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CONTENTS

FACULTY AND STAFF, THE COAST ARTILLERY SCHOOL, 1927 *Frontispiece*

THE PREPARATION OF FIRE FOR ANTIAIRCRAFT ARTILLERY . . 485
By CAPT. C. S. HARRIS

COAST DEFENSE 500
By CAPT. E. M. BENITEZ

COLORS, STANDARDS, AND GUIDONS 517
By COL. R. E. WYLLIE

THE GRAND OLD ARMY OF THE FUTURE 531
By CAPT. W. J. GILBERT

EDITORIAL 537
Inactive Service by Reserve Officers—Coast Artillery in Coast Defense.

PROFESSIONAL NOTES 543
Fifteenth Coast Artillery (HD)—Antiaircraft Development—Antiaircraft Firing by 213th C. A. (AA), Pa. N. G.—Principles Governing Promotion in the British Army—A Method of Training National Guard.

COAST ARTILLERY BOARD NOTES 555

BOOK REVIEWS 557
Revolt in the Desert—The Automobile Blue Book, Vols. 2 and 3—An Outline History of China—William Hohenzollern—Theory of Vibrating Systems and Sound—Imaginative Writing—Criminal Paris—A Laboratory Plane Geometry—A Satchel Guide to Europe—All About Going Abroad.

INDEX TO VOLUME 66 565

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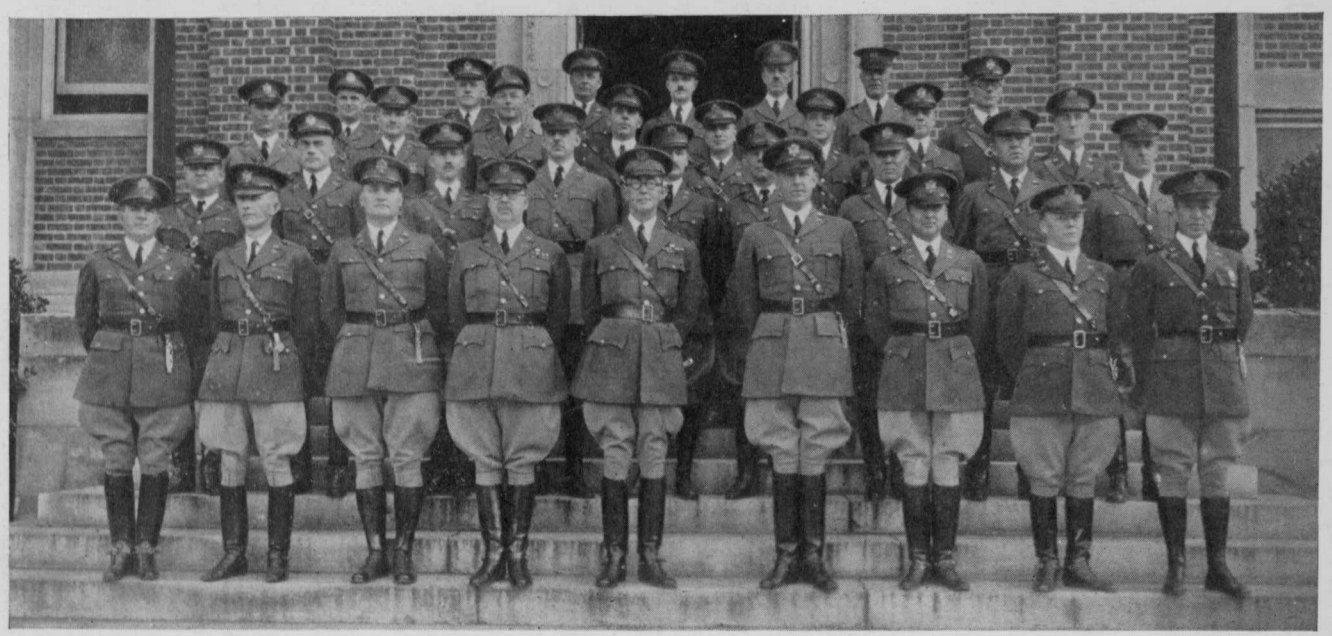

FACULTY AND STAFF, THE COAST ARTILLERY SCHOOL, 1926-1927

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THE COAST ARTILLERY JOURNAL

Volume 66 JUNE, 1927 Number 6

The Preparation of Fire for Antiaircraft Artillery

By CAPTAIN CHARLES S. HARRIS, C. A. C.

Honorable Mention, Annual Prize Essay Contest.

WHEN Field Artillery guns are laid by the use of a compass, the battery commander finds a key to his orientation problem through the solution of a factor which they call the "magic number." Unfortunately (or fortunately, if you prefer), no magic number for Antiaircraft Artillery has been found thus far. The determination of accurate firing corrections is a difficult problem, and its solution requires intelligent and careful attention. The problem is somewhat the same as that of the Harbor Defense Artillery in that it is desired to place the center of impact on the target and hold it there. There is, however, a point of difference. In antiaircraft firing it is paramount to place the center of impact on the target for the first round of bursts. The fire control system is based on the assumption of straight line of flight, constant altitude, and constant speed. These conditions may well hold true when the target is first engaged, but when the pilot of the plane is warned by the first bursts he may be expected to react in a perfectly human manner. That means that he will begin such maneuvers as to present an extremely difficult target. The conclusion must be that the greatest opportunity for destruction is presented during the first salvos, and this, in turn, points out the necessity for accurate preparation of fire prior to the arrival of the target. Observation of fire may well be conducted with a view toward the application of corrections for a later shoot, but adjustment during fire does not present a very favorable solution. Hence the importance of preparation by trial shots.

Battery commanders in our service have followed a number of methods in firing trial shots. Two methods, however, are outstanding in that they have received wider recognition. The altitude correction method

was devised in 1917 by French artillerymen. It is outlined in detail in *Gunnery and Position Finding for Antiaircraft Artillery*, Coast Artillery School, Fort Monroe, Virginia, 1925. The elevation correction method was proposed by the Coast Artillery Board, and published under the title, "Solution of Trial Shot Problem, Antiaircraft Artillery" (Bulletin O. C. C. A., dated July 28, 1926). It is believed that a careful study and comparison of the two methods will be worth while. Before proceeding to such a study it will be well to see what some of the causes for deviations are.

With the materiel now issued to the service direct fire is employed. The firing data include (1) vertical deflection, (2) lateral deflection, and (3) fuse range. The application of the deflections operates to point the gun toward the predicted position of the target, with corrections for wind effects. The fuse range serves two purposes. When applied on the gun it operates to elevate the gun above the predicted position by the angle necessary to compensate for the curve in the trajectory. This angle is called superelevation. When the fuse range is applied on the fuse setter it serves to determine the length of the fuse powder train. With the firing tables as a basis, data computers are constructed to furnish the firing data.

If the target follows the predicted course, and if correct firing data are sent to the guns, the burst may still deviate from the target due to either of the following causes:

(1) Errors in the application of the firing data;

(2) Variations in ballistic conditions, *i. e.*, variations in either the gun, ammunition, or atmosphere from firing table standard conditions. The war-time guns, with their defective sighting mechanisms, allowed excessive deviations due to the first cause. The sighting mechanism has been a greater source of error than the variations in ballistic conditions. For that reason the battery commander, in firing trial shots, has been largely interested in adjusting his sighting mechanisms. However, the sighting mechanisms on our 3-inch A. A. guns are now being modified to permit far more accurate adjustment by bore sighting, and the guns to be manufactured in the future will be further improved in this respect. With this improvement the battery commander, in firing trial shots, can now devote his attention properly to the determination of corrections for variations in ballistic conditions. In this article it is proposed to deal solely with that phase of the subject.

Under this heading we find that the main causes for deviations in the location of the bursts are:

1. Wind;
2. Change in the muzzle velocity;
3. Change in the atmospheric density;
4. Change in the ballistic coefficient;
5. Change in the rate of fuse burning.

The latest firing tables include under differential effects data which furnish a basis for a close study of some of the variations enumerated above. In more detail, the causes for deviations are:

(1) Wind. Ordinarily the wind will blow obliquely across the line of fire. For simplicity it is resolved into its two components, *i. e.*, the lateral and the range components. The lateral component will blow the projectile either to the right or left and it is necessary to apply a correction to point the gun into the wind by the required angle. The effects of the range component are shown in Figure 1.

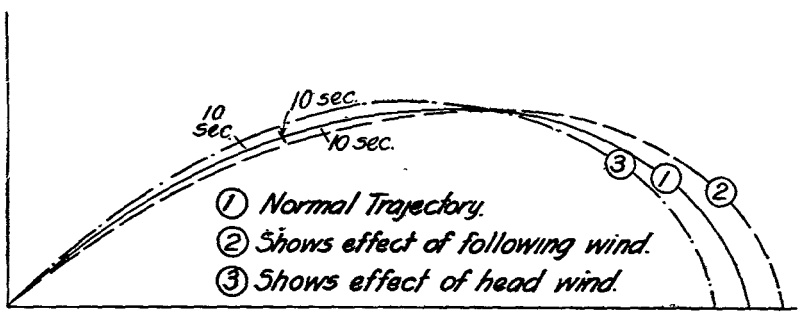

FIG. 1

Note the effects on the shapes of the trajectories and on the relative locations of the projectile on each trajectory at the end of a given time. Antiaircraft Artillery employs the ascending branch of the trajectory. There the effects of a head wind are:

(a) An increase in the angular height of the burst;
(b) A decrease in the altitude of the burst;
(c) A decrease in the slant range of the burst.

The effects of a following wind are exactly the reverse. The wind effects are shown in Parts 5*d* and 5*e* of firing tables. Obviously, if wind corrections are determined by trial shots fired in one direction, and the target appears in another direction, the corrections will be in error. These corrections are determined continuously by means of a wind computer and applied on the guns. In trial fire, therefore, wind effects are carefully eliminated before the corrections are computed.

(2) Change in the muzzle velocity. This result may be due to

change in the quality, weight, or temperature of the powder charge, change in the weight of the projectile, or wear in the gun. The effects are shown in Figure 2.

Note the effect on the shapes of the trajectories and on the relative locations of the projectile on each trajectory at the end of a given time of flight. Note, too, that the correction for change in superelevation increases with the range. This figure illustrates the effect as indicated by data given in Part 5*b* of the firing table.

(3) Change in the atmospheric density. Density depends largely upon the temperature and barometric pressure. The effects of a change in density are similar in general to those illustrated in Figure 2. The

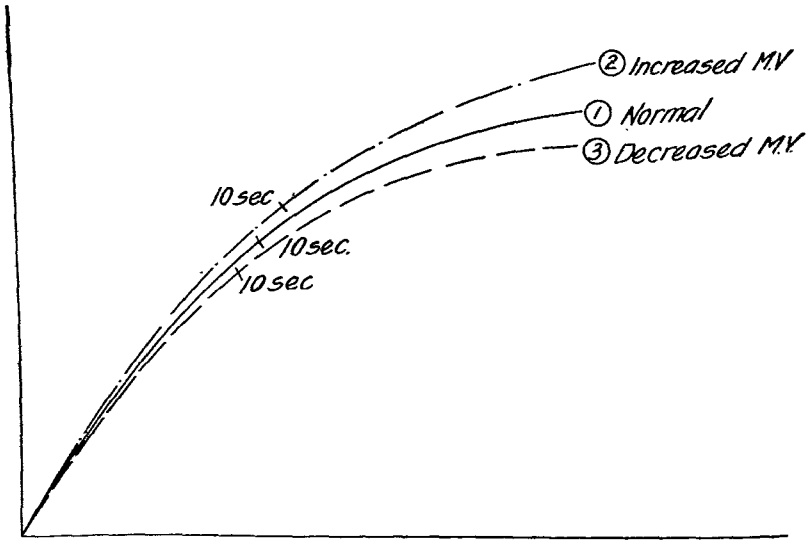

FIG. 2

trajectory for increased density would follow that for decreased muzzle velocity; and for decreased density, that for increased velocity. Density effects are particularly noticeable at long ranges. They increase with range more rapidly than do the effects from change in muzzle velocity. Comments are based on data given in Part 5*c* of the firing table.

(4) Change in ballistic coefficient. This may result from a change in the weight or shape of the projectile, or from wear in the gun which may result in producing a wabbling in the projectile. Ordnance requirements in manufacture, however, are rather severe and for that reason only small changes may be expected. The firing tables do not list any differential effects for this factor, but they are similar in nature to effects from change in atmospheric density.

(5) *Change in rate of fuse burning.* If the fuse powder train burns more rapidly or more slowly than normally expected, it is evident that the burst will not occur at the normal point on the trajectory. No differential effects are tabulated in the firing tables, but it is logical to assume that if the burst occurs one second early for a time of flight of 20 seconds, it will occur about one-half second early when the time of flight is ten seconds. The correction for variation in rate of fuse burning is applied by making a change in the corrector setting on the fuse setters. The type of fuse setter now in service provides only for a flat correction. The corrector is graduated from 0 to 60, with 30 as the normal setting. An increase in the corrector setting will result in a decrease in the actual fuse setting. The table below indicates the effect of the corrector setting on the fuse for given fuse ranges.

Fuse range	Corrector setting	Fuse setting on projectile
10	30	10
10	20	11
10	40	9
20	30	20
20	20	21
20	40	19

The rule to follow in adjustment is, "To raise the burst (in angular height), raise the corrector." The latest type of fuse setter provides for a fuse setter correction in terms of percentage. With it a given corrector setting will produce variable effects, varying directly with the value of the fuse range. Notice that a change in the corrector setting will affect only the fuse setting on the projectile. There is no effect on either the fuse range or superelevation applied to the gun.

The corrections required for change in the shape of the trajectory will be due largely to change in the muzzle velocity and to change in atmospheric density. Ordinarily the trajectory will vary from normal in one of two ways as illustrated in Figure 2. It is evident that if the trajectory varies as indicated by trajectory No. 2, the required superelevation (or required quadrant elevation) for any point will be less than normally required. It can also be seen that the time of flight to any given point will be less than that given in the firing tables. It is entirely possible to obtain a trajectory varying from normal in either of the two ways indicated in Figure 3. Variations of this kind are much more likely to be experienced in long range firing than at short ranges such as are employed in Antiaircraft Artillery. The possibility of such variations in antiaircraft firing appears to be remote.

The discussion thus far leads us to the conclusion that conditions may vary from firing table standard conditions in such manner as to require any or all of the following corrections:

(1) Correction in fuse setting;

(2) Correction in superelevation;

(3) Correction in time of flight to be applied on the data computer. This correction will affect both the vertical and lateral deflections.

We can now proceed to the trial shot methods employed to determine these corrections.

The Elevation Correction Method.

The elevation correction method has been followed by battery commanders for a few years, although no detailed method of procedure was published prior to the publication of the Bulletin, O. C. C. A., heretofore referred to. The principle of the method is simple. It will

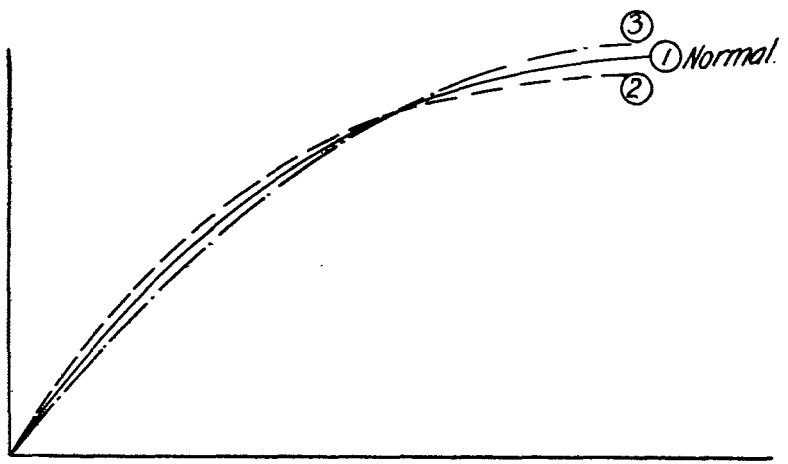

Fig. 3

be outlined briefly. A trial shot point is selected at the azimuth, range and altitude at which targets are expected. The elevation, fuse range, and azimuth having been determined, five shots are fired with the data. The altitude of each burst is read by means of a height finder; the angular height is read by means of a theodolite or A. A. telescope; the lateral deviation is read by means of the gun sight. From these observations average values are computed. From the average altitude and average angular height the average horizontal range is computed, using the formula: horizontal range equals the product of altitude and the cotangent of the angular height. The wind effects on altitude and horizontal range are computed. Then the altitude and horizontal range that would have been obtained without wind are determined. This furnishes the

data for plotting on a chart the corrected mean position of the burst. See Figure 4.

The correction in elevation can be determined by interpolation between the 800-mil and 900-mil trajectories. A special method of making a mathematical interpolation for this value is given in the Bulletin referred to. The correction indicated in Figure 4 is approximately minus 30 mils. The fuse setter correction is determined by interpolation between fuse range curves 10 and 11. The correction indicated in the figure is four points, since ten points on the corrector setting equals

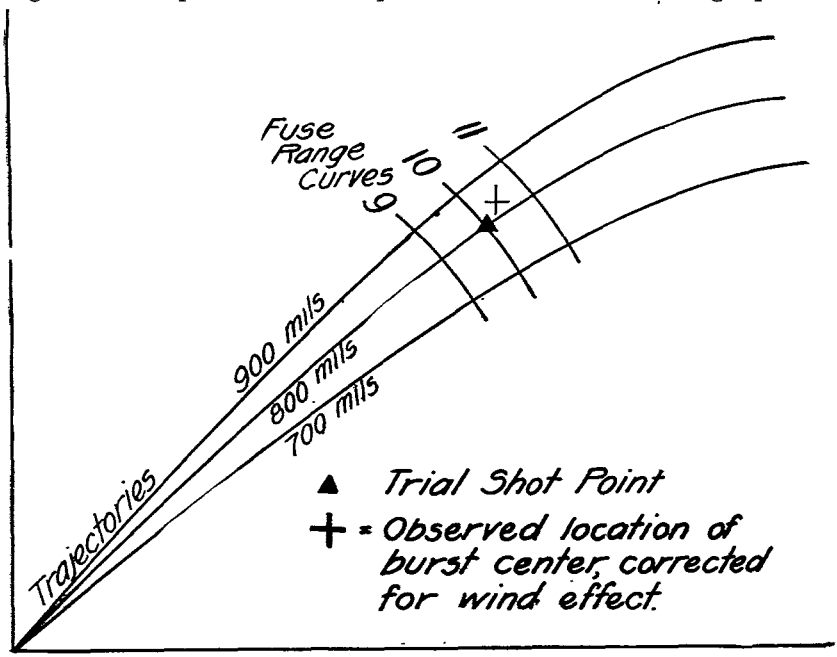

FIG. 4

one fuse setting. The corrector setting is changed from 30 to 34 in order to reduce the fuse setting the desired amount. A lateral correction is determined from the lateral deviation considered in conjunction with drift and wind effects. It is believed however, that this correction has litttle value for any gun other than the one used in firing the trial shots. The two important corrections, then, are:

Correction in quadrant elevation,	minus 30 mils
Correction in corrector setting	plus 4 points

The correction in the corrector setting would probably give better results if applied in terms of percentage rather than as a constant correction, and that will be possible with new materiel. The flat correc-

tion in quadrant elevation, however, is a questionable feature. It is, of course, a correction in the superelevation. Now the superelevation varies widely in the field of fire, and, consequently, the superelevation correction should also vary. That feature was pointed out in Bulletin heretofore referred to, and the suggestion was made that the ideal solution required firing trial shots at "about six points." Such a procedure would involve a system of corrections cumbersome to the point of impracticability. The result is that corrections are determined for only one trial shot point. It will be well to see just how the corrections will vary under given conditions.

In this article all computations are based on Firing Tables 3-A. A.—I—1, for 3-inch A. A. Gun, Model 1918, firing A. A. Shrapnel,

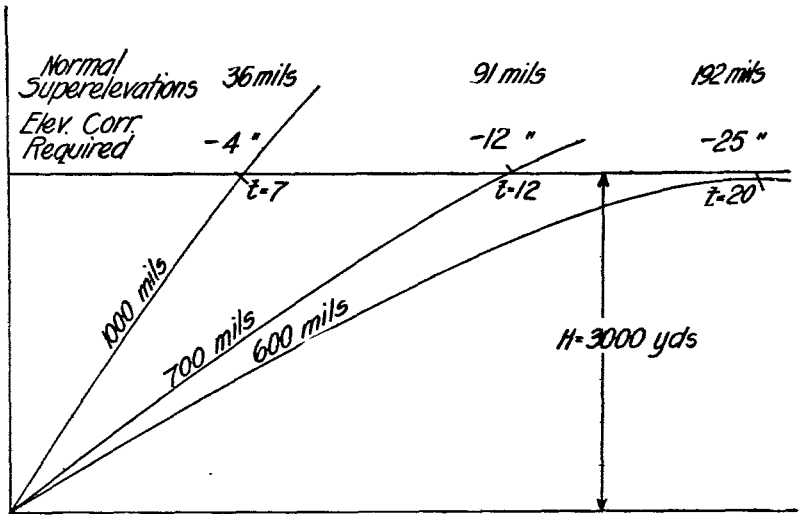

FIG. 5

This figure shows for three points in the field of fire the normal superelevation for each, and the required elevation corrections for (a) an increase in muzzle velocity of 100 f. s., and (b) atmospheric density, 95%. 3" Gun Model 1918.

Mark I, Mark III Scovil Fuse. We shall select three points at an altitude of approximately 3000 yards as indicated below:

Point	Quadrant elevation *mils*	Time of flight *seconds*	Fuse range	Altitude *yards*	Horizontal range *yards*
1	1000	7	7	2984	2150
2	700	12	11.3	3014	4424
3	600	20	18	2894	6845

Assume that the actual muzzle velocity obtained is 100 foot-seconds greater than standard and that the atmospheric density is 95 per cent. From Parts 5*b* and 5*c* of firing tables, data can be obtained to determine the deviation of the actual trajectory from the standard trajectory

at each of these points. The actual trajectories can be plotted and the required elevation corrections determined for the points. Figure 5 indicates for each point the required correction.

Note the rapid change in the value of the correction for a constant altitude while the fuse range varies from 7 to 18. Yet such conditions will ordinarily be encountered in service, and may be encountered in target practice. Obviously a flat correction in elevation leaves a lot to be desired.

This solution of the trial shot problem also fails to make any time of flight correction. Now the vertical and lateral deflection angles are arrived at by the multiplication of the angular velocities by the time of flight. If the time of flight value is in error, the error enters the deflections. For example, the firing table value of the time of flight for point 2 is 12 seconds, while the actual time of flight under the conditions assumed is 11.2 seconds. Unless a correction be made, the data computer will apply the firing table value of the time of flight, whereas the deflection angles should be based on actual time of flight. The result will be an error in the deflection angles of approximately 7%.

This method of solution, then, does not quite fulfill the requirements of the problem in that—

a. The flat correction in quadrant elevation does not compensate correctly for the varying conditions that will be encountered in service;

b. No time of flight correction is applied.

The Altitude Correction Method.

The detailed procedure to be followed in altitude correction method, as now published in *Gunnery and Position Finding for Antiaircraft Artillery,* does not provide instructions for the use of the latest firing tables. Nor does it provide for the selection of the trial shot point at any point other than at the summit of one of the trajectories. An effort will be made here to bring the method up to date in the use of the firing tables, and a slight modification in the method of procedure will be made to permit the selection of a trial shot point at points other than at the summit.

Select the trial shot point at approximately the altitude at which it is expected to open fire, and at a whole fuse range on one of the hundred-mil trajectories well toward the summit, but never beyond. The direction of trial fire should be approximately that from which targets are expected to arrive. In the example given here the trial shot point is selected at a quadrant elevation of 700 mils; fuse range, 15; azimuth, 1700 mils. By consulting the firing tables and the meteorological message the following preliminary data can be tabulated:

	Symbol	Source	
1. Quadrant elevation	i	B. C.	700 mils
2. Fuse range	B	B. C.	15
3. Expected angular height	S	Part 2, Firing Tables	556 mils
4. Expected time of flight	t	Part 2, Firing Tables	16.89 secs.
5. Change in corrector setting required to change angular height of burst one mil		(See note below)	0.6 point
6. Wind velocity	W	Meteorological message	20 mph.
7. Wind azimuth		Meteorological message	2600 mils
8. Azimuth of plane of fire		B. C.	1700 mils
9. Wind-fire angle	ϕ	Lines 7 and 8	900 mils
10. Range component of wind —head wind—	$W \cos \phi$	$20 \times .6344$	12.7 mph.
11. Lateral wind component —right to left—	$W \sin \phi$	$20 \times .7730$	15.5 mph.
12. Effect on altitude due to a 10 mph rear wind		F. T. Part 5 *d*—2	11 yds.
13. Effect on angular height due to a 10 mph rear wind		F. T. Part 5 *d*—3	2.8 mils
14. Effect on deflection due to a 10 mph cross wind		F. T. Part 5 *e*—2	7.3 mils
15. Deflection due to drift		F. T. Part 3—2	R 12 mils
16. Effect on altitude of burst due to wind		Lines 10 and 12: 11×1.27	—14 yds.
17. Effect on angular height of burst due to wind		Lines 10 and 13: 2.8×1.27	+4 mils
18. Effect on deflection of burst due to wind		Lines 11 and 14: 7.3×1.55	L 11 mils

Note. Data given in line 5 computed from data given in Part 2 of the Firing Tables in the manner indicated below:

Quadrant elevation	Fuse setting	Angular height
mils		*mils*
700	14	572
700	15	556
Change of one fuse setting, or 10 points on corrector, causes a change in the angular height of		16 mils
Change in corrector setting for one mil change in angular height (10/16)		0.6 point

Trial Fire.

Two rounds are fired. The average values of observations made are as follows:

Angular height of burst	546 mils
Altitude of burst	3410 yards
Time of flight	17.8 seconds

Since the wind effect was to raise the burst 4 mils (line 17), the actual angular height in still air would have been 542 mils. The vertical deviation of burst is 14 mils low (line 3). If the average vertical deviation of the two rounds is less than 10 mils, four more rounds are fired with same data and all six are considered as improvement fire.

If greater than 10 mils, as in this example, a correction is made in the fuse setting to secure burst at the expected angular height. The change in the corrector setting is $14 \times .6$ (line 5), or 8.4 points. Since the burst was low, the corrector setting is raised from 30 to 38. With a fuse range of "15" this corrector setting will give a fuse setting of 14.2.

Improvement Fire.

The fuses are set and the gun laid at the same elevation and azimuth as in trial fire. Four rounds of improvement fire are fired as rapidly as is consistent with accurate laying and observation. The results of the observations may be tabulated in the following manner:

	Average value observed	Observed data corrected for wind effects	Expected data
Angular height of burst (mils)	562	558	556
Altitude of burst (yards)	3320	3334	3456
Time of flight (seconds)	16.6		
Lateral deviation (mils)	R 9		

If the trial shot point is at the summit of the trajectory, the altitude given in the firing tables for that point may be taken as the expected altitude. For any other point the expected altitude must be based on the actual observed angular height of the burst, corrected for wind effects. Referring to Figure 6, the altitude of the point P_2 is the expected altitude. Its value may be computed as shown below. From Part 1, Firing Tables, table for an elevation of 700 mils, the following data are taken:

Time of flight	Angular height	Altitude
16	567	3405
17	555	3473

By interpolation it is found that the altitude for an angular height of 558 mils is 3456 yards. This is the expected altitude. The altitude percentage correction is $\frac{3456 - 3334}{3334} = +3.7\%$. This correction is applied to the altitude readings before they are sent to the data computer. When the two-station altimeter is used, the best practice is to make the correction through a change in the length of base line. For example, if the length of base line is 3000 yards, the corrected length would be $3000 \times 1.037 = 3111$ yards. The altitude readings will be increased by the same amount. The application of this correction will cause an increase in the fuse range and time of flight readings on the data computer. The increase in the fuse range will result in the application of

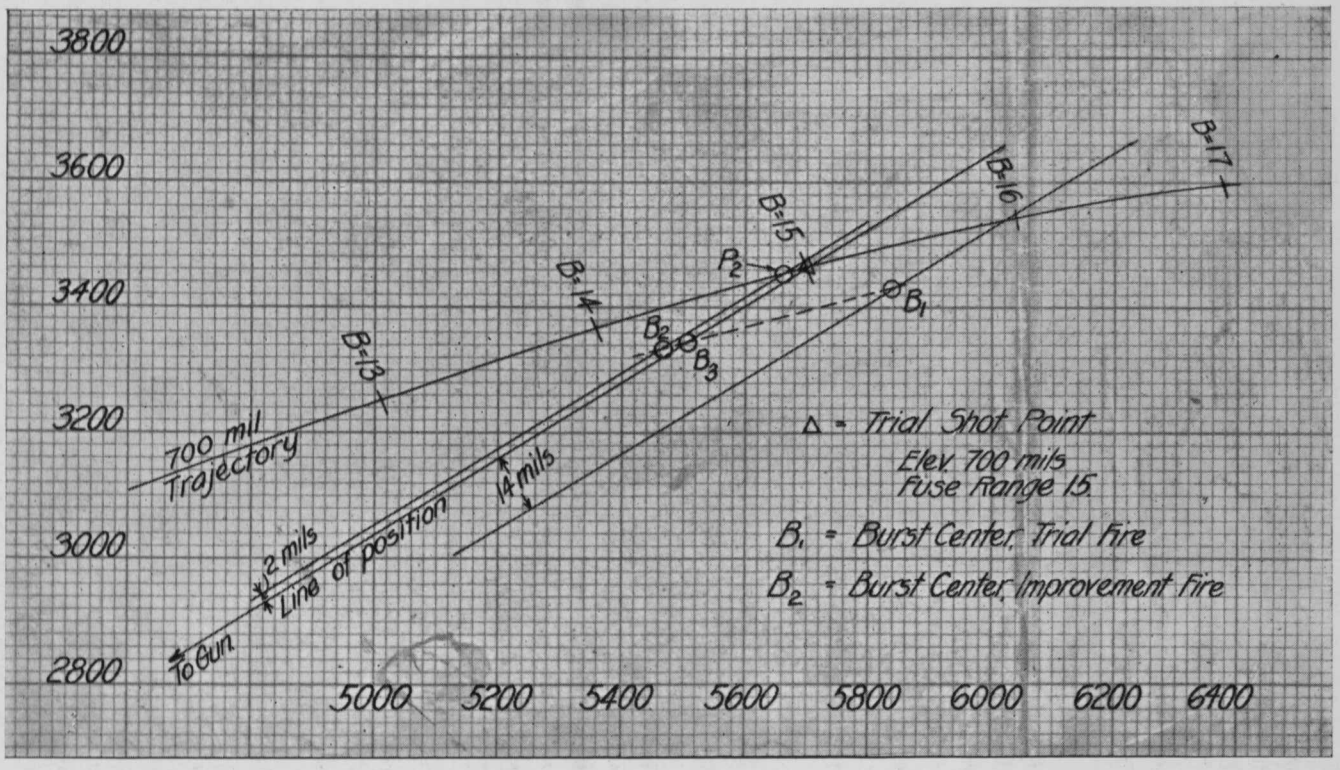
3800
3600
3400
3200
3000
2800
5000
5200
5400
5600
5800
6000
6200
6400
B=13
B=14
B=15
B=16
B=17
P2
B1
B2
B3
700 mil
Trajectory
14 mils
2 mils
Line of position
To Gun
Δ = Trial Shot Point
Elev. 700 mils
Fuse Range 15
B1 = Burst Center, Trial Fire
B2 = Burst Center, Improvement Fire

Fig. 6

an increased superelevation on the gun. The increase in the time of flight will result in increased deflection angles. We shall see later how the correction operates under given conditions.

A further correction is made in the fuse setter corrector setting, since there was a vertical deviation in improvement fire. The deviation was two mils. The correction is 2 x .6=1.2 points on the corrector. Since the burst was high, the corrector setting is decreased from 38 to 37.

The Firing Tables give the deflection due to drift for this point right 12 mils (line 15) and the deflection due to wind left 11 mils (line 18). The expected lateral deviation, then, was right 1 mil. Since the observed lateral deviation was right 9 mils, there was a lateral error of right 8 mils. A correction should be made for this error, and also for drift, since the present type of data computers provide no drift correction. If it is assumed that the normal drift during firing will be 10 mils, then the correction for both factors will be:

Correction for lateral error	left 8 mils
Correction for drift	left 10 mils
Total correction	left 18 mils

This correction is applied on the gun sight by moving the adjustable index on the lateral sighting mechanism. As in the elevation correction method, this correction will have little value for any gun other than the one used to fire the trial shots. The battery commander may boresight carefully the other guns and apply an arbitrary correction for drift, or he may fire in the corrections for each of them.

Reference to Figure 6 may serve to clarify the solution of the problem. The fuse setter correction made after trial fire moved the burst location from B_1 to B_2. The fuse setter correction made after improvement fire is made to move the burst to B_3. The altitude percentage correction is made to move the burst from B_3 to the trial shot point.

The two important corrections are the altitude percentage correction and the fuse setter correction. The application of the altitude correction causes a correction in the superelevation and a correction in the time of flight used to determine the deflections. The fuse setter correction is applied to cause the burst to occur at the right angular height. The firing tables do not include differential effects for variations in rate of fuse burning, and for that reason it is impracticable to make any check on the fuse setter corrections determined. But a check can be made against the altitude percentage correction.

The same conditions will be assumed as were in the study of the elevation correction method, *i. e.*, an increase in the muzzle velocity of

100 f. s. and an atmospheric density of 95%. Same gun; same firing tables used in obtaining results. If the trial shot-point is selected at fuse range 15, quadrant elevation 600 mils, and the deviations occur as indicated in parts 5*b* and 5*c* of the firing tables, the altitude percentage correction is computed to be minus 6.3%. At fuse range 15, quadrant elevation 700 mils, the correction is 6.4%; at fuse range 15, quadrant elevation 800, the correction is 6.4%. At any elevation from 400 to 800 mils, and at any point on either of the trajectories from a fuse range of 14 to the respective summits, the altitude percentage correction is found to be approximately minus 6% for the conditions of muzzle velocity and atmospheric density assumed. This correction in altitude will give results as indicated below for the three points shown in Figure 5.

Point	Elevation correction required	Elevation correction obtained from altitude percentage correction	Actual time of flight	Time of flight given by alt. percentage correction	Firing table time of flight
	mils	*mils*	*seconds*	*seconds*	*seconds*
1	— 4	— 3	6.5	6.4	7
2	—11	—10	11.2	11.0	12
3	—25	—24	18.7	18.1	20

With the same correction other points in the field of fire can be checked and found to give results equally as good. Other ballistic conditions may be assumed and similar checks made. It will be found that the altitude correction will always give results more accurate than will be obtained from an elevation correction.

In paragraph 5 of the Bulletin, O. C. C. A., heretofore referred to, the statement is made that "any corrections applied as result of trial shots will apply only for that trial shot point, regardless of what method of trial shot correction is used." That is certainly true for an elevation correction, and it is true to an extent for any correction, but if we may judge from the indications given by the differential effects in the latest firing tables, the errors are small when an altitude percentage correction is used. Certainly the errors for that correction are far less than the errors from an elevation correction.

In any method of firing trial shots the following points should be borne in mind.

Selection of Trial Shot Point.

The trial shots should never be fired at very short ranges. At a fuse range of 8, for example, the ballistic variation in the shape of the trajectory will rarely cause a deviation to exceed 5 mils. Often the errors in observation will exceed the deviation due to ballistic condi-

tions. More accurate data can be determined at longer ranges. If the altitude corection method is followed, the trial shots should never be fired at a fuse range less than 12.

Accuracy in Laying.

Laying in elevation by gun quadrant may lead to errors. A check against the quadrant should be made by use of a clinometer prior to the firing.

Accuracy in Observation.

The most important observations made are those made on the altitude and angular height of the burst. Extreme care should be exercised. The angular height should be read by an accurate instrument, such as a theodolite. The instrument should be checked prior to the firing, and should be leveled with particular care for the observation. The observer should see the burst through the field of view of the instrument when it occurs. The wind will often change the angular height of the burst several mils in a few moments. Tardy observations are worthless. If the altitude is read by means of the two-station altimeter, orientation in direction should be emphasized. The trial shots will automatically tend to correct for error in length of base line, but not for error in orientation. In observing bursts the following procedure is suggested. Let both observers get on the burst and report. Thereupon the B′ reader should give the signal to "take." Simultaneously both instruments are halted and the ϕ_1 and ϕ_2 readings made and recorded. Thereupon, the altitude reading can be made carefully and accurately. If the altitude readings are made by use of a stereoscopic height finder, there will be errors. Experiments should be made at various ranges and altitudes to determine, as far as possible, what the errors in readings are. The errors on the burst may not be the same as the errors on the target. In applying corrections both errors must be considered if accurate fire is to be obtained.

Today, we are groaning under a debt of billions due directly to unpreparedness.—*Boston Transcript.*

Coast Defense

By CAPTAIN E. M. BENITEZ, C. A. C.

The Coast Artillery holds the Front Line, the Seacoast. No man's Land is the Ocean washing our shores.—COAST ARTILLERY JOURNAL, March, 1920.

PRESIDENT Taft summarized the true principle upon which the mission of coast artillery is based when he said in an address before the Naval War College in 1909: "For the protection of our coasts we need fortifications; we need these fortifications, not merely to protect the salient points of our possessions, but we need them so that our Navy can be foot-loose." The successful accomplishment of the mission of the Navy, which consists in the defense of our shores against foreign aggression, the guarding of American interests in the high seas, and the enforcement of our national policies, depends upon the Coast Artillery to a large extent, because, as Mahan has said: "In naval warfare, coast defense is the defensive factor; the navy, the offensive. Coast defense, when adequate, assures the naval Commander-in-Chief that his base of operations—the dock yards and coal depots—are secure." Coast defense is, therefore, a measure of naval strength and a vital asset of naval warfare. Due to our geographical position, all our past wars against foreign powers have been naval wars, in which the Coast Artillery has played a very important part. The development of the air power and antiaircraft artillery, as well as the introduction and development of new means and methods of combat on the air, on the sea and on land, have modified, to a certain extent, the manner in which our mission can be best performed; but the basic object remains unchanged, and the importance of its successful accomplishment is today as necessary as it ever was in the past.

The Coast Artillery is provided with three great weapons for the accomplishment of its mission:

1. The Cannon.
2. The Antiaircraft Gun.
3. The Submarine Mine.

To handle these weapons we must have a trained and efficient personnel, because these means are merely mechanical devices which are of no value, unless efficiently handled and put to the purpose for which they have been designed; therefore, they must be endowed with human skill and intelligence. General Hines says that "men without weapons only make a useless sacrifice. Weapons without trained men are with-

out military value." The 9th British Army Corps, composed of inexperienced officers and men, receiving its first real test at Suvla, presents a striking contrast to that of the British troops at Gaba Tepe and Hellas. The disaster that befell on the 9th Corps is another illustration showing that officers and soldiers cannot be improvised, that lack of proper training only results in defeat and useless sacrifices of lives, and that material means nothing, unless there is a properly trained personnel to handle it.

Coast defense is a matter of the utmost importance to all branches of the Service, and especially so to the Coast Artillery. It demands the use of all the fighting elements of the Nation, and they must participate always in cooperation towards the achievement of the common purpose: *Victory*. Let us, then, analyze the rôle of the Coast Artillery in the case of a naval war, studying the weapons and means at our disposal, so that we may make some deductions and proper conclusions concerning the manner of successfully accomplishing our mission in coordination with the means available by the Army at large. We are only a part of the team, and cannot properly perform our functions unless our efforts are directed along the same channels and governed by the same ideas and principles as the other members of the team.

Role of the Navy

The role of the Navy is purely offensive; it must be prepared to put to sea upon short notice and be in readiness to meet and defeat the enemy's fleet. It constitutes, therefore, the first line of defense, because no enemy fleet will dare approach and attack our shores as long as ours remains undefeated. Our naval forces cannot, however, accomplish their mission efficiently unless they are assured, when they take the sea, that their naval bases and strategic harbors will be safeguarded in their absence, and this is, in fact, the *raison d'être* of the defense of our military ports. They must sail with a free hand, and be completely freed from any defensive missions or be hampered by conditions at home which might prevent them from concentrating all resources against the hostile navy. They must assume the offensive with boldness and precision, because as Sun, the Master, did so wisely express: "While victory may be easy in attack, it is difficult in defense," or, as it is commonly expressed, it is better to strike than to parry. Our fighting fleet must have freedom of operation and must not be chained to our shores, its main object is to obtain command of the sea, by defeating the hostile fleet. "Seaports should defend themselves; the sphere of the fleet is on the open sea; its object offense rather than defense; its objective, the enemy's shipping where it can be found." [1]

[1] *The Influence of Sea Power Upon History*, Mahan.

The Navy has undergone great developments in the late centuries; the vulnerable side-wheeler has given way to the protected screw propeller; the wooden walls of Nelson's time yielded to the ironclads, and these have been, in turn, replaced by battleships provided with thick walls of the highest grade of steel possessing great resistance to projectiles; with the progress of civilization, wind has been replaced as motive power by huge steam engines and steam turbines, and these are being, in turn, discarded for powerful oil engines and electric machinery; new devices are being continuously introduced in naval operations, making it necessary for a modern fleet to contain a proper proportion of subsurface, surface, and air craft; nevertheless, the mission of the Navy and the Coast Artillery remains basically unchanged. The great Nelson summarized the problem of the Fleet Commander in the following manner: "The business of the Commander-in-Chief is, first, to bring the enemy's battle fleet under the most advantageous terms to himself, and secondly, to continue them there without separating until the business is decided." Jellicoe and Beatty did not succeed at Jutland because they could not cut the German fleet off its base, and, through skillful maneuvering, Scheer succeeded in maintaining his advantageous position throughout the battle and returned home in safety. Nelson's doctrine was followed by Dewey at Manila and by Sampson at Santiago, and if we are to judge by the results obtained, the soundness of this policy admits no questioning. Sir Walter Raleigh emphasized the principle that "he who commands the sea, commands the world and the trade at large." The command of the sea was one of the important factors that contributed to the victory of the Allied Powers, for had Germany suceeded in obtaining sea supremacy through their intensive submarine campaign, undoubtedly the Great War would have had a totally different outcome. The weaker German High Sea Fleet, operating from strong German naval bases, kept the British Grand Fleet aloof and in a state of inactivity throughout the war. The German Fleet was, in the meantime, kept busy clearing the passages beyond the naval bases for the egress and return of the U-boats, thus making possible the great submarine campaign launched in the early part of 1917, which all but stopped the beat of Britain's heart. The British fleet did not dare attack its weaker opponent because the latter was protected by the strong coast defenses of Heligoland. Thus, we see that the mission of the Navy and that of the Coast Artillery are very closely related and that the efficiency of the one is vital to the efficiency of the other.

Role of the Army

The role of the Army is, of course, to utilize all its means—combatant and noncombatant—combining them in such a manner, as to bring successful and decisive results in the shortest possible time and with the minimum of loss. In the old days, the problem of coast defense was simpler, as it was mainly confined to the defense of fortified places. Modern naval inventions have given the naval forces greater mobility, more armor protection, higher speed, and greater gun range, and have so modified time and space that coast defense must also be provided for unfortified harbors and possible landing points along the coast. For this reason, coast defense constitutes today a question of great magnitude and of vital importance to the nation, and one which demands the combined efforts of all the branches of the service which, working as a team under an intelligent leadership, must properly perform with the smoothness, efficiency, and harmony that guarantees success.

Coast Artillery Doctrine

The mission of Coast Artillery is given in detail in our Training Regulations, but it may be briefly summarized thus:

1. To hold strong points tactically and strategically located along the coast.*
2. To furnish antiaircraft defense for localities which require it, in order to permit free radius of action to friendly aircraft.
3. To man the large caliber field pieces with field armies.

It is, therefore, an acknowledged fact that, in order to carry out this mission, the Coast Artillery must have intimate relations, not only with the Navy, but with the Air Corps as well. In France, for instance, coast defense is under control of the Ministry of the Navy; in Japan, Great Britain, and Italy, the army is charged with the operation of the coast defenses; in Germany, the Navy was charged with providing harbor defense, and this is also the case in Chile and other South American republics, where German military influence still predominates. The line of demarcation is not very distinct, and some military authorities in this country believe that coast artillery should more properly come under the Navy than under the Army. This, in fact, matters little; but our chief concern should be the proper performance of our mission, which requires cooperation and intimate contact, not only with the Navy and Air Corps, but with all the other branches of the military forces as well. We are, when engaged in coast defense, essentially a defensive branch, so we are forced to fight at the ranges selected by the

*Editor's Note.—Not completely and accurately stated.

enemy and cannot maneuver for position nor assume the initiative; we must, therefore, make up for these disadvantages by a thorough and flexible system of training, which would permit us to deliver, under the emergency, a rapid, vigorous, and well-directed fire, either against a rapidly moving naval target, probably operating in the dark or behind a smoke screen, or against an ærial target travelling at a rate of from 70 to 120 miles per hour.

Ordnance in Coast Defense

The sources of the invention of gunpowder, the oldest of the explosives, is not exactly known. Some writers attribute this invention to the Chinese, others to the Arabians, and still others to the Hindus. Gunpowder for use in guns is, probably, not the invention of any one person, but the result of progressive development. The first machines employing gunpowder as the propellant agency were used early in the fourteenth century, when the gunpowder cannon replaced all previous forms of ordnance. Great improvements were gradually made, both in the guns and in the mountings, but the most outstanding ones are:

1. Principle of built-up guns.
2. Rifling.
3. Breech block.
4. Breech loading.

These improvements increased the range of guns from a few hundred yards to several miles and also increased the accuracy of the piece in similar proportions.

Harbor defenses sprange out of necessity. The age of maritime discoveries, the improvements in size and quality of ships, brought distant lands into closer contact. Nations realized the necessity of navies to protect commerce and, with the growth of maritime trade, good harbors and roadsteads became essential. Consequently, ports of trade were needed for shelter and repairs of the fleet, as well as points of refuge for ships in case of bad weather. The installation of guns to defend these harbors also became necessary. In the early days, the vessels were not adaptable to maneuvers and the main plan of attack consisted in effecting a landing on an undefended neighboring place with a view to the capture of the place by land. Consequently, the old sea forts had to be provided with defenses very similar to those required for land forts. In those days, ships were made of wood, and all seacoast forts were equipped with furnaces for heating shot. The cannon balls were heated to a dull red, then raised by tongs and rolled into the cannon; they retained their heat for several minutes; if one of the

shots fired would find the target, it would set fire to the wood, burning the vessel down to the water soaked hull.

During the Civil War, there were more smoothbore pieces than rifled ones; but the advantages of the latter were so apparent that the smoothbore cannon was eventually discarded altogether. The introduction of the rifled cannon increased the accuracy of fire and range of guns to a great extent and this, naturally, had a great effect upon the construction of permanent fortifications as well as upon coast artillery tactics.

The first attempt to use the railway cannon took place during the Civil War at the siege of Petersburg. Mortars placed on strengthened railroad cars were used with effect against the Confederate works. The British mounted small cannon on armored railroad cars and used them against the Bœrs in the South African war. Since that time, all the first class nations of Europe began experimenting with railroad mounts for large guns; the Germans, however, were apparently the most successful, as it was disclosed during the early days of the World War, when they transported heavy guns mounted on railway cars, firing them from tracks without the necessity of elaborate emplacements. The development of railway artillery during the Great War is well known; the postwar development has introduced railway artillery weapons comparatively simple and of tremendous power, so that railway artillery will, undoubtedly, prove of still greater value in Coast defense.

Seacoast fortification was practically abandoned in this country after the Civil War until about 1890, after which date the construction of permanent harbor defenses, equipped with gun embodying the principles known then, were commenced under the direction of the Corps of Engineers.

Much progress in fire control, communications, and ordnance has taken place in recent years and, as a result of the experience gained in the World War, our coast defense tactics have suffered some modifications. Basically, however, they remain unchanged, as we have already stated, because they are founded on well tried-out theories, whose soundness have been demonstrated in all naval wars. The Coast Artillery is today the Heavy Artillery of the Army and coast defense is simply part of its mission.* The relegation to the past of such terms as "Coast Defense Command," "Fire Command," "Battery Commander's Station," and the like, substituting therefor, "Harbor Defense," "Group," "Battery Command Post,"[2] is the only logical policy, and it comes from the realization that we must have a terminology that will

[2]See C. O. No. 13, W. D., June 9, 1925.

*Editors Note.—In its subordinate capacity as the artillery of the forces responsible for protection of the maritime frontier. The reader should not get the impression that the Coast Artillery is charged independently with the defense of the coast.

fit in, not only with our modern conception of coast defense, but one that will be more truly descriptive and brings us into closer contact with the other components of the Army. Our mission as the Heavy Artillery of the Army implies that we must operate with the field armies, in case war conditions so demand. In such a case our regiments will be attached to corps and armies; similarly, in case of a successful foreign invasion, our regiments of tractor, railway, and antiaircraft artillery will probably be pooled in the G. H. Q. Reserve and attached to corps and armies in the field. Consequently, it is of the utmost importance that we speak the same language and use the terminology and system of training that more nearly conforms to the other branches of the service, and also have an organization that, if necessary, will permit the withdrawal of units from the harbor defenses and their assignment for duty with the forces in the field.

Let us now make a brief study of the three great weapons placed at our disposal for the accomplishment of our mission, namely, the cannon, the antiaircraft gun, and the submarine mine.

The Cannon

We have just traced the development in ordnance to the present times, when our seacoast artillery embodies all the modern principles in design and construction. The size of the naval guns has been limited to sixteen inches by the provisions of the Washington Treaty of Limitations, and this gives a range of about 34,000 yards. The 16-inch gun on barbette carriage, the largest type of Ordnance in coast defense today, is more powerful and has greater range than any gun now mounted or contemplated to be mounted on any battleship afloat. The 16-inch howitzer is a most successful type of long-range howitzer. The latest type of railway artillery is the 14-inch railway gun. These three types of seacoast artillery constitute the very latest development in heavy artillery and are superior to any naval armament in existence today. Moreover, land artillery has a distinct superiority over naval artillery, or, as Napoleon expressed it, "a gun on land is worth ten at sea." The gun on land presents a less visible and a less vulnerable target than the naval armament, its platform is fixed, and therefore more stable, and its means of observation and range finding, which means accuracy of fire, are vastly superior. Mahan, the most respected naval authority of modern times, expresses his dictum thus: "Ships are unequally matched against forts in the particular sphere of the fort. The quality of one is ponderousness, enabling great passive strength; that of the other is mobility." Past experience has clearly demonstrated that naval attacks on properly equipped and efficiently manned defense are seldom

successful; in fact, a well fortified harbor is the best safeguard against naval attacks. The German Fleet in all its raids against the English coast avoided the harbor defenses and only attacked those armed with light guns and, similarly, all the attacks made by the Dover Patrol against the German defenses along the Belgian coast were made by old ships and monitors, and not by modern vessels. The risk of destruction is too great, and the Allies very wisely avoided this danger.

The failure of the artillery of the Allied Fleet against the Turkish forts at the Dardanelles is well known. Similarly, the fire of the French and Spanish ships against the hastily improvised Riffian coast defenses at Alhucemas in September, 1925, was also another disappointment. The fire of the 12-inch guns of the *Paris* and the *Jaime I* inflicted little damage on the Riffian works, failed to demoralize the defenders, and, had not Abdel-Krim scattered his weak forces instead of keeping them concentrated near his capital which, obviously, was his most vital spot, the Alhucemas landing would have probably failed, despite the fact that the Riffian leader was greatly outnumbered, lacked the proper equipment, and had no navy nor airplanes at his disposal.

There are, of course, many other types of guns; in fact, as a result of the World War, the Coast Artillery has a heavy mobile armament such as it never has had in its history and one that might rightly considered as a great asset; but we have simply mentioned the best and most modern types, in order to point out that our artillery today is ahead of any naval artillery that may be brought against it; that guns on shore, if well placed, cannot be dominated by ships' guns, and that a properly fortified harbor can very well take care of itself against any naval attack.

The Antiaircraft Gun

Every new weapon devised by man for war purposes has always been counterbalanced, either by a weapon of similar class or by another weapon, which nullifies to large degree the advantages that would otherwise be obtained. Regardless of the date of its invention, it may be truthfully stated that the value of the airplane, as a fighting machine, dates back to the World War. Previous to this time, the real fighting value of aircraft was really unknown; the great struggle, however, saw the use of aircraft on an unprecedented scale and the antiaircraft gun was devised to counteract this menace from the air. We are told that the first shot delivered against aircraft was fired by the Austrians at Maubege on June 25, 1794, against the captive balloon *L'Entreprenant*[3]; but antiaircraft fire was entirely developed during the Great War and its developments came from the necessity of a defense against attack from the air.

[3]*Revue d'Artillerie*, June, 1926.

So much has been written on the relative merits of aircraft and antiaircraft fire that little remains to be said on that subject. It has been shown conclusively that antiaircraft fire proved to be an efficient means for the defense of vital areas, both in the advanced and rear zones, and that, as a result of the gradual improvements introduced, antiaircraft guns gained steadily on planes. The post-war work shows the great capabilities of this new arm and also the need of its further development. For example, in the firing tests conducted at Fort Tilden in July and August, 1925, the actual percentage of hits on the hypothetical target was about 4.6%, while the percentage of hits should have been 32% had the guns been correctly aimed at all times.[4] There is no doubt that this discrepancy may be largely attributed to faulty materiel, especially as regards fire control instruments, but it also shows the tremendous field of improvement for accuracy in antiaircraft fire.

The development of new equipment in antiaircraft fire is essential, and must include improvement in accuracy, reduction of dead time of maneuver and time of flight, and increase in volume of shell fragmentation. The present fire control system is not entirely satisfactory and is, undoubtedly, the weakest link of antiaircraft defense today.

In time of war, the Coast Artillery will be called upon to furnish antiaircraft protection to military and naval establishments and also to industrial centers engaged in the production of war materials. Paris and London proved to us that antiaircraft defense is an efficient means of protecting cities against air raids. The Coast Artillery, however, can make no wild claims and must realize the impossibility of preventing a bomber from dropping explosives on extensive areas, such as those covered by cities like New York, Philadelphia, or Washington; but antiaircraft defense can keep hostile planes at such a great altitude that their aim will be so inaccurate as to make it practically impossible, or at least extremely difficult, to inflict damage from a military point of view. Speaking of the War of the Future, Marshal Foch says: "I do not think that the destruction of great cities—, even of capitals and industrial centers—, will end war. Armies in the field, victories over armed enemies, superior mechanical devices and better trained men, led by better officers, will continue to spell victory or defeat. You cannot scare a great nation into submission by destrying her great cities."[5] It must be clearly understood that antiaircraft artillery can only effectively defend limited areas, such as munition plants, drydocks, airdromes, canal locks, and the like, and in this manner it frees the Air Corps for the prosecution of its proper mission. To assign aircraft

[4]From Report of General Ruggles, O. D.

[5]"The War of the Future," Marshal Foch, in *New York Times Magazine*, August 8, 1926.

to the defense of localities would prove a fatal mistake, because aircraft is strictly an offensive arm and as such cannot assume defensive rôles. The functions of antiaircraft artillery may be compared to that of our harbor defenses; just as the latter furnish protection for naval bases and dock yards, thus leaving the fleet "foot-loose," so should antiaircraft artillery furnish sufficient defense to leave our air forces free to undertake offensive and aggressive missions.

There is no doubt that the possibilities of antiaircraft defense are great, and that antiaircraft today can hold its own against aircraft; but there is still much to be accomplished by both, and the best results can only be obtained through a mutual and perfect understanding of the difficulties, powers and limitations of the two arms and a proper coordination of efforts in policy, training, and missions of these two branches of the military establishment. It is the opinion of many officers that the terms "antiaircraft service" and "antiaircraft artillery" are misleading and not well understood, and it has been suggested that these terms be discontinued and the present "Antiaircraft Service" be known as "Aerial Artillery." This suggestion merits consideration and it should be adopted if it will tend, in any way, to enable us to accomplish more effectively and more quickly the aim that we are all striving for, namely, to provide the Nation with a *real* defense against hostile ærial activity.

The Submarine Mine

The use of submarine mines dates back a great many years. They were used against the Spaniards at the siege of Antwerp in 1585. Bushnell, the father of the submarine boat, and Fulton, the inventor of the steamship, worked in the development of mines; but Colt was the first to explode mines by electricity. Extensive use of mines was made by the Confederates during the Civil War; not having any ships, the Southern states were blockaded, and the Confederates retaliated by planting mines in their harbors, thus causing the destruction of many northern vessels. Not much importance was placed, however, on the value of mines until the Russo-Japanese War. Both Russians and Japanese suffered heavy losses due to mines, especially during the siege of Port Arthur, where the Russians lost, among others, their Naval Commander, Admiral Makaroff, who went down with his flagship *Petropavlosk*, which was struck by a mine that had been planted by the Japanese at the entrance of the channel.

Turkey tried to use mines to offset the naval supremacy of Italy during the Italo-Turkish War. The Ottoman Empire closed the Dardanelles in this manner, but was later forced by the European powers to open this passage and pick up all the mines that had been planted.

The World War saw the use of submarine mines in an unprecedented scale. The famous Northern Barrage Mine Project, conceived by the British and Americans in concert, called for a barrier of mines 240 miles long, and in three rows—one below the other—across the North Sea, from the Norwegian territorial water to a channel 10 miles wide left free off the Orkney Islands. Minelaying operations were begun in March, 1918, the mines containing a charge of 300 pounds of TNT and were planted at an interval of 300 feet; the upper row, at a depth of 45 feet; the middle row, at a depth of 240 feet. This great undertaking, in which 56,600 American and 16,300 British mines were laid, was another step to prevent the egress of the German U-Boats that were playing havoc with the Allied shipping, and stands out without precedent in naval annals. At the beginning of the war, mining operations, which merely consisted in scattering a few mines on the water, developed later on into a vast system of mine fields, the like of which the world had never seen before.

It has been estimated that the Central Powers planted about 50,000 mines and the Allies in the neighborhood of 160,000. The Allies lost, through mining operations, 586 merchant vessels, not including fishing boats, for a total of 1,112,187 tons, besides a large number of war vessels. It may be truthfully stated that the submarine mine was one of the means that most powerfully contributed to bring about the total collapse of Russia. The Germans placed a large number of mine fields in the Baltic Sea, obstructing the passage of ships in such a manner that the Russians had to give up this route; similarly, the Finnish ports of Bjorneborg and Raumo, in the Gulf of Bothnia, through which Sweden supplied Russia, were closed by the mine fields placed by the Germans in the North Sea; the Dardanelles were also closed to her and the only outlet that was left open was the port of Archangel in the White Sea, which was frequently visited by German submarines. Archangel is, moreover, closed during the winter months, so that the Russians were completely isolated and, under these conditions, this once powerful empire whose foundations had been crumbling for many years, became weaker and readily collapsed.

The rôle played by submarine mines in the defense of the Dardanelles is well known. The French Admiral Guépratte, in a telegram to the Paris government after the naval action of March 18, said among other things: "... In short, in the artillery duel, the Allies would have had the advantage if the sly action of the mines had not destroyed the equilibrium." The English Admiral, de Robeck, who was in command of the Naval forces, reported to the Admiralty after that naval action: "Squadron is ready for immediate action, but it is necessary to recon-

sider the plan of attack. A method for dealing with floating mines must be found."

The Germans gave us a big scare when their submarine boats planted 18 mines in 1918, which were scattered all along the Atlantic coast from Cape Lookout to Long Island. The armored cruiser *San Diego* hit a submarine mine on the morning of July 19, 1918, in waters northeast of Fire Island Light Vessel and sank in twenty minutes. A battleship was damaged by a mine and had to return to the Norfolk Navy Yard for repairs. What would have happened if German submarines had visited the United States at the outset of the declaration of war and planted a few mines at random along the coast? It is very likely that the American naval forces would have been retained on this side of the Atlantic, because the moral effect produced by the knowledge of the mere presence of mines is so deterrent and fear-inspiring that the American people would have demanded the clearing of the coast before engaging in any other naval projects. Mine fields are very hard to clear. The German tactics consisted, at first, in blockading the entrance to harbors and rivers using a large number of mines; however, since the submarines could only carry a limited number of these engines, these tactics were modified and the new adopted scheme consisted in planting a small number of mines near important harbors frequently visited by vessels. As a last resort, they adopted a retarding device, by means of which the mines would stay at the bottom of the sea for a certain length of time. With this device mines could become dangerous at any desired time and, even though a channel had been swept, there never was an absolute certainty of safety. In this manner, the Germans succeeded in compelling the Allies to maintain a large fleet of light vessels and mine sweepers, engaged in nothing but mine-sweeping work, which could have otherwise been very profitably used for patrol or other purposes. There is no doubt that a few mines planted along the coast would have considerably upset and retarded the help from America. The German War Lord never considered America as a deciding factor, and for this reason never thought of this scheme until the summer of 1918. It was then too late, for the psychological moment had passed!

Our Problem Today

From this very brief study of the Coast Artillery weapons, we see that the Coast Artillery is provided with very efficient means with which to carry out its mission. The oldest of these three weapons—the gun and the submarine mine—have played such an important task in coast defense in the past that every one feels certain of their value in future conflicts. Military history shows that their efficiency has been conclu-

sively proven, and this probably led to the following statement from the Chief of Coast Artillery: "I wish especially to urge at this time the necessity for increased activity on the development of our antiaircraft service. Other Coast Artillery weapons are either reinforcements or extensions of well tried-out ideas. The antiaircraft service is, however, at a point where original investigations and extended trials or new designs and methods are imperative. Every assistance should, therefore, be given this new service both of supplying the organizations thereto with the latest developed equipment and by affording them the maximum opportunities for perfecting themselves in its use. It is only in this way that a true estimate may be had of the value of a service which bears such an important relation to the national defense."[6] These remarks emphasize the importance of antiaircraft artillery and the necessity for further development that we are facing; in fact, this is one of the greatest problems which the Coast Artillery is facing today. Insufficient personnel and shortage of funds can, in no way, be considered as an excuse for not devoting our best efforts along these lines as enunciated by our Chief. The man that does great things in spite of insurmountable obstacles is the man whom we should imitate, or to express it in the words of the great Napoleon: "Real industry is not the employment of known and given means. Art and Genius consist in achieving in spite of difficulties and in finding little or nothing impossible."[7] Major Rowan's achievement in successfully carrying the message to Garcia will live forever in the minds of the American people. Foch's famous message to Joffre, "My right is in defeat, my left has been driven back, I will strike with my center," will be forever remembered in history; the cry of the French soldier at Verdun, when, fighting with his back to the wall, he exclaimed: "They shall not pass," will never be forgotten; all these deeds have been accomplished in the face of impossible odds. There is more merit in perfecting our antiaircraft defense under the existing conditions than if all the desired means existed; but should we ever get discouraged, let us then remember that truthful old saying: "A mule never makes any headway while he is kicking. Neither can you."

Coast Artillery Plans and Policies

A study of the weapons assigned to the Coast Artillery, a true and thorough knowledge of their powers and limitations, a clear and proper conception of the effect of gun fire upon naval vessels, is absolutely essential, not only for the proper training of the personnel, but also

[6]From Annual Report of the Chief of Coast Artillery to the Secretary of War, June 30, 1925.
[7]Napoleon, *Maxims of War.*

for the preparation of any defense projects. In addition to this, every Coast Artillery officer, especially those in the higher echelons, must have an accurate idea of the coast line and frontiers and a fair knowledge of the country's railway system. These requisites are essential, not only for the preparation of plans, but in order to visualize these plans properly and to be prepared to introduce any variant, should circumstances demand. A subordinate officer should not only possess a thorough knowledge of his guns in so far as they relate to battery work alone, but should also have a thorough understanding of the part that his battery is to play in the general scheme of sector or harbor defense.

Other factors must enter into the proper conception of a plan. Our guide in preparing for a possible emergency should be the enemy's preparedness and his human characteristics, because as Fuller says,[8] training must be based upon:

1. The permanent characteristics of men.
2. The permanent characteristics of war.
3. The probable conditions in which war will be fought.

An American fights differently from a Japanese, an Englishman differently from a Spaniard, and a Frenchman differently for a German. The German Navy is now a matter of history; Bolshevism has sounded the deathknell of Russia as a maritime nation, and France, Italy, and Spain have ceased to be rated as first-class naval powers; therefore, there are only two nations in the world today, namely, England and Japan, that are capable of facing the American Navy. The Washington Treaty of Limitations has recognized that the three great naval powers at present are: Great Britain, United States, and Japan, in a 5 : 5 : 3 ratio. Whether or not the same situation will prevail years hence, is a question that cannot be answered now; nevertheless, our plans must be based upon conditions such as they exist, making these plans flexible enough to take care of unforeseen events, but dealing with facts and not fanciful ideals.

Foreign policies also play a very important part and often are the causes of friction and hard feeling between nations, that ultimately may lead to war. The United States has five well defined national policies, which is bound to defend: the Monroe Doctrine, the Freedom of the Seas, the Open Door in China, the Merchant Marine, and the Panama Canal. Their discussion would be out of the scope of this article; nevertheless, we wish to mention them, because their study should prove of great value and importance to students of military

[8] *Foundations of the Science of War*, Col J. F. C. Fuller.

and political science. The Monroe Doctrine forced France to abandon Mexico in 1867, after she had put Maximilian on the Mexican throne, and brought us close to a war with Great Britain during Cleveland's administration on account of boundary disputes with Venezuela; the Freedom of the Seas was the cause of the War of 1812 against England, and also brought about the declaration of war against Germany. Who can deny that any of these policies may not be the real cause of future trouble in which America may become involved?

Training

There is one point that must be emphasized when it comes to the question of training and that is the necessity of the preparation of men for a higher command in time of war than what their rank demands in time of peace. In the past war, this was made evident, as officers were usually given higher rank without the least time for preparation, and the same situation will probably repeat itself in any future war. The corporal should be prepared to command a section; the sergeant, a platoon; the lieutenant, a battery; the captain, a battalion; the major, a regiment, and the colonel, a brigade or division. Our able Secretary of War, John W. Weeks, said, referring to National Defense, that "*national security depended upon the rapidity and thoroughness with which* those already familiar with military matters will be able, not only to train and instruct those not normally concerned with such matters, but also to perform duties far more difficult than any duties of their pre-war rank." Since the World War, and as a result of the lessons derived therefrom, the United States Army has developed a school system second to none. Foreign officers were amazed at the wonderful showing of the American Expeditionary Forces; in fact, this has been considered the greatest military exploit of modern times. Veterans like Joffre and Haig were astounded at the magnitude of the American effort, and so was the Kaiser, much to his sorrow. In the Army War College, the student, benefited by his experience at Leavenworth, is trained to handle corps and armies by the applicatory method; he receives special training as general staff officer, responsible for organizing the effort of this great country of one hundred and ten million people. Such a man must necessarily be broad-minded enough to understand these problems and must, of necessity, possess a thorough knowledge of the powers and limitations of all arms. Our Regular Army today is a corps of instructors, and the character of instruction received at the Service Schools will greatly influence the army at large, because graduates are, as a rule, the ones called upon to disseminate this knowledge among the civilian components of the army.

We have stated that the relations between the Coast Artillery and the Air Corps and the Navy must be intimate and cordial, because coast defense is, in fact, a combined effort of the Army and the Navy. They constitute the two war-making agencies of the Government, are co-equal but interdependent, and the highest combat efficiency can only be arrived at through the development of the maximum degree of cooperation and teamwork between them; therefore, it would be advantageous to have among the members of the Faculty of the Coast Artillery School, both an Air Corps officer and a Navy officer.

The present policies of the Coast Artillery are sound, and if our Training Regulations and programs are followed, we believe the results will be gratifying. Even this policy of the most strict economy is proving to be, in some cases, a blessing in disguise, and the army is already doing things that were thought to be extremely difficult, if not utterly impossible. War time conditions are in many ways similar to this, and if we learn to work with a shortage of men and officers, among other handicaps, there is no doubt that the hardships, which are bound to come in cause of an emergency, will not be so keenly felt.

Conclusion

We shall summarize this article by briefly stating, in a general way, what we believe should be the governing policies of our Corps:

1. A proper conception of the weapons assigned to the Coast Artillery for the proper accomplishment of its mission and, especially, a thorough knowledge of their powers and limitations.

2. A general knowledge of the powers and limitations of *all* arms, which should be made the subject of special study in our garrison schools, eliminating, if necessary, the study of other subjects that may not be so important.

3. To include at least one competent officer of the Air Corps and one Navy officer as members of the faculty of the Coast Artillery School.

4. To have graduates of Leavenworth, and of the Army War College as soon as circumstances permit, as members of the faculty of the Coast Artillery School.

If we follow these policies and, in addition thereto, have a system of training that is flexible and so designed that it will instill both "pep" and pride, a system that will bring every officer and soldier to the realization that he *belongs* and *is* a part of the *Big Gun Corps*, one of the best and most efficient components of the United States Army and one *that has never failed* in the successful accomplishment of its important mission, we may consider our indoctrination complete.

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APHORISME XXVII

These which by our means, and for our cause are brought in case not to help themselves, by us ought carefully to bee tendered. It is therefore a shamefull thing in a Generall to give Hostages for keeping of Articles capitulated, and after by wilfull breaking of them, to leave the lives of those pledges at the enemies mercy.—Ward's Animadversions of War *(London, 1639).*

Colors, Standards, and Guidons

By Colonel Robert E. Wyllie, C. A. C.

FLAGS carried by troops are called colors, standards, or guidons, depending upon how they are used. Colors are carried by foot troops, including railroad artillery; standards are used by mounted and motorized units. The difference between a color and a standard is principally in the size, the standard being the smaller, as it is more difficult to handle a flag when mounted on a horse than when marching on foot. In addition, in our army a color has a cord with tassels hanging from the staff, while the standard has not. The staff for a standard is called a lance and is slightly smaller than that for a color, which is called a pike; the spear-heads of the two are also different. This is sufficient to show the differences between a color and a standard; and hereafter, in order to avoid unnecessary expressions, I will simply use the word color to include both the color and standard.

Colors are carried only by regiments or separate battalions or corresponding units known under different names; for example, a harbor defense has colors. The expression "separate battalion" means one which is not a part of a regiment. A battalion which is a part of a regiment, but is stationed away from it is not entitled to colors—it is the regiment that has the colors, not the battalions belonging to it.

A guidon is a small, swallow-tailed flag carried by companies, troops, or batteries. Formerly a guidon was confined to mounted units—cavalry and field artillery; now, however, all our organizations are entitled to them. The word guidon was originally *guide homme,* or "guide man," meaning the man who is the guide of the unit, and this explains what the flag is for; it gives the company something quickly discernable on which to dress in ranks. In the field the guidon, placed at the head of the company street, guides a man to his own organization, and in battle it serves as a rallying point. The staff of a guidon is called a lance, the same as the staff of a standard.

This use of flags by troops dates from the middle ages, when each noble and knight had a banner, usually carrying his coat-of-arms or badge as a design, and under that banner fought those who owed him allegiance. These banners were of different shapes, depending somewhat on the rank of the noble. A knight, corresponding roughly with a company officer of our time, had a pointed banner called a pennant

*Lecture delivered before Noncommissioned Officers' School, Hawaiian Coast Artillery District.

Fig. 1. Mediæval Banner of Lord Hungerford

—sometimes with one point, sometimes with two. By cutting off the pointed end he had the rectangular flag of the grade above, called a knight banneret, and this was frequently done on the field of battle as a reward for services in the engagement. A high noble always had a number of knights flying their own pennants under him, hence the distinction that we have today between the double-pointed guidon of a company and the rectangular colors of the regiment. The nobles in their turn owed allegiance to the king, who flew his royal banner, decorated with the arms of the country, and that was the predecessor of the flag of a modern nation, carried by a regiment as the national color.

Those mediæval banners constituted a modification of a custom many centuries older. In ancient times troops carried standards, but they must not be confused with the standard that we now know. The standard of the ancients was not a flag; it was an emblem of wood or metal on the top of a staff. The famous Roman standard was an eagle, but it was always accompanied by some other devices pertaining to the particular legion which carried it and sometimes to the commander thereof—all being placed on the same staff. This, therefore, took the place of both the regimental colors and the national colors, the eagle being the emblem of the Roman Empire.

The Greeks, Egyptians, and Britons likewise used similar devices in battle; and readers of the Bible may remember that in their wanderings in the wilderness the Israelites pitched their camp by tribes, each man under the standard of his tribe and the ensign of his family. The standard for the tribe of Judah, for example, was a lion. The expression "ensign of the family" would indicate that each family had its own emblem, corresponding to our company guidon, the standard of each tribe being the same as our regimental colors.

Only troops of the United States and Great Britain carry both national and regimental colors. In other countries only the national flag is used, but always with some addition, such as the name or badge of the regiment, the battles in which it has taken part, etc. In this country we were accustomed to the British army; in fact, we fought shoulder to shoulder with the British during the wars against the French in the early part of the eighteenth century. It was therefore only natural that we should retain many British army customs after we had become an independent nation. The British adopted the two-color system during Marlborough's wars on the continent, about the year 1710, although some trace the origin of the custom to a much earlier time, when, at the king's station in battle, was displayed, not only his banner, but also frequently a specially consecrated flag. Of this char-

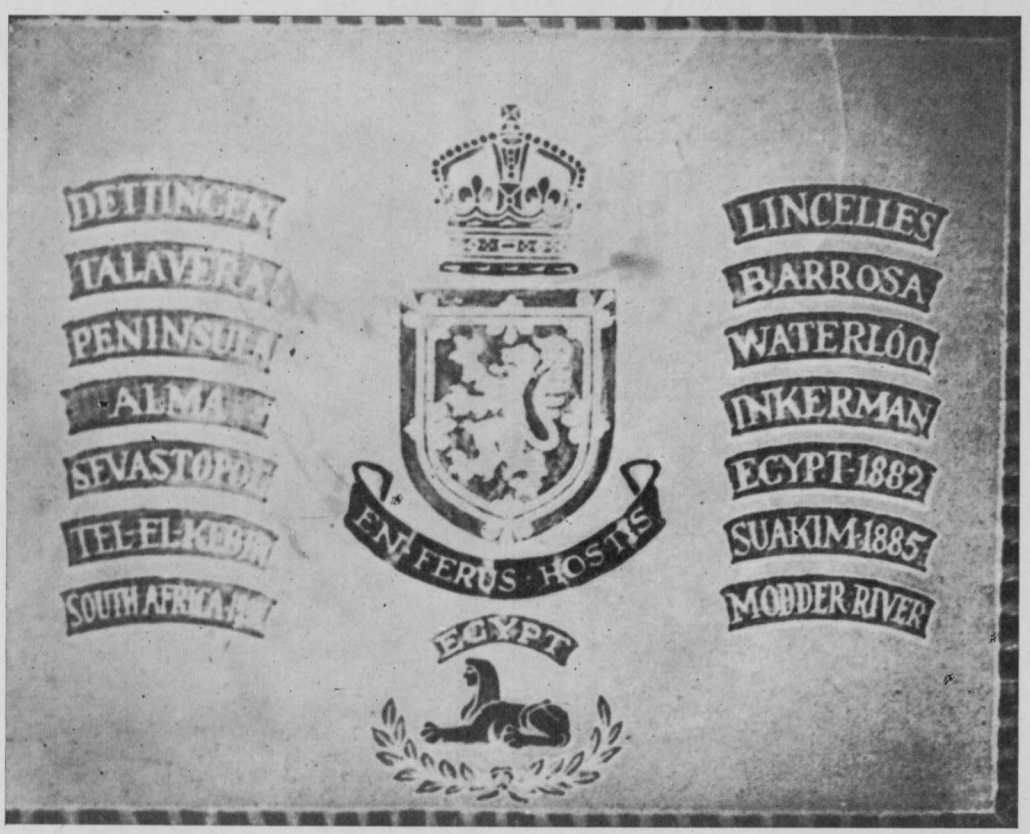


Fig. 2. Regimental Color of the Scots' Guards

acter was the famous Oriflamme of France, the Dragon flag used by some of the English kings, and the cross carried by the Crusaders.

Notwithstanding our heritage from the British we have not always had two flags for a regiment. Surprising as it may seem, the Stars and Stripes were not carried officially by American troops until 1834, and even then only the artillery had the right to them. The infantry was not permitted to carry the national flag until 1841, while the cavalry did not get it until 1887. At the battle of the Cowpens, in January, 1781, the 3rd Maryland Regiment carried the Stars and Stripes, but it was without official sanction, and it is the only* case where our national colors were carried in a land battle until the Mexican War, seventy years later.

During the Revolution troops carried the flags of their States or flags specially designed for that particular organization. As an example of this latter, it is related that as a cavalry command under Colonel William Washington, cousin of the famous general and president, was on its way to the front, Colonel Washington's fiancée noticed that the regiment had no flag. She accordingly cut a square piece out of the red plush back of a chair in her home and gave it to the Colonel as his standard. The regiment carried it for three years and it is still kept as a trophy.

After the Revolution, when the Army of the United States really came into being, each regiment carried a flag something like our present regimental colors. It had the United States shield on the breast of an eagle. Above it were thirteen stars; below it, on a scroll, the name of the regiment. This design was of course taken from the national coat-of-arms, but it was not a correct copy thereof, whether intentionally or not there is no way now of telling.

When the artillery was authorized to carry the national flag, a regimental color was adopted for it, consisting of red crossed cannon on a yellow flag, and this was the first appearance of crossed cannon as the insignia of the artillery. This, the first strictly regimental flag in our history, is commemorated today by placing crossed cannon in the center of the scroll in the new design of harbor defense colors, not on the colors of any other organization.

At the time of the World War, regimental colors were all made on the same design. The flag itself was made in the color of the arm of service, for example, red for an artillery color. All had the coat-of-arms

*Editor's Note.—An improvised earliest flag was hoisted over Fort Stanwix (Schuyler) on August 2, 1777, and it is said that the Stars and Stripes were carried in the battle of Brandywine, September 11, 1777. The flag of the Third Maryland (the only one known to be in existence that was carried as a regimental colors in the Revolutionary War) is deposited at the State House at Annapolis. This regiment was with Washington at the siege of Yorktown as a part of Gist's brigade of Von Steuben's division.

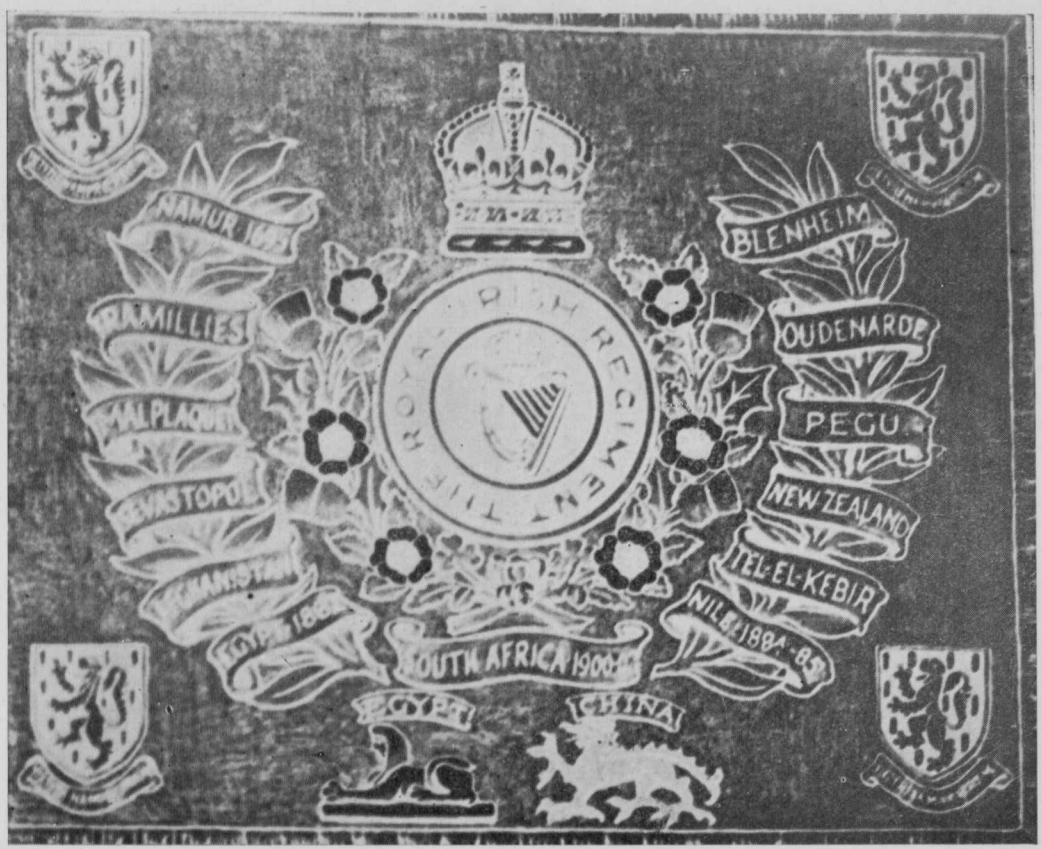


Fig. 3. Regimential Color of the Royal Irish Regiment

of the country, and the name or the regiment on a scroll below. It will be observed that that gave nothing really distinctive, the only difference between one artillery color and another was the "First," "Fifty-fifth," etc., as the case may be, on the scroll; and that was not easy to see. As a matter of fact it was really just as much a national flag as was the Stars and Stripes, because it had nothing on it but the national coat-of-arms, so the regiment really carried two national flags and nothing purely for the regiment itself.

An entirely different system has always prevailed in the British service. Their regimental colors are totally unlike each other. True, they are all designed according to settled principles, but those principles allow such great freedom of action that a person ignorant of them can be excused for thinking that each color is a law unto itself.

This difference will be illustrated. Fig. 2 is the color of the Scots Guards, an infantry regiment. The flag itself is red, the color of the regimental facings. This is one of the oldest regiments in the British army, having been organized nearly three hundred years ago as a Scotch bodyguard for the King. In the center is the old coat-of-arms of the King of Scotland, surmounted by the royal crown. On each side is a column of names of battles, the most famous in which the regiment has taken part. Below the arms is the regimental motto, and below that the Sphinx and laurel wreath, showing that it was at the battle of Alexandria, Egypt, in 1801, when Napoleon's dream of an Oriental Empire was overthrown.

Fig. 3 is the color of the Royal Irish Regiment, another infantry unit. This flag is blue, the color of the facings. In the center is the regimental badge, the Irish harp, encircled with the name of the regiment. Above it is the royal crown. Around the badge is a wreath composed of English roses, Scotch thistles, and Irish shamrocks, to show the Union of the three countries. The battles are placed on a ribbon twined around a laurel wreath. At the bottom is the Sphnix, for wars in Egypt, and the dragon to show participation in Chinese campaigns. In each corner of the flag is the shield of Nassau, the personal coat-of-arms of King William III, who gave it to the regiment for its valor at the battle of Namur in 1695.

One can see from these how different they are, although both are infantry colors. Each is distinctive of its own regiment, not in any sense national, but purely regimental in character. After the World War it was felt in the War Department that this British plan had its advantages, that a greater appeal is made by a flag, unique and distinctive; consequently a new design for regimental colors was adopted about a year after the armistice. This design while not going to the

Fig. 4. Artillery Color, War of 1812

extreme divergence of the British, nevertheless gives each regiment something not possessed by any other.

The American eagle is the central design, and this shows that the regiment is an American organization. In place of the shield, crest and motto of the United States however appear the shield, crest and motto of the regiment, and these, being different of course for each regiment, make a design which is really distinctive. A few regiments have adopted a badge instead of a shield and crest, in which case the breast of the eagle is filled in with feathers and the badge is placed above the eagle's head.

We have already seen that the British place the name of battles on the colors. So do most other countries, and during the Civil War we did the same, putting them at that time on the white stripes of the national color. After that war we removed them from the flag and placed the names on silver rings on the pike. The rings themselves were visible, but the names on them were not; it was impossible to read what engagements the regiment had been in, when the colors were passing by. They are very plainly to be seen on a British color under those circumstances, and a change was considered desirable in our service. Fortunately we had an American precedent well worthy of being followed. After the armistice General Pershing had red streamers issued to the regiments before they left France for return to the United States, the names of the battles being inscribed on the streamers. This was done because the silver rings could not be manufactured and issued in the short time before most of the regiments were demobilized, and they wanted something to show the battles they were in. The streamers were therefore attached to the pike above the color, and the names of the battles were plainly to be seen.

This principle was adopted by the War Department to take the place of the silver rings; the streamers however are now made in the same color as the ribbon for the war. For example, streamers for the World War are made just like the rainbow ribbon of the Victory Medal, larger but in the same colors, which enables an observer to tell what wars the regiment was in from the colors of the streamers, and the names of the battles on the streamers can be read without difficulty.

Some companies do not belong to regiments or other units which show battles on these streamers. In that case the company is entitled to silver rings with the names of the battles on them, placed on the lance of the guidon of the company.

Tabards attached to bugles are also a survival of a custom of the middle ages. They are really flags bearing the arms of the regiment,

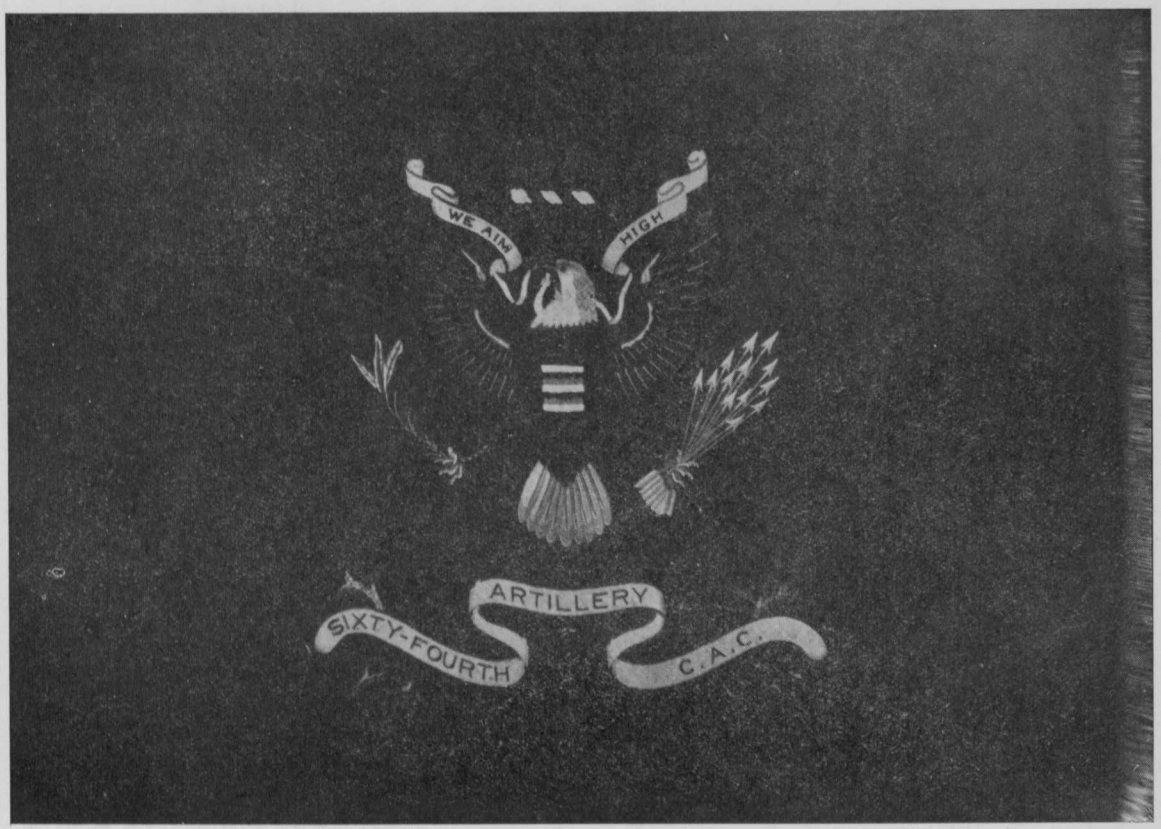


Fig. 5. Regimental Standard, 64th Coast Artillery

in precisely the same manner as has been done for many centuries. Those who saw Douglas Fairbanks in "Robin Hood" may remember the trumpeters who announced the jousting in the tournament. They were trumpeters of the king, and the tabards ornamenting their trumpets bore the arms of the king. In like manner each noble had his own trumpeters, and their tabards had the arms of that noble. That custom has been continued ever since in the armies of England and Europe, and we have just adopted it for the same reason that prompted the new design for the regimental colors, viz., something distinctive for each organization.

What was the origin of our familiar national flag, the Stars and Stripes? It was adopted by a resolution in the Continental Congress on June 14, 1777, a little over a year after actual hostilities commenced against Great Britain. It may surprise many to know that, young country as ours is compared with the nations of Europe, our flag is one of the oldest now in use. The present British flag dates from 1801; the French tri-color was first adopted during the great revolution in 1789. Germany has changed its flag since the fall of the Empire in 1918, but even the flag used during the World War was less than fifty years old.

Before the American War of Independence the colonists were of course familiar with the British flag. It was their flag; they had fought under it; it was a familiar sight everywhere; and the most familiar form of it was a red flag with the Union Jack in the upper corner. The Jack, as it then existed, was blue, and on it were a red cross for England and a white cross for Scotland. During the first year of the war there was no standard design for an American flag, neither should it be noted was there any widespread idea of obtaining independence from the Mother Country. We were fighting more for our rights under the British Constitution than for separation, and it was the attitude of England toward us that forced us to adopt independence as our aim. It was therefore natural that we should continue to use the British flag, with such modification as would enable it to be distinguished. This was effected by simply placing six white stripes, horizontally, on the red field of the British flag, making thirteen red and white stripes, one for each of the revolting colonies. The crosses of England and Scotland in the corner were retained.

This flag was never adopted by Congress, but it was hoisted by John Paul Jones in December, 1775, over the Continental Navy, and it was the only flag used by our Navy until the Stars and Stripes came into

being. The next month Washington hoisted it at his headquarters and he likewise used no other until June, 1777.

The transition from that flag to the present one is very apparent. The crosses of England and Scotland manifestly became inappropriate as soon as we declared our independence, so we removed them, substituting thirteen stars, one for each of the colonies, "representing a new constellation," as expressed in the Congressional resolution. The blue field of the British Jack was retained.

The Stars and Stripes therefore is merely a modification, in two stages, of the British flag used by the colonists before the Revolution. The original plan was to add a stripe as well as a star for each new state admitted to the Union; and there were fifteen stripes and fifteen stars on the flag used during the war of 1812. It was seen, however, that this could not continue indefinitely, so in 1818 it was directed by Congress that the stripes would remain at thirteen, while one star is added for each new state, to take effect on the Fourth of July next after admission. So we now have forty-eight stars in the union of the flag.

This country has adopted the policy of not attempting to ornament or decorate our national flag. We consider that it needs no ornament, that it is perfection in its simplicity, and that an addition is a detraction rather than an improvement, but we have not always had that idea. As already stated, during the Civil War we placed the names of battles on the national color, and practically all foreign nations have no hesitation in putting inscriptions on the flag of their country when borne by troops. The national color when borne by an American regiment has the name of the regiment, not on the flag itself, as European nations do, but on a silver ring on the pike, just below the spear-head. It may be thought that we violate that policy by the yellow fringes around the colors and perhaps by attaching a cord and tassels to the pike. Both of these are very old customs, dating from the days of chivalry. The banners of the kings and nobles, already referred to, were always fringed, and it seems natural to fringe a color carried by troops due to this tradition. The old banners likewise were usually fastened to the staff by a cord, the ends of which hung down. The cord on our colors serves no such useful purpose, but we have retained it as a matter of ancient custom. It should be observed, too, that both the fringe and the cord are exterior to the flag itself; they do not form parts of the design any more than does the pike on which it is carried, or the border around a picture of the flag. When a regimental color is decorated with war streamers, the cord and tassels are omitted.

For all our colors carried by troops we use a spear-head at the top of the staff. France has the same custom now, although Napoleon's troops all had an eagle on the top of the staff, much resembling the old Roman standard. Great Britian uses a crowned lion, the crest of the king. In our country there is a special rule for the President; the staff on the White House, from which flies the Stars and Stripes when the President is in, is surmounted by the American eagle, and the same emblem is used on the staff for the President's flag.

The origin of the coat-of-arms of the United States, which formerly appeared on our regimental colors, is a long story, much longer than the origin of the flag, and entirely too long to be given here. It is sufficient to say that, notwithstanding some resemblance to the Stars and Stripes, it has really nothing in common with it, but was designed entirely independently. This superficial likeness has caused many mistakes to be made in drawing the national coat-of-arms. The flag has seven red and six white stripes, and the same arrangement is often made drawing the United States shield. But that is wrong. The shield has seven white and six red stripes. Then the upper part of the shield is often confused with the union of the flag, and stars are placed on it. This again is wrong. It should simply be blue, without any stars at all. The stars, thirteen in number, are in the crest, above the eagle's head, surrounded by a glory of rays and clouds.

The eagle, which carries the shield on its breast, is the symbol of power and dominion, and represents the Federal Government, which is supreme over the different states. The use of the eagle on the regimental colors therefore shows that the organization bearing it is a part of the Federal Government, and it is used for all units of the army, regulars, national guard and organized reserves, but not on the flag of a purely state force. The eagle always looks toward the pike, no matter from which side of the flag it is observed. In the talon next the pike is an olive branch; in the other thirteen arrows. The olive branch symbolizes peace, the arrows war, the two together indicate that while the country desires peace, it is ready to go to war for the preservation of its rights. The number of arrows is, of course, for the original thirteen states, and when correctly drawn there are thirteen leaves and thirteen ripe olives on the olive branch.

It was previously stated that battalions belonging to a regiment are not entitled to colors. That applies to the regular silk color. Each battalion, however, can carry a national color of bunting, called a service color, when acting independently of the regiment.

In conclusion it is well to bear in mind the great distinction that exists between the national color, the regimental color, and the guidon in the matter of salutes. The national color represents the entire country, it is greater than all and therefore bows to none. Never under any circumstances should the national color be dipped in salute; it must always remain vertical, as befits the emblem which symbolizes the nation. And not only that but everyone else salutes when it passes. On the other hand both the regimental color and the guidons are dipped as a compliment whenever the troops salute.

Flags and banners are symbols. They have no intrinsic value, their value being wholly dependent on what they represent. Consequently, to understand properly the etiquette of their use and ceremony, we must be able to appreciate their meaning.

APHORISME XXXIV

Two things are most requisite for a Generall to possesse, and that is a sufficient treasure to discharge his Troops, and an high reputation, which begets a majestie in him, and an awfull obedience in his Souldiers towards him: by these hee shall preserve in health and safety the body of his Army. If reputation bee lost, neither his maturity of judgement to undertake, nor his alacritie of spirit to execute, will availe in the perfecting of his intended enterprize: for where there is no powerfull majestie to command, there is no awfull readinesse in Officers nor Souldiers to act what is commanded.—Ward's Animadversions of War *(London, 1639).*

The Grand Old Army of the Future

By CAPTAIN W. J. GILBERT, C. A. C.

IN the days when the present manhood was young, and women wore long hair and left a little to the imagination, there was a Grand Old Army.

Just as in days of yore all roads led to Rome, so today in all gatherings around the camp fire, whether it be in the officers' club or the stove in the battery kitchen, all situations led to a reference to this Grand Old Army.

It was a Grand Old Army. With enlisted men being called recruits in their second and third enlistments, and officers not being eligible for promotion to a majority until their hair was thin and gray, it was an army dedicated to service. It was not perfect. It lacked its personnel system, the Plans and Training section both with their accompanying armament of typewriters, mimeographs, and other labor saving devices. The regulations did not occupy the same shelf space as Doctor Elliot's famous collection. Time has mellowed some of the disagreeable features which were bound to occur even in those days. If, in the years to come, a review of the present new army reveals as pleasing a remembrance, then the struggles of the present day to maintain a high standard will not have been in vain.

No issue of the *Recruiting News* is complete without the statement, "The day to start reenlisting a man is the day he takes the oath of enlistment." This is an accepted axiom, but, as some say, why bother with it as long as there is a Recruiting Service whose duty it is to comb the pool rooms and bowling alleys for more material. In the old army men reenlisted for the same organization. They will today if the axiom mentioned above is carried out.

The recruiting problem of today has certain features which a number of officers overlook before "sounding off." These words are corona'd in the First Corps Area—New England's Own. The same factors are present in some form or other in the problems of the other Corps Areas.

Each Corps Area is charged primarily with the task of maintaining the organizations stationed in it at full strength. In addition to this the War Department assigns quotas for the Eighth Corps Area and Foreign service. A quota for the Eighth Corps Area is necessary as

its authorized strength is out of proportion to its civilian population. The Foreign quotas are to supply the necessary replacements.

New England is an industrial center. In the slogan, Earn, Learn and Travel, the Earn means nothing to the average young men whose weekly wages average $20.00 and up. The Learn attracts a certain element. Some of these are dissatisfied when they discover that it is necessary to perform the routine duties of a soldier while aquiring the knowledge. To the vast majority the Travel is the allurement which leads them on. For a native of this locality an assignment to some post in New England has no attractions from the viewpoint of travel. The distances are too short. Every post at sometime or other has had its C. M. T. C. or National Guard camp, so that its good as well as its objectionable features are advertised.

Carrying out the traditions of a section who from time immemorial have gone down to the sea in ships, the adventurers chose the Foreign service in the majority of its issues. The opportunities for those who wish to travel are seldom lacking.

The Recruiting Service strives for quality recruits. In spite of the four or five hundred vacancies in the Corps Area which seem to exist no matter how many men are poured into the gap, the question of quantity is of secondary consideration. This statement no doubt will be questioned by some line officers.

The average Recruiting Officer has an inkling of the good and bad features of service with the line. He has just come from it, and expects to go back to it at the end of four years, or sooner if he don't produce. On the other hand, how many line officers know what is going on within the bounds of a Recruiting District. The older officers remember it as it used to be in the days of that Grand Old Army. In those days if an applicant managed to slide by the doorman standing rigidly at attention, and the man at the desk was in good humor, an interview was arranged so that the Recruiting Officer could see him—stripped—looking for physical defects. Was any effort made to sell the Army? Why should there be? Wasn't the man fortunate to get in? Then on to Fort Slocum to be made a soldier and sent wherever they chose to send him. If the quota for the week was completed by Wednesday noon, there was so much more time for professional study. Others have recollections of the stirring recruiting campaigns of 1919-1921. Then a Recruiting Service supplied with all the working tools to accomplish the task filled the army to its strength of 285,000. In the closing days of the campaign the daily production ran over the thousand mark. It accomplished the impos-

sible. In doing so it made mistakes. Through force of necessity quantity was the slogan instead of quality. Without considering the one-year enlistments which expired by the thousands during the time, in the period of 27 months the Recruiting Service had procured sufficient men to net 285,000. Although this signal achievement marks the greatest sales campaign the world has ever known, there were those in the service who, looking through their field glasses the wrong way, could see only the mistakes. Reporting for duty in Hawaii in 1921 the opportunity was given me to observe at first hand some of the "riff raff" the Recruiting Service had sent over. If the battery I commanded for three years was a fair sample of the efforts of the Recruiting Service of those hectic times, it deserved commendation in lieu of censure. To one familiar with the Recruiting Service of those days, let us recall to your mind every district had five officers, all the men it could use, sometimes a band; and as for money, if your district did not have it, it was because you were to bashful to ask for it.

It is now the end of the 7th inning. Everybody stand up and stretch before settling down once more to witness the outcome of the game. The way in which the Recruiting Service performs its mission of procurement of desirable material, and the methods of the line in carrying out their mission of training will determine the score at the end. Good teamwork is the result of knowing what the other man does under all conditions. Therefore some of the plays of the present Recruiting Service are hereby revealed. The Commanding General of each Corps Area is responsible for the recruiting in his area. A Staff Officer known as the Corps Area Recruiting Officer is in direct charge. The Corps Area is divided into districts, to which are alloted material and funds. Each district has one officer and approximately twenty enlisted men. The main station is generally in the largest city, with sub-stations located in the other cities. In New England each district averages about five sub-stations. The sub-station is commanded by a reliable noncommissioned officer, one who will reflect credit upon the Army by his presence if nothing else. In addition to his duty as canvasser he must maintain contact with the press, City Government, and other activities. Additional men are assigned to the sub-stations, depending upon the size of the party and the territory allotted.

In the office of the main station is the force necessary to carry on the routine work. Unless the monthly enlistments run over a hundred a month, a 1st Sergeant and an enlistment clerk can handle the routine pertaining to administration, examinations, enlistments, feeding, lodging, shipment of recruits, finance, cost records, statistical and routine

reports. An additional man can handle the details of supply and publicity. In a district where five or six G. M. C. ambulances are in daily use, a motor mechanic is necessary. He is also available for the painting of display signs. Local conditions govern the assignment of the various duties. All other men are on a canvassing status where they have to produce or step aside for another man.

The problem of attaining the right man for this replacement is harder than the making of a plotter or gun commander in the battery. There you have men who, in passing the required gunners' examination and in the daily drill, have been partially trained to step into the gap. There is no training school for recruiters. According to the assertions of many in the service, none is necessary. Anybody can obtain recruits, some assert. Carrying out this thought, when called upon to detail allocated recruiters, the selection falls upon the man who can best be spared, instead of the one best fitted. The possibility of the man's transfer to the Recruiting Service in the event he makes good is weighed. The proper type of allocated representative is an asset to his organization. His appearance and ability impress the members of the party, and unconsciously they are selling his organization to all applicants. A man sent on special duty to the Quartermaster or Ordnance may seem a loss, but a good man sent on Recruiting Service will pay dividends. It pays to send the right type. He will fill his vacancy many times over. The sending of a dud as an allocated recruiter can act as a boomerang. The detail calls for a qualified man, one who is at least a soldier. Your response establishes your standard of qualification.

Some officers look at recruiting from the viewpoint of a map problem where the results obtained are by virtue of command or preponderance of the forces used. The Recruiting problem does not resemble a map problem as much as it does the one confronting a civilian sales organization. The items in a sales campaign which do not have to be considered in a map problem are: the establishment of good will in the community operating, the desire to buy, and above all the development of the satisfied customer who returns for more. The extent to which the Recruiting Service can fulfill these conditions depends upon the line. Once again the organization commander has his importance thrust upon him. The line is the factory which produces the goods the sales force has advertised and sold to the people. Unless the slogan, "The Army Builds Men," means exactly as the words indicate, it should be thrown into the discard. It is not out of place at this

time to make the assertion it is an easier task to sell the Army to the people, than it is to sell the Army to the Army.

Concerns in civil life exert great effort toward decreasing the labor turnover. It is recognized as a costly proceedure. And yet they find it necessary to discharge men before they have been in the employ for three years. To a certain extent the army must expect to follow the general trend of labor turnover.

Vacancies are caused by desertions and discharge by purchase, on which it is hard to determine the motive; others are discharged as the result of Section VIII, AR 615-360 (or paragraph 148½ as it is more commonly known), physical disability, and misrepresentation of age. The Recruiting Service is vitally interested in all these discharges. It is part of the education of the canvasser to analyze his flarebacks.

The method of executing this discharge is the vital point. Does the organization charge the man with all the broken dishes and other odds and ends and then send him away with bitter memories, so he can be a stumbling block in the way of some good man who might enlist. Or he is sent away with a realization he is missing something. In spite of belief to the contrary the Recruiting Service occasionally rejects a man. In such cases an effort is made to impress upon the man the fact he is losing one of the good things of life. Instead of developing a knocker by rough tactics, he is sent to his home community as a booster for the army, although its opportunities were not for him. Sometimes bread cast upon the waters returns in the form of sandwiches. Encourage your men on pass to drop in the local recruiting office. Sometimes there is an applicant who hasn't decided where to go. Or maybe the man has met some buddy a live recruiter could enlist and send to your organization, if he only knew about him. The best men are obtained by someone handing their name and address. Civilians are doing this, why not you?

If your men do not reenlist in the expected percentage, do you know the answer? Primarily men enlist to be soldiers, A certain amount of fatigue is necessary. Some is unnecessary. If cost records were kept on the various jobs, would all be justified? Do you operate blindly on a hit and miss basis, or are you using the task system? These are questions, not criticisms. The answer can be obtained from any man who fails to reenlist for his outfit. As for your humble servant, he is but one of the many recruiting officers who, hearing these things, first try to persuade the man to go back again to see if things have changed, and failing at this, try to sell the man something else. The motto of the Recruiting Service, "No broken promises," is adhered

to, and the other places are spoken of where the opportunity awaits the right man. The man is in the store ready to buy if convinced. If your samples in the show case look good and the salesmen believe in them, your morning report is increased by one. If not your samples gather another flyspeck.

What does the Recruiting Officer himself do, you say? Not much according to the standards of the line. He commands the detachment, is personnel adjutant, supply officer, transportation officer, summary court, agent finance officer, motor transportation officer, purchasing officer, dashes off a few paragraphs for the newspapers occasionally, all without a stenographer, broadcasts once or twice a week, makes an occasional attempt at a speech, talks to the parents and friends, inspects not only sub-stations but all the assigned territory periodically. And then six days a week he tries to spur the canvassers on to further efforts so there will be enough men to be sworn in to fill the idle moments.

Now just one more timid suggestion before signing off. According to the newspapers the present Chief of Staff is somewhat of a disciplinarian. Yet by serving under him for three years out at the Cross Roads of the Pacific it was observed he is not chary of a good word when it is due. Quoting his words, "The impulse comes from above," let us hope this characteristic may manifest itself during the coming year. Send on the data when the machine slips a cog, but if by accident or otherwise you draw a prize, again send the data so an effort can be made to duplicate it. Let's close with the benediction, "The day to start reenlisting a man is the day he takes the oath of enlistment."

APHORISME XXXI

The greatest glory of a Commander is to drive out the nail of his enemies practice with a stronger of his own, and to blow him up in his own mine. Policie against force deserveth much, and prevaileth often: but by stratagem to prevail against policie is most excellent.—Ward's Animadversions of War *(London, 1639).*

EDITORIAL

Inactive Service by Reserve Officers

THAT Reserve officers can give valuable service to the government without actually being on a duty status, and without requiring a large amount of time, is a fact which has not been generally understood by the Regular Army and which has been only partially appreciated within the Reserve. At the outset, it must be recognized that such service, valuable as it may be, will be of such a character that it cannot logically be advanced as an argument against the present policy of requiring of all Reserve officers a certain minimum amount of work along certain definite lines or else a reversion to an inactive status. On the contrary, the two classes of service work hand in glove for the advancement of the Army as a whole. Performance of the War Department requirements will enhance the value of the individual to the Army and will promote his own interests; the other inactive service will result in benefit to the Reserve itself and to the Army as a whole.

In each community in which a number of Reserve officers reside—particularly in communities containing branches of the Reserve Officers' Association—there are many details pertaining to meetings, publicity, participation in local celebrations, etc., which can best be performed if the responsibility therefor be definitely placed upon specified individuals. This calls for organization and as wide a distribution, but as specific a delimitation, of responsibility as the membership of the organization will permit. The organization suggested below has been very successfully effected and operated in one of the Chapters of the Reserve Officers' Association and is based on military lines.

The President of the chapter or other organization becomes the Commanding officer; the First Vice-President becomes the Chief of Staff; the Second Vice-President becomes Assistant Chief of Staff; and the Secretary-Treasurer becomes the Adjutant. The Commanding Officer appoints a G-1, a G-2, a G-3, and a G-4 from the membership; and each "G" appoints as many assistant staff officers as there are sections in his department. The chiefs of sections are responsible for the functioning of their respective sections. In an organization of limited membership one officer may be made head of two or more sections, but in general it is better to keep assignments distributed as widely as possible.

The following outline of such an organization appears to be complete, and is self-explanatory.

COMMANDING OFFICER

Chief of Staff
Assistant Chief of Staff
Adjutant

G-1: Personnel.

Sec. 1. Recruiting membership.
Sec. 2. Newly-commissioned officers.
Sec. 3. Officers moving to the locality to live.
Sec. 4. R. O. T. C. and C. M. T. C.
Sec. 5. Visitors.

G-2: Intelligence.

Sec. 1. Newspaper reports and announcements of meetings.
Sec. 2. General newspaper publicity—personal items.
Sec. 3. R. O. A. news, local sheet.
Sec. 4. Combating insidious propaganda.
Sec. 5. Stressing need of preparedness and support of National Defense act.

G-3: Operations and Training.

Sec. 1. Program of meetings.
Sec. 2. Speakers for special and regular meetings.
Sec. 3. Stunts, entertainments, songs.
Sec. 4. Cooperation with the National Guard.
Sec. 5. Cooperation with the Regular Army.
Sec. 6. Legislative activities—State and National.
Sec. 7. Cooperation with the American Legion.
Sec. 8. Entertaining visiting officers.
Sec. 9. Cooperation in civic affairs, parades, etc.

G-4: Supply.

Sec. 1. Monthly dinner details.
Sec. 2. Special meetings, arrangements.
Sec. 3. Finances.
Sec. 4. Supply and equipment.
Sec. 5. Budget.
Sec. 6. Transportation.
Sec. 7. Meeting places.

With such an organization, each officer has but a single phase of Reserve activity with which he is directly concerned. In some cases he must act in cooperation with representatives of other sections, but often he acts alone. The whole work does not fall, as is so often the case, upon one or two enthusiasts; all must participate. The organization has been tested and has been found practicable. It can be equally successful elsewhere.

Coast Artillery in Coast Defense

The experiences of this country during the past century and a half show that the lessons of war are slow of digestion and assimilation. Every major war produces some change or some development in the science of war which must be studied and incorporated into the military structure. As an example, following the Revolutionary War, it required thirty-eight years of experiment to demonstrate that the regimental organization adopted by Colonel Gridley for the first artillery troops arrayed before the British forces at Boston in 1775 was, in principle, the most satisfactory organization for artillery units. Again, almost an equal amount of time elapsed after the Civil War before the staff deficiencies exposed by that war approached a solution. It seems that, in addition to study of the matter involved, the perspective of time is necessary to a complete visualization of the problem and its solution.

The World War is no exception. The development of new armament and new equipment, the mechanization of armies, and the introduction of new sciences in warfare has resulted in the evolution of many new ideas which require intensive study before adoption or rejection. Nowhere has the change been greater than in our conception of the theory of coast defense. In particular, railway and heavy tractor artillery, aircraft, gas and smoke, and increased ranges of both land and naval guns have demanded a readjustment in the matter of the defense of our maritime frontiers.

With this in mind it was suggested in these pages last month that the Coast Artillery was not yet prepared to order combined tactical target practices, because it was not yet certain that unsound principles would be excluded. In this connection, a number of illustrative questions were asked. The thought back of these questions was that the new ideas bearing upon the points they touched had not yet had time for assimilation by the coast artillery as a whole. They were not meant to infer that nowhere within the coast artillery had the questions been answered. They have been answered. Any officer who has had the benefit of the course of instruction at the Coast Artillery School in the last few years knows the answers; but the number of recent graduates is still small. For the others, little literature on the subject is yet available, other than Major Smith's excellent article, "The Combined Arms in Coast Defense," which appeared in the March JOURNAL.

Among the comments received during the month on the subject, the following came from one of the ablest of our junior field officers, who, although not connected with the Coast Artillery School, is in close touch with it. It may be that not all officers will agree with him, but there is nothing in his remarks which is not in full accord with the doctrines now being taught the Corps. The entire letter deserves careful study; and, in view of the categorical character of the reply, it is to be regretted that more question were not asked.

From an editorial, "Coast Artillery Training," in the May, 1927, issue of the COAST ARTILLERY JOURNAL, it is believed that certain incorrect inferences may be drawn. The idea expressed in the first paragraph of the article, that "the command cannot function satisfactorily as a whole without practice in team-work—in coordination and cooperation." is undoubtedly correct, as are many of the hinderances to large scale practices mentioned in the second paragraph; but in the third paragraph, *et seq*, appear certain statements and questions which most certainly will cause many manifestations of the "lack of unanimity of thought" of which we stand indicted. It it proposed here to consider in reasonable detail some of these statements and questions.

There can be no question of the statement that in matters of technique the Coast Artillery is in good shape, although it may be, as many believe, that in such matters the Coast Artillery might be better than it is. Specifically, I question that in most cases "we know the limits of accuracy of our guns," except from a proving ground point of view, as the limit of accuracy of an uncalibrated battery (the majority of our batteries are uncalibrated) is an extremely variable quantity, depending on the conditions of the moment, the team-work of its personnel, reasonably accurate spotting, and the god of luck. In most batteries not even the correct velocity of a powder lot is known, as it would be if chronograph firings prior to target practice were the rule instead of the exception. Due to lack of personnel, many 2-gun and 4-gun batteries fire but one gun in service practice, the battery commanders, since they stand or fall on a figure of merit, with much justice denying the practicability of firing more guns with borrowed gun crews, either from a like caliber battery with which they are competing or from a different caliber battery with the additional training involved for an inexperienced crew. How, then, can the limits of accuracy of the guns of such batteries be known? Furthermore, how can we claim that "we can place a battery center of impact reasonably close to the target" with cannon seldom fired as a battery?

Is there not, then, an error in the major premise of the statement, "we are prepared to serve our weapons effectively within the limitations of our materiel, and we are therefore prepared to take up practice under battle conditions"? This not only ignores our present limitations in ammunition and personnel, for which no immediate relief is seen, but assumes a condi-

tion of training which does not exist. An analogy would be to state that an infantry company is prepared to take up company combat training prior to the completed combat training of the squads, sections, and platoons. Successful team-work of a unit must be predicted on the preliminary training of its composite parts. It is axiomatic that the impetus must come from above, but results must be achieved first from below.

However, with the assuming of our readiness for practice under battle conditions certain questions concerning those conditions are propounded. These unanswered questions would appear to leave an air of uncertainty as to the principles involved, from which may be drawn the incorrect inferences mentioned in my first paragraph. I have tabulated these questions and have given what I consider "an approved solution" for each:

Question	Answer
1. When does H. D. pass from ZI to TO?	When the Frontier, Sector, and Sub-Sector commands come into operation.
2. What effect does the change have on the chain of command?	Office of District Commander goes to ZI with office of Corps Area Commander, and District Commander becomes Sub-Sector Commander or Sector Chief of Artillery.
3. Influence of presence or absence of elements of mobile Army?	If present, the combined arms function as a team; if absent the artillery is analogous to Corps Artillery acting alone, an absurdity.
4. What will our tactics be?	Will depend on the situation.
5. Do we concentrate our fire?	As a general principle—Yes.
6. If so, where?	On hostile elements most dangerous to the defense.
7. Who is going to control our fire?	Normally, the group and groupment commanders (See Par. 10, TR 435-290.)
8. What will be our tactical chain of command?	Normally, Battery—Group—Groupment—H. D. Commander—Sector Chief of Artillery—Sector Commander.
9. Any distinction between fixed artillery and heavy mobile artillery in matters of employment?	Only as dictated by the characteristics of the gun and mount.
10. What becomes of battalion and regimental commanders?	Functions are the same as in Field Artillery units; normally they become group and groupment commanders.

11. Of Fort and H. D. Commanders?	Fort Commanders, not needed; H. D. Commanders remain H. D. Commanders.
12. Have we an independent rôle?	No.
13. Relation of Coast Artillery to Coast Defense?	Supporting Artillery in the team of combined arms.

I believe that the above questions are correctly answered according to the doctrine that seacoast defense is a problem in the use of the combined arms. The inference that the Coast Artillery does not know the answers to these questions and hence is not prepared for battle practice is bad on two counts; first, the answers are known; second, the cart is placed before the horse when it is implied that practice under battle conditions depends primarily on certain conditions of organization and tactics. The readiness of any arm for battle practice depends primarily on the prior technical readiness of its lower echelons and secondarily on the organization and tactics of the higher units. Until we have sufficient trained personnel to man our batteries and communication systems and an ammunition allowance sufficient to permit calibration firings, the question of the practicability of battle practice, beyond communication tests, must be answered in the negative.

But beyond the question of technical readiness is one of doctrine and principle—the doctrine of the positive system of coast defense and the principle of cooperation or team-work. In coast defense, as in any military operation, the artillery is but one of the team of all arms. If it is to function as artillery it should not be expected also to act as infantry, fix bayonets, and charge down to the shore line in beach defense against landing parties. The idea that heavy coast artillery can man and fire its batteries and at the same time be responsible for land and beach and air defense is to make it a "jack of all trades and a master of none."

It is granted that branches other than the Navy and the Air Corps will have little to do with the direct defense against enemy naval operations, as, in a land defense operation, the cavalry and infantry have little to do with the long range artillery fights. It is when the hostile infantry or cavalry elements begin an advance that the defensive infantry and cavalry come into action. Likewise, in Coast Defense, the heavy artillery may be expected to hold the hostile fleet at a distance, but if in spite of its fire power the enemy is able to initiate land raids or landing operations, infantry, in the rôle of beach-defense troops, must be available to operate against the hostile forces at the shore line or on land.

It may be said, then, that heavy Coast Artillery should function as heavy artillery, with a normal tactical chain of command and with a normal position to play in the team of combined arms. Its part in the plan of coast defense must be based on the plans of the sub-sector and sector commanders. This is where the real "lack of unanimity of thought" lies.

Forget the concrete, to which so many Coast Artillery officers are still bolted, and the shore line, which does not differ far from the M. L. R. of a battle position in land warfare. Ours is an artillery arm; why not plan its use and fight it as artillery?

PROFESSIONAL NOTES

The Fifteenth Coast Artillery (H. D.)

The Coat of Arms of 15th Coast Artillery was approved by the War Department on April 16, 1925, and its blazonry is—

Shield: Gules (red) a chevron paly of eight *argent* (silver) of the field (red), *azure* (blue) and repeated, the ordinary fimbriated *or* (gold).

Crest: On a wreath of the colors (gold and red) a cannon palewise *gules* (red), between two dolphins haurient, dexter and sinister, *or* (gold), langued of the first (red).

Motto: Littore Sistimus (We take our stand on the shore).

The shield is red for artillery, and the chervon is in the colors of the old royal Hawaiian flag, which flag was adopted by King Kamehameha early in the nineteenth century and remained the flag of the Sandwich Islands up to 1898. The colors also appeared in the coat of arms of the Harbor Defenses of Pearl Harbor, where the regiment was organized in 1924. The crest shows the big gun supported by the dolphins, the king of fishes, indicating the command of the coast.

The shield and motto of the coat of arms in metal and enamel is worn by the personnel of the regiment as the distinctive regimental badge.

The 15th Coast Artillery was organized in 1924 and the history of its units are as follows:

Headquarters Battery: organized in 1917 as the Headquarters Company, Fort Kamehameha, H. I., designated 7th Company, Coast Defenses of Oahu, in 1917, and 7th Company, Coast Defenses of Pearl Harbor, in 1921; changed to 185th Company, C. A. C., in 1922; and became Headquarters Battery, 15th Coast Artillery, in 1924.

Battery A, 15th Coast Artillery, was organized in 1901 at Fort Clark, Texas, as the 125th Company, Coast Artillery; designated 4th Company, Fort Kamehameha, H. I., in 1916, and 4th Company, Coast Defenses of Oahu, in 1917; changed to 4th Company, Coast defenses of Pearl Harbor, in 1921; 125th Company, Coast Artillery Corps, in 1922; and became Battery A, 15th Coast Artillery, in 1924.

Battery B, 15th Coast Artillery, was organized in 1901 at Jackson Barracks, Louisiana, as the 91st Company, Coast Artillery; designated 3rd Company, Fort Kamehameha, in 1916, and 3rd Company, Coast Defenses of Oahu, in 1917; became 3rd Company, Coast Defenses of Pearl Harbor, in 1921; 91st Company, Coast Artillery Corps, in 1922; and Battery B, 15th Coast Artillery, in 1924.

Battery C, 15th Coast Artillery, was organized in 1907 at Fort Washington, Maryland, as the 143rd Company, Coast Artillery Corps; designated 5th Company, Fort Kamehameha, in 1916, and 5th Company, Coast Defenses of Oahu, in 1917; changed to 5th Company, Coast Defenses of Pearl Harbor, in 1921; 143rd Company, Coast Artillery Corps, in 1922; and became Battery C, 15th Coast Artillery, in 1924.

Battery D, 15th Coast Artillery, was organized in 1917 as the 6th Company, Fort Kamehameha, H. I.; designated 6th Company, Coast Defenses of Oahu, in 1917, and 6th Company, Coast Defenses of Pearl Harbor, in 1921; changed to 184th Company, Coast Artillery Corps, in 1922; and became Battery D, 15th Coast Artillery, in 1924.

Battery E, 15th Coast Artillery, was organized in 1901 at Fort Wadsworth, New York, as the 86th Company, Coast Artillery; designated 6th Company, Fort Mills, P. I., in 1916, and 6th Company, Coast Defenses of Manila and Subic Bays, in 1917; 86th Company, Coast Artillery Corps, in 1922; and became Battery E, 15th Coast Artillery, in 1924.

Battery F, 15th Coast Artillery, was organized in 1901 at Fort Hancock, New Jersey, as the 95th Company, Coast Artillery; designated 2nd Company, Fort Mills, P. I., in 1916, and 2nd Company, Coast Defenses of Manila and Subic Bays, in 1917; 95th Company, Coast Artillery Corps, in 1922; and became Battery F, 15th Coast Artillery, in 1924.

Antiaircraft Development

The Chief of Coast Artillery and the Chief of Ordnance have recently rendered a report which constitutes an analysis of the present status of antiaircraft development as revealed by exercises last fall at Aberdeen Proving Grounds. The report is of unusual interest in that it covers tests of antiaircraft materiel designed and manufactured since the war, and indicates, in a general way, the trend of future development.

The exercises showed that greater progress was made in antiaircraft development during the past year than during the entire period since the war. Progress with machine guns has been substantial, though not indicated so much by improved target practice results as by recognition of principles which give great promise. For guns the progress was marked by the development of a 3-inch gun of greater accuracy, range, and rate of fire. For searchlights the advance was represented by two models of increased value, by the adoption of distant electric control, and by the development of a sound-locator system which decreases the searching time and permits picking up the target at an increased range.

The antiaircraft exercises covered a period of nine weeks, during which there was daylight practice with both guns and machine guns from each Monday to Friday, inclusive, and night practice for either guns or machine guns for three evenings a week. Searchlight practice, in addition to the employment of the lights in illuminating targets for these firings, was scheduled for three nights a week. This heavy program was carried out without interruption. Airplanes flew 292 flying hours in towing targets and on other missions during the tests.

The 3-inch antiaircraft gun with a fixed mount, the first new design adopted since the war, was found to be highly satisfactory and to be suitable for service with a correction of a few minor defects. The gun and mount comprise a unit which embodies the most desirable modern principles. It is easily traversed and elevated and has a high rate of fire facilitated by an automatic breech. The gun has a maximum vertical range of 10,400 yards.

One unit of a 105-mm. antiaircraft gun was tested, although not adequately, due to failure of minor features which should be easy to rectify. The report indicates that this gun is a great improvement over present equipment, and may be adopted as a standard for manufacture after minor changes and further test.

The maximum vertical range of this gun is about 14,000 yards. Three principal advantages have been shown for the 105-mm. gun: (a) Increased danger volume of shell burst; (b) decreased time of flight; and (c) increased range.

The 3-inch and 105-mm. guns both are provided with the same new sighting system. Optically, both the sight proper and the finder appear satisfactory. The telescopic sight of eight power is a marked improvement over those of four power heretofore in use.

Flashless powder was used for a considerable portion of the night firing. The absence of flash has a marked effect on the accuracy of the pointing of guns and instruments. However, the flashless powder produces considerable smoke which affects visibility when the wind is toward the guns from the target. The advantage appears to outweigh the disadvantage.

For the 3-inch and 105-mm. gun firing, the A-1, B-2, B-4, B-6, and Navy types of targets were used; for machine guns the B-5 (flag) target was also used. The A-1 target is an open-end sleeve, 15 feet in length, 2¾ feet in diameter at the mouth, and 2 feet in diameter at the tail. The B-2 target is a cigar shaped target with a hoop ring at the mouth 1½ feet in diameter, 14 feet 3⅝ inches long, and 3 feet in diameter at it largest dimension. The B-4 target is a sleeve the shape of a truncated cone, 16 feet long, 3½ feet in diameter at its mouth, and 1 foot in diameter at its tail. The B-6 target is an enlarged B-4 target, with a length of 18 feet and all other dimensions increased proportionately. The Navy sleeve target is a large stream-line target constructed along the lines of the B-2 type target. It has a flexible wire hoop in the mouth 3 feet in diameter, and is closed at the tail. The target is 23 feet long. The B-5 (flag) target originally was a flag 12 feet long and 6 feet wide with a wooden stick across the width, by means of which the target is attached to three bridle ropes looped to the hook of the towline. Several modifications were made in this target. For machine-gun practice one of these targets, measuring 4 feet or more in width by 36 feet in length, is considered the most satisfactory of the targets developed to date.

The following colors of targets were tested: White, blue, deep red, light red, chrome yellow, and orange. The deep red was found generally to be most suitable for day firing and the white targets for night firing.

Tests were made of targets equipped with flashlights to facilitate prompt location. On the first test, due to a light mist, the flashlights could not be seen from the ground, although the artillery observer reported that they were visible from his plane. On the second test the visibility was excellent and the flashlights could be seen from the ground. However, they were easily confused with stars and rendered little if any assistance to the searchlight battery.

Motion picture cameras were located on both ground and airplane for the purpose of locating and synchronizing bursts. This method gives some promise as a means to determine deviations. It is believed that if the amounts of all deviations were exactly known, there would follow the elimination of the cause of a large percentage of misses.

As has been the case in the past, fire control apparatus for antiaircraft machine guns still lags behind that for guns, although substantial progress has been made during the year in the solution of the difficult problem of directing antiaircraft machine guns. The following machine guns were fired during the exercise: Caliber .30 Browning machine gun, Model 1917; Caliber .50 Browning machine gun, Model 1921. The .30-caliber gun now appears capable of full effective use up to 1500 yards and the .50-caliber gun up to 2000 yards.

A 37-mm. Browning automatic gun was also tested. This gun was fired at an average rate of 43 shots per gun per minute, although a maximum rate of 65 shots per minute was attained during practice. With correction of present imperfections it is believed that 60 shots per minute may be considered a normal rate of fire. Judging from the firing it is thought that the gun is more accurate than the fire control data furnished it for test.

The result of the year's progress has been to increase the range at which targets may be engaged; to give greater rapidity to picking up and changing targets; to increase the volume of 3-inch gun fire from a salvo each five and a half seconds to a salvo each three seconds; and to increase the hits per gun battery per minute from two to seven.

Below is a table of comparisons on the firing of the three-inch gun in the Aberdeen tests with those of the Fort Tilden exercises in 1925.

3-Inch Antiaircraft Gun

	Aberdeen Proving Ground, 1926		*Fort Tilden, 1925*	
Total shots fired for which results were computed	5188		4343	
*Number of hits	475		108	
Per cent of hits		9.15		4.67
Shots per battery per minute (4 guns)		76.64		43.4
Hits per battery per minute		6.9		2.03
Average altitude (yards)	2297		1890	
Average slant range (yards)	4392		3962	
Number of shrapnel holes (on 26 targets recovered)	263			
Average ground speed of plane, miles per hour	76			

The following is a summary of the salient points of the machine gun firing at Aberdeen:

Caliber .30 Antiaircraft Machine Gun

Number of shots fired	95,613	
Number of guns fired		6.8
Hits		979.59
Per cent of hits		1.06
Shots per gun per minute	387	
Hits per gun per minute		3.46
Average slant range (yards)	887	
Average altitude yards	390	
Average ground speed of plane, miles per hour	79	

Caliber .50 Antiaircraft Machine Gun

Number of shots fired	52,536	
Number of guns fired		5.3
Hits		296.7
Per cent of hits		0.57
Shots per gun per minute	227	
Hits per gun per minute		1.20
Average slant range	1,272	
Average altitude, yards	550	
Average ground speed of plane, miles per hour	82	

Note: The number of hits in the machine gun firing was determined by examination of target.

*The number of hits in the gun firing tests was determined by plotting the coordinates of burst recorded by air and ground observers.

Antiaircraft Firing by 213th C. A. (AA), Pa. N. G.

The batteries of the 213th C. A. (AA), Pa. N. G. worked out the reports of their record target practices for 1926 in the regular army way, though they were not required to do so by regulations, and found that they had attained the following results.

3-Inch Gun, Firing at Towed Sleeve, Grand View, Va., Aug. 2, 1926

	Battery B	*Battery C*	*Battery D*
Rounds fired	50	33	76
Elapsed time	7.38 min.	4.63 min.	5.798 min.
Hits	2	1	4
Rounds per gun per minute	6.8	7.1	13.1
Hits per gun per minute	0.271	0.216	0.69
Percentage of hits	4.0	3.03	5.26

It will be noted that the rate of firing of Battery D was very good, as also were the results obtained. This battery is stationed in Easton, Pa., and Captain Russell Hahn is the battery commander.

30-Cal. Machine Gun, Firing at Towed Sleeve, Fort Monroe, Va. July 27 and Aug. 3, 1926

Batteries	*Rounds*	*Holes in target*	*Theoretical hits*	*Percentage of hits*
E	10,428	38	148.2	1.42
F	4,167	8	31.2	0.75
G	19,167	84	327.6	2.00
H	18,276	35	136.5	0.83

Record Practice of Battery A (Searchlight)

Course	*Number times target illuminated*	*2 minutes or more*	*Less than 2 minutes*	*Misses*
1	0	1	0	0
2	1	0	1	0
3	0	0	0	1
4	1	0	0	0

Principles Governing Promotion in the British Army

Editor's Note.—Because of the present interest in the subject of promotion and the studies that are being made in the United States, we give below the latest war office Regulations on the subject of promotion in the British Army as they recently appeared in the *Journal of the Royal United Service Institution*.

PROMOTION TO THE RANKS OF COLONEL, MAJOR GENERAL, AND LIEUTENANT GENERAL

1. Promotion to the ranks of colonel and above is by selection and a lieutenant colonel, colonel, or major general will not be selected for promotion unless he is considered fully qualified—

(*a*) for a colonel's (major general's, lieutenant general's) command and appointment;

(*b*) for a colonel's (major general's, lieutenant general's) command;

(*c*) for a colonel's (major general's, lieutenant general's) appointment, respectively.

2. Although as a rule the claims of officers for promotion will be considered in order of seniority, an officer whose early advancement is in the interests of the service

may be specially selected for promotion to fill the vacancy, whatever may be his position as regards seniority in his rank at the time.

3. When selections for promotion are made the following points will be carefully examined in each case:

(*a*) whether the officer's past record justifies his favorable consideration and particularly whether his promotion has been recommended with confidence by the officers under whom he has lately served;

(*b*) whether he is fitted in every way to fill adequately all or any of the appointments likely to be available for him in the higher rank for which he is being considered;

(*c*) whether, taking into consideration the merit, age and seniority of other officers, his promotion is clearly in the best interests of the service.

4. An officer who is passed over for promotion will be superseded temporarily or permanently; if permanently, he will not again be considered for promotion and will be so informed.

PROMOTION TO THE RANK OF LIEUTENANT COLONEL

5. (*a*) Promotion to the rank of lieutenant colonel will be by selection and will be given to the major best suited by his records and according to the circumstances of the case to fill the vacancy under consideration.

(*b*) Accelerated promotion to the rank of lieutenant colonel may be given to a major who has shown outstanding proof of ability and industry, together with capacity for command, initiative, tact, reliability, and loyalty to his superiors.

6. Promotion to command a regiment of cavalry or a battalion of infantry will be given to a major within the regiment or to a major selected for accelerated promotion from another regiment.

In the event of a major being passed over for promotion, his supersession will be temporary or permanent.

Temporary supersession means that the officer will be considered for promotion to fill a subsequent vacancy. A major who is permanently superseded will be relegated to the half-pay list.

7. (*a*) Promotion to the rank of lieutenant colonel to fill vacancies in the establishments of the R. A., R. E., R. Signals, R. Tank Corps, R. A. S. C., and R. A. O. C., will be given as follows: The records of the senior majors in each case will be reviewed in order of seniority and promotion will be given to those who by reason of their merit, seniority and age are most deserving of it. Such promotion will be given to majors in order of seniority or in such order as may be decided.

(*b*) The supersession of those passed over will be temporary or permanent (the effect in each case being as described in par. 6).

(*c*) In the interests of the service officers from the accelerated promotion list [see par. 5 (*b*)] may be specially selected to fill vacancies for promotion to lieutenant colonel.

PROMOTION TO THE RANKS OF LIEUTENANT, CAPTAIN, AND MAJOR

General Remarks:

8. While no general change in the present system of normal promotion from the rank of second lieutenant up to the rank of major is contemplated, it is essen-

tial that officers of marked ability shall be given the chance of reaching the highest ranks of the Army at a reasonable age.

9. An officer will be recommended for accelerated promotion only if he has given outstanding proof of both ability and industry together with capacity for command, initiative, reliability, tact, and loyalty to his superiors.

10. Accelerated promotion in the cavalry and infantry will be given by promotion to the next higher rank; in the R. A., R. E., R. Signals, R. Tank Corps, R. A. S. C., and R. A. O. C., by means of an antedate. A subaltern may receive an antedate not exceeding one year, a captain not exceeding three years.

11. An officer will not receive seniority in his own rank by virtue of an antedate, which will only come into effect when, by reason of it, the officer becomes due for promotion to the next higher rank (see Appendix). The award of an antedate is not necessarily final; subsequent repors may result in increases, decreases, or cancellation of the antedate.

12. Though an officer may be recommended for accelerated promotion or antedate as soon as he shows clearly that he possesses in a marked degree those qualities mentioned in par. 9 above, he will not be eligible for such promotion or antedate until—

(*a*) He has been twice recommended, one of the recommendations being made, if possible, whilst he is at regimental duty.

(*b*) He has passed the necessary qualifying examinations for promotion.

(*c*) As a subaltern, he has seven years' service or is twenty-eight years of age, or as a captain has twelve years' service or is thirty-two years of age.

METHOD OF SUBMITTING RECOMMENDATIONS FOR ACCELERATED PROMOTION OR ANTEDATE

13. Recommendations for accelerated promotion and for antedate, where applicable, will be submitted through the usual channels on A. F. B. 195 yearly, immediately after the annual confidential reports have been rendered. They will be signed by the officer's immediate C. O. and superior reporting officers will add their remarks stating whether they do or do not support the recommendation.

14. Recommendations in the case of subalterns will, whenever possible, be accompanied by independent recommendations written by the two senior officers of the corps present in addition to the C. O.

15. A list of all officers recommended for accelerated promotion or antedate will be kept by the command. When an officer on that list leaves the command, the latter will be responsible for notifying his name, with the necessary information concerning the recommendation, to the new command to which he is transferred. Such information will contain the number of times that the officer has been recommended for accelerated promotion, and the amount of antedate recommended (where applicable). Those officers under whom the officer is directly serving in the new command will also be duly informed. Each officer on the accelerated promotion list will be reported upon annually on the prescribed form until promotion has been received or his name removed from the list.

16. If it be desired to remove an officer's name from the list, the fact and reasons will be notified by the command concerned to the War Office, and the officer will be informed.

BREVET PROMOTION

17. Specially meritious service, both at regimental duty and on the staff, may be recognized by the grant of brevet promotion to next higher rank.

18. The object of brevet promotion is to ensure the advancement of selected officers in order that they may be able to reach the higher ranks of the army at the most suitable ages.

19. An officer who has received a brevet colonelcy or brevet lieutenant colonelcy, and who is subsequently promoted colonel, will count seniority on the colonels' list from the date of his brevet colonelcy or four years from the date of his brevet lieutenant colonelcy, whichever is the more advantageous.

APPENDIX

The following table shows how an antedate will take effect:—

Captain "A"	30.10.14
Captain "B"	30.10.14
Captain "C"	30.10.14
Captain "D"	23. 7.15
Captain "E"	23.12.15
Captain "F"	16. 2.16

Captain "F" is granted one year antedate. This will bring him up for promotion between Captains "C" and "D."

He remains in his present position on the regimental list of captains, however, until the next vacancy occurs after Captain "C" has been promoted; he will then be promoted into that vacancy.

A Method of Training National Guard

HEADQUARTERS ——TH COAST ARTILLERY
—— NATIONAL GUARD
STATE ARMORY, —— STREET

(Place)
September 1, 1926.

Training Memorandum No. 5.

Subject: Prescribed courses of study and examination (Training Year, 1926-1927).

The following having been approved by the Adjutant General, State of ——, is published for the information and guidance of all concerned:

1. Officer instruction will consist in part of the following courses of study, including the three battalion schools and a written examination.

2. Subjects are:
   1st School: The Battery Command Fixed—T. R. 435-220.
   2d School: Fire Control and Position Finding—T. R. 435-221.
   3d School: Adjustment of Fire—T. R. 435-280 and Sec. XI and XIII.
   3d School: Analysis of Drill and Target Practice—T. R. 435-55.

3. Dates of Schools will be:
   1st School: (Place), November 13.
   2d School: (Place), January 15.
   3d School: (Place), March 1.

4. Instructor assignments will be made by these headquarters for the schools.

5. The prescribed courses of study will be the pamphlets indicated for the study at the schools. One month preceding each school the Senior Instructor will send out a correspondence lesson. Answer sheet will be due back in the Instructor's officer 15 days preceding the school date.

6. The written examination will be mailed to all officers immediately following the last school and will be due back in the Instructor's office within 15 days. It will cover the above subjects taken up in the schools. Examination papers will be marked in the Instructor's office, and marks attained will be turned over to the Regimental Commander for consideration.

By Order of COLONEL ——:

(Signature)

Lt. Col, ——th C. A. (H. D.),

Plans and Training Officer.

Approved: Sept. 10, 1926.

(Signature)

Adjutant General, State of ——.

SPECIAL CORRESPONDENCE COURSE

——TH COAST ARTILLERY: 1926-27

Instructor: Major ——, C. A. C. (DOL)

In four lessons. Mailed, Oct. 13, 1926.

Answer sheet due on November 1, 1926.

Lesson 1. The Battery Command Fixed.

Time Allotted: 2 Hours.

Text Assignment: Training Regulations 435-220.

Suggestions: This lesson covers in part Sub-course 9, Basic Coast Artillery Course, Army Correspondence Schools, and will be supplemented by the 2d Battalion School in —— on November 13-14 and 1st Battalion School in —— November 20-21. A careful study of T. R. 435-220 will give our officers greater knowledge of the essential features of training necessary to give the desired "Readiness for Action." It is requested that you mail your answers to the Exercise in the enclosed envelope on or before November 1. Study in groups is suggested.

Exercise: 1. Forming the Battery. (a) Name the four sections of the Coast Artillery Battery, formed for Artillery, from right to left. (b) Where is the post of the Buglers? (c) Where is the post of the Chief of Section at the Command "Fall in"? (d) At command "Report" what do the chief of sections do? (e) When does the Range Officer form in line and where is his post? (f) What is the command to form the battery for infantry drill? Who gives it?

2. Make a diagram showing points within the battery command usually connected by telephone.

3. In a gun battery range differences are marked where?

4. In a gun pointer's test, the assumed deflection was 2.15, the deflection sent to gun pointer was 3.20, reading of the deflection scale at the end of time of flight 2.25. What is the error? Can the gun pointer's test be conducted in your Armory?

5. What is the object of sub-caliber practice?

6. Pick out five of the 26 tests and adjustments which you think are most important in both gun and mortar batteries.

7. State briefly 7 special arrangements for target practice.

8. Prepare a week's schedule of instruction for your battery, based on Section X, T. R. 435-220.

9. Name the supply department furnishing (a) Time interval records, (b) Time interval system, (c) Circular benches for observing stations, (d) Magnetos for firing, (e) Field glasses, (f) Cameras, (g) Red streamers at the Battery.

SPECIAL CORRESPONDENCE COURSE
——TH COAST ARTILLERY: 1926-27

Instructor: Major ——, C. A. C. (DOL)

In four lessons. Mailed December 27, 1926.

Answer sheet due on January 10, 1927.

Lesson 2. Fire Control and Position Finding.

Time Alloted: 2 Hours.

Text Assignment: Training Regulations 435-221 (Omit par's. 7, 25, 31, 38, and 40).

1. You are a battery commander. You wish to begin tracking the Tug *Reno* in sub-area OCEAN. State the commands you would give.
2. You are the range officer in question 1. Do you repeat the commands? What commands do you give, if any?
3. To whom do the observers report, "Sir, Station in order"? Do paragraphs 8 *d* and 9 *a* agree on this point?
4. How many men make up a detail for a spotting observing station?
5. Where does the spotter observer set the vertical wire before each shot is fired?
6. When the splash occurs what does the spotter observer do?
7. Horizontal base system guns, Case II is being used. The travel reference number is being determined in the B. C. Station and sent to No. 8. Is it necessary then to have No. 1 in the range section?
8. Angular travel is best taken between plotted points or setforward points?
9. What are the duties of the assistant plotter?
10. What number member of the range section operates the wind component indicator?
11. How often is the WCI changed in azimuth?
12. Suppose the azimuth of the wind is 180 degrees, velocity 15 MPH, and azimuth of the target 219 degrees. What reference number will go to the Pratt range board and gun deflection board?
13. What information is necessary to operate the Pratt range correction board? Where is it obtained?
14. What is done with the percentage correction obtained from the Pratt range correction board?
15. What information is necessary in order to operate the gun deflection board and where is it obtained?
16. Predict the azimuth from the BC station for time 3, if time 1 azimuth from the BC station is 232.65 and time 2 azimuth is 231.85.
17. Using 30-second observing interval, predict the range for time 2 plus 15 seconds, if the range at time 1 is 12,350 and time 2 is 12,300.
18. State the numbers of enlisted men in your range section who must have the assistance of Nos. 16 and 17 recorders.
19. Using Fig. 12, Impact board, give the plotted deviations in percentage for shots 1, 2, 3, and 4.
20. Given range of 16,700 yards and range deviation of 350 yards short, what is the percentage deviation?
21. What two adjustments of a telescope are necessary and why are they made?
22. What is the purpose of the atmospheric slide rule?
23. In selecting telephone operators what methods of testing will be used?
24. In sending messages, state briefly 6 rules to be observed.
25. In receiving messages, state briefly 4 rules to be observed.

SPECIAL CORRESPONDENCE COURSE

——TH COAST ARTILLERY

Instructor: Major ——

Coast Artillery Corps (DOL)

In four lessons. Mailed February 23, 1927.

Lesson No. 3.

Text Assignment: Coast Artillery Memo No. 7, 1926.

References: Training Regulations 435-55 and 435-280.

Answer sheet due on March 10, 1927. Use penalty envelope for reply.

NOTE: The True-False type of examination used in pedagogy is particularly applicable to examinations where time is short. They are answered by simply checking. Do not guess. Papers will be graded on the basis of two points deduction for each wrong answer. but only one point off for questions not answered. But at least 25 questions must be answered, including 20-22-23.

1. The cross check of all records will disclose errors in operating the several boards and computing devices. True or False.
2. The object of analysis of drill is to disclose the personnel errors incident to the drill and the individuals responsible for them. True or False.
3. The object of analysis of practice is to separate the personnel errors from the armament errors and locate the sources of personnel errors. True or False.
4. The replot of target course is undertaken first of all. True or False.
5. The replot of target course is made by the plotter assisted by the Range Officer. True or False.
6. In replotting the target course, errors of the B′ and B″ readers and arm setters must be eliminated as nearly as possible. True or False.
7. In checking the Range Percentage Corrector for errors in operation, the ranges to the setforward points, as determined by the replot course of the target, are used. True or False.
8. In checking the Gun Deflection Board for errors in operation, the angular travel recorded on the deflection boards operators' record is used. True or False.
9. The cross check of records is done while the Battery Commander is replotting the course of the target. True or False.
10. Errors in application are disclosed by the cross check of records. True or False.
11. On the B. C. check sheet are three lines corresponding to each time interval. State the line used for: (a) Errors ____ , (b) Data from record sheets_____, (c) Data from replot and checking operations_____.
12. An error of twenty yards in range is not charged critically against the personnel. True or False.
13. An error of 0.20 degrees deflection is not charged critically against the personnel. True or False.
14. Record No. 19 is a record of the azimuth of the target at the instant of impact. It should be made by an observer especially detailed, using an azimuth instrument carefully oriented. True or False.
15. In the analysis of practice, the Battery Commander plots the position of the setforward points. True or False.
16. State on what line of the analysis of target practice (range) the following data is filled in:
    (a) Actual uncorrected range to replotted target, _____
    (b) Pratt Range Board corrections, _____
    (c) Fire Adjustment Board corrections. _____

17. From Figure 1, Graphical Analysis, it is evident that the battery was in adjustment after firing eight record shots. True or False.

18. From the same figure, it is evident that the Battery Commander applied his rules of adjustment correctly. True or False.

19. Photographic films determine the lateral deviations of the impacts. True or False.

20. What is the hitting component score for a one-gun 10-inch DC battery practice completing record shots in 10 minutes with four hits: danger space of 200 yards; DPAE of 50 yards? Answer: _____

21. The calibration component score for only one gun firing is 10. True or False.

22. What is the adjustment component for a practice which has a DPAE of 75 yards and deviation of the last CI circle determined from plotting is 65 yards? Answer: _____

23. What is the penalty component score for a practice which developed a DPAE of 60 yards, the rules of adjustment were not applied properly, one shot had a deviation more than 240 yards, and four shots had personnel errors of 110, 50, 30, and 20 yards each, and the spotting errors were 200, 50, 40, and 60 yards with an average range of 12,000 yards? Answer: _____

24. No battery will be permitted to proceed to service practice until at least one simulated practice using the hit bag has been conducted under the supervision of the battalion commander, the simulated practice analyzed, and the battalion commander certified to the regimental commander that the battery is qualified to proceed. True or False.

25. Twelve-inch long-range batteries are normally fired using Case III. True or False.

26. Adjustment should be made on the material target, not on the center of the danger space. True or False.

27. The projectile is rammed with one motion from the shot truck to its seat in the bore. True or False.

28. Powder trays need not be used, powder being placed on the shot truck and rammed directly therefrom. True or False.

29. Gun battery targets will be towed from left to right. True or False.

APHORISME XXXII

The chiefest weapon to gain victory, is good discipline; for if Souldiers have not this true temper, they lose their edge in their tryall, and turn the point into their own bowels that use them. Wherefore nothing is more necessary in a Martiall government than obedience, both for the generall good of their affaires, and safety of the Souldiers.
—*Ward's* Animadversions of War *(London, 1639).*

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the Service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. R. S. ABERNETHY, *Colonel, Coast Artillery Corps, President Coast Artillery Board.*

Projects Initiated During the Month of March

Project No. 548, Sound-Ranging Camera.—The Coast Artillery Board was directed to have tested by the 1st Sound Ranging Battery, and report on a new high-speed sound-ranging camera, developed in the Signal Corps Laboratories, Washington, D. C.

Project No. 549, Test of Deflection Board, T1.—The first Universal Deflection Board of Arsenal manufacture has been received by the Coast Artillery Board and is under service test in the 52d Coast Artillery (Ry.).

Project No. 550, Draft of Proposed TR 435-440, "Combined Training of Coast Artillery and Air Corps."—The Coast Artillery Board was directed to submit a draft for a Training Regulation covering the forms of combined training of Coast Artillery and Air Corps units. A complete draft was submitted with the idea of providing coordination and uniformity in all commands.

Project No. 551, Portable Shower, Test of.—A portable shower bath for field use has been sent to the Coast Artillery Board for test under service conditions.

Project No. 552, Confidential.

Project No. 553, Fixed Platens for Cloke Plotting Board, T1, for Fort Story, Test of.—Two fixed platens for Fort Story have been received and tested in conjunction with test of long-range Plotting and Relocating Board.

Project No. 554, Oakite Cleaning Compound.—This compound is being tested particularly with a view of finding something that will facilitate the great amount of cleaning and paint removing required of caretaking detachments.

Project No. 555, Report of Test of Long-Range D. P. F., M1-Class 1.—This range finder was tested under the direct supervision of a member of the Coast Artillery Board at Fort Hancock, N. J., in connection with the test of a new 100-foot tower, during January and February, 1927.

Project No. 556, Fields of Fire for Antiaircraft Target Practice.—The Coast Artillery Board was directed by the Chief of Coast Artillery to criticize and make recommendations on a proposed tentative bulletin on the above subject. The purpose of the bulletin is to facilitate National Guard antiaircraft, and similar organizations, in the selection of proposed fields of fire for antiaircraft target practice.

Project No. 557, Hand Extractor for Dummy Projectiles, Test of.—A new design of a hand extractor for dummy projectiles has been received from the Ordnance Department. This extractor will be tested under the supervision of the Coast Artillery Board.

Project No. 558, Questionnaire Relative to Requirements for Motor Transportation.—The Coast Artillery Board has been directed to prepare answers to a questionnaire from the Office of the Quartermaster General as to types and characteristics desirable in motor passenger and freight vehicles for the service.

Project No. 559, Powder Charges for 10-inch Gun, Model 1900—510-lb. Projectile.—The Coast Artillery Board was directed by the Chief of Coast Artillery to submit its recommendations as to the advisability of using the 510-lb. projectile in the 10-inch Gun, Model 1900, with the regular charge for the 617-lb. projectile. The expected muzzle velocity would be approximately 2350 f. s., which will permit the use of the range table for this weight projectile based on a normal muzzle velocity of 2400 f. s. by making an initial correction of 50 f. s.

Completed Project

Project No. 560, Data Routing, Position Finding and Fire Control, Naval Targets, Case II and III

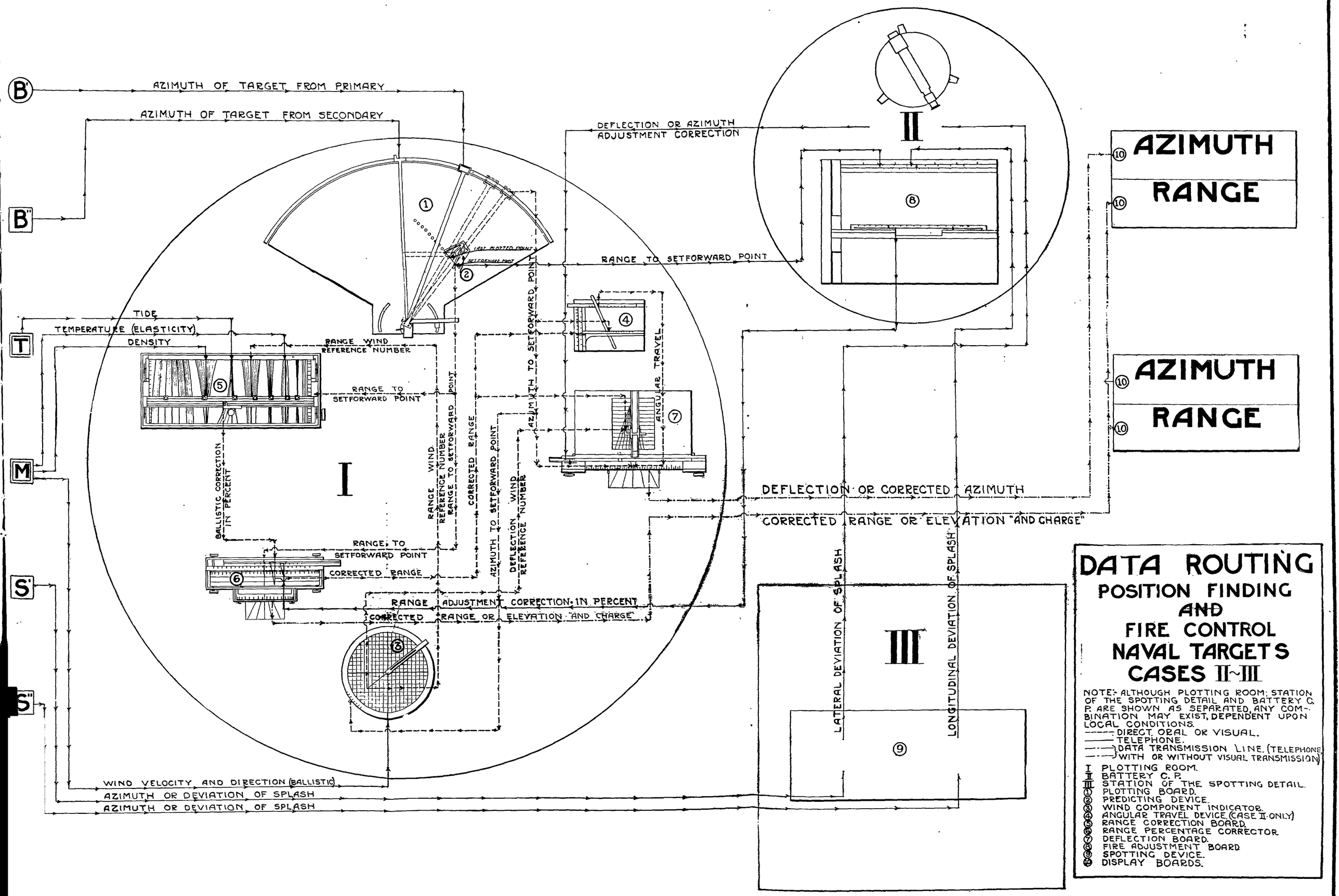
I. PROJECT.

See accompanying chart.

II. ACTION OF THE CHIEF OF COAST ARTILLERY.

"1. With reference to Coast Artillery Board Project No. 560, 'Data Routing, Position Finding and Fire Control, Naval Targets, Case II and III,' recently received in this office, you are advised that this project has been approved and authority is given for its publication in the COAST ARTILLERY JOURNAL."

* * * * *



C.A.B. PROJ. No. 560

BOOK REVIEWS

Revolt in the Desert. By T. E. Lawrence. George H. Doran Company, New York. 1927. 6″ x 9″. 355 pp. Ill. $3.00.

On the outbreak of the World War, the author was serving as an assistant in the British Museum's Archeological excavations of Carchemish on the Euphrates. He had already acquired an unusual understanding of and sympathy with Arabia and the Arabians, and this special knowledge of his brought him a commission in the British Intelligence Service at Cairo. Here he conceived and inspired the Arabian revolt. His subsequent reorganization and leadership of the revolt is one of the most romantic episodes of modern military history.

Selecting the most promising of the Arab chieftains as the man to whom to rally the many tribes of that desert country, Lawrence joined the Arabs, dressed as an Arab, and lived as an Arab. Organizing, pacifying, and guiding the natives and acting as liaison agent between them and the British, he built up an army and led it to success. By always holding up an Arab chief as nominal leader for any enterprise he was able to retain the confidence and respect of all classes and all tribes. He received his reward when, as "Urens," he entered Damascus and, with the principal Arab leaders, was greeted by the acclaim of thousands of the populace, chanting their names, "Feisal, Nasir, Shukri, Urens."

The book is a condensation of the original manuscript, and it appears to have lost nothing in the cutting. Its style is vigorous and its action is rapid. The author, however, refrains from giving a comprehensive statement of his opinion of the Arab. In general, his comments are favorable, and we find rather a marked contrast between the native described by Lawrence and the Arab pictured by Rafæl de Nogales in *Four Years Beneath the Crescent.* Both agree closely concerning the Bedouin.

The reading public of both England and the United States has given an enthusiastic reception to this remarkable account of remarkable exploits. The welcome is deserved, for this is the most interesting war-book that has appeared in recent years.

Wilhelm Hohenzollern—The Last of the Kaisers. By Emil Ludwig. Translated by Ethel Colburn Mayne. G. P. Putnam & Sons, New York. 1927. 6″x 9¼″. 528 pp. Ill. $5.00.

"This book is a portrait of William the Second—no more; it presents neither his epoch nor the whole story of his life."

The writer proceeds as follows in his preface to establish a claim for historical accuracy, not invalidated by recentness of the events:

> In the seven years since his abdication the pace of events, the overthrow of accepted forms of government have brought to light a greater quantity of relevant documents than seven decades would hitherto have afforded us.

But Herr Ludwig does take into account that political and partisan passions are not so soon cooled, and though claiming to know too much rather than too little of William the Second, adds:

> For fairness' sake, at any rate, we here design to *let no adversary of the Emperor bear witness*, but to construct our portrait wholly from his own deeds and words, together with the reports of those who stood in close relation to him; . . . The present chronicler has often felt obliged to repress his more summary judgment in favor of the individual opinions of eye witnesses, thus guarding himself against the reproach of a one-sided interpretation. . . .
>
> In short this is an attempt to trace from the idiosyncracies of a monarch the direct evolution of international polital events—from his essential nature the course of his country's destiny.

The story begins at birth, the mother in deathlike unconsciousness, the future emperor lifeless for an hour and a half, and as was not perceived for three days, with the left arm paralysed, the shoulder socket torn away, "and the surrounding muscles so severely injured that in the then state of surgical knowledge no doctor would venture to attempt the readjustment of the limb."

Herr Ludwig believes that "the perpetual struggle with a defect which every newcomer must at once perceive, and he, for that very reason the more ostentatiously ignore—the hourly lifelong effort to conceal a congenital, in no way repulsive stigma of nature, was the decisive factor in the development of his character."

Other malign influences mentioned are: a father's harshness; the cold-heartedness of a despotic mother—who could not forgive his imperfection, and whose short-coming embittered his mind; the romantic idea that the history of his land was that of his family alone, and a failure to be taught or perceive that the "Kingdom of Prussia was founded on the strength and devotion of a courageous people"; but most of all "the innate vanity inherited from his father which drove him all his life to seem what he was not."

The character outlined in this work is an almost perfect example of self-assertiveness resulting from the consciousness of inferiority—in this case largely physical.

Another side of this character is the religious one. A sincere faith in God was essential to the Emperor's monarchical creed. Herr Ludwig says:

> His overweening disposition . . . had a double use for God, and one was a wrong one. God was his shield against the megalomania which might have made him claim equality with pagan deities, but likewise against his people and those fellow creatures, one and all, who were not born like him to "Kingship," and so were not like him *endowed with authority by God*. Throughout his royal life, William the second felt like a King of antiquity who was High Priest as well, *literally mediator between God and people;* and from this consciousness he drew the most far reaching inferences, especially with regard to kingdoms and republics. (Reviewer's italics.)

This mediæval personality, unstable, restless, hiding his lack of self-confidence under a mask of militarism, was astonishingly immature at 29. This caused the regency to be denied him even though his father was completely disabled, and the unfeeling conduct of the son at the time of the father's death may be attributed largely to the hysteria of adolescence.

Characteristically the first proclamation of the new ruler was addressed to the army, and concluded with this:

> Thus we belong to each other—I and the Army—we were born for each other and will cleave indissolubly to each other whether it be the Will of God to send us calm or storm. . . . I promise ever to bear in mind . . . that I shall have one day to stand accountable . . . for the glory and honour of the army.

After three days he bethought himself of his people, and in a proclamation, written, as were all others, by himself, boasted of his father's victories but continued:

> I vow before God to be to my people a just and merciful prince, to do all things in piety and godly fear, to keep the peace, to promote the welfare of the country, to be succourer of the poor and oppressed, a faithful guardian of the right. . . .

It is to be noted that the Kaiser rejected all suggestions and wrote his own proclamations.

The story of the reign of William the Second presents among its crowded incidents: the dismissal of Bismarck seen from a new viewpoint; the rise and fall of Caprivi; the rise of the oddly assorted firm of Eulenburg, Holstein and Buelow, who controlled the Empire's foreign policy for eight years, and their subsequent division and dismissal: the absurd treaty of alliance with the Tsar, signed on the German Imperial Yacht in the Bay of Bjorkoe and subsequently disavowed by the Russian Government; the constant meddling with the army and insistence on command with success in maneuvers; the veering from one international friendship to another; the vilification of the British King to the Tsar, and of the Tsar to British ministers; the gestures toward alliances which were to be rejected when offered; and the never-to-be-overcome distrust of democratic governments.

William's attitude towards his British royal relatives, and the British Empire, is shown as perhaps fuller of contradictions than any other of his international relations.

It is related that he hated the British royal family and Great Britain, was fascinated by them, was envious of them, alternately outraged the feelings of nation and royal family, and endeavored to cajole them, and was influenced largely to start building up the German Navy by the fact that Great Britain was always on his mind.

We learn that William never learned to apply himself to work, that he was a faithful husband but tremendously bored with the piety of his rustic German Empress, that he found greatest enjoyment in military display, in hunting which was really organized slaughter, and on the imperial yacht where Count Gœrz daily went through his animal tricks, and in the words of his most intimate friend Eulenburg:

> The evenings were partly musical, partly devoted to conjuring tricks by Hulsen; sometimes we had to get something else. I have already done the Dwarf and turned out the light to the Emperor's vast delectation. In an improvised sing-song, I did the Siamese twins with G; we were connected by an enormous sausage.

The Kaiser affronted England by sending congratulatory telegrams to Kruger at the time of the Jameson raid in 1896 and again in the Bœr War largely on his own initiative (later he advised England how to win the war), but it appears he was persuaded despite his initial opposition, to consent to the landing at Tangier in 1905, which materially contributed to the formation of the Triple Entente, and to sending the Panther to Morocco in 1911.

Herr Ludwig recounts fully and dispassionately the events leading to the 1914 crisis and then casts their logic aside to bring forward the good old traditional villains—the cabinet ministers:

> Neither Poincare's pretensions nor William's provocations, neither the whooping of a few thousand Lorrainers on the boulevards, nor the arrogance of as many Pan Germans . . . not trade rivalry nor race antagonism, not

> material nor moral causes . . . made this cabinet-war a necessity. The life blood of ten millions of her sons was shed by Europe not under any "tragic necessity," not through any "fatal cancatenation" of circumstances; the sacrifice was extorted from her only by her wrangling statesmen.

William the Second was now confronted by the one ordeal of his life. His attitude is epitomized in this verdict of an aristocratic—even monarchistic—German General:

> The Emperor, during the War, refused to face facts and intrenched himself in optimism. . . . The contrast between the masterful personality which he tried to assume . . . and the absence of any real force of character, grew daily more glaring until the bitter end. It was his and Germany's misfortune that it could not be said of him as of his Grandfather that he was no mere War-Lord but a true soldier. (Freytag-Lovinghoven.)

Herr Ludwig's account of the events leading up to, and the manner of, the abdication go further to explain that final imperial act than any other known to this reviewer.

The translation is done in clear, idiomatic English with scarcely a trace of German locution. In an appendix to this and the English edition is published a letter from Sir Rennell Rodd, Private Secretary at the time of Emperor Frederick's death, to the British Ambassador in Berlin, which seems to prove that whatever may have been his historical sources, Ludwig is in error in laying on the Empress Victoria the blame not only for calling in the English surgeon MacKenzie but also for giving out a false diagnosis and delaying operation.

The reviewer cannot but admit that this work does not attain the excellence of Ludwig's *Napoleon.* On the other hand, it is not less readable than *Napoleon,* and when considered in comparison with other historical biography, not only interesting and important, but entertaining.—R. S. A.

The Automobile Blue Book, Volumes 2 and 3. Automobile Blue Books, Inc., Chicago. 1927. 5¼"x 9¼". 586 and 898 pp. $3.00 each.

These are the first volumes issued of the 1927 series, which will be complete in four volumes; numbers one and four issued during the present Spring. Volume two includes the states of Tennessee, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Florida, and parts of Virginia, Kentucky, Arkansas, and Louisiana. Volume three includes Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio, Kentucky, Virginia, West Virginia, Maryland, Delaware, New Jersey, Pennsylvania, and parts of New York and of Ontario province. Printed on thin, but opaque paper, and bound in dark blue flexible fabrikoid, a complete volume is but a scant inch in thickness.

A rearrangement of the territories covered by each volume has made it possible to plan more extended trips in almost any direction by the use of not more than two volumes. The large colored "route map" is folded into a transparent faced holder which can be placed opposite the printed route being followed, bringing graphic and detailed instructions immediately available.

The usual convenient city maps and "places of interest" notes add materially to the value of the book, which impresses one as being the most useful article that can be carried in the car on both long and short tours.—W. R. S.

An Outline History of China. Herbert H. Gowen and Joseph Washington Hall. D. Appleton and Company. 1926. 5½"x 8¼". 525 pp. Map. $4.00.

It has been said and often quoted that "East is East and West is West. and never the twain shall meet." The present disturbance in China seems to lend verification. The Western Civilizations, however have had a decided tendency to attempt to deal with China in the light of Western civilizations only. The Chinese, on the other hand, are most prone to regard the Western Nations as mere upstarts who should learn at the shrine of the world's oldest civilization.

The authors of this brief outline history of China have most successfully endeavored to present in one brief volume an outline of almost five thousand years of Chinese history. As to the purpose of the book, the authors can best speak for themselves. At the close of the preface they state:

> American institutions are being studied in every school in China. Every Chinese pupil can name the great men of our history. How many of our American pupils, college students, or even teachers and professors, can name the outstanding figures of the "Immortal Nation," or give the briefest account of its beginnings, its characteristics, or its trend?
>
> The answer is the authors' apology for the present book.

In as much as the history of any nation is reflected in the lives and deeds of its leaders and heroes, the authors have given briefly the chief points of the principal leaders and teachers of China, throughout her history which have made these individuals heroes, saints, or—forgotten. Such a method of attack of a subject so voluminous as the history of a nation throughout more than four thousand years, gives the reader, in a most brief manner, the background of the Chinese nation and people; and it is with full regard for the history of her past, and the utmost reverence of those ancestors who made that history that the Chinese nation and people will act in their contact with the outside world.

The first half of the book rapidly reviews the history of China to include 1850 A. D. Although such review must needs be sketchy in the extreme, one is left with the impression that he has been introduced to the crucial points of the history of this people.

From the middle of the nineteenth century to the Tariff Conference of 1925, which closes the book, the work is more in detail, and the growth of the Chinese Nation is followed quite closely indeed. The growth of nationalistic ideas and ideals and the attempts of the Chinese to bring about their accomplishment are well presented.

In light of the recent developments in China, the exact quotation of the author's closing paragraphs would not seem amiss.

> For a half-century this mundane sphere has been a "White man's world." It was evident that China's recovery of full independence would bring the white man's world in Asia within appreciable distance of the end.
>
> Fortunately, changing conditions in China were making it easier for the foreigner to abdicate his special privileges. Some loss to foreign enterprises as well as foreign "face" was inevitable, and affiliated Chinese business was destined to suffer with it. But the day when extraterritorial prestige was an aid to both missionary and business man had passed. Business was more and more done through Sino-foreign partnerships in which extraterritoriality meant little and intercourse on a basis of equality meant much. In both religious effort and trade it was coming to be the personal touch with individual Chinese which counted.

The book closes with a comprehensive bibliography for those who would learn more of the background of the forces which are bringing about the present revolution in and of China.—G. H. B.

Theory of Vibrating Systems and Sound. By Irving B. Crandall. D. Van Nostrand Company, New York. 1926. 6"x 9". 272 pp. Ill. $5.00.

Dr. Crandall has prepared a text-book which is much more than merely a compilation of the progress of acoustics.

But what kind of a book is it? Is it one of those dry-as-dust tomes meant for the scientist? Can anyone who is not an expert find mental sustenance in it? On the face of it, it would appear to be very technical and highly specialized.

The author has applied the theory of vibrating systems and sound to the current problems which have come about because of the renewed interest in acoustics. He does not attempt to supply a complete treatise on sound, but presupposes a knowledge of the classical theories which he takes as his foundation in developing the new methods.

In the chapter on radiation and transmission, the theory of the finite exponential horn is developed. Another interesting feature is the chapter on architectural acoustics which has attracted much deserved attention largely as the result of the researches of Sabine and Watson.

Not the least important part of the book is the bibliographical data, which are carefully indexed under many subjects such as submarine signaling apparatus, under water sound detection, and depth finding, sound ranging apparatus, direction finding, airplane location.

This book, which is deservedly ranked as the first textbook on the new method, is of inestimable value to research workers, students in advanced acoustics, and those who may have a penchant for accoustic research.—J. J. J.

Imaginative Writing. By Adele Bildersee. D. C. Heath and Company. 1927. 4¾"x 7¼". 226 pp. $1.96.

The aim of this book is, as announced by the author, to guide students in learning how to write. The theme is simple: (1) Writing is an art difficult for all, but (2) it is an art attainable by all, for (3) through study and practice facility may be acquired.

The title is somewhat misleading, for the greater part of the book is devoted to descriptive and narrative writing, both of which require powers of observation and of narration rather than of imagination. Of expository writing and its analytical requirements bare mention is made, and of the exercise of imagination in them or plot building no mention at all is made. The presumption is that imagination not necessarily an important factor in short-story writing, for stress is laid upon building the story from material close at hand. The characters of the story are thus characters—individual or composite—known to the writer, and the conversation of these characters in the story becomes a tribute to the observation and memory of the writer.

Taught along these lines the student is encouraged, and his feet are set upon a conservative path. He will follow in the footsteps of many successful authors and later, as he acquires skill in sentence building and finds the mechanics of writing calling for less attention, he can give fuller play to his imagination.

The points made by the author are driven home by copious quotations, and are developed slowly enough to be readily grasped and retained by the student. The aspiring young writer will find the book an excellent starting point in the development of his literary ability.

Criminal Paris. By Netley Lucas. George H. Doran Company, New York. 1926. 5½"x 8¾". 235 pp. $3.50.

Here is an opportunity for the one-half of the world to find out how a part of the other half lives and operates. Paris, gayest and most cosmopolitan of cities, has an underworld second to none in breadth of its undertakings, its field, or the skill of its operators. To the student of criminology it offers one of the richest fields in the world—and probably the most dangerous, for neither student nor writer would be welcomed for long among Parisian crooks.

The author, who appears to have abandoned the field of crookdom for that of literature, possessed unusual facilities for pursuing his investigations in Paris. To his own record of achievements, which was not altogether unknown in France, he added the friendship of one of Europe's cleverest international crooks, who acted as "circerone through the human jungle of Paris' underworld." As one of the profession from another country, vouched for by his friend, he was able to visit and to secure first-hand information of the many strange haunts of Paris and to meet some of the world's most famous and cleverest crooks.

The result is an interesting (although not overly well assembled) account of many things: the Apaches, notorious the world over; French burglars, including "La Mouche," Paris' master cracksman; the hunchback of Algiers; the drug traffic in Paris; the victimization of tourists; the white slave traffic; counterfeiting; a school for women crooks; motor bandits; and many tales of many individuals, including the super-criminal "Bluebeard" Landru. Mr. Lucas may or may not have employed his imaginative faculties in his descriptions, but any one who has ever wandered around in the vicinity of Place Bastille, or through the side streets of Montmartre, or along the Seine at night, will suspect that the author wrote only what he saw. And any one who has ever unsuspectingly engaged a guide in front of, say, the Café de la Paix will, after reading the book, shudder at his own guilelessness and congratulate himself that there were no untoward consequences.

A Laboratory Plane Geometery. By William A. Austin. Scott, Foresman and Company, New York. 1926. 5½"x 8¼". 392 pp. Ill. $1.40.

The conventional text book on plane geometry treats a large part of the subject from the viewpoint of mathematical philosophy which has a somewhat remote bearing on the practical problems relating to plane figures. In this book, the viewpoint of deductive reasoning is subordinated and the geometrical theorems presented as a series of construction problems. In many theorems the proof is made obvious without discussion by the method used in construction of the figure. The usual geometrical relationships of lines, angles, polygons, and circles are covered in detail and illustrated by many interesting practical problems and examples.

The scope and aim of the work is given in the authors preface:

> . . . an explicit effort to apply modern laws of learning both to the content and to the method of plane geometry . . . through a technique of which the following are the outstanding features; (1) The consistant use of a laboratory plan for studying the subject—a plan of learning by doing; (2) a systematic use of geometrical drawing.

It is essentially an effort to introduce the applicatory method of study to a subject which has been presented almost without change since its inception. Simply worded text and profusely illustrated.—K. M.

A Satchel Guide to Europe. By William K. Rolfe. Revised by William D. Crockett. Rev. ed. Houghton Mifflin Company, Boston and New York. 1927. 4"x 6". lxxxii + 572 pp. Maps. $5.50.

This justly popular guide to travel in Europe, so well known to American tourists, reaches its forty-seventh annual edition. The inexperienced traveller, hesitating in the selection of a handbook on Europe from the great number available, cannot go wrong in choosing this. Compressed into small space are all the details of travel in a large part of Europe. Countries east of Russia, south of Czecho-Slovakia, and west of France alone are omitted.

Among the principal changes in the present edition are new chapters on motor routes, motoring in Europe, cycling in Europe, and travel by air; and revised or rewritten chapters on air lines and changes recent and prospective. Of special value to the inexperienced traveller is the Introduction: "Hints for the Tourist," which includes such miscellaneous subjects as preparatory study, money, cost of the tour, luggage, passports, hotel expenses, fees and tips, laundry, local guides, shopping, addresses of interest to tourists, etc. In connection with preparatory study, a comprehensive bibliography provides recommendations for all the reading the tourist can hope to accomplish, including books as recent as Wilstach's *Islands of the Mediterranean* and Muirhead's *Wayfarer in Switzerland.*

Travel always has an object or a destination. For the tourist it is usually an object, the attainment of which is made easy by the *Satchel Guide.* Of perhaps half a dozen books that will accompany the tourist in central Europe, this is the only one which must be taken along regardless of itinerary.

All About Going Abroad. By Harry A. Franck. Brentano's, New York. 1927. 4"x 6½". 160 pp. Maps. $1.00.

When you find yourself poring over atlases and maps of foreign countries, when you develop an usual interest in books of travel and guide books, when you begin to study time tables and schedules, you might as well cease to struggle. Lay up the flivver and put the radio out of commission, for you are going abroad. The state of your pocketbook need make little difference, and the time of the year less. Travel is no longer limited to the wealthy, and somewhere the season is just right no matter when you take your vacation.

The starting point is this little book which tells all about going abroad. The author draws upon a wealth of experience in advising where, when, and how to go, what to take, how to prepare, what it will cost, and all the important—but frequently annoying—details of passports, visas, guides, hotels, tipping. etc. Few men have journeyed farther than Mr. Franck, as many of us know from his delightful books, and in this little volume he carries us in one breath from Argentine to Japan and from China to Europe.

The book is an excellent example of condensation—a veritable "diminutive encyclopedia"—for in 107 small pages the author gives a surprising amount of information, including the principal points of interest in thirty-five countries, things not to be missed in twenty-eight cities, rates of exchange, foreign weights and measures, and foreign customs. The fifty-four pages left blank for a travel diary, record of expenses, and memoranda may not be required, for other and more detailed literature will be bought before the trip begins. The purchase, however, should be postponed until a study of Mr. Franck's book has helped to determine when and where the trip is to be taken.

Index to Volume 66

January to June, 1927

I. AUTHORS

BAIRD, C. W. Coast Artillery Memorandum No. 7 44
BEEBE, M. O. The Discipline of Details (Professional Notes) 465
BENITEZ, E. M. Coast Defense 500
BRAND, C. E. The Training of a C. M. T. C. Antiaircraft Battery 20
BUTLER, H. L. The Modified Noyes Puff Board for Moving Targets 133
CRANFORD, T. G. A Short Discourse on the Japanese Language 346
DAVIS, R. C. The Adjutant General's Department 99
DEDIEU-ANGLADE. Notes on Artillery Fire 444
DYER, E. L. Fortress Facing the Sea 473
ENSLOW, H. R. Preparedness—The Guarantee of Peace 224
FLORY, L. D. Making Use of the 155-mm. G. P. F. in Our Fixed Defenses 218
GEERE, F. Military Mental Methods 322
GILBERT, W. J. The Grand Old Army of the Future 531
GREENWOOD, D. B. Some High Spots in the Training of a Railway Artillery Battery 114
HARMON, B. F. Preparation and Adjustment of Antiaircraft Fire 399
HARRIS, C. S. The Preparation of Fire for Antiaircraft Artillery 485
HEDRICK, H. B. Probable Errors in Bombing and Antiaircraft Fire (Professional Notes) 368
HERO, A. Annual Report of the Chief of Coast Artillery 1
Letter (Editorial) 71
HINMAN, G. W. Adequate defense of Nation Necessary to Peace of World and Prosperity of America (Professional Notes) 367
HOHENTHAL, W. D. A Study of Artillery Fire Control with Special Reference to the Sixteen-Inch Rifle 310
IRELAND, M. L. Army Officers' Pay 333
JOHNSON, R. L. An Improved T. I. System for Mobile Artillery 327
JOHNSTON, J. R. Fort Morgan, Alabama (Professional Notes) 365
JOHNSTON, J. R. Harbor Defenses of Portland (Professional Notes) 76
JONES, C. The Personnel Outlook as Viewed from the Office of the Chief of Coast Artillery 30
KILBOURNE, C. E. The Strategic Position of the United States 389
MACNIDER, H. The Problem of National Defense (Professional Notes) 362
MCWILLIAMS, W. S. The Profession (?) of Arms (Professional Notes) 464
MILLER, S. M. The Dardanelles Naval Attack (Professional Notes) 364
MONOD. The Red Army 122
PATRICK, G. A. Mechanical Fire Adjustment 298
POULEUR. Determination of the Muzzle Velocity of Projectiles (Professional Notes) 457
REIERSON, J. E. A More Effective Danger Volume for Antiaircraft 426

RENDULIC. Fundamental Principles and Spirit of French, English, and German *Fighting Regulations of Today and Some of the Reasons for Their Divergences* (Professional Notes) 460
ROSS, C. B. Military Policy of the United States 418
SACKVILLE, W. A Suggestion for a New Method Locating Aircraft at Night 411
SMITH, R. H. The Combined Arms in Coast Defense 197
SUMMERALL, C. P. The Human Element in War 293
SUMMERALL, C. P. Letter 1
WANGENHEIM, BARON VON. The Use of Flying Craft in the Service of Supply 258
WARNER, O. C. A Moving Target Device for Training Range Sections (Professional Notes) 359
WUCZKOWSKI, H. Command or Directive Order: A Contribution to Fighting Training (Professional Notes) 261
WYLLIE, R. E. Colors, Standards, and Guidons 517

II. SUBJECTS

Adequate Defense of Nation Necessary to Peace of World and Prosperity of America (Professional Notes) 367
Adjustment of Fire:
- Field Artillery Observers to Direct Fire Urged (Professional Notes) 257
- Mechanical Fire Adjustment 298
- A More Effective Danger Volume for Antiaircraft 426
- *Preparation and Adjustment of Antiaircraft Fire* 399
- The Preparation of Fire for Antiaircraft Artillery 485

The Adjutant General's Department 99
Administration:
- Command or Directive Order: A Contribution to Fighting Training (Professional Notes) 261

Aeronautics, Military:
- A Practice Hop in Hawaii (Illus.) 197
- The Use of Flying Craft in the Service of Supply 258

The Annual Prize Essay (Editorial) 247
Annual Report of Chief of Coast Artillery 1
Antiaircraft Artillery in Italy (Professional Notes) 75
Antiaircraft Defense:
- Antiaircraft Development (Professional Notes) 544
- Antiaircraft Firing by 213th C. A. (AA), Pa. N. G. (Professional Notes) 547
- A More Effective Danger Volume for Antiaircraft 426
- Preparation and Adjustment of Antiaircraft Fire 399
- The Preparation of Fire for Antiaircraft Artillery 485
- A Suggestion for a New Method of Locating Aircraft at Night 411

Antiaircraft Development (Professional Notes) 544
Antiaircraft Firing by 213th C. A. (AA), Pa. N. G. (Professional Notes) 547
The Army (Editorial) 353
Army Correspondence Courses 229
Arms, Coat of:
- The Eleventh Coast Artillery (HD) (Professional Notes) 165
- The Fourteenth Coast Artillery (HD) (Professional Notes) 455
- Tenth Coast Artillery (HD) (Professional Notes) 73

The Thirteenth Coast Artillery (HD) (Professional Notes) 358
The Twelfth Coast Artillery (HD) (Professional Notes) 253
Army Officers' Pay 333
Army Training for War (Editorial) 250
Artillery—Firing:
Notes on Artillery Fire 444
Artillery—Tactics:
Notes on Artillery Fire 444
Artillery—Training:
Coast Artillery Training (Editorial) 453
Artillery, Antiaircraft:
Field Exercises for Antiaircraft Artillery 47, 139
The Preparation of Fire for Antiaircraft Artillery 485
Artillery, Antiaircraft—Firing:
Probable Errors in Bombing and Antiaircraft Fire (Professional Notes) 368
Artillery, Coast:
Annual Report of the Chief of Coast Artillery 1
Coast Artillery in Coast Defense (Editorial) 539
Coast Artillery Memorandum No. 7 44
Coast Artillery Training (Editorial) 453
Coast Defense 500
Harbor Defenses of Portland (Professional Notes) 76
Letter of General Summerall 1
Mechanical Fire Adjustment 298
The Personnel Outlook as Viewed from the Office of the Chief of Coast Artillery 30
Artillery, Coast—Reserves:
An Invitation to All Ye Roaming Artillerymen (Professional Notes) 78
National Guard and Reserve Officers' Classes, Coast Artillery School, 1926 (Illus.) 99
Artillery, Coast—10th (HD):
Tenth Coast Artillery (Professional Notes) 73
Artillery, Coast—11th (HD):
The Eleventh Coast Artillery (Professional Notes) 165
Artillery, Coast, 12th (HD):
The Twelfth Coast Artillery (Professional Notes) 253
Artillery, Coast, 13th (HD):
The Thirteenth Coast Artillery (Professional Notes) 358
Artillery, Coast, 14th (HD):
The Fourteenth Coast Artillery (Professional Notes) 455
Artillery, Coast, 15th (HD):
Fifteenth Coast Artillery (Professional Notes) 543
Artillery, Coast, 64th (AA):
Target Practice Results, 64th Coast Artillery (Professional Notes) 174
Artillery, Coast, 64th (AA)—Battery I:
Battery I, 64th Coast Artillery (Professional Notes) 75
Artillery, Field:
Field Artillery Observers to Direct Fire Urged (Professional Notes) 257

Artillery, Heavy, Fixed:
Making Use of the 155-mm. G. P. F. in our Fixed Defenses 218
Artillery, Heavy, Mobile:
An Improved T. I. System for Mobile Artillery 327
Artillery, Heavy, Mobile—Railroad:
Some High Spots in the Training of a Railway Artillery Battery 114
Ballistics:
Determination of the Muzzle Velocity of Projectiles (Professional Notes) .. 467
A New Work on Ballistics (Professional Notes) 253
Battery I, 64th Coast Artillery (Professional Notes) 75
Battle Casualties of the United States Army in the World War (Professional Notes) 78
Boarding Naval Vessels (Professional Notes) 362
Bombing:
Probable Errors in Bombing and Antiaircraft Fire (Professional Notes) ... 358
Bulletin Belge Des Sciences Militaires:
Determination of the Muzzle Velocity of Projectiles (Professional Notes) .. 467
Chicago Tribune:
The Army (Editorial) 353
The New French Army Plan (Editorial) 250
Citizens' Military Training Camps:
The Training of a C. M. T. C. Antiaircraft Battery 20
Coast Artillery in Coast Defense (Editorial) 539
COAST ARTILLERY JOURNAL:
Ex-Kaiser Reads the Journal (Editorial) 352
The Journal (Editorial) 72
Letter of General Hero 71
Coast Artillery Memorandum No. 7 44
Coast Artillery School:
Colonel Francis L. Guenther, Commandant Artillery School, September 3, 1900—February 22, 1902 (Illus.) 350
Colonel John P. Story, Commandant Artillery School, March 11, 1902—January 24, 1904 (Illus.) 475
Faculty and Staff, The Coast Artillery School, 1927 (Illus.) 485
Lieutenant Colonel Royal T. Frank, Commandant Artillery School, November 6, 1888—March 26, 1898 (Illus.) 253
National Guard and Reserve Officers' Classes, Coast Artillery School, 1926 (Illus.) 99
Coast Artillery Training (Editorial) 453
Coast Defense:
Coast Artillery in Coast Defense (Editorial) 539
Coast Defense 500
The Combined Arms in Coast Defense 197
The Dardanelles Naval Attack (Professional Notes) 354
Making Use of the 155-mm. G. P. F. in Our Fixed Defenses 218
Coast Defense 500
Colleges:
Report of Association of Land-Grant Colleges (Professional Notes) 180

Colonel Francis L. Guenther, Commandant Artillery School, September 3, 1900—February 22, 1902 (Illus.) 350
Colonel John P. Story, Commandant Artillery School, March 11, 1902—January 24, 1904 (Illus.) 475
The Combined Arms in Coast Defense 197
Command or Directive Order: A Contribution to Fighting Training (Professional Notes) 261
Dardanelles—Siege, 1916:
The Dardanelles Naval Attack (Professional Notes) 354
The Dardanelles Naval Attack (Professional Notes) 364
Deflection Boards:
Interpolator for Coast Artillery Board Universal Deflection Board and Percentage Corrector (Professional Notes) 356
Determination of the Muzzle Velocity of Projectiles (Professional Notes) 467
Detroit Free Press:
This Should be Explained (Editorial) 354
Discipline:
The Discipline of Details (Professional Notes) 455
The Discipline of Details (Professional Notes) 465
Editorials:
The Annual Prize Essay 247
The Army 353
Army Training for War 250
Coast Artillery in Coast Defense 539
Coast Artillery Training 453
Ex-Kaiser Reads the Journal 352
Inactive Service by Reserve Officers 537
Inadequate Defense is Profligacy 249
The Journal 72
Letter of General Hero 71
Mapping the Missouri River 355
The New French Army Plan 250
The Regular Army 248
This Should be Explained 354
The Eleventh Coast Artillery (Professional Notes) 165
European war, 1914-1918—U. S.:
Battle Casualties of the United States Army in the World War (Professional Notes) 78
Evergreen Chatter:
The Profession (?) of Arms (Professional Notes) 464
Ex-Kaiser Reads the Journal (Editorial) 352
Extracts from Annual Reports (Professional Notes) 167
Faculty and Staff, The Coast Artillery School, 1927 (Illus.) 485
Field Artillery Observers to Direct Fire Urged (Professional Notes) 257
Field Exercises for Antiaircraft Artillery 47, 139
Fifteenth Coast Artillery (Professional Notes) 543
Fire Control:
A Moving Target Device for Training Range Sections (Professional Notes) 359
A Study of Artillery Fire Control With Special Reference to the Sixteen-Inch Rifle 310

Flags:
Colors, Standards, and Guidons 517
Fort Morgan, Alabama:
Fort Morgan, Alabama (Professional Notes) 365
Fortress Facing the Sea 473
The Fourteenth Coast Artillery (Professional Notes) 455
French—Army:
The New French Army Plan (Editorial) 250
Frank, R. T.:
Lieutenant Colonel Royal T. Frank, Commandant Artillery School, November 6, 1888—March 26, 1898 (Illus.) 253
Fundamental Principles and Spirit of French, English, and German Fighting Regulations of Today and Some of the Reasons for Their Divergences (Professional Notes) 460
Gt. Brit.—Army—Promotions:
Principles Governing Promotion in the British Army (Professional Notes) 547
Guenther, F. L.:
Colonel Francis L. Guenther, Commandant Artillery School, September 3, 1900—February 22, 1902 (Illus.) 350
Gunnery:
A More Effective Danger Volume for Antiaircraft 426
Guns—16-inch:
A Study of Artillery Fire Control With Special Reference to the Sixteen-Inch Rifle 310
Harbor Defenses of Portland (Professional Notes) 76
Hawaii:
A Practice Hop in Hawaii (Illus.) 197
The Human Element in War 293
The Hump in Promotion (Professional Notes) 79
Idaho (Battleship) U. S.:
U. S. S. *Idaho* (Illus.) 293
An Improved T. I. System for Mobile Artillery 327
Inactive Service by Reserve Officers (Editorial) 537
Inadequate Defense is Profligacy (Editorial) 249
Indianapolis News:
Army Training for War (Editorial) 250
An Invitation to All Ye Roaming Artillerymen (Professional Notes) 78
Interpolator:
Interpolator for Coast Artillery Board Universal Deflection Board and Percentage Corrector (Professional Notes) 356
Interpolator for Coast Artillery Board Universal Deflection Board and Percentage Corrector (Professional Notes) 356
Isabel (Patrol) U. S.:
Patrol Vessel *Isabel* (Illus.) 389
Italy—Artillery, Antiaircraft:
Antiaircraft Artillery in Italy (Professional Notes) 75
Japanese Language:
A Short Discourse on the Japanese Language 346

The Journal (Editorial) 72
Journal Militaire Suisse:
The Red Army 122
Land Grant Colleges:
Report of Assocation of Land-Grant Colleges (Professional Notes) 180
Lieutenant Colonel Royal T. Frank, Commandant Artillery School, November 6, 1888—March 26, 1898 (Illus.) 253
Making Use of the 155-mm. G. P. F. in Our Fixed Defenses 218
Mapping the Missouri River (Editorial) 355
Mechanical Fire Adjustment 298
A Method of Training National Guard (Professional Notes) 550
Military Courtesy:
Boarding Naval Vessels (Professional Notes) 362
Military Education—U. S.:
Army Correspondence Courses 229
The Strategic Position of the United States 389
Military Mental Methods 322
Military Policy of the United States 418
Military Training:
A Method of Training National Guard (Professional Notes) 550
Military Mental Methods 322
Militär-Wochenblatt:
The Use of Flying Craft in the Service of Supply 258
Utilization of War Experiences (Professional Notes) 456
Minneapolis Journal:
The Regular Army (Editorial) 248
Minneapolis Tribune:
Inadequate Defense is Profligacy (Editorial) 249
Missouri River:
Mapping the Missouri River (Editorial) 355
The Modified Noyes Puff Board for Moving Targets 133
A More Effective Danger Volume for Antiaircraft 426
A Moving Target Device for Training Range Sections (Professional Notes) 359
National Defense:
Army Training for War (Editorial 250
Inadequate Defense is Profligacy (Editorial) 249
Preparedness—The Guarantee of Peace 224
The Problem of National Defense (Professional Notes) 362
Utilization of War Experiences (Professional Notes) 456
National Defense—U. S.:
The Grand Old Army of the Future 531
Military Policy of the United States 418
National Guard and Reserve Officers' Classes, Coast Artillery School, 1926 (Illus.) 99
New Classification for Reserve Officers (Professional Notes) 255
The New French Army Plan (Editorial) 250
New Plan for Inactive Units, Regular Army (Professional Notes) 257
A New Work on Ballistics (Professional Notes) 263
Notes on Artillery Fire 444

Noyes Puff Board:
The Modified Noyes Puff Board for Noving Targets 133
Oesterreichische Wehrzeitung:
Command or Directive Order: A Contribution to Fighting Training (Professional Notes) 261
Officers, Commissioned:
Army Officers' Pay 333
The Profession (?) of Arms (Professional Notes) 464
Officers' Reserve Corps:
Inactive Service by Reserve Officers (Editorial) 537
New Classification for Reserve Officers (Professional Notes) 255
Pacifism:
This Should be Explained (Editorial) 354
Patrol Vessel *Isabel* (Illus.) 389
The Personnel Outlook as Viewed from the Chief of Coast Artillery 30
Portland, Harbor Defenses of:
Harbor Defenses of Portland (Professional Notes) 76
A Practice Hop in Hawaii (Illus.) 197
Preparation and Adjustment of Antiaircraft Fire 399
The Preparation of Fire for Antiaircraft Artillery 485
Preparedness—The Guarantee of Peace 224
Principles Governing Promotion in the British Army (Professional Notes) 547
Prize Essay Competition, 17th:
The Annual Prize Essay (Editorial) 247
Prize Essay Competition, 17th, First:
The Combined Arms in Coast Defense 197
Prize Essay Competition, 17th, Second (Tie):
Mechanical Fire Adjustment 298
Preparation and Adjustment of Antiaircraft Fire 399
A Suggestion for a New Method of Locating Aircraft at Night 411
Prize Essay Competition, 17th, Honorable Mention:
The Preparation of Fire for Antiaircraft Artillery 485
Prize Essay Competition, Second—Target Practice:
The Training of a C. M. T. C. Antiaircraft Battery 20
Prize Essay Competition, Third—Target Practice:
Some High Spots in the Training of a Railway Artillery Battery 114
Probable Errors in Bombing and Antiaircraft Fire (Professional Notes) 368
The Problem of National Defense (Professional Notes) 362
Professional Notes:
Adequate Defense of Nation Necessary to Peace of World and Prosperity of America 367
Antiaircraft Artillery in Italy 75
Antiaircraft Development 544
Antiaircraft Firing by 213th C. A. (AA), Pa. N. G. 547
Battery I, 64th Coast Artillery (AA) 75
Battle Casualties of the United States Army in the World War 78
Boarding Naval Vessels 362
Command or Directive Order: A Contribution to Fighting Training 261
The Dardanelles Naval Attack 364

Determination of the Muzzle Velocity of Projectiles 467
The Discipline of Details 465
The Eleventh Coast Artillery 165
Extracts from Annual Reports 167
Field Artillery Observers to Direct Fire Urged 257
Fifteenth Coast Artillery (HD) 543
Fort Morgan, Alabama 365
The Fourteenth Coast Artillery (HD) 455
Fundamental Principles and Spirit of French, English, and German Fighting Regulations of today and Some of the Reasons for Their Divergences 460
Harbor Defenses of Portland 76
The Hump in Promotion 79
Interpolator for Coast Artillery Board Universal Deflection Board and Percentage Corrector 356
An Invitation to All Ye Roaming Artillerymen 78
A Method of Training National Guard 550
A Moving Target Device for Training Range Sections 359
New Classification for Reserve Officers 255
New Plan for Inactive Units, Regular Army 257
A New Work on Ballistics 263
Principles Governing Promotion in the British Army 547
Probable Errors in Bombing and Antiaircraft Fire 368
The Problem of National Defense 362
The Profession (?) of Arms 464
Report of Association of Land-Grant Colleges 180
R. O. T.C. Graduates 78
Savings Effected by Salvage 179
Target Practice Results, 64th Coast Artillery 174
Tenth Coast Artillery (HD) 73
The Thirteenth Coast Artillery (HD) 358
The Twelfth Coast Artillery (HD) 253
The Use of Flying Craft in the Service of Supply 258
Utilization of War Experiences 456
The Profession (?) of Arms (Professional Notes) 464
Projectiles:
Determination of the Muzzle Velocity of Projectiles (Professional Notes) 467
Range Boards:
The Modified Noyes Puff Board for Moving Targets 133
Range Sections:
A Moving Target Device for Training Range Sections (Professional Notes) 359
The Red Army 122
The Regular Army (Editorial) 248
Report of Association of Land-Grant Colleges (Professional Notes) 180
Reserve Officers' Training Corps:
Report of Association of Land-Grant Colleges (Professional Notes) 180
Revue d'Artillerie:
Notes on Artillery Fire 444
R. O. T. C. Graduates (Professional Notes) 78

Russia—Army:
The Red Army 122
Salvage:
Savings Effected by Salvage (Professional Notes) 179
Savings Effected by Salvage (Professional Notes) 179
A Short Discourse on the Japanese Language 346
Some High Spots in the Training of a Railway Artillery Battery 114
Story, J. P.:
Colonel John P. Story, Commandant Artillery School, March 11, 1902—January 24, 1904 (Illus.) 475
The Strategic Position of the United States 389
A Study of Artillery Fire Control with Special Reference to the Sixteen-Inch Rifle 310
A Suggestion for a New Method of Locating Aircraft at Night 411
Tactics:
Fundamental Principles and Spirit of French, English, and German Fighting Regulations of Today and Some of the Reasons for Their Divergences (Professional Notes) 460
Utilization of War Experiences (Professional Notes) 456
Target Practice:
Antiaircraft Firing by 213th C. A. (AA), Pa. N. G. (Professional Notes) 547
Coast Artillery Memorandum No. 7 44
Target Practice Results, 64th Coast Artillery (Professional Notes) 174
Target Practice Results, 64th Coast Artillery (Professional Notes) 174
Tenth Coast Artillery (Professional Notes) 73
The Thirteenth Coast Artillery (Professional Notes) 358
This Should be Explained (Editorial) 354
Time Interval System:
An Improved T. I. System for Mobile Artillery 327
The Training of a C. M. T. C. Antiaircraft Battery 20
The Twelfth Coast Artillery (Professional Notes) 253
U. S.—Army:
The Adjutant General's Department 99
The Army (Editorial) 353
Extracts from Annual Reports (Professional Notes) 167
The Grand Old Army of the Future 531
The Regular Army (Editorial) 248
U. S.—Army—Correspondence Courses:
Army Correspondence Courses 229
U. S.—Army—Pay and Allowances:
Army Officers' Pay 333
U. S.—Army—Promotion:
The Hump in Promotion (Professional Notes) 79
U. S.—Army—Regulars:
New Plan for Inactive Units, Regular Army (Professional Notes) 257
U. S.—Army—Reserves:
Inactive Service by Reserve Officers (Editorial) 537
New Classification for Reserve Officers (Professional Notes) 255
U. S.—Army—Salvage:
Savings Effected by Salvage (Professional Notes) 179

U. S.—Army—Training:
Army Training for War (Editorial) 250
U. S.—Defenses:
The Strategic Position of the United States 389
U. S.—Militia:
National Guard and Reserve Officers' Classes, Coast Artillery School, 1926 (Illus.) 99
A Method of Training National Guard (Professional Notes) 550
U. S. Adjutant General's Dept.:
The Adjutant General's Department 99
U. S. S. *Idaho* (Illus.) 293
The Use of Flying Craft in the Service of Supply 258
Utilization of War Experiences (Professional Notes) 456
War:
The Human Element in War 293
Wehrzeitung:
Fundamental Principles and Spirit of French, English, and German Fighting Regulations of Today and Some of the Reasons for Their Divergences (Professional Notes) 460

III. BOOK REVIEWS

AUSTIN, F. B. The War God Walks Again. 1926 196
AUSTIN, W. A. A Laboratory Plane Geometry. 1926 563
Automobile Blue Book, Vol. 2 and 3. 1927 560
BILDERSEE, A. Imaginative Writing. 1927 562
BUTLER, S. D. Walter Garvin in Mexico. 1927 388
BYRNE, P. E. Soldiers of the Plains. 1926 91
CARTER, J. Man is War. 1926 287
CRANDALL, I. B. Theory of Vibrating Systems and Sound. 1926 562
CURTIS, E. E. The Organization of the British Army in the American Revolution. 1926 292
DALY, R. A. Our Mobile Earth. 1926 388
DRURY, A. The Metric Advance. 1926 94
FOWLER, H. W. A Dictionary of Modern English Usage. 1926 92
FRANCK, H. A. All About Going Abroad. 1927 564
GEER, W. Campaigns of the Civil War. 1926 97
GOWEN, H. H. An Outline History of China. 1926 561
HARRELL, I. S. Loyalism in Virginia. 1926 195
HINKHOUSE, F. J. The Preliminaries of the American Revolution as Seen in the English Press, 1763-1775 93
HIRST, F. W. British War Budgets. 1926 385
HUGHES, R. George Washington, the Human Being and the Hero, 1732-1762. 1926 384
JAMES, W. M. The British Navy in Adversity. 1926 94
JONES, D. L. Diesel Engines. 1926 97
KNOWLES, D. The American Civil War. 1926 383
KUYKENDALL, R. S. A History of Hawaii. 1926 385
LAWRENCE, T. E. Revolt in the Desert. 1927 557

LUCAS, N. Criminal Paris 563
LUDWIG, E. Napoleon. 1926 289
LUDWIG, E. Wilhelm Hohenzollern. 1927 557
MACARTNEY, C. E. Highways and Byways of the Civil War. 1926 195
MACDONALD, H. G. Canadian Public Opinion on the American Civil War. 1926 96
MACINNES, T. Chinook Days. 1926 92
MAURICE, F. Statesmen and Soldiers of the Civil War. 1926 381
MOULTON, F R. New Methods in Exterior Ballistics. 1926 383
PHIPPS, R. W. The Armies of the First French Republic and the Rise of the Marshals of Napoleon I 483
PRICHARD, J. L. The Book of the Aeroplane. 1926 387
ROBERTSON, W. Soldiers and Statesmen, 1914-1918 193
ROLFE, W. K. A Satchel Guide to Europe. 1927 564
RUCKER, W. C. Leadership—A Manual on Conduct and Administration. 1926 93
RUSSELL, P. Benjamin Franklin: The First Civilized American. 1926 95
SHERMAN, W. C. Air Warfare. 1926 98
STEPHENSON, N. W. An Autobiography of Abraham Lincoln. 1926 290
STONE, E. W. Elements of Radio Communication. 1926 388
SULLIVAN, C. J. Army Posts. 1926 387
TAYLOR, W. I. Reminder List for Field Training. 1926 388
TURNER, T. A. The Causes of War and the New Revolution. 1927 484
WALKER, A. T. Cæsar's Gallic War. 1926 96
WILLIAMS, A. Conquering the Air. 1926 386
WRISTON, R. C. Hawaii Today. 1926 93

IV. COAST ARTILLERY BOARD NOTES

Aerial Spotting and Communications from Spotting Plane to Ground 268
Artillery, Antiaircraft:
Effect of Horizontal Distance on Antiaircraft Ballistic Wind 374
Modification of Elevation and Correction Pointers on AA Sight for 3-Inch AA Gun, Model 1917-1918 476
Correction Pointers:
Modification of Elevation and Correction Pointers on AA Sight for 3-Inch AA Gun, Model 1917-1918 476
Data Routing, Position Finding and Fire Control, Naval Targets, Case II and III 556
Deflection Computor T-1 87
Dummy Projectiles, 12-inch Gun 187
Effect of Horizontal Distance on Antiaircraft Ballistic Wind 374
Fire Control Instruments:
Deflection Computer T-1 87
Jackson Sound Lag Computer 376
Meteorology:
Effect of Honizontal Distance on Antiaircraft Ballistic Wind 374
Modification of Elevation and Correction Pointers on AA Gun, Model 1917-1918 476
Projectiles:
Dummy Projectiles, 12-inch Gun 187

Sights:
Modification of Elevation and Correction Pointers on AA Sight for 3-Inch AA Gun, Model 1917-1918 476
Sound Locaters:
Jackson Sound Lag Computer 376
Spotting, Aerial:
Aerial Spotting and Communications from Spotting Plane to Ground 268

V. MILITARY NOTES

Army Pigeon Service (Japan) 478
Aviation Training for Cadets of Military Academy (Japan) 478
Belgium:
Standard of Noncommissioned Officers 266
Belgium—Army—Officers, Noncommissioned:
Standard of Noncommissioned Officers 266
Chemical Warfare:
Toxic Gas Field Exercise (Japan) 265
China:
Manchurian Armored Train 481
China—Army:
Manchurian Armored Train 481
China—Army—Officers:
Chinese Officers in Japanese Military Schools 181
Chinese Officers in Japanese Military Schools (Japan) 181
Distribution of the French Army in 1927 (France) 184
Emergency Entrainment of a Tank Battalion (France) 83
France:
Distribution of the French Army in 1927 184
Emergency Entrainment of a Tank Battalion 83
Functions of Chiefs of Branches and Inspectors General 265
New Pay Rates for the French Army 479
Reduction of the French Army 83
France—Army:
Distribution of the French Army in 1927 184
Emergency Entrainment of a Tank Battalion 83
Functions of Chiefs of Branches and Inspectors General 265
Reduction of the French Army 83
France—Army—Pay, Allowances, etc:
New Pay Rates for the French Army 479
Functions of Chiefs of Branches and Inspectors General (France) 265
Germany:
A New Infantry School at Dresden 181
Germany—Infantry:
A New Infantry School at Dresden 181
Italy:
Physical Training in the Army 479

Italy—Army—Physical Training:
Physical Training in the Army 479
Japan:
Army Pigeon Service 478
Aviation Training for Cadets of Military Academy 478
Chinese Officers in Japanese Miltary Schools 181
Military Educational Films 84
Proposed Change in Length of Service 84
The Supreme Military Council 265
Toxic Gas Field Exercise 265
Japan—Army:
Military Educational Films 84
Proposed Change in Length of Service 84
The Supreme Military Council 265
Manchurian Armored Train (China) 481
Military Education—China:
Chinese Officers in Japanese Military Schools 181
Military Education—Germany:
A New Infantry School at Dresden 181
Military Education—Japan:
Aviation Training for Cadets of Military Academy 478
Military Educational Films 84
Military Education Russia:
Military Schools 184
Military Educational Films (Japan) 84
Military Schools (Russia) 184
A New Infantry School at Dresden (Germany) 181
New Pay Rates for the French Army (France) 479
Physical Training in the Army (Italy) 479
Pigeons:
Army Pigeon Service (Japan) 478
Proposed Change in Length of Service (Japan) 84
Reduction of the French Army (France) 83
Russia:
Military Schools 184
Standard of Noncommissioned Officers (Belgium) 266
The Supreme Military Council (Japan) 265
Toxic Gas Field Exercise (Japan) 265