imperfect lines of communications. Colonel Wilson has much to say that is complimentary and otherwise about the conduct of the Mesopotamian campaign.

The story is admirably told, with an exceptional breadth of view and deep human sympathy and understanding. A large number of portraits add to the general interest. The appendix contains a number of interesting documents including two that should prove very interesting to philatelists. A very elaborate bibliography and an excellent map complete the volume.

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WITH MEADE AT GETTYSBURG by George Gordon Meade. Published by the John C. Winston Co., Philadelphia. 201 pages.

Whether justly or not, Major General Meade has been severely criticized for not instituting a more vigorous pursuit of General Lee and the defeated Confederate forces, after their repulse at the Battle of Gettysburg. As long as men will continue to argue and defend their own ideas such controversies always arise—and no one yet ever heard of any one ever changing his opinion.

Published under the auspices of the War Library and Museum of the Military Order of the Loyal Legion of the United States, Philadelphia, Pa., this book was compiled by General Meade's son and edited by his grandson. It is plainly for the purpose of putting General Meade's side of the argument before the public. Copious extracts are made from the General's personal correspondence to his wife, from his orders issued in the field, and from his testimony before Congress nine months after the battle. Also there are extracts from General Halleck's letters to General Meade. Twenty-four maps help the reader form a picture of events, which would almost be impossible from just reading the written details.

The author opens the narrative with a very sketchy outline of the Civil War in the east up to the assignment of General Meade to the command of the Army of the Potomac. With the aid of good maps the reader is then given a clear picture of the distribution of the federal forces in the Maryland-Pennsylvania area, and their concentration on Gettysburg. Following this is a detailed description of the movements and actions of almost every Union brigade, insofar as it was directly concerned with the fighting, on the first, second, third, and fourth days of the battle. This is supplemented by enough information of the Confederate forces to give the complete story. Then the Confederate retreat and the Union hesitation, and finally the Confederate offer of battle at Williamsport and the refusal of Meade to accept.

If the reader is willing to accept the limited mission of the Army of the Potomac as given by the author, namely "the mission of the Army of Northern Virginia was to establish for the Confederacy an offensive military supremacy on Northern soil and the mission of the Army of the Potomac was to defeat the Army of Northern Virginia in accomplishing its mission," then the book has accomplished its mission. But there will probably be quite a few readers who will be unwilling to accept such a limitation to General Meade's mission, especially after the crushing repulse administered to the Confederates on the third day. The magnificent

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conduct of the troops during the three days fighting, their worn out condition, the shortage of supplies, and the like, are all brought forth to show why it was not considered wise to attack a foe who time and again had demonstrated his fighting ability, and who at this particular time was occupying a strongly entrenched position. General Meade states that for him to have attacked Lee on the fourth day would have resulted in the same disaster for the Union forces that the Confederates suffered on the third day. The reader can judge for himself who was right—General Meade, or his critics. There is one positive outstanding fact, and that is that we cannot help but be thrilled at the splendid tactical handling of his forces by General Meade during battle. To offset that, though, is the habit of calling his corps commanders together "for consultation," which, however one may try to disguise it, was nothing more nor less than a council of war. Fatal to aggressive action since time began.

It is an interesting book. For those who wish to have a splendid reference in their library on the Battle of Gettysburg this will be a welcome addition.

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THE MARTIAL SPIRIT, by Walter Millis. Published by Houghton Mifflin Company, 1931. 410 pages. \$4.00.

This book concerns our war with Spain. The author states "the foregoing book was undertaken rather as an essay in history than as history itself" and "it may seem that I have stressed the satiric aspects of war." It is certainly written in a sort of jazzy, serio-comic style, and at the same time is strongly satirical. Just what the real object of the book is, is hard to determine.

The reviewer has heard from childhood that our war with Spain was probably unnecessary, and brought on by a powerful group of "yellow journals." Mr. Millis stresses this factor. He describes very graphically the immense power of the press, and clearly shows the influence it had in working the public up to the war pitch. In his comments and criticism of the part politics played in using the press, both to bring on the war, and then later to handicap the operations of both the Army and Navy, he points out a grave danger to be avoided in the future.

In his dealings with personalities the author seems to cheapen the book. He is an excellent "second guesser." With sarcasm and innuendo he savagely criticizes the older Theodore Roosevelt, Henry Cabot Lodge, and William Randolph Hearst, together with a host of their contemporaries, the great majority of whom are now dead and of course unable to defend themselves. The author seems to forget that in preparing his essay he had the advantage of studying thirty years of debate on this particular subject, both oral and written, and access to the records of both Governments. It is not apparent in his criticisms that he has taken that fact into account, and that the leaders of the country, political, civilian and military, made their decisions and acted solely on the information that they had at the time. It hardly seems fair to abuse and ridicule men now dead for their thoughts and actions in

the eighteen-nineties in the light of developed information in the nineteen-thirties. It is only just to state, however, that the book seems to "knock" practically everybody and everything.

The evils of a non-censored press and unlicensed political meddling in military affairs in time of war are interestingly set forth.

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IN THE ENEMY'S COUNTRY, by Joseph Crozier. A. A. Knopf & Co., New York, 1931. 235 pages.

Joseph Crozier, a French business man and aviation enthusiast, became the head of a secret service group in Holland during the World War. He tells the story of the work there simply and entertainingly. There are no heroics. The translation leaves the Gallic flavor undisturbed. Though the book contains little of value to the military man, it makes interesting reading.

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MEMORIES OF THE WORLD WAR, by Robert Alexander, Major General, U. S. Army, Retired. Published by the MacMillan Company, New York, 1931. \$4.00.

In a foreword the author states that he has two objects in view in presenting these "Memories" to the public; one, to tell the unvarnished truth, and secondly, to record his appreciation of the devoted service and the determined valor of the troops with whom he was associated. He accomplishes his purpose well, and the reader will find in the pages of General Alexander's book a clear and interesting description of the work of a combat division.

The author starts his book with a rebuke to President Wilson for not fully preparing the military forces of the United States to enter the war, and consequently causing the deaths of so many soldiers due to untrained leadership. Then follows the author's story of crossing the Atlantic, his arrival in France, training trips to the French and British forces, his duties as commander of a replacement division, and finally his assignment to the command of a brigade in the 32nd Division, and some combat experiences.

In August, 1918, he was promoted to Major General and assigned to command the 77th Division. The 77th made a fine record, and the General gives full credit to both individuals and organizations who helped make that record. He is most positive in all his statements and does not mince his words in discussing either the success or failure of various officers. He gives authentic facts on some disputed questions, and in particular explains the so-called "lost battalion," which in the opinion of the 77th Division was neither lost, nor had to be rescued.

In the opinion of the author far too much time was "wasted" in the instruction of the tactics of "trench warfare," which could have been better and more profitably used in the instruction of minor tactics for open warfare. He is also a great believer in the value of the Command and General Staff School at Fort Leavenworth, and the efficiency of its graduates.

The book is of interest to the general military reader and worth while adding to that ever-growing library of "War books." It is of special interest to veterans of the 77th Division.

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