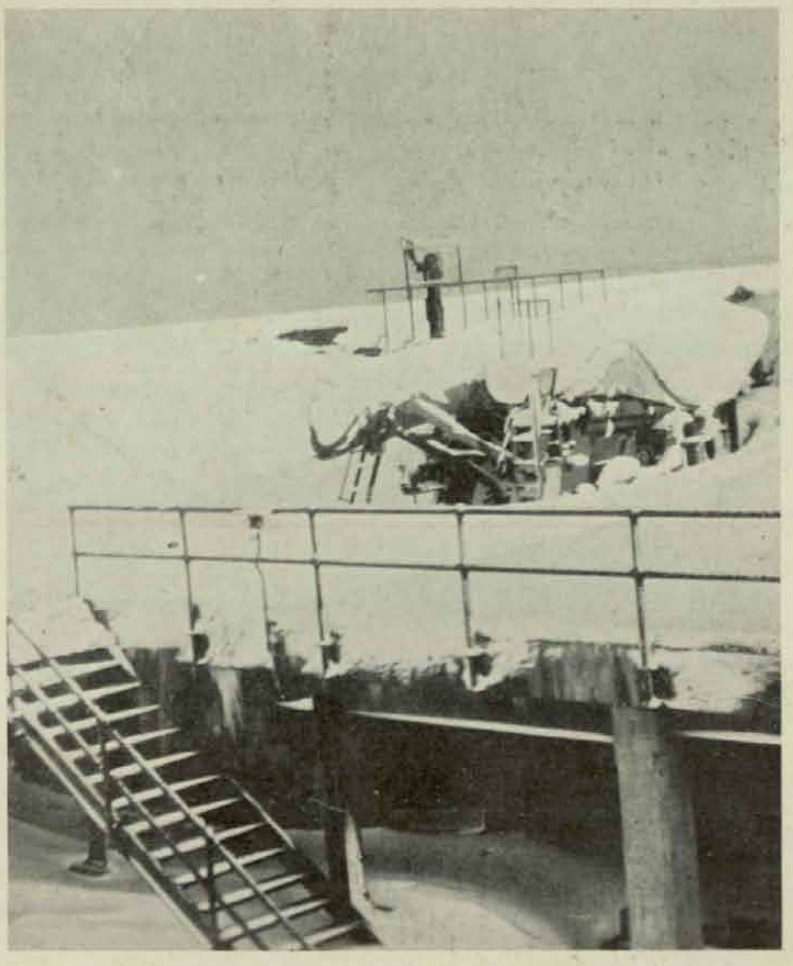
COAST ARTILLERY JOURNAL



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The Coast Artillery Journal

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THE COAST ARTILLERY JOURNAL

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THE UNITED STATES COAST ARTILLERY ASSOCIATION

AS THE Coast Artillery Association approaches its first anniversary it seems timely to report its progress and accomplishments to its members through the pages of the Journal.

It was formed and held its first meeting on January 10, 1930, with 2347 original members enrolled. These members are carried on the rolls as *charter* members. Since that time the membership has increased to 3865.

During the past year effort of the Executive Council of the Association has been devoted principally to organization and membership campaigns. Although the membership has not reached a point near its potential (about 8500) it has increased steadily. Considerable progress has been made in the formation of local chapters of the association. There are now organized chapters in all parts of the United States. Other chapters are in process of organization.

The following chapters have been recognized:

	Indiana (State)
Maine	Delaware (State)
West Point	Washington (D. C.)
Schenectady	203d C. A. (AA) (Mo. N. G.)
Metropolitan (New York City)	Houston (Texas) Antiaircraft
Philadelphia	University of Cincinnati (R. O. T. C.)
Western Pennsylvania (Pittsburgh)	Cincinnati Antiaircraft
Richmond	Duluth (Minn.)
Seattle (Wash.)	San Francisco

In connection with local chapters there seems to be some inclination to stand by and await instructions from the national headquarters. The founders of the Association never conceived an autocratic organization which would apply an inflexible rule to the conduct of activities of its local chapters. It was desired to create a coordinating agency for local organizations, working for the good of the Coast Artillery as a whole, which would produce unity of effort and smooth progress towards the accomplishment of the missions of the Coast Artillery Corps. Conducted in this manner the principal activity of the Association headquarters will be apparent in the furnishing of information to all components of the Coast Artillery upon which local chapters may act intelligently towards a common end. Its function is service rather than government. The success of the Coast Artillery Association will depend upon the initiative of its local chapters.

The income of the United States Coast Artillery Association has suffered greatly due to legislation enacted by the last Congress unfavorable to the Coast Artillery Journal. The effect of this legislation was to deprive the Journal of its advertising income and force it to adopt a bi-monthly schedule of publication. By reducing the frequency of publication and by increasing the number of its subscribers the Journal has been able to meet its obligations and maintain the quality of the publication. The number of subscribers is now more than double the number on January 1, 1930. This is a remarkable record in a time of business depression especially when it is considered that the subscription price of the Journal per copy has been doubled. The Coast Artillery Association has been able to continue publication of the Journal without drawing upon its reserve funds only through the excellent support and cooperation of its members. This support is appreciated by the Executive Council.

Early next year the Executive Council will consider a system of awards in the form of certificates, medals, cups, pennants or other trophies in recognition of outstanding professional accomplishments in the Coast Artillery by individuals or organizations. While the Chief of Coast Artillery has been prompt to recognize outstanding accomplishments by official letters it is believed that in the case of organizations a cup or similar trophy which may be displayed will add to their effect and will foster efforts to reach new higher standards of efficiency and attainment. The Coast Artillery competes at present only for the Knox Trophy awarded annually by the Massachusetts Chapter of the Sons of the American Revolution. This has been productive of excellent results but it is felt that it does not go far enough. The National Guard and Reserve units should be considered. It is possible that some medals or trophies for individuals may be issued. The Executive Council would welcome comments from members along these lines.

The thanks of the Association are due Brigadier General Joseph P. Tracy, Colonel Charles C. Dawes, Colonel James S. Ervin, and Lieut. Col. J. A. Green, retiring members of the Executive Council, for the intense interest and efficient service which they have given the Association. Their successors will be elected at the annual meeting to be held in Washington on January 9, 1932.

WAR DEPARTMENT

OFFICE OF THE CHIEF OF COAST ARTILLERY

WASHINGTON

IN extending the customary greetings of the season to the officers and enlisted men of the Coast Artillery of the Army of the United States, I do so with great satisfaction, having in mind the commendable progress which has been made in all Coast Artillery activities during the calendar year 1931.

Since July, 1930, I have visited all Coast Artillery stations where troops and detachments of the Coast Artillery are located in the United States, the Panama Canal Zone, the Hawaiian Islands and the Philippine Islands. It has been an inspiration to me to see our troops and detachments carrying on important tasks under difficult conditions with the highest efficiency and high morale.

There has been a marked improvement in the maintenance of seacoast artillery and materiel and in the training of all organizations and detachments assigned to harbor defenses. Certain adjustments in our harbor defenses have been initiated through the revision of existing projects and the formulation of new projects, which, I believe, will place our harbor defenses in the United States upon a sound and firm basis. Looking forward to the future I hope to see the development of a more flexible system of harbor defense wherein the fixed armament is reduced to that absolutely essential and is supplemented wherever practicable with railway and other types of movable artillery.

There has been progressive improvement in the organization, training, equipment and general efficiency of all antiaircraft artillery regiments and there has been progressive improvement in the development of antiaircraft artillery materiel. However, there remains a large and varied field in this activity for further investigation, study and development; all of which demands our best thought and efforts.

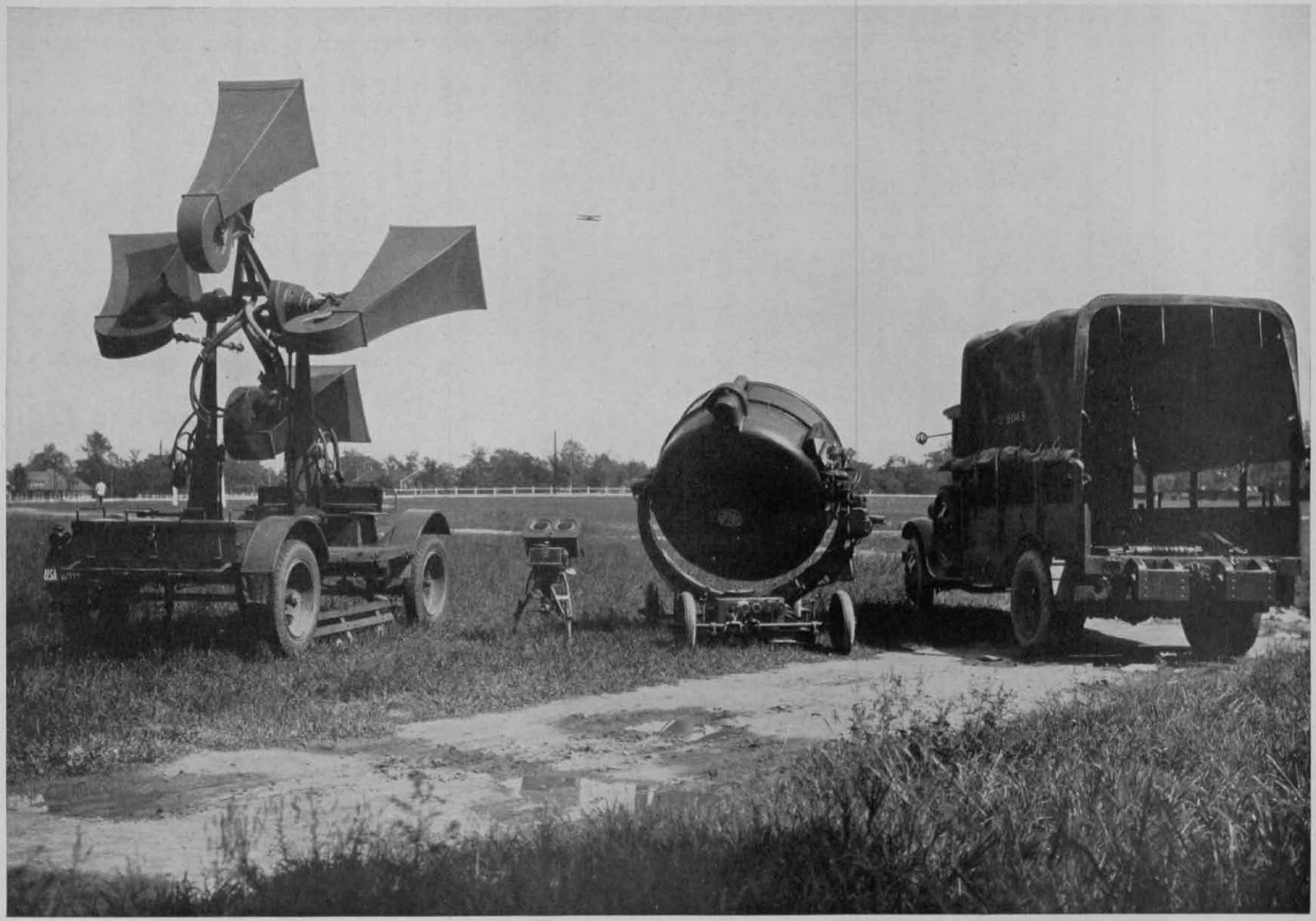
The employment of mechanical aids in fire control, such as directors, data transmission systems, spotting and other devices, is essential to the efficient conduct of fire of both seacoast and antiaircraft artillery and, while progress is being made in the development of these devices, I have frequently pointed out that these devices are purely mechanical aids and that they cannot replace the human element. Their efficient employment demands personnel with the highest standards of training and resourcefulness.

During the year I have visited many National Guard and Organized Reserve regiments and R. O. T. C. units at their home stations or during their field training. I have been impressed with the high standards of training being carried on in all of these components under limitations imposed upon them. They constitute important elements in the National Defense. I have been pleased to observe the intelligent manner in which Coast Artillery officers of the Regular Army are assisting in the training of these components and the splendid cooperation that they are receiving from the officers and members of the Coast Artillery civilian components.

The organization of the Coast Artillery Association, which was announced in the January, 1931, number of the Coast Artillery Journal, has proceeded satisfactorily. The membership now numbers approximately four thousand and is still increasing. Subscriptions to the Coast Artillery Journal have exceeded the highest point previously reached in its history. Through the Coast Artillery Association, more intimate contact has been established with all Coast Artillerymen and Coast Artillery organizations. I believe that the Association is fulfilling its announced purpose.

All of the above should be a source of satisfaction to all officers and enlisted men of the Coast Artillery of the Army of the United States and should cause us to look forward to the future with confidence, to a new year of even greater accomplishments. It is with these thoughts in mind that I extend to you my best wishes for a Merry Christmas and A Happy New Year.

Major General,
Chief of Coast Artillery.



LATEST ANTIAIRCRAFT AND SOUND LOCATOR EQUIPMENT.

Sound Locator MIEI, Comparator MVI, with Distant Electric Control MVI, 60-inch AA. Searchlight MVI (Sperry). Searchlight Truck and Power Plant MVI (Duplex).

Metal Mirrors, Night Glasses and Oscillators

By Major G. B. Robison, Coast Artillery Corps

IN other words, some of the high lights of the 1931 antiaircraft searchlight exercises held at Fort Humphreys, Virginia. If you have a passing, or better, interest in such matters, you may find profit in the summary which follows.

The work was sharply divided into two parts: the technical tests of new, or newly modified, materiel; and the tactical tests of our modern equipment in a 360 degree area defense.

Materiel Tested

The personnel was supplied mainly by the searchlight batteries of the 12th Coast Artillery, Ft. Monroe, Va., the 62nd Coast Artillery, Ft. Totten, N. Y., and the 69th Coast Artillery, Ft. McClellan, Ala. They arrived at Fort Humphreys, Va., by convoys, August 14, 1931. Two bombardment planes were sent from Langley Field to their base at Bolling Field on August

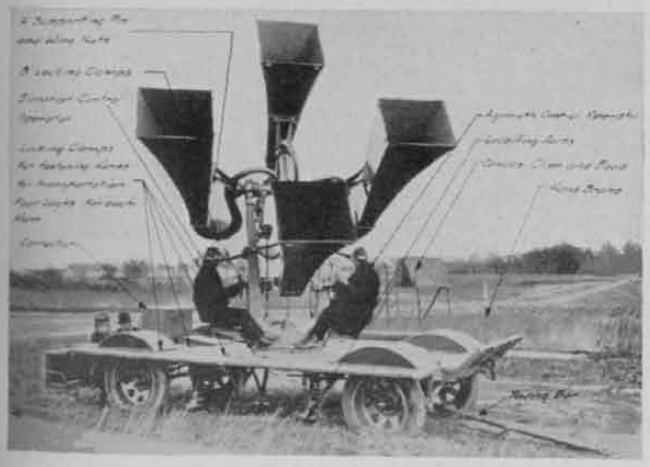


Fig. 1. Sperry Sound Locator.

17, and the technical tests began the same day. The service and cooperation rendered by the Air Corps throughout the tests was superb.

The sound locator units supplied were standard M1-E1 instruments equipped with acoustic correctors M1 and had been tested previously. It was known that they possess a high degree of mechanical accuracy and the tests made dealt mainly with comparatively minor matters. However, the Sperry Gyroscope Company submitted a unit which was built for the Italian government and which possessed a number of interesting features. An excellent idea of its appearance in the operating position may be obtained from the photograph, Figure 1. Some of the desirable and unique features of this locator are:

The bows and canvas cover for use when not operating. Comparatively light weight, removable end sections. Large platform surface provided by the hinged side boards.

Comparative isolation of the acoustic channels from the frame. Handwheel speeds about four times those of the M1-E1 without loss of accuracy or increase of noise.

The Sperry acoustic corrector is radically different from any previously produced, although a comparable machine is being developed by the Ordnance Department. It operates automatically, after the original settings are made, and continuously indicates the correction on a scale by means of a moving pointer. It includes corrections for wind and parallax, a fixed base line being used for the latter purpose. Because of its cost; the difficulty of obtaining accurate, up-to-the-minute meteorological data; and the mechanical difficulties incidental to new developments, it seemed desirable to defer a decision upon the eventual usefulness of such an instrument. It is likely however that some modification of this corrector, particularly the inclusion of the continuous rate feature for sound lag, with a continuous indicator, will be incorporated in future developments.

The Duplex searchlight trucks furnished for the tests were also the latest standard equipment. They are highly satisfactory in practically all important respects and few new recommendations were made in regard to them. The most serious defect of the present truck is the noise made by the engine when operating during an attack. Sound defilade is not always available in the field position and it will unquestionably be profitable if this source of disturbance to the locator listeners is reduced. Future searchlight trucks may

Fig. 2. Power Plant M-VI.

be equipped with wire reels to assist in wire laying. It was also recommended that telephonic communication be established regularly between the searchlight and its power plant when in the field. The standard

truck is shown in Figure 2. The elements of the complete unit are shown in the Journal frontispiece.

The truck for the Sperry-Italian light did not differ in any important respect from our standard equipment. A new Coleman truck was submitted for test, however, which had four double wheels in the rear, and numerous other differences. Its operating superiority to the standard Duplex did not seem to be sufficient to warrant its substitution, for the present, at least.

A portable power plant was also tested and considered suitable to the purpose for which it was designed.

A new type of distant electric control was submitted which was found to be superior to the present standard type. This present type has D. C. series wound power motors for azimuth and elevation which have movable brushes controlled by secondary D. C. step by step motors mounted within the case of the power motor. The new controller has only the primary motors which are themselves of the step by step type, thus eliminating the brush shifters. The new system is more rugged, simpler to maintain, of better design and smoother and more steady in action. It will probably supplant the present type in the future.

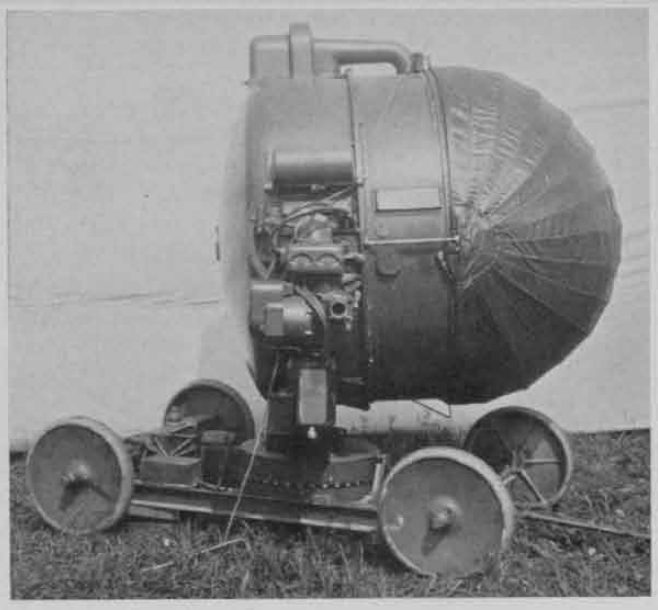


Fig. 3. Right Side of Mouse Trap Occulter (closed).

A demountable searchlight tower, 25 feet high, designed for harbor defense use, was tested primarily to determine its desirability for a mobile searchlight battery. It weighs slightly less than 8000 pounds, can be transported dismantled, in one truck, and can be erected or dismounted by ten trained men in less than a day. Its usefulness in the field is so extremely limited however, that its adoption for such employment was not recommended.

A new occulter, called "mouse trap" for some obscure reason, was tested and considered very satisfactory. An excellent idea of its appearance and important features may be obtained from Figure 3, where it is shown in the closed position. It is light in weight, simple to attach and operate, inexpensive, and completely effective in hiding the light. It is pulled into the position shown by a tug on the cord which runs through a pulley at the top of the light near the ventilator duct. When the cord is released, the occulter collapses downward until nothing remains in the beam except the cord. It is made of heavy cloth attached to semicircular, metal hoops pivoted at the two poles. The only disadvantages discovered in this occulter as compared to the metal shutter type are its probably shorter effective life and the difficulty of sending dot and dash light signals if desired. The metal shutters of the Sperry-Italian light were used once very effectively during the tactical exercises to send a message to one of the planes. The issue of any occulters to the service in time of peace is believed unnecessary.

Figure 4 shows, not too clearly, the searchlight oscillator, more familiarly known as a wobble-ator, originated and developed by Captain A. M. Jackson. It is mounted on the lower wooden base (with the handles) and consists essentially of three jacks which are raised and lowered at a speed, in a sequence, and to an extent determined by cams on shafts driven by an electric motor. Referring again to the picture, the upper wooden platform rests on these three jacks, one of which may be seen in the lower left corner, and the searchlight chassis frame rests on this platform, wheels clear of the ground. A portion of the single forward jack and the sprocket gear and chain which drives it, may be seen at the forward end of the platform. The motor, which derives its power from the same source as the searchlight, and the chain of gears, are behind the light. The motion of the jacks causes the beam to move in an ellipse around its true center. The major axis of the ellipse is vertical, giving greater search in elevation at low angles. The ellipse becomes a circle when the beam is vertical. The average diameter of the search is 3 degrees. The rate is ½ cycle per second. The purpose of the device is to search in the direction indicated by the locator at a rate slow enough to show a flick and over an area approximately the probable error of the sound data from well trained listeners. When a flick is obtained, the switch in the hands of the observer at the distant control is opened, the motor stops practically instantaneously and the beam is brought on the target by the observer who

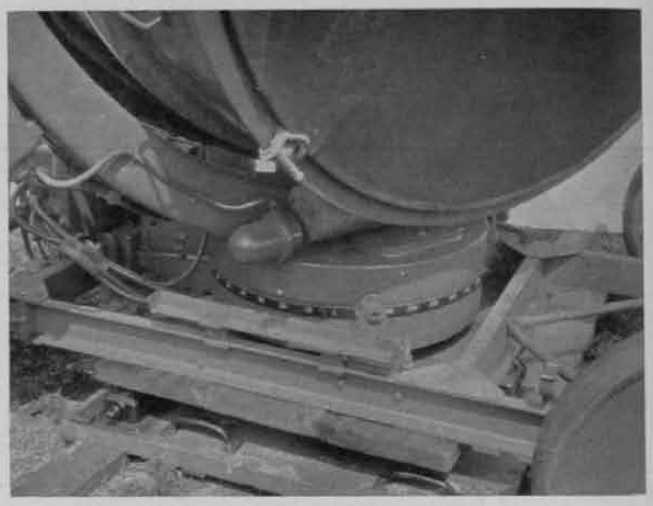


Fig. 4. Searchlight Mounted on Oscillator.

moves the electric control. The idea upon which this device is based is sound and the results obtained are good when the listeners are capable. If the locator indications are poor there is no advantage to be gained except that the instrument provides an excellent demonstration of the proper speed for searching. At least one will probably be provided each antiaircraft regiment for further test.

One of the most interesting items tested was the new metal mirror. The glass mirror, quite aside from its cost and fragility, is objectionable because of the difficulty of obtaining sufficient production volume in time of war. Such mirrors can be made satisfactorily only by highly trained experts and such do not exist in sufficient number, nor can others be trained quickly enough, to meet war time demands. Metal mirrors have been built before but their efficiency has been seriously low.

Fig. 5. Showing Clamping of Metal Mirror.

Since the new mirror seems likely to come into general use, further description is warranted.

Pictures of mirrors are never very satisfactory. Figure No. 5 shows a view of a portion of one of the new mirrors through the door in the searchlight drum. Its reflecting quality is shown best by the reflection of the metal strip at the lowest clamp (in the picture).

The process of manufacture consists of making a mold from the best existing mirror available; placing a metal rim ring, (showing as the light band under the clamps) over the mold and electroplating on, first the rhodium reflecting surface and then the copper nickel backing. Each new mold becomes the foundation of a new series of mirrors and the increase can be carried to any necessary extent. The cost, now less than for a glass mirror, will be further reduced by quantity production and breakage will be practically eliminated.

Photometer tests with this mirror showed about 15 per cent less reflected light than from a glass mirror but the range tests showed a range loss averaging only about 5 per cent. This loss, in view of other advantages, is negligible.

Under a casual glance, this mirror, when installed, might easily be mistaken for a glass mirror. The color is slightly darker and the rim is a sure identification.

There still remains a possibility that this mirror may discolor or deteriorate under severe atmospheric conditions. The inventor of the process by which it is produced is not concerned over this possibility. In the first place, the reflecting metal is so chemically inert that his greatest difficulty was to get an electrolytic solution of it. Secondly, he has found it impossible to separate the reflecting metal from its backing by any mechanical means. Lastly, one of these mirrors was left hanging exposed in the acid laden fumes of the manufacturing plant for over a year and, when the dust was wiped off, was as good as new. The resistance to corrosion and oxidation eliminates any necessity for polishing during service. Ten of the mirrors will be distributed to antiaircraft regiments throughout the service for extended service tests.

The light beam from the metal mirror is more noticeably different from that of the glass mirror than are the mirrors themselves. The new beam is thin, bluish and spectral instead of white and thick by comparison. Mr. Bart, the inventor, said that his first views of the seemingly sickly beam caused him to fear that his efforts had been a failure. Yet this beam is not only 95 per cent as powerful in range, but it will probably be more effective in pickups since a flick is plainly visible in any portion of the beam. It is rather difficult to carry a target in the side of a standard beam which is away from the observer because of the beam intensity. This trouble is entirely absent in the metal mirror beam, which turns its seeming weakness into a tower of strength.

Development of high intensity carbons still continues and the latest type was tested in a 220 ampere searchlight against the standard 150 ampere beam. The photometer tests show better distribution and greatly increased illumination but the service range tests still show no considerable gain in range. The beam is also very thick and difficult to see through.

Quite another story was told by the tests of the night glasses. The true night glass, as you may know, is constructed to take advantage of the distension of the pupil caused by the relative absence of light. The average diameter of the pupil at night is taken at 7 mm. The diameter of the beam as it leaves the night glass is therefore made 7 mm. also. In the daytime, part of this delivery light would be wasted on the contracted pupil. Conversely, the ordinary day glass used at night is not using the full power of the eye. All the day glasses tested gave results which were actually no better than the unaided eye. Two binocu-

lar night glasses, an eight power Goerz and a seven power Zeiss, gave from 40 to 60 per cent increase in carry range, with the higher percentage for the poorer visibility. Figure 6 shows an experimental night glass mounting on a distant electric control. The power and usefulness of a good glass is frequently astonishing. Two outstanding examples were: 1. A low flying bomber was seen in the glasses and the observer placed a searchlight beam on the plane and carried it for two minutes and forty seconds before any sound could be heard. 2. During the target practice of the 69th Coast

Fig. 6. Night Glass Mounting.

Artillery for 1932, conducted immediately after the conclusion of the tactical tests, a bomber at about 10,000 feet altitude was picked up in the glass and illuminated by the beam when approximately 8000 yards from the light. Of course these results were exceptional. Both nights were moonlit. In the first case it was known approximately where the target would appear; in the second, aid was received as to general direction from the locator. It does indicate that the possibilities of such glasses offer a fruitful field for experiment. The issue of one such glass for each searchlight has been recommended.

A series of tests was conducted with 36 inch mirrors of different focal lengths. These tests will be continued as it seems certain that the beam can be improved by a proper change.

Some of the facts brought out by an analysis of the data taken are interesting.

The maximum range at which a given plane can be seen in a given beam on a cloudless night increases with the altitude. This increase is about 25 per cent for 12,000 feet as compared to 1,500 feet altitude when the visibility is excellent. If the general visibility is low the percentage increase will be greater, always assuming the absence of definite cloud layers. This appears to be due to two factors: namely, more favorable presentation of the target at higher altitudes and more haze in the lower strata than in those above.

To see a bombardment plane in a standard beam at 8000 yards on a night of very good visibility is about all that may be reasonably expected from the unaided eye in these latitudes. The maximum range obtained in the tests was 10,000 yards; with glasses, 14,000 yards.

Dirty mirrors and slightly frosted front window glass will cut thousands of yards from the range obtainable.

The horizontal range at which a target may be picked up depends upon a number of factors, but one of which is undoubtedly the altitude. Other things being equal, the higher the plane, the greater will be the average horizontal range to pickup with *both* the locators and the lights. At altitudes below 1500 feet the target will be so close before it is heard, the locators and distant control will both be useless. It is not difficult, however, after a little practice, to pickup these machine gun targets using only hand control on the lights. The maximum horizontal pickup ranges were obtained on targets at 12,000 to 14,000 feet altitude.

There is a simple and very good reason why low flying targets can not be heard until they are comparatively close. The reason is that the sound wave does not reach the listener. At low angles of elevation the wave front is nearly perpendicular and it requires only slight wind and temperature differences, which nearly always are present near the surface, to tilt the wave front backwards and cause the sound to pass overhead, until the critical angle is reached and the sound is heard suddenly with good volume.

To offset this condition somewhat, under normal conditions, planes below 1500 feet should be picked up within 10-12 seconds after going into action as against about twice this length of time on the average for targets at 10,000 feet altitude.

The Tactical Exercises.

The reconnaissance map, Figure 7, which shows the terrain in the vicinity of Fort Humphreys was studied, in June, to choose the area which would be the most suitable for the tactical exercises. Such exercises were, briefly, the 360 degree defense of an area by searchlights against progressively heavier and more complicated air attacks. There were no deep and mysterious reasons for placing the objective where it is shown; it was simply the center of an area of proper size, con-

veniently accessible by land from Fort Humphreys and by air from Bolling Field. It might have represented an ammunition dump on roads near a railroad, but what it represented theoretically was immaterial; actually it was just a reference point. It should be mentioned perhaps that it was not as well defined as a normal bombardment target but since there was absolutely no restrictions on the aerial reconnaissance of the area and since, in general, its location seemed to be well known by the attacking forces, it was suitable for the purpose.

The area was divided more or less arbitrarily into three platoon sectors and three searchlight positions were tentatively chosen in each sector, equally spaced on a circle with a five mile radius from the objective. These positions were then inspected for suitability. All were fairly satisfactory except the center light in cut out but under the conditions prevailing it was necessary to use four lights and relocate a total of six po- the 69th area which was in the center of an extensive sitions. This gave a satisfactory solution as shown on the map.

Nothing further was done until the latter part of August when sectors were assigned and battery officers accompanied by selected noncommissioned officers made a final reconnaissance of all positions in their own sectors.

The five mile radius for the outer ring of lights was chosen on the assumptions that pickups would be made, on the average, slightly in front of the outer ring and that the speed of the target would average 100 miles per hour. This would give a carry time of about 3 minutes to the proper bomb release point. An inner ring of carrying lights was placed about 3 miles from the objective although one of these lights was soon moved to the battery C. P. as shown. An advanced listener with a telephone was placed four miles in advance of each forward light on a line through his light and the objective. The information which is supplied by these advance listeners is almost indispensable.

A total of about 150 miles of twisted pair wire was laid several days before the start of the exercises. Listeners had been given intensive training from the middle of August on the binaural trainer and on actual targets. All troops were well trained in platoon defense but had no training as a coordinated battery or in meeting the types of attack involved in the problems. This was unavoidable but naturally was a disadvantage for the defense forces.

A preliminary test of all defense elements was held on the night of September 11. Everything was manned except the locators of the inner lights. These locators were not used during the exercises owing to a slight shortage of men caused by the demands on personnel of the data taking sections.

On the first night, September 14, 1931, the weather was clear and there were no clouds below 10,000 feet. There was no moon. Attacks were to be by single bombers flying straight courses from any direction and at any altitude. There were three attacks by a standard B3 bombardment plane at altitudes of 5400, 7200 and 9600 feet. The average time of search was fifty-five seconds, the average pickup was 1400 yards in front of the outer ring and the average carry time to the proper release point was 168 seconds. This was followed by three attacks by a silenced (muffled) bomber at 5700 feet altitude. In the first attack the plane disclosed its position visually when three miles from the objective and was not illuminated. In the second, the defense failed to pick it up at all and in the third it was picked up in four seconds, 1100 yards in front of the outer ring and carried for 157 seconds.

This silenced plane proved difficult to handle throughout the tests although there was marked improvement with greater experience. Recommendations have been made which should lead to more effective results with such targets in the future.

On the second night, September 15, 1931, there were some clouds at 6,000 feet and no moon. Attacks were by single bombers flying at will. The first attack at

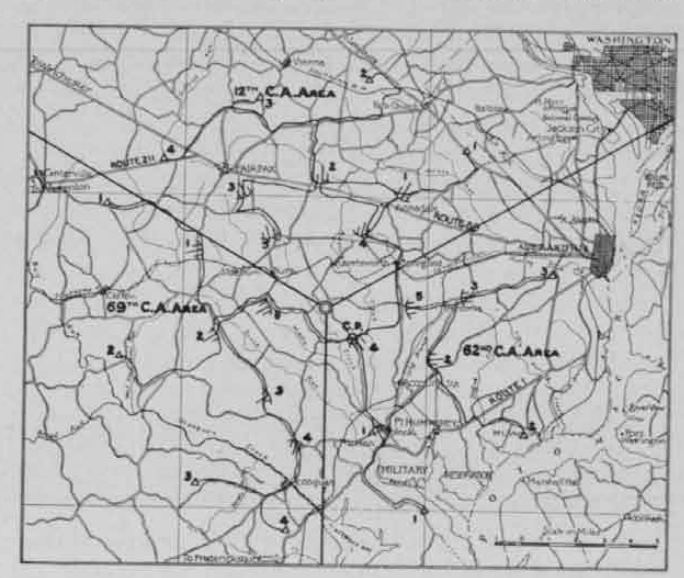


Figure 7.

600 feet was picked up in five seconds, 1200 yards inside the outer lights, for 130 seconds of carry. The second at 1650 feet was gotten in 32 seconds, 2100 yards behind the forward lights and carried 114 seconds. All carry times given are the corrected times to the proper release point for a 100 mile per hour target. The third attack at 6675 feet was picked up in 32 seconds, 2900 yards in front of the outer ring and carried 204 seconds. The silenced bomber was then supposed to make three attacks.

On the first of these at 1,000 feet altitude, it had not been illuminated when it disclosed its position two miles southwest of the objective. The second attack scheduled did not occur and the third was picked up in five seconds at 5,000 feet and well beyond the outer ring. It was carried 248 seconds. Experience gained the first two nights indicated that it would be advantageous to have one of the inner lights directly under the control of the observer with night glass at the B. C. station, and number four of the 62nd Coast Artillery was moved there from its original position.

Rain prevented flying on the night of September 16 and cut the exercises short on the 17th. This test was

held in conjunction with a friendly pursuit ship which was to try to illuminate the attacking bomber from above by a flare. Cutting a long story short, it may be said that such a method is not likely to have much success. The first attack at 600 feet was picked up in the night glasses when over the outer lights. The second attack was illuminated at an altitude of 3500 feet, 800 yards in front of the outer lights after 10 seconds of search and carried for 168 seconds. The third and last attack of the evening at 4800 feet was picked up in 56 seconds, 1400 yards in front of the outer ring and carried for 162 seconds.

The night of September 18, was clear and there was a moon. This problem involved the use of hostile attack planes. Pursuit ships were used for the purpose as the attack planes had not yet arrived. They maneuvered at low altitudes throughout the defended area the entire evening. Two of these ships flew in close formation for a time without any lights, except cockpit lights, not visible from the ground. The sound produced was quite similar to a twin motored bomber. They were picked up by the searchlights a number of times and dropped when identified.

The first smoke was laid at the beginning of this attack. It was laid at a very low altitude in the 62nd area but was not placed in a position to blanket any element of the defense at any time. There were seven attacks at an altitude about 1,000 feet except the last which was at 2500. Four were picked up between the inner and outer rings after an average search of 25 seconds for an average carry of over two minutes. In the other three attacks, two of which were by the silenced bomber, the position was disclosed by the plane lights about 2, 3 and 4 miles from the objective. Whether these targets would have been picked up otherwise must remain an open question.

This problem showed some interesting results. Smoke made its first failure. The "attack" planes did not bother the sound locators for the perfect reason that locators were not used on the bombardment planes when at such low altitudes. It was a matter of ears, and hand control of the light, only. The planes, when attacking at such low altitudes, had great trouble in finding the objective, judging by the courses. Although the pickup points were behind the forward lights the carry times were very long for machine gun targets. Much valuable experience was gained with this type of attack which was used with profit later.

The next test was on the night of September 21. The weather was clear and the moon two-thirds full. The first phase consisted in bombers attacking singly from different directions at medium to high altitudes with accompanying attack, and one smoke blanket. Three planes laid this blanket at 4350 feet altitude. The silenced bomber came in above the blanket some distance behind. It was picked up in 4 seconds when 2700 yards in front of the outer lights and carried for 186 seconds. The smoke failed again to obscure the target. The second attack at 3500 feet was illuminated at the outer ring in 41 seconds and carried 150. The silenced bomber at 10,200 feet was next picked up in 35 seconds 2900 yards in front of the outer lights and carried 184. The fourth, immediately following in time, and over the same platoon, was picked up at 6300 feet after 55 seconds, 800 yards past the first line, and carried 120 seconds.

The next three attacks were by three bombers converging upon the objective at different altitudes from different directions while hostile attack planes tried to harass the listeners. These nine planes were all picked up. Altitudes ranged from 6300 to 11,000 feet. The average search time was 54 seconds, the average pickup was at the outer ring and the average carry was 143 seconds. From this it may be seen that the attack planes did not injure the effectiveness of the listeners.

September 22 was clear at first with clouds later. The moon was three-quarters full. There were two phases. The first was a concentrated attack at a low altitude by 16 planes coming from the same direction at the same time. There were six bombers, six attack and four pursuit planes, all simulating bombers of various speeds. No data could be taken other than the following. The Air Corps reported eight of the planes picked up well in front of the objective and two more at or beyond the objective. The altitudes were well below 1000 feet. More targets were illuminated during this attack than could have been fired on effectively by any normal concentration of machine guns.

The second phase was devoted to gliding attacks. The silenced bomber glided in without being picked up. It flashed its lights about 3 miles west of the objective at 5000 feet altitude.

The next one was picked up at 5400 feet, 400 yards in front of the outer ring and carried 144 seconds.

The third and last attack was by three bombers coming at the same time from the west, southwest and south. Two were picked up quickly well outside the forward lights and the other, after a two minute search, 1800 yards inside the outer ring. All three were between 5000 and 6000 feet altitude. These results on gliding targets were considered very satisfactory.

Rain again prevented tests on the 23rd. On the 24th the weather for the last test was clear and cold. There was a full moon.

The attacks came in three waves. During the first phase an attempt was made to blanket the searchlights by laying smoke clouds around them. The ships could be seen very clearly in the moonlight and were fine machine gun targets. The smoke did not remain in the vicinity of any light long enough to cause any inconvenience.

Three bombers attacked together from the same direction but different altitudes. The muffled bomber led the way at 1800 feet. The other two were at 5000 and 6000 feet. All were illuminated with an average carry of 130 seconds by the 62nd Coast Artillery.

Five bombers struck the 69th the next blow at altitudes between 5500 and 10,000 feet. Four were picked up and carried for an average of 150 seconds and the fifth one was flicked inside the outer ring but was one too many to handle just then.

Three planes attempted to get through the 12th Coast Artillery defense at altitudes between 6300 and 9600 feet. All were picked up for an average carry

of 120 seconds. A fourth plane was flicked and turned on its lights, a fifth turned on its lights outside the area and a sixth plane did not enter the area.

These exercises made it clearly evident that searchlight target practices as now conducted are nothing more than the A B C's of the alphabet that a competent battery must know thoroughly to be effective in war. It is not that they do not make a good foundation, for they do, but they do not go as far as they should or might. Certain very important phases of training can not be handled at all by only five lights but there seems to be no strong reason why training should not be required on very low flying targets, on gliding targets and on simultaneous attacks by at least three planes. These things cannot be learned without practice and require in the latter case a close coordination of effort and a careful and sparing use of the defense elements.

The majority of this training in the current exercises had to be obtained from the tests themselves. The results would certainly have been better if previous practice had been possible. The improvement was marked as the tests progressed and continued to be evidence to the very end.

Very low flying planes can be handled by the searchlights quite well with practice. The muffled, gliding plane is the most serious menace to future effective operations although great improvement in meeting such attacks was noticeable with increased experience.

Coordinated defense, when the attack comes on the boundary line of two sectors, can be learned only from a complete battery installation.

There was a tendency in the beginning to use more lights than necessary to pick up targets. This discloses positions needlessly and squanders the strength of the defense if more than one plane is attacking. A surprising number of attackers can be dealt with after proper training.

The materiel functioned excellently.

Smoke appeared to be practically valueless to the attacking forces. Gas might be more dangerous.

Flares, as counter illuminants, were of no value.

The usefulness of friendly pursuit appears to be very limited.

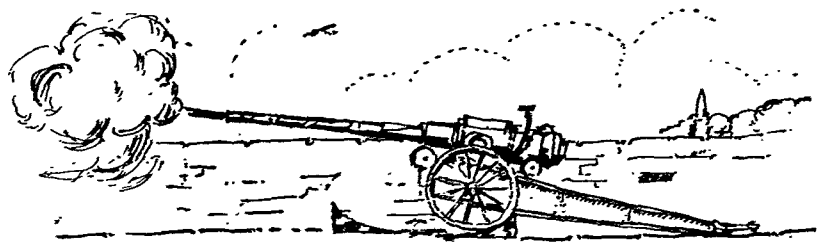
While it was not possible to test machine guns with blank ammunition during these exercises, it was tested by the 69th Coast Artillery at Fort Benning in April, 1931. The flash and smoke of the propellent charge was not serious for .30 caliber ammunition. It might be for .50 caliber guns. A flash hider and smoke deflector is considered to be worthy of further development. It may well be that the flare of the tracers will be even more objectionable than the smoke and flash of the propellent. There are several ways around such a difficulty. The least desirable would be to use a thinner loading of tracers, say one to every nine ball. A better way would be to develop a tracer with reduced visibility for such use. This is objectionable from the standpoint of complicating the ammunition supply. It is not believed however, that there is any good reason why machine gun targets, whether bombers, attack, smoke layers, or gas layers should not be illuminated by the searchlights. In this case the problem is simple. It is strongly believed as a result of these tests that machine guns in pairs should be distributed near searchlights for the most effective use at night.

The listeners on locators are not bothered by the noise of attack planes when tracking other targets.

The Goerz 8-power night glasses proved to be exceedingly valuable. One should be supplied to every searchlight. The Battery Commander and each Platoon Commander should also have one each.

Much new light was thrown on the desirable functions of searchlight battery and platoon commanders. The battery commander should be given only the general mission of illuminating all possible enemy targets. During an engagement he can relay valuable information from one platoon to another. This is particularly important for attacks near a sector boundary. It is believed that, if night glasses were furnished, each platoon commander should be behind the front line of his lights at one of the inner lights. He will frequently be able to see the dark outline of the attacking ship against the beams of the forward lights. It is a very simple matter then to put the rear light on the target. The Battery Commander may also be well stationed at a rear light.

It is believed that a well trained battery could use a considerably larger radius in the defense area without seriously reducing its effectiveness. This would give longer carry times, or the same time for higher speed bombers.



Antiaircraft Tactics for Moving Columns

*By Second Lieutenant Frank T. Ostenberg, C.A.C.**

THIS article deals entirely with the tactics of antiaircraft machine guns in connection with the tactics of the command protected. No consideration is given to the use of the larger caliber antiaircraft guns, since the writer believes that these guns will not be assigned to protect columns but that they will have relatively permanent positions protecting defiles, bridges, etc. within bombing radius of the enemy planes.

It is not desired to submit the plan for antiaircraft machine gun protection of a moving column, but rather to present a few of the problems which have developed while operating with the Mechanical Force on its maneuvers; and to show how these problems have been solved by the antiaircraft platoon. These solutions were developed under the most difficult situation a highly motorized or mechanized column capable of traveling a hundred or more miles to attack might encounter. It is believed that these same principles can well be applied to slower columns made up of foot or mounted troops.

The mission of antiaircraft artillery, equipped with .50 caliber antiaircraft machine guns, assigned to protect commands, is; *to maintain continuous protection of the command from low flying air attacks.* This mission continues during three general situations. First: protection of the moving column. Here the mission is to furnish antiaircraft protection without hindering the progress of the column.

Second: Protection of the troops when going into battle or bivouac. The mission in this case is to be in position to protect the column when it is closed up on the road and the attention of the troops is directed to unloading.

Third: Protection of the carriers, kitchens, and supply train while the command is engaged in battle or is in camp or bivouac. The mission in these situations is to deny the enemy the use of the air for low flying air attacks over the area desired to be protected.

In war time the commander who is able to move his troops from one place to another in the shortest time, in the best condition to fight, under good control, has a decided advantage. Troops are transported by motor vehicles to expedite the movement and to keep the men in good fighting condition. Control is a result of plans and training. A commander should use every means available to accomplish these ends. Unless the antiaircraft troops can carry out their missions without loss of speed by the column and with ease of movement, it should not be used to protect the column.

There are two principal advantages in the use of antiaircraft artillery to protect a column. The mere fact that guns and men with the sole purpose and responsibility of protecting the column from low flying air attacks are present in the column adds to the morale of the troops protected and at the same time renders attacking enemy aviators less confident before and during an attack. This is especially true if a previous attach has ended with planes destroyed or showing the effect of fire.

The mission of antiaircraft is primarily a defensive one. It is accomplished if, by its presence alone, it can keep the enemy from attacking. The antiaircraft detachments must establish a reputation for allowing no air attacks to pass without some evidence of effective fire. Once this reputation is established the moral effect on the enemy should decrease the frequency of air attacks; or in the event of attack, the effectiveness of his fire.

The advantage of having antiaircraft weapons in the column is important to our own troops. The officers and men of the column can devote all their attention to their primary mission of reaching a certain point or going into battle or camp without the added responsibility for and worry over proper antiaircraft defence and discipline.

The following is quoted from Field Service Regulations: "The antiaircraft artillery reinforces the antiaircraft measures of the arms and units and operates especially against hostile aircraft flying beyond the range of their material." This principle is kept in mind in discussing the method of coordinating antiaircraft artillery with the antiaircraft fire of other arms and units. The tactics of the Air Corps assigns considerable importance to "hedge hopping" in attacking columns. Due to the difficulties of meeting the hedge hopping plane with effective fire it should be the responsibility of the antiaircraft personnel to identify the target and initiate the fire. After the antiaircraft artillery has initiated the fire, all weapons available in the column should be used to augment it.

This responsibility requires that it be constantly on the alert for air attacks and places the power of decision in the initiation of fire upon one responsible officer and trained individuals under his command. By providing antiaircraft artillery for the protection of the column, the volume of the fire is increased and each subordinate unit commander is relieved to a great extent of the responsibility of the defense and fire discipline against attacking planes. However, against attacking planes this does not lessen the incentive of these subordinate commanders to have trained antiaircraft men who may be depended upon to defend the organization in case antiaircraft artillery is not assigned for protection. Using its normal weapons the column can assist the antiaircraft detachments greatly against low flying air attacks, which measure in turn permits the antiaircraft artillery to decrease to a mini-

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mum the number of trucks and men furnished the column. This minimum may be considered the number required to initiate fire in case of attack and to fire at harassing planes which stay beyond the effective range of the smaller caliber machine guns. Due to the great expenditure of ammunition and to difficulties of technique encountered, only the best trained and most skillful antiaircraftsmen should be allowed to fire on planes which remain at a distance of more than two hundred yards from the column.

Firing on enemy airplanes should be accomplished, not only by the antiaircraft detachments but by all units, without causing the column to slow down, as movement is not only essential to accomplish the mission of arriving at a designated place quickly but is also, to some extent, a defense against airplane fire. If the enemy learns that he can stop the column and cause the troops to seek shelter by merely having a plane or a flight of planes make a feint at the column, and still remain beyond range of the antiaircraft guns, what more could he ask? His planes would accomplish the desired mission of delaying the column and by repeated feints at irregular intervals would render it inactive. Furthermore, when a column stops and troops seek cover or deploy, control is decreased, and the fighting condition of the men is reduced due to physical exertion and mental strain. It is believed that in case of air attacks the column should keep moving and, if possible, increase its speed.

Antiaircraft machine guns mounted in trucks may be used in three ways: first, to protect a column by moving by echelon and by bounds; second, to protect a column by taking a fixed position along a road; and third, to protect it by being distributed within the column in depth.

Protecting the column by moving by echelon and by bounds is the method prescribed in Field Service Regulations, which were written, no doubt, with the larger caliber antiaircraft guns in mind. This method should be used only in case the machine guns have to be removed from the trucks to fire. It has several disadvantages, the first of which is roads. In peace time it is difficult to find roads wide enough to pass the column without being held up by civilian traffic. It is usually impracticable to travel on parallel roads, as there is usually only one good road. What will it be in war time with very little choice as to roads to be taken and with all roads jammed with traffic? The second disadvantage is lack of freedom of movement. With fast transportation covering great distances situations will change quickly. The antiaircraft unit, if this method is used, will have to precede the column by several minutes at the beginning of the march in order to take its initial position off the roads before the column passes. If this is not done, it will be difficult to pass the entire column to go into the first position or to repass it to take a new one. With the antiaircraft weapons in position, covering several miles of the road ahead of the column, the column commander has no choice of roads in case some unforeseen situation develops, unless the change of route is made without antiaircraft protection. The column commander will also be forced to have his column travel as one group instead of being allowed to send the heavy group over one route and the light group over another route if desired. A third disadvantage is the additional amount of material and the larger number of men required to carry out the defense of a column traveling about a mile every two minutes. There are many additional situations where this method will fail, such as defiles in mountainous or wooded country or muddy roads where the column closes up or delays for any reason. Unless these unforeseen situations develop near the antiaircraft position, the column would not be adequately or effectively protected.

Situations appropriate for the antiaircraft artillery to take a fixed position along a road will no doubt be the unusual in war time. When the opportunity arises this method of defense may easily be adopted. If the antiaircraft artillery is able to function as described in this article, firing from stationary positions will be simple.

It is believed that the method of distributing the antiaircraft machine guns within the column in depth will overcome all of the above disadvantages and will give maximum protection at all times and under all conditions. In the depth formation the length of the column on the road, traveling at its normal speed, must be known, as the number of antiaircraft machine gun trucks required to protect it depends on its road length. Consideration must also be given to whether or not the column is divided into groups because of speed

Antiaircraft Detachment of the Mechanized Force in the Travelling Formation.

or load so that the battery commander may divide his platoons so as to have one complete unit in a group.

The antiaircraft commander distributes his command by platoons. In this article a battery of antiaircraft artillery consisting of four platoons is assumed, each consisting of three or four machine gun trucks protecting the column. In war time a battery could be substituted for the platoon in the distribution of antiaircraft artillery if required. The platoon commanders distribute their platoons, if possible, so that each antiaircraft machine gun truck when traveling will be close enough to the antiaircraft truck in front and in rear to be able, on a straight road to bring effective fire on attacking planes flying above the road during

Antiaircraft Machine Gun Mount T2.

Showing—gunner, 2 assistant gunners, and 2 observers—firing position—giving 360 degrees observation while firing—(shows how quickly the mount may be manned and changed to the firing position if seats are provided as shown in picture No. 1.)

the dead time (time required to traverse through 180 degrees) of the guns of the preceding and following trucks It is desirable that the distance between machine gun trucks be as small as practicable due to curves in the road and to the fact that the elevation of the guns, firing at "hedge hopping" planes, is small if the distance to the target is great. In order to prevent the possibility of any effect of our antiaircraft fire on our own troops, it is believed that antiaircraft machine guns should not be fired parallel to the column at an elevation less than that which will give maximum range. The distance between antiaircraft machine gun trucks should be reduced if the road is winding or passes through defiles.

The control of the antiaircraft machine gun trucks is as follows: The antiaircraft commander rides in a command car in the column near the column commander. The command car should be equipped with a radio to enable the antiaircraft commander to be in constant communication with the column commander and his platoon commanders. The antiaircraft commander should also have motorcycle messengers. The platoon commander rides in a command car preceding his platoon to enable him to assemble his platoon in case of going into battle or bivouac. He communicates with his machine gun trucks by motorcycle messenger or runners.

Due to the vulnerability of motorized or mechanized troops when concentrated on the road before going into battle or bivouac, the distribution of the antiaircraft artillery in the column should be such as to allow them to take up a regular area defense without losing time or causing confusion. The above described distribution is believed to be the solution of this problem. The change from the column defense to the area defense is as follows: The column commander makes his decision as to the place the troops are to unload and park their vehicles. He gives his orders to the antiaircraft commander who locates each platoon on the map so as to cover the desired area. The antiaircraft commander radios to his platoon commanders the general map locations for their platoons, leaving the exact locations to them. The primary mission in this situation is to have the platoons in a firing position before the column reaches the unloading point. The antiaircraft commander should issue orders so that the leading platoon forms the apex of a triangle on or near the road on which the column is traveling. The second and third platoons by moving about half a mile to each side of the road from the base of the triangle. The fourth platoon, which covered the camp when it was broken in the morning, would be back with the kitchen and supply group and should go into position on or near the road on which the column is traveling when that group is ordered forward. The defense formation therefore takes the shape of a square. This formation should be kept until the column is ready to move when the antiaircraft commander would order the platoon commanders to distribute their trucks in the column as they were before the area defense was assumed.

When the platoon commanders receive their orders, they should, moving independently, place their platoons in the positions ordered as soon as possible. The platoon commander should immediately, after reaching his position for area defense, post the two observers from each truck as outposts with the dual mission of engaging and holding any attacking enemy ground force and of warning the platoon commander by prearranged signals of the approach of low flying enemy aircraft. The second part of the mission for the outposts does not relieve the observers at the gun position of their responsibility of watching for planes. The outposts merely supplement the alertness of the men at the guns. The outposts are not so necessary in bivouac due to the protection given by the outposts of the unit protected, but if contact is about to be made with the enemy, their mission is considered very important. The observers should work in pairs and should be armed with light, one-man machine guns, capable of great fire power. In case of a ground attack these men would no doubt be sacrificed in order to save the materiel, trucks and men of the platoon.

The tactics of antiaircraft artillery must correspond to the tactics of the enemy. In peace time we have to visualize the attack tactics of a probable enemy or develop our defense from the tactics adopted by our own troops. The usual method advocated for attacking marching columns by airplanes is in formations of three planes. Three planes in line can effectively cover

a road, one down the center and one on each side. Plans for defense should be made to meet this formation. The planes may come from any direction and at any altitude. The probable attack will be down the road and the probable altitude, just clearing obstructions. This method of attack allows the planes a better target and a continuous one with a surprise approach, practically unseen or unheard, and a very short time during which the planes are targets for ground troops (about forty seconds).

The following arrangement of guns is believed best to meet all probable attacks. The number of antiaircraft trucks should be kept down to a minimum as road space should not be sacrificed for defensive purposes at the expense of our attacking forces or supply trucks. It is believed that one truck can accomplish the mission of bringing under effective fire three planes simultaneously. In order to accomplish this mission each truck should have three machine guns, each free to move quickly to any position and each capable of firing at targets from any direction. This arrangement differs from present multiple mount having two or more guns rigidly fixed so as to be controlled by one gunner. The multiple mount gives great fire power, but if the one gunner is off the target, the increased fire power is wasted. With trucks of the type described firing at one target, the chances of hitting are three gunners against one, and the probability of all three gunners being off of the target is greatly reduced. There is also a very big advantage in the speed by which each of the three gunners should be able to move their guns regardless of the slant of the body of the truck. This feature is now lacking in the present multiple mount even when the body of the truck is level. There is also the principal advantage of being able to bring three planes simultaneously under fire.

Three gunners and two observers for each truck should be allowed. A truck of this type should be able to replace a platoon of four trucks now required to bring a flight of three planes coming from any direction under fire. Each truck should have seats provided for eight men; driver and assistant driver in the cab; a non-commissioned officer, three gunners, and two observers on the mount. These seats should be arranged so that each man on the mount may observe for enemy planes; distributed, so that each man can reach his position for action without loss of time and so that there will be 360 degrees observation. Each man should face the guns. With this arrangement of guns, used with the above described distribution, it is believed that very few flights of enemy aircraft will attack without having fire brought upon each ship.

When traveling each man is an observer. When a target appears the gunners move to their firing positions, the two observers watch for planes coming from directions not covered by the guns. In order to carry out the antiaircraft mission without hindering the progress of the column, the gunners should be able to fire while the truck is moving at the speed of the column. In case they are not able to bring effective fire on targets while moving, the driver at the command "target" should pull out to the side of the road and halt. This halt should be accomplished without loos of time —if possible, before the gunners reach their position and get their guns trained on the targets. There will be occasions when the antiaircraft truck will be placed at a disadvantage by pulling out of the column, such as soft shoulders, deep ditches, muddy roads, or blinds for the gunners as trees, hills, etc. In these situations the driver makes the decision, and the truck should continue moving. The gunners will have to fire as best they can. Plans for war time should be made with the most unsatisfactory conditions in mind. If the antiaircraft artillery can fire effectively from moving vehicles, there should be no trouble when firing from stationary mounts. It is believed that the antiaircraft artillery when protecting moving columns, will be called to fire while moving due to the danger of causing road congestion by pulling out of the column and the subsequent attempt to regain position. Without the antiaircraft trucks regaining their positions, the head of the column would soon be without antiaircraft protection.

Identification of aircraft is a big problem in protecting a moving column. The identification of aircraft must be immediate. Seconds lost, with a forty second target, are valuable. It must be certain to prevent firing upon our own aviators.

There are two main methods of identification of aircraft—sight and sound. Both are almost useless against "hedge hopping" planes, due to the fact that

Antiaircraft Machine Gun Mount T4-1

Showing sides of body lowered—working platform including ammunition boxes 11 ft. by 12 ft.—gun in firing position mounted on experimental pedestal mount.

the planes are not seen or heard until they are well within effective range. Also, what will keep our mythical enemy from having planes with the same sound or silhouettes as ours?

There is one plan which will go far towards eliminating doubt on the part of the gunners, thereby reducing the time lost and uneasiness of them. It is cooperation between the antiaircraft artillery and the friendly Air Corps. In this plan the column commander will keep the Air Corps advised as to the location of his column and the Air Corps should notify the column commander if it becomes necessary to send planes near the column stating the number of planes, the direction from which they will approach the column, altitude, and the approximate time. This

method will be especially necessary for "hedge hopping" planes. With this cooperation the antiaircraft artillery should be authorized to open fire immediately on any plane seen if no information had been received concerning friendly planes. With the antiaircraft commander in communication with the column commander and with each platoon commander by radio, and the platoon commander in communication with each machine gun truck by messenger, the information concerning friendly planes should reach the machine gunners with very little loss of time after it has reached the column commander.

From time to time discussions arise as to whether men and guns with the primary mission of antiaircraft defense are necessary to protect the column in addition to the normal armament with which the different organizations have to perform their primary mission. Experience on maneuvers with the Mechanized Force has shown that there must be some unit distributed throughout the column with the primary responsibility for initiating antiaircraft fire; otherwise some individuals of the column acting on their own responsibility may expose it unnecessarily to the enemy. When a column is traveling under cover of darkness no matter how many enemy planes presenting good targets are flying overhead, the antiaircraft should not begin firing unless it is reasonably certain that the enemy observers have seen the column. The antiaircraft guns should track these different planes so as to be able to open effective fire the moment a flare or some other means of notification of discovery by the enemy observers is used; but the decision as to fire should be made by the troops who are responsible for the defense. This means controlling fire and discipline, centralizes the responsibility of initiating the fire with the antiaircraft commander and permits the organization commanders to devote their attention to the problems of the moment.

Antiaircraft Machine Gun Mount T4-2

Showing sides of body lowered—working platform including space for ammunition boxes 11 ft. by 12 ft. .50 caliber machine gun mounted on antiaircraft tripod M1.

With the necessity of bringing untrained civilians into the Army in case of an emergency, duplication of effort should be avoided, that is, Infantry should train to accomplish Infantry missions, Artillery, Artillery missions, etc. Time, material and men should not be wasted in trying to train one organization to accomplish dual missions. It is believed that in a large organization protection against aircraft should be the principal mission of one special unit.

This unit should be composed of intensively trained specialists, familiar with the tactics and technique of antiaircraft defense. Under our present organization the troops best qualified to carry out this mission can be best furnished by the antiaircraft artillery regiments. If the weapons which the main combat force uses in its mission are suitable and can be mounted for antiaircraft protection without increasing the number of vehicles required to accomplish their mission, they should be carried ready for antiaircraft defense and used in close-in defense after the antiaircraft troops of the column of which that organization is a part, have initiated the fire.

Having trained men with guns and transportation for only antiaircraft purposes is believed essential to properly protect a column from low flying air attacks because at the time the column is most vulnerable, when it is closed up on the road unloading, the troops of the column which may have been available for antiaircraft protection during the march are performing other duties; guns may have been removed to be used in other places or to allow the unloading of the carriers. This is a time when there is a great deal of confusion with little thought to antiaircraft protection. With antiaircraft artillery assigned to a column with the mission *of maintaining continuous protection of the command from low flying air attacks,* and the responsibility of the defense, including the initiating of fire, centralized under one command, equipped and distributed as described above, adequate protection for any column, at all times, and in all situations, should be obtained.

War Policies

By Major Dwight D. Eisenhower, Infantry

FOR ten years several of the veterans' organizations have persistently advocated legislation intended to eliminate, from any future war, opportunity for profiteering and to insure an equitable distribution among all citizens of the burdens that must inevitably accompany war. The worthiness of this objective has been universally recognized, but it has been difficult to secure any substantial agreement on measures for its attainment. As Congressman Laguardia once very aptly remarked:

> ". . . the subject of equalizing the burdens of war and minimizing the profits of war is about the easiest of any to make a speech on, but probably the most difficult to work out in detail."

These difficulties arise from a variety of causes. Pertinent statistics of past war experiences are by no means complete, nor are they easy to interpret intelligently. Every proposal made must rest to some degree upon abstract reasoning, and even on pure conjecture. Class fears and prejudices are easily aroused —while a mass inertia engendered by the feeling that "any war is a long way off" has likewise contributed to the defeat of efforts to secure decisive action.

It gradually became apparent that no progress would be realized unless the many factors involved were thoroughly investigated and a comprehensive plan presented to Congress that would embody the considered opinions of those best qualified to speak.

War Policies Commission

Finally, in June, 1930, by a Joint Resolution entitled, "To Promote Peace," Congress created the War Policies Commission. It was directed to consider amending the Constitution "to provide that private property may be taken by Congress for public use during war;" to study methods for equalizing the burdens of and removing the profits from war; and to develop "policies to be pursued in event of war." The Secretary of War is Chairman of the Commission, which is composed of six Cabinet officers, four Senators, and four Congressmen. During open hearings held in March and May, 1931, the Commission listened to some fifty witnesses, many of them nationally prominent citizens.

The press has devoted much space to the Commission's activities, both in news columns and editorially. War Department interest in the proceedings is quite natural, as the subjects under consideration by the Commission constitute some of the most vexing problems confronting the Department in the preparation of war plans.

An interesting feature of the testimony presented at the hearings was the great diversity of individual opinion expressed concerning the tasks confronting the Commission. In general, each witness gave his own interpretation to the resolution creating the Commission. For example, a considerable number insisted that the entire effort should be devoted to the promotion of peace,—some even going so far as to say that investigations carried out under the remainder of the Congressional directive would adversely affect our friendly relations with other powers.

Methods for Preventing War

Among those who confined their attention almost exclusively to methods for preventing war were a retired admiral of the Navy, two ministers of the Gospel, a leader of the Socialist party, an oculist, editors of magazines of so-called "pacifist" leanings, and officials of various peace associations.

Admiral Samuel McGowan advocated amending the Constitution of the United States,

> ". . . so as to require that, before war can be declared or participated in (except only in the event of attack or invasion) there must be a referendum. . . ."

He was supported in his view by a later witness, Dr. Thomas Shastid, who heads an organization known as the "War-Check-Vote, Incorporated." Both of them argued that the people that have to fight the battles never desire war—that they are rushed into hostilities by "big interests" and governmental officials. In the Admiral's words:

> ". . . the only good war is a war that doesn't take place; and it will never take place in this or any other country, if the people back home, the mothers . . . all through the country, are allowed to have their say."

In response to questions by Commission members, other witnesses vigorously opposed this proposal. Newton D. Baker, Ex-Secretary of War, voiced the substance of this opposition as follows:

> "If the question were submitted to popular vote in the United States—shall the United States go to war with X—and we had a great debate about it over the United States, . . . country X would in the meantime be . . . making all the preparations, and we would not be making any until we found out what the vote would be. Our people would be separated into opposite camps about war, and if a small majority decided in favor of the war, it would be a practical advantage to our adversary by our *going to war with a divided people whose feelings were split wide open;* it would put us in a very weak situation."

Neither Admiral McGowan or Doctor Shastid advocated disarmament as a definite means of preventing

war. The latter, although intensely interested in methods for maintaining the peace, characterized many of the so-called peace movements as futile "gestures." Among these he included the League of Nations, and disarmament.

Dr. Arthur Call, Secretary of the American Peace Society, concluded, as did the others of this group, that the only real solution to the problems given the Commission was through positive prevention of war. Unlike most of the others, however, he believed that conditions of the "living world" were such as to require the maintenance of military force of approximately the size now existing in this country. He said:

> "I am quite of the opinion that the 'reasonable defensive posture,' as phrased by President Washington, remains still a necessary posture on the part of our people . . . we could not wage a war in a foreign country by our Navy alone; it has to be waged by the Navy in cooperation with the Army. Since our Army is as small as it is, I am of the opinion that our Military Establishment, as is, does not constitute, therefore, a menace to the peace of the world and that it is not necessary to think that it does."

On the other hand Rev. John Sayre, representing the Fellowship of Reconciliation; Tucker Smith, Secretary of Committee on Militarism in Education; and Miss Dorothy Detzer, Secretary of the Woman's International League for Peace and Freedom, bitterly attacked our present military program. They said that it was a hindrance rather than a help in maintaining the peace; that it tended to make our population "war-minded;" and that it encouraged the adoption of economic and imperialistic policies likely to lead us into war. While it was generally agreed that there was small chance for other countries to take measurable steps in disarmament at present, it was nevertheless urged that America should by "example" show its complete reliance upon the Kellogg-Briand peace treaty—a document by the way that came in for considerable discussion before the Commission. Mr. Smith had the following to say about military preparation:

> ". . . your report must recognize that military preparedness that envisions the ability to strike hard and fast makes peace almost impossible in a crisis, and that the task before humanity is a task of getting a degree of disarmament that will prevent that situation; . . ."

Surprisingly though, Mr. Smith did not concur in the popular assumption that the hope of profiteering by "business" has a great effect in influencing us toward war. In this he differed sharply with the following statement of policy contained in the Democratic National Platforms of 1924 and 1928:

> "In the event of war in which the man power of the Nation is drafted, all other resources should likewise be drafted. *This will tend to discourage war by depriving it of its profits.*"

Miss Detzer likewise did not entirely agree with Mr. Smith on this point. She contended that the searching for trade by the munitions industry in time of peace, and its hope of large profits in war, both tend to bring on conflict.

Most of the witnesses just named advocated adherence to the World Court and to the League of Nations; withdrawal of Marines from Nicaragua; independence of the Philippines; recognition of Soviet Russia; and revision of national policies with respect to Latin American countries. Some also recommended cancellation of war debts. They opposed the development of any "policies that should be pursued in the event of war." They insisted that to admit the possibility of war was to make war more likely, and helped to make our people "war-minded." Such expressions as "peace-minded," "war-minded," "atmosphered in the psychology of war," "peace policies," and "preparation for peace" were used repeatedly, but no attempt was made to define them.

A listener gained the distinct impression that the members of this group, with possibly one or two exceptions, were earnestly and unselfishly laboring for the promotion of an idea in which they implicitly believed. One—Dr. Mercer Johnston—wore in his lapel the ribbon of the Distinguished Service Cross, won while serving with the A.E.F. in 1918.

Equalization of War's Burdens

Other witnesses addressed themselves to the more specific tasks laid down in the resolution creating the Commission. They urged the intensive study in time of peace of the serious economic, industrial, and social disturbances that are certain to occur in war, and the development of a comprehensive program designed to minimize the effects of these disturbances. They believed the Commission's efforts to do this were perfectly proper and could not logically be interpreted by any foreign nation as indicating "double-dealing" by the United States. Congressman Laguardia said:

> "As I understand the purpose of the resolution . . . it is entirely separate and distinct from the question of the prevention of war . . . The mere fact that one takes an interest in the purpose of this resolution is no indication he is . . . not doing all he can to avoid war.
>
> "Anyone who contemplates the terrors of another armed conflict, I believe, will see the necessity of providing ahead of time, as far as we can, for equalizing the burdens of war."

Bernard M. Baruch, Chairman of the War Industries Board in 1918, stated a similar view even more emphatically:

> "I take it that we are of the common belief that war ought to be avoided if possible, but that we must plan in such a way that, if war comes, we shall meet the enemy with our maximum effectiveness. . . .
>
> "War on this vast modern scale has hitherto so violently disturbed the pattern of the normal economic structure of belligerent nations that, . . . the aftermath of the struggle prostrates both the conqueror and the conquered. With these

most serious considerations you must deal. . . . The neglect of them is, in my opinion at least, one of the most threatening aspects of our governmental policy. It is for these reasons that I regard the work of this commission very seriously. . . ."

Proposals concerning these matters naturally varied as widely as did those submitted by the "peace" contingent. On one question, however, witnesses were divided of necessity into two camps. This question was: "Should the United States, in the event of war, actually seize, and take title to, all private property during the period of the conflict?"

Congressmen Frear and Laguardia, as well as Dr. Shastid and others, took the affirmative. Congressman Royal C. Johnson and Past Commander P. V. McNutt of the American Legion, approved the idea in principle, but expressed doubt that it would be accepted by the majority of the people.

Directly opposing the idea of actual seizure of all property were Newton Baker; Daniel Willard, President of the Baltimore and Ohio Railroad; Commander Ralph O'Neil of the American Legion; Walter S. Gifford, President of the American Telephone and Telegraph; Dr. Leonard P. Ayres, Statistician and Economist; A. H. Griswold, Executive Vice President of the International Telephone and Telegraph; C. B. Robbins, Ex-Assistant Secretary of War; William Green, President of the American Federation of Labor, and many others.

Since the American Legion has long advocated "Universal Draft" in time of war, Commander O'Neil's testimony was particularly interesting from the standpoint of establishing just what was meant by the phrase. Remarking that this term had been used largely as a "symbol," it developed that he did not believe in the actual confiscation of private property, but rather in a strict governmental control over it. The true purpose of the program he advanced was clearly stated in answers he gave to questions by Commissioners:

> Mr. Collins. And in event of war, you think they (Producers of munitions) ought to be paid up to 7 per cent per annum?
>
> Mr. O'Neil. That is a fair return; yes. If they do not get any more than that, it will help considerably. That is a maximum, you understand.
>
> Senator Vandenberg. You are talking about taking the exploitation profits out of war?
>
> Mr. O'Neil. That is what I am trying to do.
>
> Mr. McSwain. In other words, eliminating what is ordinarily called profiteering; that is, unreasonable and excessive profits?
>
> Mr. O'Neil. Yes.

Some witnesses maintained that the recognized right of government to tax wealth to any extent it saw fit, and to commandeer property for public use, was in fact a recognition of the principle of "conscription of wealth." This view was rejected by those who want to extend materially the right of government to seize private property. Mr. Laguardia was in favor of a constitutional amendment to

> "give the government the broad, all-sweeping powers that it needs to take over property, nationalize industry, stop speculation, and *suspend all normal gains and profits;* nothing short of that will equalize the burdens of war."

Mr. Frear was in substantial agreement with this suggestion. It is curious to note, in view of this statement of Mr. Laguardia's that he later disclaimed any intention of "equalizing the burdens of war." He put it thus:

> "If any plan is to go through *to take the profits out of war,* it must do just that thing. . . . everybody in the United States, whether in the infantry, in a bank, or in a factory, will enter the service of the country, taking all the chances of war and *chancing the inequalities that war brings.* In other words, to do this we have to nationalize all of the industries and militarize everybody from Texas Guinan to J. Pierpont Morgan. . . .
>
> "It is difficult, and it is going to involve a lot of details and perhaps chaos. . . .
>
> "Now, it is quite possible that one man's factory will be used and abused and he may come out of the war almost ruined, while another man's factory may not have been used at all—*yet no one will have made any profits.* . . .
>
> "You can not stop and worry . . . *Whether one is going to suffer more than the other* . . .."

The opponents of actual conscription of property based their arguments largely upon their convictions of its impracticability in operation. Mr. Baruch summarized his reasons as follows:

> "Nobody with any familiarity with industry could seriously urge a wholesale assumption by any Federal Bureau of the responsibility for management of any or all of the vast congeries of manufacturing establishments upon which we must rely for extraordinary effort in event of war. Even if such bureau management could prove adequate to the task (which it could never do) the mere process of change would destroy efficiency at the outset."

He said that when similar suggestions with respect to specific industries were made during the World War the proposal split upon the rock of the following argument:

> "Who will run it? Do you know another manufacturer fit to take over its administration? Would you replace a proved expert manager by a problematical mediocrity? After you had taken it over and installed your Government employee as manager, what greater control would you have then than now? Now, you can choke it to death, deprive it of transportation, fuel, and power, divert its business, strengthen its rivals. Could any

disciplinary means be more effective? If you take it over, you can only give orders to an employee backed by threat of dismissal, and with far less effect than you can give them now."

No witness that advocated an actual seizure of all private property without giving owners the "just compensation" required by the 5th Amendment to the Constitution came forward with a detailed plan for administering the system. Statements were made that the population should be rationed—that the government should put our 125,000,000 people on its pay roll—that money would cease to circulate, or be used only by the government in foreign trade—that property would be returned to the original owner at the end of the war on an "as is" basis—but no one explained through what agency all this should, or could, be done.

Finance and Price Freezing

With respect to the use of money in war, Mr. Eugene Meyer, Chairman of the Federal Reserve Board, expressed an interesting view.

> ". . . The obvious lesson is that the course of war depends upon resources in man power, supplies, and morale, and that finance is only incidental to these, for, after all, money is only a medium of exchange, and to the extent that men, material, and morale are available some medium of exchange will be available or will be developed so as to permit their continued functioning to the maximum limit."

Mr. Meyer thus indicates that under certain conditions something might be substituted for money as a "medium of exchange." With a system of universal conscription this medium could scarcely be anything else than governmental orders.

Mr. Baruch advocated a so-called "price freezing" system. Because this proposal came in for much discussion during later meetings of the Commission, newspaper accounts presented it generally as constituting the whole of Mr. Baruch's plan. Actually, it was only one of the features of his complete proposal. He favored the development in peace of broad plans for setting up promptly in emergency an administrative machinery corresponding generally to that existing in the fall of 1918—and the preparation of specific plans for procuring the supplies that would be needed initially. He praised the work now being done along this line in the War and Navy Departments and emphasized the necessity for its continuance. His "price freezing" plan was advanced as an added means of securing justice and efficiency, and was proposed particularly to assist in *preventing inflation*. Simply stated, the proposal is to place on the statute books a law that would empower the President in emergency to declare that the maximum prices existing in each locality for all services and things, at the time of the promulgation of the order, should not be exceeded during the war. A "Price Fixing Board" would be created to adjust prices where found necessary. The serious effects of rapid inflation in war, which the "price fixing" scheme is intended to eliminate, are described by Mr. Baruch as follows:

> "Inflation enormously increases the cost of war and multiplies burdens on the backs of generations yet to come. The war debt of the nation is necessarily incurred in terms of debased dollar values. In the inevitable post-war deflation the debt, of course, remains at the inflated figure. Thus the bonds that our Government sold in the World War for 50-cent dollars must be paid through the years by taxes levied in 100-cent dollars."

Much discussion centered about the constitutionality of this part of the plan. At first it was thought Mr. Baruch intended that the government should *compel* the sale of private property to individuals or to the government at prices fixed by fiat, thus constituting a "taking" of property without according what the owner might consider "just compensation." Later it was explained that no compulsion was intended—it was expected only to *prohibit* a buying or selling at a higher price than that specified. Doubt was expressed by some witnesses as to the possibility of administering such a law. Objections of other kinds were raised—objections that Mr. Baruch in a second hearing attempted to meet by presenting an additional brief in support of his idea.

Aside from Mr. Baker and Mr. Baruch, many other witnesses had had unusual experience in the World War, from which they were able to offer valuable suggestions. Among these were Daniel Willard; Walter S. Gifford; William Green; and Howard Coffin, head of the Aircraft Production Board during the World War, and a devoted advocate of industrial preparedness long before we entered that conflict. Others were J. Leonard Replogle, Director of Steel Supplies, War Industries Board; George N. Peek, Commissioner of Finished Products, War Industries Board; Herbert Bayard Swope, prominent newspaper man and editor, and Benedict Crowell, Assistant Secretary of War during the period 1917-1920.

Mr. Willard and Mr. R. H. Aishton, President of the American Railway Association, outlined the program the railways have developed in cooperation with the War Department to insure the effective use of transportation systems in emergency. Assistant Secretary of the Treasury, Arthur Ballantine, discussed the operation of tax laws in war. Clyde B. Aitchison, member of the Interstate Commerce Commission, described the proper functions of that body under emergency conditions. Honorable William Ramseyer, Member of Congress, presented an interesting paper on "Paying for War as You Go." In the World War about 27 per cent of current expenses were met by current taxation—the remainder of loans. It is Mr. Ramseyer's view that all of the expenses should be paid for out of current revenues. He argued that by taxing incomes heavily enough to do this, people would not have money to spend freely, inflation would be automatically prevented, expenses would be kept at a minimum, and there would be no serious economic aftermath to the war.

War Department Plans

On May 13, 1931, General Douglas MacArthur discussed before the Commission the principal features of War Department plans for the mobilization of men and material in emergeny. In describing the premise on which these plans are built he said:

> "We have a General Mobilization Plan. This plan does not envisage any particular enemy. It contemplates the mobilization, *by successive periods*, of six field armies and supporting troops, or approximately 4,000,000 men. . . .
>
> "This general plan establishes the basic policies for a . . . systematic mobilization of the manpower of the United States. *Being arranged by successive periods, the mobilization plan is flexible and can be made to fit the manpower needs of any military situation. . . .*"

The press generally jumped at the conclusion that in any emergency the War Department would insist upon raising immediately an army of 4,000,000 men. The language quoted above, of course, conveys no such meaning. Other remarks of the Chief of Staff further emphasize his real intent.

> "An emergency involving no more than the Regular Army, raised to its full strength and perhaps strengthened by some National Guard units, would cause scarcely a ripple in American life and industry. . . . there would be no occasion for the application of any governmental control not usually applied in peace. . . ."

After discussing the basic provisions of the selective service system that the War Department believes should be applied if it ever becomes necessary to mobilize large land forces, General MacArthur took up those portions of the plan, prepared under the supervision of the Assistant Secretary of War, that affect the economic problems of war. He described the effects that proposed measures would have in war in equalizing burdens and minimizing profits.

The War Department Plan provides in detail for the orderly procurement of all supplies it will need so as to occasion the minimum of disturbance in the normal economic life of the nation. Beyond this it provides for a civilian organization to exercise, under the President, an efficient control over all resources. It makes provision for setting up promptly, in an emergency, all the administrative machinery that will be necessary. The plan conforms to existing constitutional provisions and to the laws that could be reasonably expected to be passed promptly in an emergency. General MacArthur's address—which, with the War Department "Plan for Industrial Mobilization," is published in Part II, Hearings before the Commission authorized by Public Resolution 98—contained these general conclusions:

> "Modern war demands the prompt utilization of all the national resources. Measures for transforming potential strength into actual strength must work in emergency with the utmost speed and effectiveness. . . .
>
> "The human burdens of war must be equalized in so far as possible. To this end liability for combat service must be determined under a selective service system developed along the general lines of that used in the World War.
>
> "The economic burdens must be equalized through:
>
> *a.* Systematic registration of wealth and all accretions thereto during the period of the emergency; and tax legislation framed to place an equitable burden thereon.
>
> *b.* Orderly and economic procurement by the government itself.
>
> *c.* Strong and intelligent leadership . . . exercised through an organization adapted to the purpose.
>
> *d.* Application of governmental controls . . . to prevent any profiteering at the national expense.
>
> *e.* Prompt resumption of normal peace conditions upon the termination of the war. During the progress of any war the President should appoint a committee to study and prepare plans for demobilization. These plans must facilitate the reemployment of men returning to civil life from the Army and Navy, and the freeing of industry of the accumulations of stocks produced to meet war requirements.
>
> "All of the above demand an intensive and intelligent planning program carried out continuously in time of peace. Because of their peculiar responsibilities, the War and Navy Departments must be definitely required to carry on this work as the agents of the whole government.
>
> "Congress should satisfy itself at frequent intervals as to the progress of plans under development by requiring their presentation to appropriate committees of Congress."

In commenting on the War Department plan, many witnesses, including a representative of the Navy Department, gave their endorsement to its general provisions. Mr. Coffin, a thoughtful student who has had a wealth of experience, studied the whole plan carefully and expressed the opinion that it is splendidly conceived, and practicable in every respect. He believes that, in case of need, it would work with the maximum speed and effectiveness, with the least possible injustice to individual citizens.

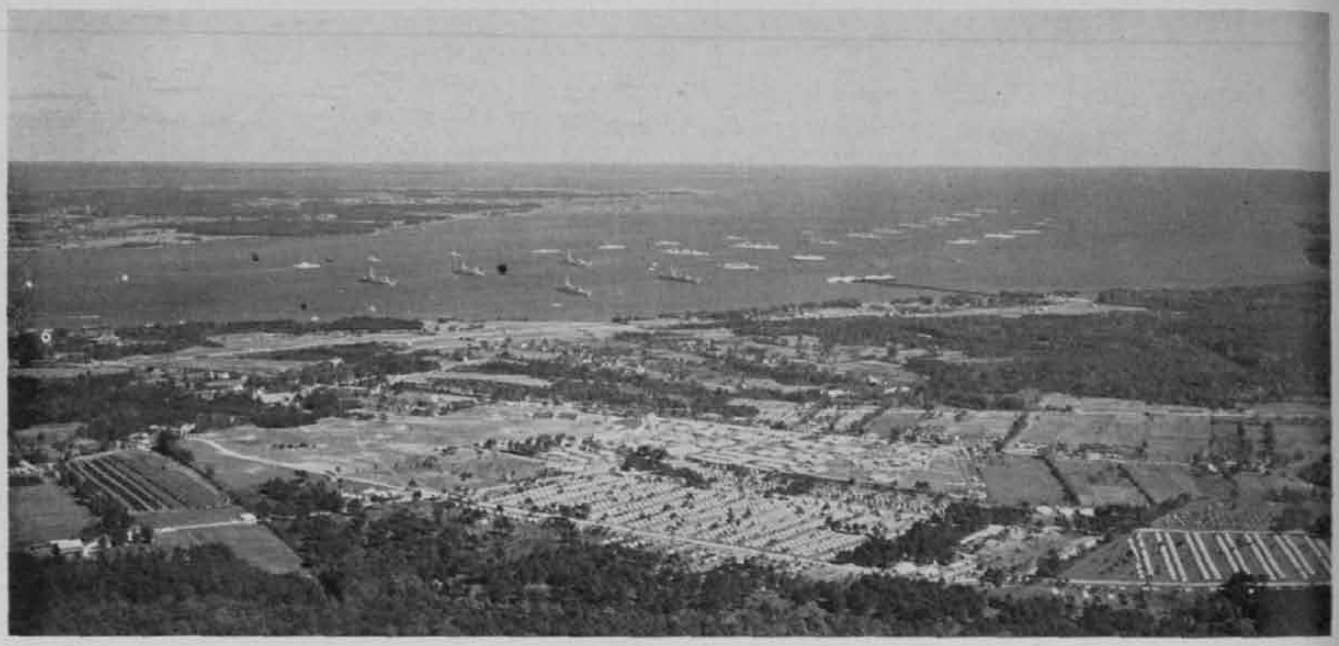
After acknowledging the debt of the Department to the many public spirited civilians who have been of so much assistance in bringing plans to their present state of development, General MacArthur said:

> "It must be apparent to the Commission that the principles on which War Department plans are based do not differ essentially from those expressed by the majority of the witnesses who have previously appeared before you. The goal we seek is that sought by the men responsible for the drafting of Public Resolution No. 98. Our plans simply set forth the methods whereby it is believed these principles and theories could be applied in the event of another great emergency."

The Yorktown Sesquicentennial Celebration

By Second Lieutenant John R. Lovell, Coast Artillery Corps

THE Sesquicentennial Celebration of the Siege of Yorktown and the Surrender of Cornwallis provided an unexpected opportunity for the United States Army to render a peace-time service where organized assistance was sorely needed. Few of us had any idea that we were to take such an important part in it until the War Department placed Brigadier General S. D. Embick, Commandant, Coast Artillery School, in general charge of the demonstration. The Yorktown Sesquicentennial Celebration was one of the greatest projects that the United States Army has undertaken since the World War.



For this celebration Congress appropriated $200,000 and created the United States Sesquicentennial Commission composed of five senators and five representatives. In addition the state of Virginia appropriated $12,500, and appointed its own commission of ten members. In order to supplement the two commissions, and to act where the federal and state organizations could not function, the Yorktown Sesquicentennial Association was formed. This association was composed of public spirited and patriotic citizens from the several states and territories of the Union.

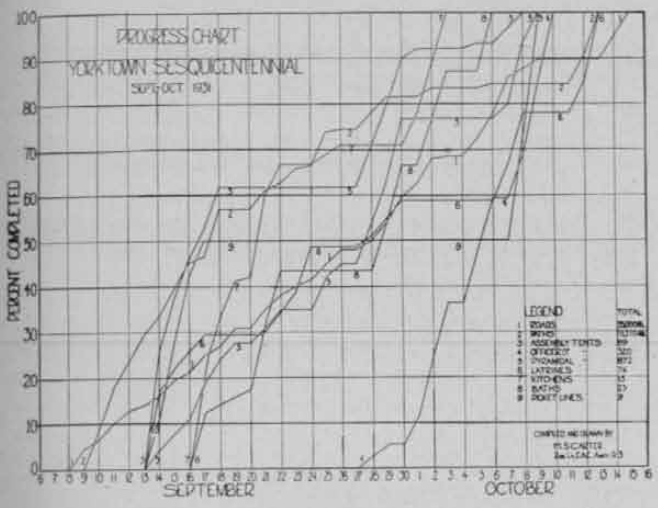
The Colonial National Monument, an organization operating under the National Park Service of the Department of Interior, was established and undertook much of the preparatory work. Mr. Oliver G. Taylor, Engineer in Charge of the park project at Yorktown, Mr. William M. Robinson, Jr., Superintendent of the Colonial National Monument organization, and Mr. J. R. Lassiter, Associate Engineer, and their assistants deserve great credit for their unlimited and willing cooperation with the Army personnel. The Colonial National Monument organization assisted in clearing the battlefield, prepared the specifications for and awarded the contracts. They performed a large part of the construction work under the supervision of their engineers.

Mr. Albert R. Rogers had been appointed as the Director of the Celebration prior to the time that the Army took charge of the project. Many of the details in connection with the Celebration had been worked out by Mr. Rogers months in advance.

The Commanding General organized a complete general and technical all-army staff as follows:

C. G.	Brig. Gen. S. D. Embick, U. S. A.
C. of S.	Major D. S. Lenzner, C. A. C.
A. C. of S.	Major C. W. Bundy, C. A. C.
A. de C.	Lieut. J. D. Moss, C. A. C.
G-1	Major T. C. Cook, C. A. C.
	Capt. J. P. Ratay, F. A.
	Lieut. M. L. Elliott, A. C.
G-2	Major Hayes A. Kroner, Inf.
	Lieut. C. W. Allen, A. C.
G-3	Capt. W. W. Irvine, C. A. C.
	Capt. H. B. Smith, Inf.
	Lieut. M. S. Carter, C. A. C.
G-4	Major L. L. Stuart, C. A. C.
Qm.	Capt. I. J. Wharton, Q. M. C.
Asst. Qm.	Lieut. C. J. Hauck, C. A. C.
Mess Officer	Capt. G. M. O'Connell, C. A. C.
Asst. Adjutant	Lieut. J. R. Lovell, C. A. C.
Provost Marshal	Capt. B. L. Milburn, C. A. C.
M. P. Officer	Lieut. F. T. Ostenberg, C. A. C.
In charge of buses, taxis	Lieut. W. R. Ellis, C. A. C.
In charge of parking lots	Lieut. R. F. Cuno, A. C.
Transportation Officer	Capt. C. F. Johnson, 34th Inf.
Asst. Trans. Officer	Lieut. T. V. Stayton, C. A. C.

Musical Director	Capt. K. J. Fielder, Inf.
Communications Officer	Capt. Creighton Kerr, C. A. C.
Chaplain	Capt. I. J. Bennett
Fire Marshal	Capt. P. E. Bermel, C. E.
Asst. Fire Marshal	Lieut. D. P. Norman, Inf.
Engineering Officers	Colonel J. C. Ohnstad, C. A. C.
	Lieut. H. E. Strickland, C. A. C.
Liaison Officer	Capt. W C. Rathbone, Inf.
Surgeon	Colonel D. F. Duval, M. C.
C. O. Troops	Colonel C. H. Miller, Inf.



At first glance, the staff appears to be a top-heavy organization, but its size was fully justified during the actual period of the Celebration. The Commanding General and his assistants were officially designated as the Executive Staff, United States Sesquicentennial Commission. This staff actually commenced to function in its entirety at 9:00 a. m., October 5.

The work assigned to the regular army troops consisted of the construction and improvement of roads and paths, the erection of tents for the Celebration, preparation of camps required to shelter the regular army, national guard, and other units.

The first regular army contingent began work under the supervision of Captain W. W. Irvine, C. A. C., G-3. Two regiments, the 51st and 52nd Coast Artillery, were designated special duty organizations. The permanent guard, tractor and truck drivers, janitors, orderlies, and other special duty personnel were detailed from these organizations, so that the other outfits would have their full strength for pageant activities and drill rehearsals.

The celebration ground was a large alfalfa field with a small patch of cotton, tobacco, and peanuts, and numerous beds of flowers within it. The alfalfa was harvested. Colonel J. C. Ohnstad, C. A. C., was detailed engineer in charge of the Celebration grounds, and Lieut. H. E. Strickland was detailed engineer in charge of the army camp area. The task of staking out the fields was begun, accurate sketches were made, and the work progressed rapidly in its early stages.

Captain P. E. Bermel, C. E., assisted by Lieut. B. S. Shute, C. E., and Lieut. Frank Blue, C. E., and Company C, 13th Engineers had charge of the construction of the paths and roads. Marl, excavated in the vicinity, proved to be excellent road and path building material. It was hauled by Mack army dump trucks which were obtained from all over the Third Corps Area, and small, privately owned, dump trucks hired by the U. S. Commission.

As fast as they could be utilized efficiently, troops were sent to Yorktown to rush the preparation work to completion. These details were sent from the Mechanized Force and the 34th Infantry at Fort Eustis, and the Coast Artillery organizations at Fort Monroe. Materials were obtained from practically all of the posts in the Third Corps Area and from the Quartermaster Depots.

Company C, 13th Engineers, was designated as the fire company. In addition to other assignments, this organization was to be considered as a reserve for any emergency that might occur.

The Yorktown Sesquicentennial Celebration covered the period October 16-19. Friday, October 16, was designated Colonial Day; Saturday, October 17, Revolutionary Day; Sunday, October 18, Religious Day, and Monday, October 19, Anniversary Day.

There were many prominent speakers on the four day program including the President of the United States; Marshal Petain of France; our own General Pershing; the Acting Secretary of War, the Honorable Frederick H. Payne; the Secretary of the Navy, the Honorable Charles Francis Adams; the Secretary of the Interior, the Honorable Ray Lyman Wilbur; the Governor of Virginia, the Honorable Garland Pollard; the Governors of the Thirteen Original States, and many other notables.

The series of pageants which were held in connection with the Celebration was splendid. It was most

PLAN OF THE SIEGE OF YORKTOWN.

impressive, and the details were historically correct insofar as they are of record. The difficulties to be overcome in training and rehearsing several thousand persons can well be imagined.

Mr. Thomas Wood Stevens was the Pageant Director,

and incidentally, the author of the pageants. He was ably assisted by Mr. Theodore Viehman, Associate Director, Mr. Alexander Wyckoff, Designer, Warrant Officer George Dahlquist, 12th C. A., Musical Director, and others. Major F. C. Phelps, 34th Infantry, assisted the Pageant Director and acted as a liaison officer between the Director and the Military units participating.

The U. S. Army troops arrived at their camp near Yorktown October 10, became settled in quarters over the week-end, and commenced rehearsals Monday, October 12. Rehearsals and exercises were held every morning for the military personnel while civilian groups took over the pageant field every afternoon.

The drill regulations that were in effect in the colonial and French armies during the revolutionary period were carefully rehearsed weeks in advance. It was difficult for our Infantry, Cavalry, and Coast Artillery units to enact even a sham battle where the troops advance toward one another in a single line,

Marshal Petain, President Hoover, Mrs. Hoover, General Pershing, Mr. Townsend.

shoulder to shoulder, with volley fire predominating. Revolutionary tactics were entirely different from those employed now, and it required several rehearsals before our soldiers were rated as good exponents of Baron Von Steuben's drill regulations.

The costumes used by the participants in the pageants were accurate and complete. Many of them were made by ladies living in the communities in and near Yorktown, under supervision of Evelyn Cohen, Costume Designer. The remainder were furnished commercially. Over 4000 costumes were used in the entire pageant.

The Pageant was divided into three separate parts —the Pageant of the Colonies, held on Friday, October 16, the Pageant of the Yorktown Campaign on Saturday, October 17, and the Anniversary Day Pageant on Monday, October 19.

The Pageant of the Colonies depicted scenes of the history and character of the Original Thirteen Colonies, in the form of drama and pantomime with events leading from the landing at Jamestown in 1607 to the signing of the Declaration of Independence. The actors in this pageant were drawn from Fort Monroe and Langley Field.

The Pageant of the Yorktown Campaign was a military and naval pageant, depicting, through historical scenes, the planning and execution of the Yorktown campaign, including preliminary battles. This was a spectacular show. The chronicler, by means of a public address system, kept the audience informed as to the historical significance of the events that were being portrayed on the large field in the stadium. Scenes on the large revolving stage in the center of the field represented events that took place away from Yorktown. The participants in this pageant were drawn almost entirely from military personnel.

The Pageant of the Yorktown Campaign included scenes of the conference between Washington and Rochambeau at Weathersfield, Connecticut, May 21, 1781; the fight at Green Spring when Mad Anthony Wayne, under Lafayette, charged the British under Cornwallis, July 6, 1781; Washington at his headquarters on the Hudson, receiving word that de Grasse was sailing for the Chesapeake, August 14, 1781; Sir Henry Clinton, at his headquarters in New York learning of the American and French march to Virginia; and the besieging of Yorktown including the taking of Redoubts 9 and 10, the bombardment of Yorktown, the capitulation of the British, and the order to cease firing.

The Anniversary Day Pageant portrayed the historical scene representing the surrender of the British forces at Yorktown in 1781. The banquet given to Lord Cornwallis and General Rochambeau by General George Washington was reproduced, and was followed by a masque dealing in symbolic, or allegorical, form with the great development of America after Yorktown, with the main motifs Peace, Liberty, and Democracy. At the close of the masque, the British flag was raised from the British redoubt and the national salute was fired.

This Pageant, which was witnessed by the President of the United States and many other dignitaries, was a most stirring one, intensely interesting throughout. The sight of the British and Hessian soldiers, in their new and colorful uniforms, filing out of their fortifications at Yorktown with General O'Hara at their head, their colors cased, and marching to the music of the appropriate British air, "The World Turned Upside Down," was one that will live long in the memories of those who were fortunate enough to see it.

The personnel participating in the pageants were drawn from nearby communities—Yorktown, William and Mary College, High Schools, Military Posts, Theatrical Societies, and other organizations. Army officers played many of the important parts.

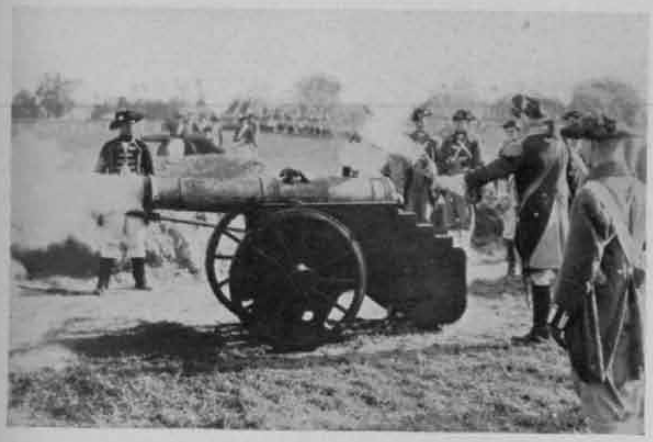
The Grand Military Review, which officially closed the Yorktown Sesquicentennial Celebration, was one of the most colorful and impressive military formations that has been conducted in the last decade. It was a sight that would stir the souls of all loyal and patriotic Americans—the appropriate finale to a great Celebration.

A cool brisk October day, not a cloud in the dark blue sky, groves of trees with multi-colored leaves in the distance, and a military spectacle headed by the

Commanding General, Brigadier General S. D. Embick, and his Staff, consisting of a column several miles long with the smart Corps of Cadets from the Virginia Military Institute bringing up the rear, the thunderous applause of over one hundred thousand Americans—this is a picture not often seen in these times.

Units of the Regular Army, a detachment of French Marines, the United States Navy, the United States Coast Guard, the United States Marines, the National Guard, the American Legion Drum and Bugle Corps from Delaware and West Virginia, and the Corps of Cadets, Virginia Military Institute, all participated in this great spectacle.

Many of the National Guard organizations wore special uniforms that added color to the formation.



George Washington Firing First Shot Against Yorktown

The somber drabness of the regular's uniform was sharply contrasted with the orange, gold, red, and blue colors of the National Guard. The Governor's Foot Guards of Connecticut, the composite Battalion from New York, the Governor's Troop of Cavalry from Pennsylvania and the famous "Black Horse Troop," Troop B, 102d Cavalry from New Jersey, were outstanding.

The President of the United States arrived at Yorktown aboard the U. S. S. Arkansas on the morning of October 19. As the presidential party steamed up the river, the entire fleet rendered the prescribed salute. President Hoover disembarked, received the Guard of Honor, and then motored to the stadium between lines formed by National Guard organizations from the various States.

The 3rd Cavalry with their gold standards and lances escorted the President and his party through the Virginia Arch into the huge amphitheater, and then into the center of a hollow square formed by the 12th Coast Artillery, the massed colors, the 3rd Cavalry, and the United States Army Band. As the President alighted from his automobile, the band played the National Anthem, while the vast throng arose and paid homage to the nation's Chief Executive. President Hoover then advanced to the speaker's stand and delivered his address over the radio and the public address system. Following the President's address the party of distinguished guests was escorted through a pathway formed by two lines of sentinels in special uniforms, to the official luncheon tent where approximately fifteen hundred guests were seated.

The President and his party rested in the President's tent after the luncheon and then returned to the stadium where they witnessed the Anniversary Day Pageant, and the Grand Military Review.

It was a difficult and delicate problem to handle so many dignitaries as were present at the Yorktown Celebration, but the problem was successfully solved by detailing aides to important guests. A careful plan was prepared in advance, the aides were well informed and instructed, and all details were coordinated.

Units from the Regular Army filled out the celebration program with drills and exhibitions that were very interesting to the public. On October 19, after the Grand Military Review and the departure of the President, it was expected that there would be a big rush to depart in automobiles, thereby causing intense traffic congestion and possibly serious accidents. This exodus was counteracted by arranging an attractive military demonstration which held a large part of the audience in the stadium and allowed the automobiles to clear the Yorktown area gradually.

The 3rd Cavalry from Fort Myer made a big hit in all of their demonstrations. The 16th Field Artillery conducted several battery field artillery drills that fascinated our civilian friends.

One of the best military exhibitions of the whole celebration was the silent drill conducted by a special platoon from the 3rd Battalion, 12th Infantry. This crack outfit drilled through several hundred movements that lasted at least twenty minutes without a command or signal, or a flaw in their performance. It was a demonstration that won the admiration of and drew applause from the entire audience.

Battery C, 12th Coast Artillery, conducted a spectacular antiaircraft demonstration that night, the illumination being furnished by the sixty-inch antiaircraft searchlights of Battery A, 12th Coast Artillery. In the first phase of this demonstration, the plane was illuminated and Battery C opened fire with blank ammunition. The pilot did a falling leaf, snapped out his running lights, the searchlights were extinguished, giving a very realistic impression that the plane had been shot down.

On the Celebration grounds, there were many exhibits that held the attention of the visitors. The National Park Service filled two large tents with relics, pictures, models of mother nature's wonders and specimens from all over the United States. Major Eugene B. Walker, C. A. C., arranged a War Department exhibit that proved to be very interesting and well attended. The exhibit included a miniature mine system, a modern tank, an airplane motor, and other military materiel.

The United States Navy exhibit contained samples of Navy materiel and models of ships. The State of Virginia arranged a fine agricultural exhibit. Descendents of the Pamunkey and Mattaponi Indian tribes established an Indian camp that fascinated the kiddies (Yes, the Army pitched their tepees and built their latrines for them, also)! The State of Virginia had

many specimens of wild life in the zoo on the Colonial Fair Grounds.

The Colonial Fair Grounds, a section of the Celebration grounds, included a childrens' playground and checking tent, a free marionette show, a dancing pavilion, a colonial tilting arena, and many top and souvenir concessions.

Sunday, October 18, was designated Religious Day. In the big stadium, Catholic field mass was held at 9:30 a. m., union Church Services at 10:30 a. m., and military religious services at 4:30 p. m. The latter service was attended by a vast throng. Two thousand sailors from the fleet, all of the Regular Army and National Guard personnel attended in formation, and the stands were well filled with civilians. Chaplain Ivan B. Bennett, U. S. Army, who had general charge of the program on this day, arranged a very impressive stage background for the 4:30 p. m. service. Chaplain Julian E. Yates, Chief of Chaplains, delivered the sermon while Chaplain Morris S. Lazaron, Lieut. Col., Chap.-Reserve, Chaplain Bart D. Stephens, Chief of Chaplains, United States Navy, and Chaplain J. W. Turner, U. S. Navy, also took part in the service.

The part taken by the United States Navy in the celebration lent much color to the occasion and assisted greatly in making the celebration the success that it was. In addition to transporting the President of the United States between Annapolis and Yorktown, the Navy participated in many of the formations, permitted visitors to board their ships every afternoon for inspections, illuminated their ships at night—a sight that inspired the visitors, conducted searchlight demonstrations that could be seen for miles in the dark skies, besides escorting the French cruisers bearing the French delegation from outside the Virginia Capes to Yorktown.

The Coast Guard assigned anchoring grounds on the York River, controlled water traffic, and participated in the Grand Military Review.

The Provost Marshal, Captain B. L. Milburn, C. A. C., was charged with the responsibility of traffic control, special transportation services, and police protection. It was his duty to formulate the general plan for traffic control, secure cooperation from state, county, and municipal authorities, and to arrange for the housing, feeding, deputization, and employment of civilian police personnel.

During the weeks preceding the Celebration, the Provost Marshal devised a plan for the control of all traffic in the Celebration area, and in the vicinity of Yorktown. This was done after consultation with Mr. T. McCall Frazier, Commissioner of Motor Vehicles for the State of Virginia, and local police authorities near Yorktown. Two traffic maps showing the routing of traffic were published in many newspapers, and distributed in information circulars at gasoline stations and other points all over the eastern states. Signs were posted along the highways near Yorktown

As can be imagined the handling of traffic was one of the most difficult and important problems occurring during the four days of the Celebration. One hundred ninety state police, five officers and one hundred thirty enlisted men of the Marine Corps and twenty-eight officers, one hundred eighty-five enlisted men of the Regular Army comprised Captain Milburn's traffic force. The Provost Marshal established telephone lines to critical traffic points. Parking stands were provided for buses and taxis. Additional parking space was provided for the great number of private cars present. Army tractors and trucks were present to assist cars encountering difficulties in traversing the parking lots and temporary roads. Some idea of the immensity of the traffic problem can be realized when it is stated that 40,000 cars were parked in the parking areas on the last day of the celebration.

A force of twenty-three uniformed patrolmen and six detectives was used to operate in the Celebration grounds proper, to prevent disorders and thefts, to return lost or stolen articles, and to return lost children and ladies to their families. It was found that a force of at least double this number could easily have been used. The crowds were orderly and well behaved. There was very little drunkenness, and the operations of the pickpockets were kept at a minimum by Sergeant Foler and his detectives.

General View of Sesquicentennial Grounds

In using the military police of the Army and the Marine Corps, the Provost Marshal adopted the general policy of turning over all serious police cases to the civilian police so as to avoid any embarrassing situations that may arise concerning the use of Federal troops for police purposes. The military police and the civilian police functioned very well together. There was not a single case of friction between members of the police forces.

One of the most important phases of the celebration was the part taken by the Army Medical Department under Colonel D. F. Duval, M. C., in caring for the sick and injured, in the prevention of disease, and in the promulgation and enforcement of sanitary regulations.

A model camp hospital was constructed. During the period from October 5 to October 20, with a varying strength of approximately 4000 men in camp, 463 cases were handled including 248 civilian cases.

The American Red Cross established and maintained five first aid stations during the four days of the Celebration. The Surgeon had general charge of these

stations, and the Army furnished the tentage, chairs, beds, bedding, litters, and telephone service. 896 cases of minor injuries and illnesses were treated by the first aid stations during the four day period.

Three ambulances, manned by experienced personnel, treated many cases in the stadium during the exercises.

As the Army camp site was on the water shed of the city of Newport News, all wastes were removed daily. The National Park Service hired laborers, and the Army furnished transportation for this purpose. Manure was hauled away to a nearby farm. Liquid kitchen wastes were satisfactorily disposed of in sewage pits near the kitchens. Dry earth closets, that is, covered pail latrines with wooden seats and covers, were used in the Army area. These latrine pails were emptied daily, thoroughly cleaned and disinfected.

Fire regulations were published and widely distributed because the fire hazard was very great in the celebration area. The area was divided into fire zones, and two-wheel chemical carts were placed at key points. One 2½ gallon extinguisher was placed in each large assembly tent. Hand extinguishers were placed in kitchens and in other places of danger.

The city of Newport News loaned the Army six experienced firemen, one water pumping unit, and one chemical unit. A G. M. C. chemical engine was borrowed from Fort Monroe.

Only one fire occurred during the celebration caused by a careless person tossing a lighted cigarette butt on the canvas side wall of one of the large assembly tents. The fire was immediately extinguished by the 2½ gallon extinguisher placed in that tent.

The Fire Marshal, Captain P. E. Bermel, 13th Engrs., arranged for emergency details to report to each tent in the area to maintain them in case of a bad storm.

The Communications Officer, Captain Creighton Kerr, 12th C. A., established and maintained a complete system of communications at the celebration grounds. The Army switchboard was a 150-drop local battery board that maintained telephonic communication with all important points. There were three trunks from the Army switchboard to the commercial switchboard. About one hundred telephones and eighty miles of wire were used in the installation of the telephone system.

An S. C. R. 136 radio set was installed, and regular schedules were maintained with Fort Eustis, Fort Monroe, and the U. S. Navy.

The lighting contract with the Virginia Light and Power Company permitted lights to be installed in all kitchens and certain latrines only in the army camp. To supplement this service Captain Kerr installed a 25 KW set mounted on an Ordnance trailer, that furnished lights for over three hundred officers' tents, the motor park, the quartermaster area, recreation rooms, and other places where lights should have been provided.

The Army Motion Picture Service installed a talking moving picture machine and the communications officer furnished a motor generator set driven by a Mack searchlight unit. Shows were conducted every evening except during the four days of the celebration.

One large tent in the celebration area contained a complete commercial switchboard unit with trunk lines to Newport News, Richmond, Washington, and New York; a Western Union Telegraph Office; a Postal Telegraph Office and a United States Post Office.

The messing problem was successfully handled by unit messes, and the restaurant concessionaire, Mr. W. M. Cease. In the Regular Army camp, one mess was provided at the head of each company street. Each mess served over two hundred men. Mess officers submitted their requisitions to the unit mess officer, Captain G. M. O'Connell, C. A. C., who obtained the supplies from the rail head and supply depot at Fort Eustis. Deliveries were made before 8:00 a. m. daily.

What is reputed to be the largest restaurant in the world, was erected on the Celebration grounds to feed the public at the rate of 5300 persons per hour. The restaurant, erected by Lieut. Norman and his detail, covered an area of 7500 square feet.

An information bureau, organized and operated by G-1, Major T. C. Cook, C. A. C., and Captain R. P. Ratay, F. A., and their staffs, performed an invaluable service to the public. This bureau registered all guests of the U. S. Commission, maintained a money exchange

Americans Taking Redoubt Ten

(for the benefit of the French sailors) disseminated general information and transportation, helped to locate missing children, helped to find wanted persons, delivered hundreds of messages, helped to find lodging for hundreds of visitors, etc. Reserve Officers, Boy Scouts, and volunteer assistants were used to great advantage in this service.

Many commendations for their splendid work on this occasion were received by the Army. These commendations came from the President, Cabinet Members, Senators, Congressmen, Governors, Foreign Dignitaries, the Navy, Marine Corps, and the Coast Guard, and many other distinguished persons and organizations. The high point of these is the President's message which was sent shortly after he had embarked at Yorktown, October 19.

"2919 for Commanding General, U. S. Troops, Yorktown. The President sends his congratulations to you and all troops participating in the exercises today 1700."

Rocket *vs.* Airplane

By 2nd Lieut. Dallas D. Irvine, Inf. Res.

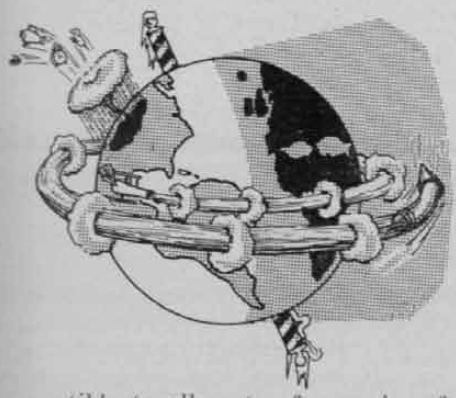
IT WILL perhaps appear to be stating a mere platitude to say that the characteristics of the art of war in every age have depended fundamentally upon the nature of contemporary civilization. Actually the consideration and historical study of this relation is the most pregnant intellectual activity in which a student of the art of war or a military theorist can engage. For the historian the recognition of the importance of this relation acts as an "Open Sesame" to a comprehension of the development of the art of war that is otherwise unattainable, while for the military theorist it provides the only sound basis for evaluating the military ideas and methods of his time in the light of a probable future. Neglecting the other aspects of the relation, however, one may call attention here to the peculiar importance of the relation between the mechanical means of warfare and the stage of advancement of contemporary industry and science. At all times the nature of the mechanical contrivances whose use is practicable in war has depended upon the immediate capabilities of general technology.

The limitations of contemporary technology, however, impose no necessary restrictions upon the imaginative faculty of the human mind. At various times, therefore, contrivances or devices have been conceived of in the abstract whose construction, development, or employment has been impracticable at the time but become feasible later as the capabilities of technology have increased. Numerous instances might be cited. One may mention, however, merely the fact that the ideas underlying the form of modern artillery—steel construction, rifling, breech-loading—were conceived very early in the history of artillery but only became practically applicable in the latter half of the nineteenth century when the iron industry had reached a requisite stage of progress. General consideration of the many instances of once impractical ideas which have become susceptible, at the hands of a more advanced technology, of a development which has made them of greatest practical importance should lead one to inquire if there have not been other ideas advanced in the past, and then found impractical, which are now capable of being developed to a high degree of usefulness.

Speculation of this sort, combined with meditation upon problems of present day warfare, has led the writer to wonder if he cannot point out a particular case where the present day development of an old idea might be of great importance, the idea in mind being that of the military rocket.

Well over one hundred years ago, General Congreve, of the British army, conceived the idea of an explosive rocket which should fulfill some of the functions of artillery and at the same time make available in war certain advantages peculiar to the use of such a device. The idea was practically put into execution as well as could be done at the time, and one finds Congreve rockets to have been used in the naval attacks on Boulogne in 1806, on Copenhagen in 1807, and on Rochefort in 1809. A detachment of British troops equipped with Congreve rockets also took part in the battle of Leipzig in 1813. Though the results obtained were far from satisfactory, the limitations of contemporary artillery caused these rockets to be considered as one of the regularly available implements of war for half a century. Large numbers of Congreve rockets were used by the allies in the siege of Sebastopol—not without a certain peculiar effectiveness—and by the Austrians in the war with France of 1859. By that time, however, the artillery arm was undergoing a rapid transformation which made the Congreve rocket of no further practical use. It was consequently quickly eliminated from war equipment and soon almost forgotten. Some experimentation with rockets seems again to have been made in the late war but with no practical results. Apparently, then, the far superior characteristics of modern artillery as compared with the old type rocket have caused the *principle* of the rocket to be neglected.

The great inferiority of the Congreve rocket to modern artillery has been due, first, to the extremely poor accuracy of rocket fire, and, second, to relatively short range possible with ordinary powder used as a means of propulsion. Certain technological advances made since the Great War lead the writer to ask, however, if both these disadvantages cannot now be overcome. So far as the means of propulsion is concerned the recent, widely publicized experiments in Germany and elsewhere with rocket-propulsion for non-military use would seem to give ground for supposing that the desirable propulsion characteristics in a military rocket could easily be achieved. The great difficulty would



remain, however, of securing accuracy of fire.

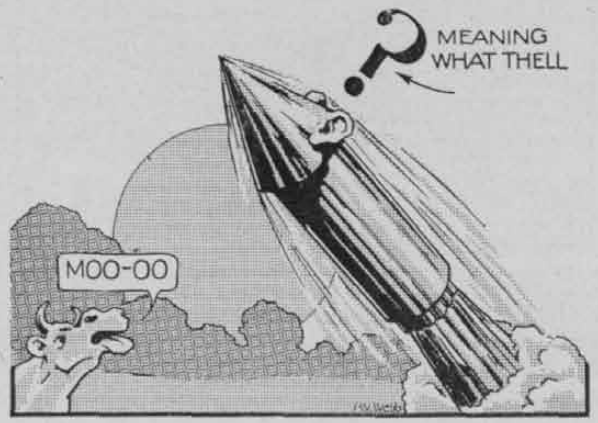
The inaccuracy of rockets of the Congreve type depended on factors which are quite obvious. Such a rocket was highly susceptible to all sorts of vagaries of the atmosphere and its own propelling charge. It was useless, therefore, to attempt to give it any great exactitude of initial direction. Today, however, it should be possible to eliminate these earlier defects. Discharge of the rocket from a rifled cannon-bore would impart to it the rotary motion and resultant flight stability of a shell and at the same time allow all the exactitude of initial direction it is possible to give a shell. If the breech of the bore were closed or partially closed a high velocity—perhaps comparable to that of a shell—could be given the rocket before it left the muzzle. The accelerating force of the propelling charge subsequently exerted would consequently result in an important increase in range. The fact that the propelling force would be exerted upon the compressed gases in the bore rather than by them should allow relatively low internal pressures to be used with the resultant advantage of lighter construction. This effect could in any case be secured by leaving a sufficient breech opening. Any lower acceleration could be compensated for by lengthening the tube, which would insure also a sufficient rotation of the rocket and increase the accuracy of initial direction. Lighter construction resulting from lower pressures should make it possible to employ projectiles of larger caliber. By employing the rocket principle in artillery, therefore, it should be possible to secure results in long range bombardment far exceeding those of the Paris Gun used by the Germans in the late war.

Flight stability in a rocket might be secured otherwise than by its own rotation through the use of gyroscopes. Discharge from a smooth bore would then be sufficient to give the rocket exact initial direction. This method of discharge would have the advantage of decreasing friction in the bore. Whether it would be more advantageous on the whole is problematical.

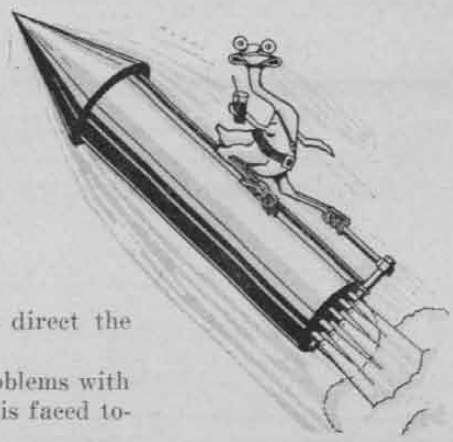
From this line of reasoning it would appear that there may be advantages of great importance to be gained from the development of a rocket artillery. There would undoubtedly also be certain disadvantages such as the increased weight of the projectile, but if such an artillery is practical at all, there might be many ways in which it would be of high value. Whether the traditional type of artillery could be replaced entirely is a matter for speculation.

However, the mere substsitution of rockets for inert projectiles in artillery would not fully utilize the peculiar characteristics of the rocket. Rockets, unlike shells, are self-propelling, and there is therefore no reason why they must necessarily depend upon their original direction of discharge for their trajectory. May it not be possible to devise a rocket which will direct itself to its target regardless of inaccuracies in the initial direction given it or any vagaries to which it is subsequently subject?

Since a rocket does not need to rotate, the necessary alteration of the trajectory during flight might be accomplished by the operation of rudder vanes, but it could probably best be accomplished through an alteration of the direction of the propelling impulse with respect to the axis of the projectile. One can conceive of the propelling force, such as that produced by the combustion of liquid oxygen and hydrogen, being exerted through a tube joined to the rocket body by a socket joint and capable of being moved out of alignment with the axis through a small angle in any direction

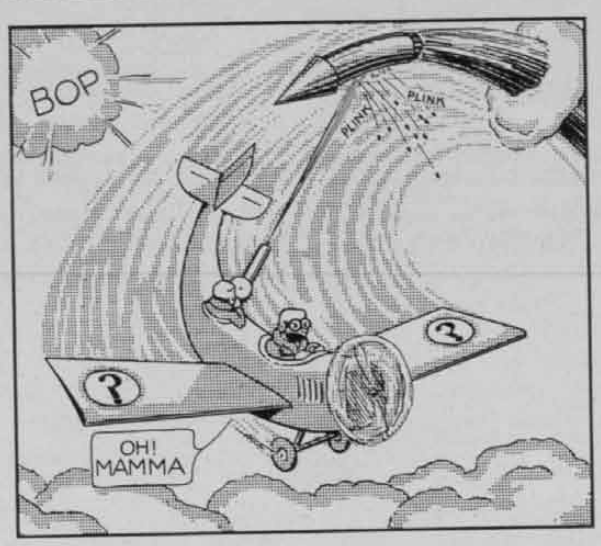


But supposing that the provision of a rocket with a steering device be possible, the operation of that device so that the rocket would reach its target would require the exertion of some directive force upon the rocket while in flight. Various possibilities suggest themselves. Radio control by an observer would hardly be practicable. It might be possible, however, in using rockets against very large targets, to give sufficiently accurate direction thereto by a directed beam of radio-electric energy. Some possibilities might lie in the use of a compass and declinator within the rocket to cause it to strike near a certain latitude and longitude at perhaps hundreds of miles distance. However, the greatest possibilities would obviously lie in a dependence upon some force emanating from the target itself to direct the rocket to it.



Of all the problems with which artillery is faced to-

day none can begin to compare in importance with that of perfecting anti-aircraft fire. Remarkable developments appear recently to have been made in the effort to solve this problem. It appears probable, however, that limitations inherent in the principles upon which these developments have been made will make any wholly satisfactory solution along these lines impossible. As long as the anti-aircraft projectile is dependent for the entire course of its flight upon the initial direction and impulse given it anti-aircraft fire can hardly be as effective as is desirable. Even under conditions of maximum visibility the speed, distance, and three-dimensional maneuverability of the target must combine with minute inaccuracies in the working of the directive mechanisms to prevent any close approximation to absolute accuracy. Where visibility is poor, however, or at night, the accuracy must be less even with searchlights and sonic directors of a highly developed type. One need only consider the vagaries to which the transmission of sound is subject as compared with that of light. It appears probable, therefore, that anti-aircraft fire on present principles can hardly approximate perfect effectiveness. But security against aircraft demands hardly less.



However, the airplane of today is one target which normally must emit, in the form of sound, a relatively strong force which it might be possible to utilize in causing it to steer a rocket to the target. Not being a technician, the writer is in no position to judge accurately the possibilities in this idea. He would like to ask, however, if four microphones placed in the sides of the rocket ninety degrees of its circumference apart would not receive the sound of an airplane motor —which was out of line with the axis and not too far away—with sufficient difference in intensity to allow the difference to be amplified and transformed electrically into a difference of magnetic energy sufficient to steer the rocket toward the source of sound? If not, would there be a difference in the pitch of the sound received by opposite microphones caused by the component of the rocket's motion which was toward the plane and the different directions in which the microphones would face, and would it be feasible to utilize such a difference similarly?

The characteristics of a rocket with a sonic directive mechanism of this type, if it were a possibility, will readily occur to anyone familiar with dynamics. Given approximate direction toward the source of sound, even in total darkness, the rocket would incline toward the source of sound until directed at it. It would then continuously correct its direction to correspond to the altering position of the plane, and, as it drew very close, the obvious inaccuracies of direction due to gravity, the low velocity of sound, the speed of the plane, etc. would become infinitesimal, that is, approach zero as a limit. Detonation might be by percussion, or perhaps a discharge of shrapnel might be brought about by a certain equal intensity of sound in the microphones. If the steering could be made sharp enough, the rocket could be made to continue in pursuit of its target regardless of how many times it missed as long as its propelling force lasted, for the effect of gravity would be counteracted by the force of propulsion and the direction given it by the directive device. One can conceive of such a rocket literally hounding down its target through a complex series of evolutions.

Any extended speculation on the effects such a rocket would have on tactics and strategy would be futile before the practicality of the idea be demonstrated. However, one may point out the great advantage which would be obtained from the relatively simple method of discharge possible. If discharged from a trench-mortar-like tube aimed approximately by sight or a simple sonic finder, it would be possible to distribute the means of air defense over wide areas at a relatively small cost—exactly what is needed for adequate air protection and for avoiding the possibility that more complicated, and hence more concentrated, air defenses would be destroyed by operations preliminary to the main air attack.

Whether such a device as here suggested is really practicable a layman can hardly judge. In view of the great advances made in rocket propulsion and sonic devices since the war it would not appear to him, however, in the lack of technical knowledge, to be beyond the realm of possibility. The suggestion is offered for what it is worth. Even if it is of no value, a technical discussion of the principles involved by someone competent to undertake it would be of great interest.

The Lewis Universal Impact and Trial Shot Chart for Antiaircraft Artillery

EDITOR'S NOTE:—*The methods of obtaining adjustment corrections for antiaircraft guns based on preparatory fire, described in the following article, were submitted to the Coast Artillery Board by Captain John T. Lewis, C. A. C. The Board recommended their adoption and its recommendation was approved by the Chief of Coast Artillery.*

The charts and scales required by this method will be furnished by the Coast Artillery Board and will be distributed by the Office of the Chief of Coast Artillery.

THE antiaircraft gun battery in the field is frequently required to change gun positions and observing stations. It is therefore essential that all fire control equipment and methods be adaptable to any position the battery and its associated observers may assume. The method, now in use, of analyzing trial shots is defective in that it employs two charts—an impact chart and a trial shot chart, neither of which is universal. A new impact chart is required for every change in either the battery position, the position of the trial shot point, or the position of the observers; the trial shot chart is applicable to only one trial shot point. Hence the impact chart cannot be prepared until after the baseline has been surveyed and the trial shot point selected. Although the trial shot point may be selected in advance and the trial shot chart prepared, weather conditions may prevent the use of that trial shot point. In such a case a new trial shot point will have to be selected, a new trial shot chart prepared and also a new impact chart. In order to provide a method better adapted to field use, the Lewis chart has been prepared which will solve any triangle or any problem involving triangles. In particular, it can be used for determining the corrections based on trial shots in antiaircraft artillery, forms an impact chart for any trial shot point and any baseline, and can also be used for determining calibration corrections, developed muzzle velocity and fuze error.

This article is concerned primarily with the various types of corrections associated with preparatory fire in antiaircraft artillery and will cover the following subjects:

a. The theory of the Lewis Chart.
b. Solution of triangles.
c. Description of the chart.
d. Determination of data for laying the observing instrument on the Trial Shot Point.
e. Determination of the deviations of the center of burst from the trial shot point.
f. Correction scales.
g. Determination of the trial shot corrections.
h. Determination of calibration corrections.
i. Determination of developed muzzle velocity and fuze error.

a. The Theory of the Lewis Chart:

The Lewis chart is nothing more than a graphical representation of the law of sines. In any triangle, Figure 1, by the law of sines

$$a : c = \sin A : \sin C$$
$$= \sin A : \sin (A+B) \qquad (1)$$

Taking logarithms of both sides, equation (1) becomes

$$\log a - \log c = \log \sin A - \log \sin (A+B) \qquad (2)$$

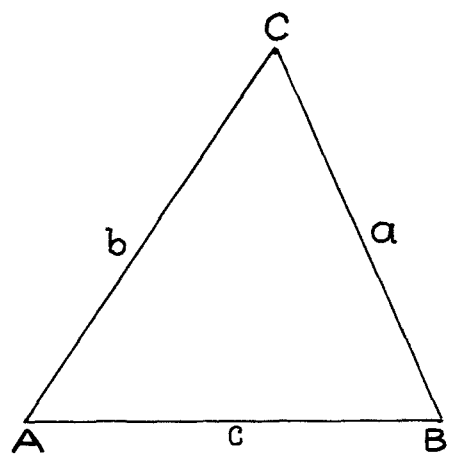


Figure 1

It will now be shown how this equation can be expressed as a family of curves.

If the angle A is assumed to be constant and the angle B is varied, a curve can be drawn whose abscissæ are the values of B and the ordinates are the successive values of the difference log a — log c. For each assumed value of A, a different curve is obtained. If curves are drawn for values of A varying by some constant quantity, such as 10 mils, from 10 mils to 3100 mils, and for values of B differing by 10 mils from 10 to 3100 mils, the family of curves thus obtained will constitute a Lewis chart. A section of such a chart is shown in Figure 2.

In the chart thus obtained, explicit values of A and B determine an ordinate which is the value of the difference log a — log c. If a (or c) is known, the value of c (or a) can be computed since log a — log c can be obtained from the chart. Such a procedure, however, would be so awkward as to destroy the usefulness of the chart. It will now be shown how the values of a (or c) can be obtained graphically when c (or a) is known.

To the same scale as the ordinate scale of the chart, draw a separate logarithmic scale but instead of graduating this scale in logarithms, graduate it in yards.

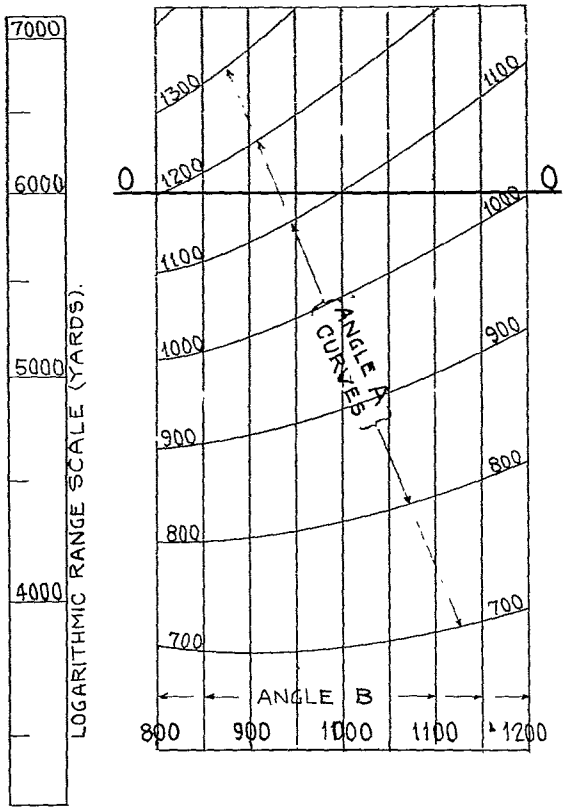


Figure 2

This separate scale will be referred to hereinafter as the "log range scale." The construction of this log range scale will become evident by recalling that if, on the logarithmic scale of ordinates, a distance of X inches corresponds to the log of 2, then, on the log range scale, if the distance between any two ranges is X inches, those two ranges are in the ratio of 2 to 1. That is, the distance between any two range graduations on the log range scale, represents, to scale, the difference between the logs of those ranges. In particular, the distance on the log range scale, from the graduation corresponding to the side c, to the graduation corresponding to the side a, is a graphical representation of the left-hand member of equation 2, viz, log a — log c.

To summarize the situation, the value, to scale, of the right-hand member of equation (2) is obtained by entering the chart with A and B. The value, to the same scale, of the left-hand member of equation (2) is obtained by entering the log range scale with the values of c and a. Furthermore, by equation (2), these two, quantities are equal. Hence, when any three of the quantities in equation (2) are known the fourth may be determined; *e. g.*, if A, B and c are known, a can be determined. For A and B determine, on the chart, an ordinate, and if the log range scale is placed along this ordinate, with the range corresponding to c opposite the origin of ordinates, the ordinate will indicate on the log range scale a distance which determines the graduation corresponding to the range a. Similarly, if a, c and B are known, by placing the log range scale along the ordinate whose abscissa is B, and with the range c on the origin of ordinates, the graduation corresponding to the range a will intersect a curve (by interpolation if necessary) corresponding to the angle A.

In order to fix the ideas, it has been convenient thus far to consider particular angles and sides; figure 2 represents the same special situation. It is now necessary to generalize the discussion. For convenience in writing, the angle represented by abscissæ on the chart will be referred to as the independent angle. The angle represented by the curves of the chart will be referred to as the parameter. The side included between the independent angle and the parameter will be referred to as the "baseline." The side opposite the parameter will be referred to as the "range."

With the foregoing nomenclature it is now possible to formulate a statement of the general rule to be followed, as well as the limitations imposed, in using the Lewis Chart.

Referring again to equation (2), it should be noted that the chart is particularly adapted to the solution of all triangles except the case in which three sides are known. While the latter case can be solved by the chart ,the solution is not a convenient one, and as this case does not occur in artillery problems, it will not be considered in this article. The following cases will be discussed:

Case I: Two sides and the included angle.

Case II: Two angles and the included side.

Case III: Two angles and the side opposite one of them.

Case IV: Two sides and the angle opposite one of them.

But, whichever of the above four cases occurs, in order to use the chart it is necessary to arrange the given data in such a way that the independent angle and the parameter include the baseline.

Another rule, pertaining to the use of the log range scale, is inferred from equation (2). The ordinates on the chart are positive or negative, depending upon whether or not the "range" is greater than the "baseline." The axis of zero ordinates on the chart is marked 0-0 and corresponds to the case in which the range equals the baseline. The log range scale is placed on the chart along the vertical line through the abscissa, with the graduation corresponding to the base line opposite the line 0-0. The curve corresponding to the parameter intersects the log range scale at the "range" of the side opposite the parameter.

The foregoing general statements, or rules, are sufficient for the solution of any triangle within the limitations of the chart. The following examples illustrate the application of the rules.

b. Solution of Triangles:

Given the triangle A B C, Figure 1.

Case I. Two sides and the included angle.

Given Angle B = 1168 mils
Side AB = 6000 yards
Side BC = 4000 yards

To find Angle A:

Set the log range scale along the vertical line on the chart (Figure 3) whose abscissa is 1168 mils (Angle

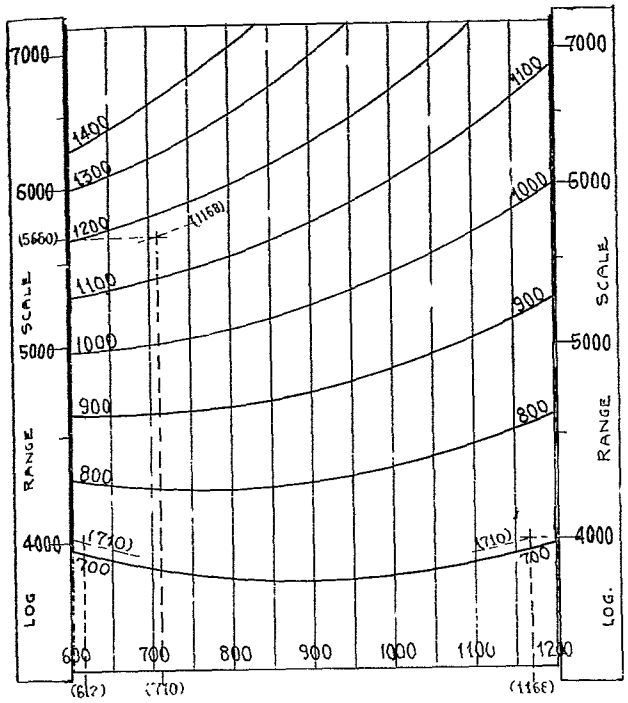


Figure 3

B), with the graduation of the log range scale corresponding to 6000 yards on the horizontal line of the chart "0-0." Opposite the graduation of the log range scale corresponding to 4000 yards can be read 710 mils, which is the value of A.

Case II. Two angles and the included side.

Given Angle A = 710 mils
Angle B = 1168 mils
Side AB = 6000 yards

Find Side AC.

To find the length of the side AC, set the log range scale along the vertical line on the chart whose abscissa is 710 mils (Angle A) with the graduation corresponding to 6000 yards on the horizontal line "0-0" of the chart. Opposite the angle B, equal to 1168 mils as read on the curves, is 5680 yards on the log range scale, the length of the line AC.

Case III. Two angles and the side oposite one.

Given Angle B = 1168 mils
Angle C = 1322 mils
Length AB = 6000 yards

Find length BC.

Angle A = 3200 — B — C
= 710 mils.

We now have two angles and the included side (angles A and B and side AB) and can proceed as in Case II.

Case IV. Two sides and an angle opposite one.

In this case several special cases arise in the solution of the triangle. We may have either one, two or no solutions, depending upon the value of the known angle and the relative lengths of the known sides.

Given Angle A = 710 mils
Side BC = 4000 yards
Side AB = 6000 yards

Find angle B.

Set the range scale with the length AB, 6000 yards, on the 0-0 line and move the scale laterally until the range BC, 4000 yards, is directly over the angle A = 710 mils as read on the curves. The abscissa of this point is the value of the angle B (1168 mils). By moving the range scale to the left, keeping the length AB = 6000 yards on the 0-0 line, we will come to another point where 4000 yards on the log range scale, meets the curve corresponding to A = 710 mils. The abscissa of this point gives B = 612 mils which is a second solution of the triangle. The number of solutions of triangles in Case IV can be determined by an inspection of the chart.

The log range scale in Figure 3 has been placed on each side in order to clarify the figure in showing the results of the four problems. In practice, the log range scale is placed on the ordinate corresponding to the proper abscissa for ease in reading the log range scale.

Rules for use of the chart.

The method of solving, by means of the chart, the four cases treated above, may be summarized as follows:

The data pertain to two angles and two sides of a triangle.

The curve corresponding to one of the angles intersects the log range scale at the graduation corresponding to the side opposite that angle.

The 0-0 line intersects the log range scale at the graduation corresponding to the side included between the two angles.

c. Descripiton of the Lewis Chart.

The discussion so far has considered only the solution of triangles. Modifications to the chart are necessary to adapt it to field use by antiaircraft artillery. To insure accuracy and limit the chart to a convenient size it is made up in six sections. One group of three sections covers ranges from half the baseline length up to slightly over the baseline length. The other group of three sections covers ranges from twice the baseline

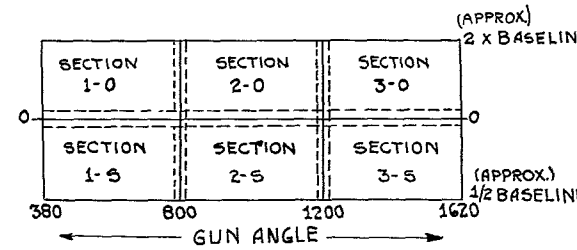


Figure 4

length down to ranges slightly less than the length of the baseline. Each section is each group covers 400 mils change in the gun azimuth. See Figure 4.

A sufficient overlap has been provided on each section to avoid transferring from one section to another while working a problem. The six sections allow the battery commander a wide range in the selection of gun azimuths, baselines, and trial shot points. For any particular situation only one section of the chart need be used, and the work connected with the determination of the corrections based on trial fire is performed on about four square inches of that particular section.

The following scales are used in the construction of the chart:

Horizontal 1 inch = 20 mils
Vertical 1 inch = .01

In order to adapt the chart for use as a combined Trial Shot and Impact Chart, certain special conventions are adopted. The angles hitherto considered have been interior angles of the triangle. In the field, it is desirable to have the angle measuring instruments turn off angles in a clockwise direction. In Figure 5, if L R is the baseline and T the horizontal projection of the trial shot point the instrument at L would determine the exterior angle QLT rather than the angle RLT. On the other hand, the station R, on the right-hand end of the baseline, would read the interior angle LRT.

The azimuth of the baseline also enters the problem. In Figure 5 if the gun is at L, the azimuth of the baseline is NLR measured clockwise from LN. On the other hand, if the gun were at R, the right end of the baseline, the azimuth of the base line would be equal to the angle NLQ. After an angle is determined from the chart, it is necessary to convert that angle to an

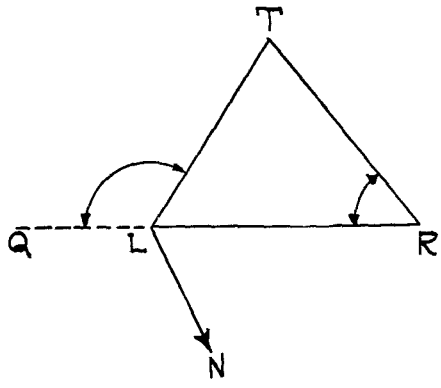


Figure 5

azimuth in order that it may be set on the instrument. This azimuth is dependent upon whether or not the gun is at the right end or the left end of the baseline. Whether or not the chart angle is an interior angle or an exterior angle is also dependent upon the relative position of the gun and baseline. It is therefore necessary to designate the angles on the chart by double sets of figures. The upper set of figures is used when the gun is on the right of the baseline; the lower set is used when the gun is on the left of the baseline.

To convert angles obtained from the chart to azimuths, and vice versa, the following working rules must be used:

When the gun is on the right of the baseline, the azimuth of the trial shot point is equal to the azimuth of the baseline plus the angle obtained from the chart.

When the gun is on the left of the baseline, the azimuth of the trial shot point is equal to the back-azimuth of the baseline plus the angle obtained from the chart.

If the angle obtained is negative, add 6400 mils.

The range scale is graduated in yards and is furnished in strips which may be pasted together to form a single scale.

As the solution of a right-angle triangle is required, when the altitude or the angular height of the trial shot point or target from one of the stations is desired, the vertical line corresponding to the 1600 mil abscissa is reproduced on all sections of the chart. The graduations on this line are merely the points where the line is intersected by the parametric curves. Thus, if we wish to determine the angular height from station 0_2, knowing the horizontal range from 0_2 to trial shot point and the altitude of the trial shot point, place the log range scale on the vertical 1600 mil scale with the horizontal range from 0_2 to trial shot point opposite the 0-0 line. Opposite the reading on the range scale equal to the altitude, is the angular height from 0_2 to the trial shot point.

d. Determination of the data for laying the observing instruments on the trial shot point.

Given: The azimuth of 0_2 from 0_1 equals 321 mils.
The distance 0_1 to 0_2 equals 6444 yards.
The trial shot point data selected for the battery of M3 guns are f = 13, ϕ = 700, azimuth 1300.
The firing table gives R = 4740 yards, H = 3223 yards, and ε = 608 mils.

To be obtained:
The azimuth of trial shot point from 0_2.
The horizontal distance 0_2 to trial shot point, and
The angular height of trial shot point from 0_2.

The angle $0_2\ 0_1\ T'$ equals 1300 — 321 = 979 mils. Set the log range scale along the vertical line on the chart whose abscissa is 979 mils, with the graduation of the range scale corresponding to 6444 yards on the horizontal line "0-0" of the chart. Opposite the graduation on the log range scale corresponding to 4740 yards (the point marked T′, Figure 8) can be read, by interpolation between the curves, 2379 mils, which is the exterior angle at 0_2.

Section 2-S is used as the range is less than the baseline and the gun angle lies between 800 and 1200 mils.

The 0_1 station is on the right and therefore the upper figures are used when reading the angles $0_2\ 0_1\ T'$ and $3200 - 0_1\ 0_2\ T$.

The azimuth of the trial shot point from 0_2 equals 2379 plus 321 (azimuth of baseline) or 2700 mils.

In order to obtain the angular height of the trial shot point from 0_2, the horizontal distance between these points must be obtained. This is done by solving the same triangle but with the angle 0_2 as the independent angle (abscissa) and the angle 0_1 as the parameter. Set the range scale on the vertical line whose abscissa is the 0_2 angle (2379 on the lower scale since this station is now on the left) with 6444 yard graduation on the 0-0 line. The point T″ on Figure 8, where the curve whose value equals the 0_1 angle (979 mils on the lower set of figures) intersects the log range scale, is the value of the horizontal distance from 0_2 to trial shot point and is equal to 5390 yards.

The angular height 0_2 to trial shot point is obtained by placing the log range scale on the 1600 mil scale with the horizontal distance from 0_2 to trial shot point (5390 yards) on the 0-0 line. Opposite the value of the altitude 3223 yards can be read 549 mils which is the angular height from 0_2 to trial shot point.

e. Determination of the Deviations of the Center of Burst from the Trial Shot Point. The observing instruments are set on the trial shot point, using the data determined in the preceding paragraph. The battery instrument (0_1) is set at azimuth 1300, angular height 608 mils and the flank instrument (0_2) is set at azimuth 2700, angular height 549 mils.

Four trial shots are fired and reported by the two stations as follows:

	0_1		0_2	
Shot	Lateral	Vertical	Over	Short
1	R8	0		R (short) 20
2	R5	B4		R (short) 30
3	R5	B3		R (short) 35
4	R6	B1		R (short) 20
Average	R6	B2		R (short) 26

The lateral deviations read at 0_1 and 0_2 are deviations measured in the inclined plane. Before the lateral deviations can be used on the chart they must be converted to the corresponding deviations measured in the horizontal plane. The deviation in the horizontal plane is equal to the deviation in the inclined plane divided by the cosine of the angular height of the inclined plane.

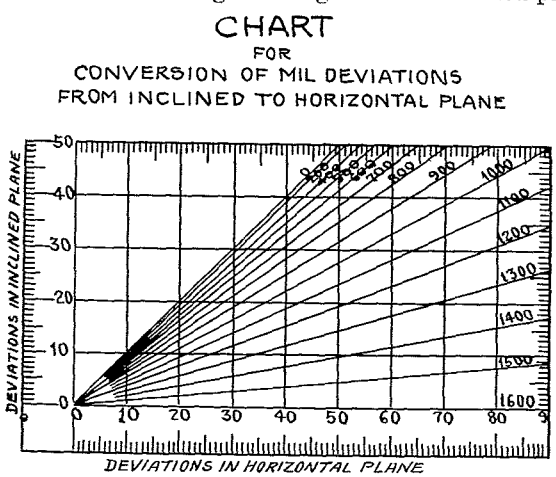


Figure 6

This transfer is made by means of a conversion chart with curves of angular height plotted with the inclined deviation as ordinate and the horizontal deviation as abscissa. (See Figure 6.) The horizontal deviation is obtained by finding the intersection of the inclined deviation and the curve representing the angular height of the inclined plane.

The following are the horizontal deviations obtained from the correction chart using the average values:

	0_1		0_2	
	Lateral	Vertical	Over	Short
Average	R7	B2		R (short) 30

(NOTE: The vertical deviations are correct as read in the inclined plane.)

In the preceding paragraph the horizontal position of the trial shot point has been plotted at angle $0_1 = 979$ and angle $0_2 = 2379$. The horizontal position of the center of burst is plotted using the horizontal deviations. The following rules hold for plotting on the chart. A "right" is always an increase in azimuth and a "left" is always a decrease in azimuth. An "over" is always towards the top of the chart and a "short" is always towards the bottom of the chart. The center of burst is therefore plotted at a point whose

$$0_1 \text{ angle} = 979 + 7 \text{ or } 986, \text{ and}$$
$$0_2 \text{ angle} = 2379 + 30 \text{ or } 2409$$

The center of burst plots a "short" at center of burst, Figure 8, (being below the trial shot point) and a "right" (azimuth of center of burst being greater than the trial shot point).

The amount of the deviations can be read from the chart as "right 7 mils" and "short 155 yards." The value of the range deviation can be obtained by placing the log range scale on the vertical line whose abscissa is 986, with the value of 6444 opposite the 0-0 line. The curve corresponding to angle $0_2 = 2409$ intersects the log range scale at 4585, which is the horizontal range from 0_1 to center of burst. The horizontal range deviation is therefore $4740 - 4585 = 155$ yards.

f. Correction Scales. In the preceding section, the reduction of observed deviations to horizontal range deviations has been described. In order that the horizontal range deviations may be converted to appropriate corrections, it is necessary to take the differential effects, which are tabulated in the Firing Tables, and reduce them to correction scales for use with the Lewis Chart. It will become evident, from the construction of these scales, that each set of scales is applicable to only one point on the trajectory. However, as the trial shot point is selected from a relatively small number of points on the trajectory, this limitation disappears in the practical application of the Lewis Chart.

Each of these correction scales gives some element of the required data by measuring ΔR, on the chart, with the scale.

In what follows, no mention is made of corrections for ballistic wind. Wind corrections can be determined by means of the chart, but the usual practice is to fire the trial shots on data corrected by the instruments for the effect of wind.

The discussion of corrections divides itself naturally into two parts: a discussion of trial shot corrections and a discussion of calibration corrections. The determination of trial shot corrections is an every day procedure and the Lewis Charts are designed especially to simplify the reduction of the results of trial shots. Calibration corrections are employed less frequently. Such corrections, though of a slightly different character from trial shot corrections, are determined with equal facility from the Lewis Charts. A third use of the Lewis Charts is concerned with the determination of the systematic errors in muzzle velocity and fuze range. This is done by means of an analysis of a series

of trial shot firings. These various uses of the charts are explained below.

g Determination of the corrections based on Trial Fire. Three correction scales are required to determine the corrections based on trial shots: the $\Delta\varepsilon_v$ scale, the dV scale and the %H scale. The scales are constructed as follows:

$\Delta\varepsilon_v$ *Scale.* $\Delta\varepsilon_v$ is the change in angular height due to a change in muzzle velocity. From page 51 of Firing Table 3 AA-J-2, 100 f/s increase in muzzle velocity will produce a change of +3.5 mils in angular height. But from page 49 of the Firing Tables, an increase of 100 f/s muzzle velocity causes an increase in horizontal range of 117 yards. Therefore, 117/3.5 or 33 yards on the range scale of the chart is equivalent to one mil change in angular height. The $\Delta\varepsilon_v$ scale is then graduated in mils by using successive increments of 33 yards on the range scale, the zero of the $\Delta\varepsilon_v$ scale being on the horizontal range of the trial shot point. Thus, if R = 4740 yards, +1 mil on the $\Delta\varepsilon_v$ scale will be opposite 4773 on the range scale, and —1 mil will be opposite 4707 on the range scale, and so on.

dV Scale. dV is the correction in muzzle velocity. Since a change of 100 f/s in muzzle velocity causes a change of 117 yards in R, it follows that if the zero of the dV scale is placed on the horizontal range (4740 yards) to the trial shot point, then +100 f/s on the dV scale will be found opposite the 4857 graduation on the range scale, and —100 f/s will appear opposite 4623 yards on the range scale.

Before a muzzle velocity correction can be determined, it is necessary to move the center of burst to the muzzle velocity line by $d\phi$ (see subparagraph 1, below). From the firing tables, ten mils change in ϕ causes a change of 33 yards in R at the trial shot point. To correct for this change in R, due to $d\phi$, an auxiliary scale is placed on the dV scale graduated according to the range scale on the chart, so that 10 mils on the scale is equivalent to a change of 33 yards in R. The zero of this auxiliary scale coincides with the zero of the dV scale.

(1) *Use* $\Delta\varepsilon_v$ *Scale:—*ϕ *Corrections.* $d\phi$ moves the center of burst to the muzzle velocity line and its value is determined indirectly by means of the $\Delta\varepsilon_v$ scale. If the zero of the $\Delta\varepsilon_v$ scale is placed on the trial shot point, the value of $\Delta\varepsilon_v$ is read opposite the center of burst. In the problem in Figure 8, the burst is 155 yards short. $\Delta\varepsilon_v$ for this point is —5 mils; *i. e.*, the burst would have been —5 mils below the angular height line if it had been on the muzzle velocity line. The burst was observed —2 mils. Hence the correction to move the burst to the muzzle velocity line is —3 mils. In general, subtract, algebraically, the observed deviation from $\Delta\varepsilon_v$ to obtain $d\phi$, the correction is quadrant angle of elevation. That is, $d\phi = \Delta\varepsilon_v - \Delta\varepsilon_o$.

(2) *Use of the dV Scale:—Muzzle Velocity Corrections.* The correction "—3 mils" will place the center of burst on the muzzle velocity line and it is now necessary to find the correction in range to move the center of burst to the trial shot point. By placing the dV scale along the ordinate through the trial shot point, with zero on the trial shot point, the value —132 f/s can be read opposite the horizontal plot of the center of burst. This value of dV, however, assumes that no change in ϕ was made. In order that dV may include the secondary effect due to $d\phi$, the dV scale is placed on the chart with $d\phi$, on the auxiliary scale, opposite the trial shot point, thus offsetting the dV scale by an amount equal to the horizontal range effect of the $d\phi$ correction. In the problem under consideration, —3 on the auxiliary scale is placed opposite the trial shot point; opposite the center of burst is found —125 f/s on the dV scale as compared with —132 f/s obtained before.

(3) *%H Scale:—%H Corrections.* Altitude corrections are required when either a semi-ballistic or non-ballistic type data computor is used. To obtain the correction in % altitude when the horizontal range deviation is known, an altitude scale must be used which shows percentage altitude correction required to move the center of burst to the trial shot point. Since $\Delta R = \Delta H \cot \varepsilon_{mv}$ the location of each division Since $\Delta R = \Delta H \cot \varepsilon_{mv}$ the location of each division the following expression:

$$\Delta R = \left\{ \frac{H_{tsp} \times 100}{100 + \%H} - H_{tsp} \right\} \cot \varepsilon_{mv}$$

where

$$\text{Cot } \varepsilon_{mv} = \frac{\Delta R_{mv}}{\Delta H_{mv}}$$

ΔR_{mv} and ΔH_{mv} are the changes in R and H, respectively, due to a change of 100 f/s in muzzle velocity.

ΔR is the horizontal range deviation.

%H is the correction in altitude in percent.

H_{tsp} is the altitude of the trial shot point in yards.

and

ε_{mv} is the angle the muzzle velocity line makes with the horizontal.

For example,

$_m R$ for the graduation marked minus 2% equals:

$$\left\{ \frac{3223 \times 100}{100 - 2} - 3223 \right\} \frac{117}{101} =$$

$$\left\{ \frac{3223 \times 100}{98} - 3223 \right\} 1.17 = +77 \text{ yards}$$

and the graduation should be placed on the scale opposite the range corresponding to 4740 + 77 = 4817 yards.

ΔR for graduations from —5 to +5 are obtained similarly.

The secondary altitude correction, due to the range effect of a correction in quadrant elevation, is taken into account in precisely the same way as in the case of muzzle velocity corrections. The same auxiliary scale is placed on the percent altitude scale and, in reading the altitude correction, the altitude scale is offset by an amount equal to $d\phi$. In the problem under consideration, with $d\phi$ equal to —3 mils, the proper H correction is +4%

h. Determination of Calibration Corrections. In the preceding paragraphs, the corrections necessary to move the center of burst to the trial shot point have been obtained in terms of ϕ, muzzle velocity or H.

The trial shot corrections so obtained are in a satisfactory form inasmuch as the corrections, which are battery corrections, are common to all the guns of a battery. Calibration corrections are individual gun corrections and may be different for each gun. Corrections to individual guns can be applied only in terms of the data with which the gun is laid, namely, azimuth, ϕ and f (fuze range).

Calibration corrections are determined as follows: The guns are calibrated in direction for parallel fire; they are calibrated in range on a base piece or the center of burst of the battery. In order to simplify the computations and allow the battery commander to use any piece as the base piece, a point is selected to which all the centers of bursts are moved individually in terms of ϕ and f. The point selected is generally some trial shot point and the corrections to move each center of burst to this point are placed in tabular form. This table permits the battery commander to use any gun or center of burst of the battery as the calibration point by subtracting the corrections of the base piece or point from the corrections of the other guns.

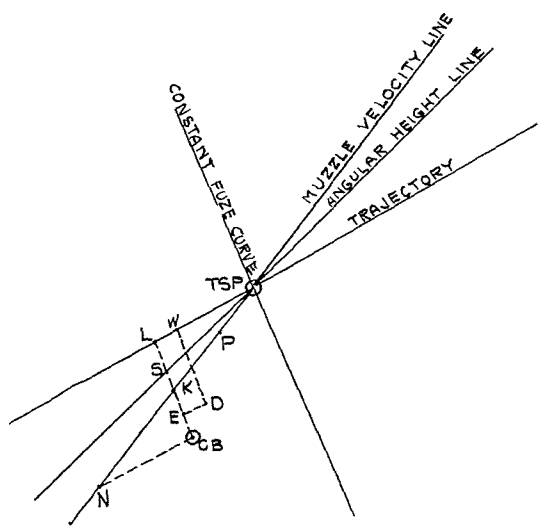


Figure 7—(See Preparatory Fire Corrections Below)

Preparatory Fire Corrections:

1. Trial Shot Corrections:—
   $\Delta\varepsilon_o$ = S to CB
   $\Delta\varepsilon_v$ = S to K
   $d\phi$ = CB to K
   dV or %H = K to 0.
2. Calibration Corrections:—
   D is the Calibration Point.
   $\Delta\varepsilon_f$ = L to S
   $\Delta\varepsilon_o$ = S to CB
   $d\phi_{ct}$ = CB to L
   $d\phi_c$ = CB to E. (CB to L — D to W)
   df_{ct} = L to 0.
   df_c = E to D. (L to 0 — W to 0)
3. Fuze Error and Developed Muzzle Velocity:—
   df_d = CB to N.
   dV_d = N to P
   Density effects = O to P

For example, if Gun No. 1 requires a correction of +8 mils and +5 Corrector Divisions (CD) to move center of burst of Gun No. 1 to the trial shot point; and Gun No. 2 requires +5 mils and +2 corrector divisions to move its center of burst to the same trial shot point; then a correction +3 mils and +3 corrector divisions to Gun No. 1 will move Gun No. 1 to Gun No. 2. By correcting only for the differences between the guns, calibration corrections are kept at a minimum.

Calibration corrections are determined in terms of ϕ and f, (fuze range) as shown in Figure 7, by the use of the $\Delta\varepsilon_f$ and f_c scales furnished with the chart.

$\Delta\varepsilon_f$ is the change in angular height due to a change in the corrector setting.

$d\phi_{ct}$ is the correction in quadrant angle of elevation to move the center of burst to the standard trajectory.

$\Delta\varepsilon_o$ is the observed vertical deviation.

Then

$d\phi_{ct} = \Delta\varepsilon_f - \Delta\varepsilon_o$

$d\phi_c$ is the calibration correction in quadrant angle of elevation to move the center of burst to the calibration point.

df_{ct} is the correction in corrector divisions to move the center of burst along the trajectory to the trial shot point.

df_c is the correction in corrector divisions to move the center of burst to the calibration point.

Calibration Correction (ϕ_c). $\Delta\varepsilon_f$ *Scale.* From the firing table 3 AA-J-2, one corrector division change in the fuze setting will produce a change of one mil in angular height. This same change in the fuze will, at the same time, produce a change of 29 yards in R. Therefore, as the burst is moved back along the trajectory the rate of change of ε per change in R is equal to one mil for each change of 29 yards in R. The $\Delta\varepsilon_f$ scale is then graduated in mils by the range scale knowing one mil equals 29 yards change in R. The $\Delta\varepsilon_f$ scale will read the angular deviation of a point on the trajectory by knowing the horizontal range deviation of that point from the trial shot point.

$\Delta\varepsilon_f$ is obtained by placing the $\Delta\varepsilon_f$ scale on the trial shot point and reading opposite the center of burst of each gun. The observed vertical deviation $\Delta\varepsilon_o$ subtracted algebraically from $\Delta\varepsilon_f$ is the correction ($d\phi_{ct}$) necessary to move the center of burst to the standard trajectory. This correction when applied will cause a change in R and requires a redetermination of $\Delta\varepsilon_f$ based on this change. An auxiliary scale giving the change in R for a change in ϕ is placed on $\Delta\varepsilon_f$ scale for this purpose. $\Delta\varepsilon_f$ is improved by offsetting the scale by an amount equal to the initial determination of $d\phi_{ct}$. Subtracting algebraically the value of $\Delta\varepsilon_o$ from the improved value of $\Delta\varepsilon_f$ results in the value of $d\phi_{ct}$ for that particular center of burst.

f_c *Correction.* The correction in f to move the center of burst along the trajectory is determined by the df_c scale. This scale is constructed from the firing tables which give the effect on horizontal range due to a change of one division of the corrector setting. This change is equal to 29 yards for the trial shot point

selected. The auxiliary scale which corrects for the change in R for a change in ϕ is placed on the df_c scale. The correction in f is obtained by placing the df_c scale, offset by the $d\phi_{ct}$ correction, on the trial shot point and reading the fuze correction opposite the center of burst.

Example: In this problem extreme conditions are used for ease of illustration.

Given: Azimuth of 0_2 from $0_1 = 500$ mils
Distance $0_1 0_2 = 5350$ yards
Azimuth of TSP from $0_1 = 1560$ mils
Horizontal range 0_1 to TSP $= 4740$ yards
Altitude of TSP $= 3223$ yards

First requirements: Azimuth and angular height of trial shot point from 0_2.

Angle $0_2 0_1$ T′ $= 1560 - 500 = 1060$ mils

Plot T′ with abscissa $= 1060$ and ordinate = distance between 5350 (on 0-0 line) and 4740 graduations of log range scale (See T'_4, Figure 8) and read 0_2 curve $= 2237$.

Azimuth of trial shot point from $0_2 = 2237 + 500 = 2737$.

Plot T″ at intersection of abscissa $= 2237$ mils and curve for 1060 mils (see T''_4, Figure 8) and read 5045 yards = horizontal range from 0_2 to trial shot point.

Place the range scale on the 1600 line with the 5045 division opposite the 0-0 line. Opposite the 3223 graduation read 579 mils, the angular height of trial shot point from 0_2.

Given: The following deviations of the centers of bursts of the individual guns:

Gun No.	Lateral at O_1	Vertical at O_1	Lateral at O_2
1	L 3	A 9	R 19
2	L 6	B 11	R 23
3	R 2	B 12	R 18
4	L 1	A 5	R 13

Second requirement: Determine the calibration corrections to be applied.

1. Use center of burst of No. 4 as calibration point.
2. Use battery center of burst as calibration point.

Convert the lateral deviations observed in the inclined plane to the corresponding deviations measured in the horizontal plane, viz:

Gun No.	Lateral at O_1	Vertical at O_1	Lateral at O_2
1	L 4	A 9	R 22
2	L 7	B 11	R 27
3	R 2	B 12	R 21
4	L 1	A 5	R 15

Plot the positions of the centers of bursts of the four guns at the intersections of the 0_1, and the 0_2 angles.

Gun No.	Abscissa	O_2 Curve
1	1060—4=1056	2237+22=2259
2	1060—7=1053	2237+27=2264
3	1060+2=1062	2237+21=2258
4	1060—1=1059	2237+15=2252

(See C_1, C_2, C_3, and C_4, Figure 8.)

Using the calibration correction scale marked $\Delta\varepsilon_f$ read off the vertical deviations that would have been observed if the centers of burst had occurred on the trajectory. When compared with the actual deviations observed, the deviations of the centers of burst from the trajectory may be computed, viz:

Vertical Deviations

Gun No.	$\Delta\epsilon_f$ Scaled	—	$\Delta\epsilon_o$ Observed	=	Initial correction ($d\Phi_{ct}$) to move the Burst to Trajectory
1	+5		+ 9		— 4
2	+6		—11		+17
3	+4		—12		+16
4	+3		+ 5		— 2

Offset the $\Delta\varepsilon_f$ scale on the chart by an amount equal to these ($d\phi_{ct}$) initial corrections and determine the final correction in ϕ_{ct}.

Now, using the df_c scale, offset by an amount equal to $d0_c$ just obtained, determine the deviations of the centers of bursts from the trial shot point in terms of corrector settings. The results are:

Gun No.	$\Delta\epsilon_f$	$\Delta\epsilon_o$	Table I	
	Bursts Should be	Observed	$d\Phi_{ct}$ Corrections	f_c Corrections
1	+4	+ 9	— 5	+4
2	+8	—11	+19	+8
3	+6	—12	+18	+6
4	+3	+ 5	— 2	+3

With No. 4 gun as base piece the corrections to be applied to the individual guns of the battery can be determined from Table I by subtracting the corrections obtained for No. 4 gun from the corrections for all the guns.

Gun No.	$d\Phi_c$ mils. Corrections	df_c, divisions of corrector. Corrections
1	— 3	+1
2	+21	+5
3	+20	+3
4	0	0

With the center of burst of the battery as calibration point, the individual corrections are:

(Corrections for center of burst of the battery are +7 mils in ϕ_c and +5 corrector divisions in f_c)

Gun No.	$d\Phi_c$ mils. Corrections	df_c, divisions of corrector. Corrections
1	—12	—1
2	+12	+3
3	+11	+1
4	— 9	—2

Inasmuch as two guns are shooting high and two guns are shooting low, calibration on the center of burst of the battery is preferred as the corrections are reduced to a minimum.

i. Determination of the Developed Muzzle Velocity and Fuze Error. In the conduct of trial fire certain

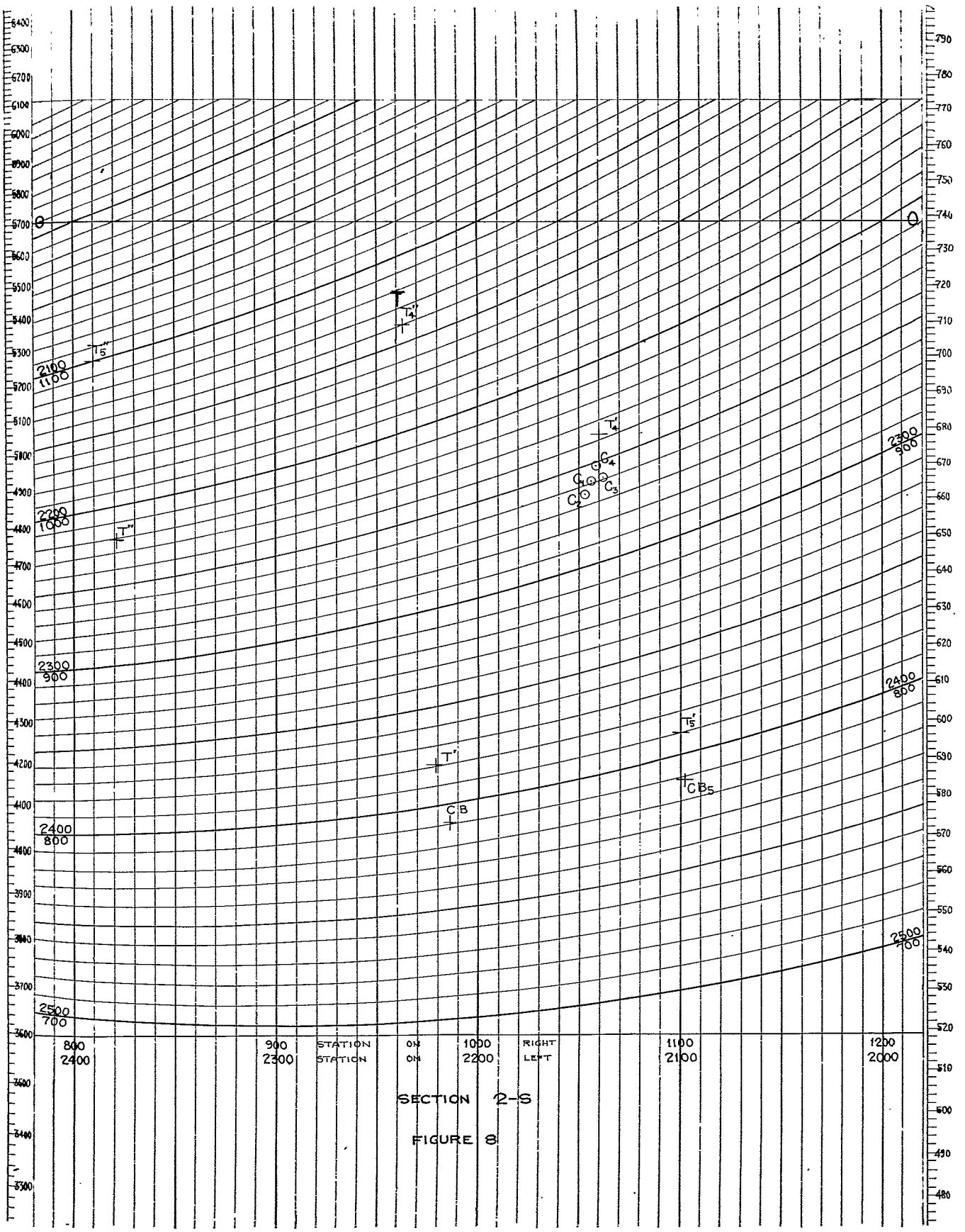

800
2400
900
2300
STATION ON RIGHT
STATION ON LEFT
1000
2200
1100
2100
1200
2000
2100
1100
2200
1000
2300
900
2400
800
2500
700
T'
T''
T'4
T'5
CB
CB5
C2
C3
C4
SECTION 2-S

FIGURE 8

assumptions are made. It is assumed that no errors are made in the setting or functioning of the fuzes. Likewise, when using a semi-ballistic or non-ballistic data computor, the muzzle velocity determined from trial shot firings is not the actual muzzle velocity but a fictitious one which includes the effects of variations from standard of the atmospheric density. It is quite important that the actual muzzle velocity and the fuze errors be known. With this information, and with an accurate meteorological message, fire for effect may be opened with a reasonable expectancy of hits when there has been no opportunity to fire trial shots. In any one trial shot problem, errors in the determination and application of the meteorological message and in the laying of the guns, will cause the results to be in error. However, during a number of trial shot problems, these errors will tend to cancel each other, and if the results are averaged, they may be accepted with considerable confidence. The only effects which will, in the long run, cause the center of burst of shots fired on corrected data to deviate from the trial shot point will be due to variations from expected muzzle velocity, fuze errors, and, except for ballistic type data computors, failure to correct for non-standard density. Knowing the density at the time of firing, its effect may be stripped out and in a series of firings any resulting error will be negligible. There remain only two unknowns, viz, muzzle velocity and fuze error.

The method of determining the developed muzzle velocity and fuze error is as follows: (See Figure 7).

The center of burst is moved to the muzzle velocity line by a change in f. This correction moves the burst parallel to the trajectory and the magnitude and the direction of this correction is the fuze error. The center of burst is then moved along the muzzle velocity line to the trial shot point by a change in muzzle velocity, which includes both muzzle velocity and density effects. Inasmuch as density and muzzle velocity are assumed to have the same differential effect line, the density effect may be stripped out by merely knowing the relative effect of density and muzzle velocity on horizontal range. For example, at a particular trial shot point, 100 f/s changes the horizontal range 117 yards and 10% density changes the horizontal range 152 yards. Therefore, 1% density is equivalent to

$$\frac{152 \times 100}{117 \times 10}, \text{ or } 13 \text{ f/s.}$$

Fuze Error. (df_d scale). The vertical correction $d\phi$ to move the center of burst to the muzzle velocity line can be determined by means of the $\Delta\varepsilon_v$ scale in conjunction with the observed vertical deviation. The fuze error is the distance along a line parallel to the trajectory from the center of burst to the muzzle velocity line.

For any one trial shot point, the constant fuze curve, muzzle velocity line, and the trajectory have definite and known slopes. These lines, or lines parallel to them, form a triangle with one side, which is known, equal to the correction in ϕ to move the burst to the muzzle velocity line. This triangle can then be solved. The length of the fuze error is seen to vary directly with the ϕ correction. Having determined this proportion graphically for any one trial shot point, it is possible to obtain the correction in f to move the center of burst to the muzzle velocity line, based on the angular deviation of that center of burst from the muzzle velocity line. To find the change in horizontal range when the burst is 10 mils below the muzzle velocity line, draw a line parallel to the trajectory and through the 10-mil graduation on the constant fuze curve until it intersects the muzzle velocity line. The length of this line is the fuze error when the burst is 10 mils below the muzzle velocity line. For example, at a particular trial shot point, if the trajectory is lowered 10 mils it will cut the muzzle velocity line at a point six corrector divisions short of the trial shot point.

Developed muzzle velocity. (dV_d scale). The developed muzzle velocity (dV_d) scale is graduated the same as the dV scale, with the exception of the auxiliary scale. To find the developed muzzle velocity, it is necessary to offset the scale by an amount equal to the

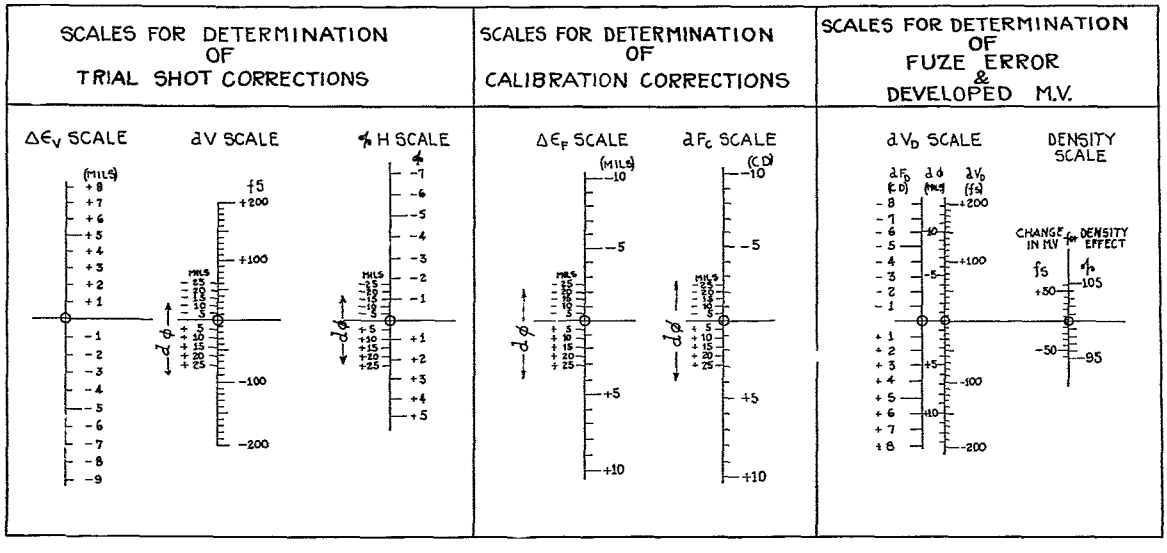


Figure 9

change in R caused by the stripping out of the fuze error. The auxiliary scale on the dV_d scale is graduated in corrector divisions corresponding to the change in R for a change in one corrector division given in its firing table. The dV_d scale is then offset by the correction for the fuze error and the reading on the dV_d scale is the residual deviation expressed in muzzle velocity to move the burst to the trial shot point. This residual deviation includes the effects of muzzle velocity and density. Density is stripped out by knowing the relation between muzzle velocity and density, as previously discussed. This conversion is made on the dV_d scale by means of an auxiliary density scale.

Example: Several series of trial shots were fired with the M3 gun, muzzle velocity 2600 f/s with the Scovil Mark III fuze at a point $\phi = 700$, $f = 13$. The Director M-1 was used, data being corrected for wind, but not for muzzle velocity or density. The ten series of five rounds each were fired with the same gun and equipment from the same position on five different days. Considerable time intervened between successive firings on the same day.

Given: Azimuth of 0_2 from $0_1 = 3500$ mils
Distance $0_1\ 0_2 = 6330$ yards
Azimuth TSP from $0_1 = 2400$ mils
Horizontal range 0_1 to TSP $= 4740$ yards
Altitude of trial shot point $= 3223$ yards

Plot the trial shot point on the chart as follows: (See Figure 8) 0_1 is on the right. Therefore:

Azimuth of the ASP = back azimuth of baseline + angle 0_1
$2400 = 3500 - 3200 +$ angle 0_1
Angle $0_1 = 2100$

Place the log range scale on the ordinate whose abscissa is 2100 with the baseline 6330 set on the 0-0 line. The trial shot point is plotted on the chart at the intersection of the ordinate whose abscissa is 2100 (lower figures) and the range on the log range scale equal to 4740 (Point T'_5 Figure 8). The angle 0_2 is read from the chart and is equal to 810 mils (lower figures).

The range from 0_2 to the trial shot point is obtained by placing the log range scale on the ordinate whose abscissa is 810 mils (upper figures since 0_2 is on the right). Opposite the parametric curve corresponding to 2100 (upper figures), read, on the log range scale 5850 yards, the range from 0_2 to trial shot point.

Using the 1600 mil scale, the angular height from 0_2 to the trial shot point is found to equal 513 mils.

The center of burst of each group and the density at time of firing was reported as follows:

No.	0_1 Lateral	0_1 Vertical	0_2	Density
1	L6	B7	S22	102
2	L4	B4	S24	102
3	0	B3	S25	102
4	R2	B3	S20	102
5	L2	B3	S16	102
6	R4	B2	S19	102
7	L6	B1	S21	101
8	L1	B3	S23	99
9	R2	B6	S 6	99
10	L2	B8	S17	102
Inclined mean	L2	B4	S19	101.3

These values of the inclined deviations are reduced to the horizontal by means of Figure 6.

Horizontal mean — L2 B4 S22

The center of burst of all the groups is plotted at

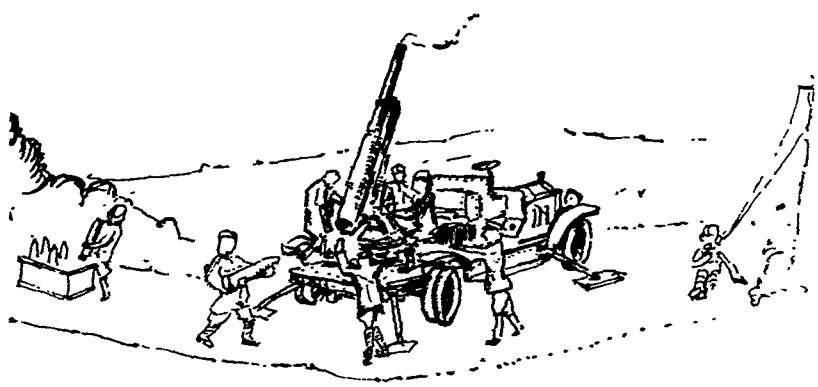
$0_1 = 2100 - 2 = 2098$
$0_2 = 810 - 22 = 788$ (See CB_5, Figure 8)

The center of burst should be below three mils (using $\Delta\varepsilon_v$ scale) and was observed four mils below. The correction to move the center of burst to the muzzle velocity line is, therefore, +1 mil.

By means of the df_d scale this ϕ correction shows that the center of burst had a fuze error of +½ corrector division.

Placing the dV_d scale on the trial shot point offset by the fuze error, the muzzle velocity (including the density effect) is read opposite the center of burst. The value read is —117 f/s.

The density effect of +1.3 percent is equivalent to a muzzle velocity effect of —13 x 1.3 = —17 f/s (effect). The developed muzzle velocity is, therefore, —117 + 17 (correction) = —100 f/s.



What It Means to be a Reserve Officer

By 2d Lieutenant M. D. Meyers, Coast Artillery Reserve

THIS is a difficult subject to generalize upon, as every officer undoubtedly has his own opinions as to the duties, obligations and benefits arising from the acceptance of a commission in the Officers Reserve Corps of The Army of the United States. I will endeavor to treat the subject in an impersonal manner and will attempt to portray every possible angle.

In the first place, it must be assumed that the reserve officer, about whom we are going to talk, is one who is taking an active part in Reserve activities. Unfortunately there are men, who having accepted a commission, proceed to forget that they are Reservists. This type of man receives no benefit whatsoever in time of peace from his appointment, and he fails to perform the simple obligations and duties that go with it. It might be well to consider this class of officer before we proceed with our subject. In time of national emergency, I feel that these officers will prove of value to our government. They have had military experience, and while they may not have been active in recent years, they will have a knowledge of the fundamentals of military service. These men, after some further military training, will be fitted to serve as much more efficient officers than men with absolutely no previous military education.

The foregoing paragraph is not to be construed as a defense for the officer who does not make every effort to improve his professional qualifications in order to merit the honor conferred upon him. The principles underlying our National Defense Act of 1920, can only be fully realized when the Officers Reserve Corps is brought up to the full strength that is needed for adequate preparedness, and its entire personnel is striving individually and through its organizations to meet their responsibilities. However, until the Reserve is so constituted, I feel that every man who holds a commission is of value to these United States. It is the duty of the thousands of active officers to interest these inactive men in Reserve affairs, for in this way they will be helping to mold the Reserve into the type of homogeneous organization that it should be.

I feel that in order to gain the benefits which accrue to the man holding a Reserve commission, that that man must first be motivated by intensely patriotic emotions. An officer must believe as Stephen Decatur did, namely:—

> "Our Country! In her intercourse with foreign nations may she always be in the right; but our country, right or wrong."

Being intensely patriotic, the reserve officer upon taking his oath, immediately realizes the importance of the obligations that go with his appointment, and will strive to make himself worthy of the trust placed in him. He feels that it is his duty to spread the doctrines of adequate defense, and attempts to gather certain facts and statistics that will enable him to intelligently discuss this problem with his civilian friends. The study of this subject is intensely interesting, and having once gathered the facts, there is a great deal of personal satisfaction to be gained in teaching the principles of preparedness. Armed with the facts as to the appalling losses of time, money and human lives as the result of our past *laissez-faire* attitude toward peacetime defense plans, the reservist can easily combat and many times overcome the pacifist doctrines that are far too widely spread among the civilian populace.

The citizen officer takes great pleasure in teaching these principles. He feels that he is doing his small share to help maintain and perpetuate the great deeds of our heroic forefathers. In the Revolution, our ancestors fought to bring liberty and freedom to this land. In 1812, they fought to maintain this hard won liberty. In 1861, they fought to preserve the Union. In 1898, they fought to maintain, and to establish on a higher level, our sacred national honor, as again we did in 1918. In 1918, we fought for something additional, we fought for world liberty and freedom, we fought in the hope that it would be a "war to end war." The reserve officer knows that this was rather an idealistic aim, as do most sane thinking people today. Perhaps sometime in the future the nations of the world may find themselves in a state of calm and may attempt to perpetuate this peace. However, at present there is much unrest, and such conditions have existed for the past decade. This is the result of political and economic revolutions, unstable currency, and the constant fear of the military and naval preparations of neighboring countries. The American citizen cannot readily understand this latter factor, because for generations our isolation from the rest of the world by two great bodies of water and with a friendly nation on our north and a small nation to the south, have made it unnecessary for us to fear a sudden hostile attack. On the European continent conditions are different. Sentries and outposts patrol all borders and all boundaries. Today the world is smaller and with modern inventions in military materiel and new and quicker forms of transportation, these United States are no longer isolated from the rest of the world.

The reserve officer knows that with other nations prepared, this country cannot afford to lay down its arms. He hopes that by having adequate defense, we can

maintain peace, for while might is not always right, nevertheless that nation which is prepared can rest assured that no other nation will lift up its sword in combat against it. Thus the reservist feels that he is doing his little share toward keeping peace and maintaining our national honor.

I have been rambling in a rather abstract manner, but all of these thoughts have come to me, as I think of the subject in hand. These things in themselves, I believe, make the holding of a Reserve appointment well worth while. There are many other benefits of a more tangible nature accruing to the civilian officer, and they will be discussed in the following paragraphs.

The reserve officer, especially the younger man, soon gains *Poise, Self Respect, Self Confidence,* and other worthwhile qualities. He finds himself in a position of *Responsibility,* often for the first time. He learns to shoulder these responsibilities, and to take them as they come. He learns to *Command,* to give commands and to expect and to see them obeyed. At the same time he realizes that he, too, must *Obey,* that a position of responsibility carries with it certain duties and obligations to those still higher who have still greater responsibilities. Greatest of all perhaps is the lesson of *Teamwork.* All of these principles can be used to great advantage in his civil pursuits. Doubtless they have been taught to him in the process of his regular education, and perhaps he has gathered their importance in his earlier military experiences, but as an officer their great significance is soon quite apparent.

In like manner, the necessity for *Accuracy* and *Thoroughness* are emphasized. Every officer knows that he must attend to every detail of the duty given to him. Failure on his part may result in failure of the mission of not only his group, but of the larger body. Then the question of the *Physical Condition* of the reserve officer must be considered. In this day and age every one speaks in terms of "health," the "great outdoors," "sun rays" etc. Despite all this, many men are far from physically fit, as the statistics of our large life insurance companies will tell you. The reservist takes particular care of his health and body—he must keep himself in the best of condition, as rigid and thorough examinations are required before a tour of active duty, before reappointment and before promotion. The average civilian gives some attention to the care of his body, but the reserve officer as the result of these many examinations knows that he is fit, or if he isn't, he will be required to remedy the defect promptly.

The moral value of a commission is great when the officer considers that only a military court can try and punish a man for "conduct unbecoming an officer *and a gentleman.*"

The men of America have always shown patriotic devotion to their country in time of stress. Today the reserve officer may in peace time prepare for service. The Reserve Corps as now established fits in well with our past policy of dependence upon civilians, it is a very definite means of providing an officer personnel through voluntary civilian training.

The officers of the Reserve feel that they are an essential part in our plan for national security. They realize the importance of obedience to our laws and respect for our institutions. They are anxious to improve their physical health, mental vigor and moral excellence. Love and reverence for the flag are the natural outcome of active membership in the Reserve.

The Reserve Officer realizes that he must fit himself to merit the rank he holds. He realizes that he must gain the necessary technical and professional knowledge that will enable him to train, command and lead combat troops in the field, and that failure to gain this knowledge may lead to unnecessary loss of priceless lives, and perhaps disaster. Through attendance at conferences and by taking courses of study in the Extension School much of this knowledge may be gained, and many officers give a great deal of their time to learn more about their avocation.

I have endeavored to state in an informal manner, my conception of WHAT IT MEANS TO BE A RESERVE OFFICER. The thoughts expressed in the following editorial taken from a 1928 edition of the Philadelphia *Evening Public Ledger,* are well worth considering:

> "For the sake of brief peace, the timid soul will dodge an issue and evade a responsibility, will let a lie live and an evil flourish. Of such weak stuff are most of us made, for—which reason evil has too much of its own way in the world and crime flourishes in the neighborhood of lazy tolerance. The will to evil puts on a false front of strength, chiefly because the will to good lacks courage. For rare indeed is the sort of courage that will make no compromise and will count an honest fight as of more importance than its consequence.
>
> "It is a topsy-turvy world when evil seems stronger than good and delusions are allowed to live while good sense is afraid of a shadow. Our timid souls need courage—courage to declare the truth as we see it and to overthrow the flimsy towers of shame; courage to declare for the good and turn the daylight on evil. Timid souls may be content with the starveling peace they earn but the decent destiny of the world lies in the hands of men who will fight for it."

Nations may be likened to individuals and that country which sacrifices its principles and self-respect in order to avoid war is degenerate or on the road to degeneracy.

The reserve officer is a believer in peace. The older officers with World War experience know that war no longer has its glamor and glory, that in its grim reality there is great suffering and horror. They teach these lessons to the younger officers, commissioned from the Reserve Officers Training Corps units of our schools and colleges, and through the Citizens' Military Training Camps. I repeat, the reserve officer does not want war, and he is a believer in peace, but not "at any price," not at the expense of our national honor, nor the ages.

Inside Dope on One R.O.T.C. Unit

By First Lieutenant (Permanent Grade)

Editor's Note: "The R. O. T. C.—Key to National Defense" by General Hagood, recently published in the Journal, aroused discussion. The first article which follows is by an officer on the receiving end of the scale. He uses a pseudonym for obvious reasons.

This article and General Hagood's article question the present R. O. T. C. system. The Journal desires to present every point of view. The R. O. T. C. is so important a part of our system of National Defense that it merits wide and free discussion and consideration.

I HAVE been on duty with a Senior R. O. T. C. Unit for four years and have attempted to instruct in almost every subject in the R. O. T. C. curriculum. In order that some one may not yell "sour grapes" at some of my following remarks I might add that our unit is rated "excellent" by the Corps Area Commander and that we have set an academic standard as good as, if not better than, most of the other departments in this college.

The remarks to follow are based on conditions existing at this institution only. I have no direct knowledge of that which takes place elsewhere, but I have my suspicions. Therefore, the remarks and comments hereinafter set down, except quotations from War Department regulations, are not to be regarded as of general application, unless of course my suspicions, above referred to, are well founded. It should also be noted that this institution is a "land-grant" college, *i. e.*, one requiring (in the school catalogue, at any rate) two years compulsory military training for all students.

But to get back to our leg of mutton. The announced purpose of the R. O. T. C. is primarily to make reserve officers out of selected students, and, as an afterthought, to give some training as privates and non-coms to such students (Basic) as do not elect to take the last two years, *i.e.*, the Advanced course. The War Department training directive at present in effect requires instruction in various subjects. In general the two Basic years embrace Second and First Class Gunners' subjects, respectively; the first Advanced year covers Gunnery, Drill and Command and Expert Gunners' subjects; the second Advanced year, Orientation, Motor Transportation, Military History, Field Engineering, Administration, Artillery Materiel, Artillery Tactics, Military Law and Drill and Command. The directive further states that each of the Basic years shall consist of a minimum of three hours instruction per week for thirty-two weeks, each Advanced year five hours per week for the same period. It lays down the rule that the instruction should be by the applicatory method and that, in general, one-third of the time spent should be on theory, two-thirds on practical application. In addition there is an Advanced camp of six weeks duration which comes in the summer between the junior and senior years. During this camp the Advanced students participate in the various phases of gun, mortar and A. A. firing (this is a coast artillery unit) with small arms practice, infantry drill, physical training and instruction with the infantry pack rounding out the period.

Does this scheme of things produce the best results? Is the government getting its money's worth out of this unit? My answer to both of these is: No. In the first place my opinion is that the unit should not be here at all but if it is to remain here then certain conditions now imposed upon the institution and the students should be changed. These changes would of course require some legislation and some administrative action by the War Department before they could become effective. I shall discuss each of these.

First, conditions of service. As we stated at the beginning of the article, this institution requires compulsory training for freshmen and sophomores. It matters not that each year several hundred students are excused from the requirement of military training for various reasons. (Only about 52 percent of the total male registration is borne upon our rolls at any one time.) Students and faculty alike are constantly irked that all students must take the training unless excused. Compulsion is not the spirit of the age (or of any age?) so it is doubtful if the board of trustees of the college is conferring any great boon upon this department by requiring this training. The mere fact that we have great difficulty each year in getting twelve to fifteen suitable men to take up the Advanced course, out of a cadet corps of over three hundred should indicate that most of the basic students are anxious to lay aside the "army" or the "war," as it is variously called.

Therefore I believe that if the training were not compulsory it would not be as distasteful to all concerned. Our past experience proves this. A few years ago all students' requests for exemption were decided by the Military Department; later (at our request) a committee of the faculty was granted all the powers formerly held by us. We act now only in an advisory capacity concerning this matter. Results were just what we expected. The military enrollment dropped but the attitude of students and faculty toward our department changed for the better. Where formerly only men in the advanced stages of tuberculosis or angina pectoris got by, now any one of a dozen reasons, aside from physical, may be advanced for an excuse. "Flat feet" and "outside employment" are eagerly sought after by some. Where formerly we had a large

element of malcontents in our corps always giving trouble and airing its grievances in the student paper and elsewhere, now, it is a dumb objector who can't muster up some disqualifying defect or find a job. Thus the system is now pseudo-compulsory, still bearing some of the disadvantages of the compulsory with a few of the advantages of the voluntary.

Along this line it might not be amiss to mention another phase which is impossible to handle to the satisfaction of the student and the Military Department. That is the method of handling students who have had service in the Regular Army, the National Guard or C. M. T. Camps. We can, locally, excuse these men from part or all of the Basic course depending upon the character of their previous service, but we cannot, according to law, permit them to take the Advanced course if thus excused. It is of course logical from a military standpoint to consider only equivalent service, but each time we turn down a man who has voluntarily engaged in some prior service we have lost a friend. Believe you me, believers in the military are not as numerous as some would have us think. Not only that but when one considers that the actual knowledge of artillery which a student has absorbed by the end of the second Basic year is so slight that he could enter the Advanced course without handicap, is there any practical objection, military or otherwise, to granting Advanced standing to a student who has obtained his Basic training in some other manner, *i.e.,* C. M. T. C., National Guard or Regular Army? Of course the actual nature of the type of training would have to be evaluated for what it has accomplished in each case, but that would involve no great problem. The main point at issue would be: Has this student been as well grounded in discipline as he would be had he attended this institution during his basic years? Off hand, I should say that, in general, two C. M. T. Camps of any combat arm, two months actual duty in the Regular Army and a somewhat longer period in the National Guard should produce the same results in discipline as two years in the Basic course.

Second, the number of instruction hours prescribed, *i.e.,* three per week for the Basics and five for the Advanced students, is too much when one considers the subject matter, the size of the cadet corps and the available text, materiel, instructors, class rooms and drill halls. The greatest difficulty arises in attempting to treat the subjects academically; most of the Advanced subjects can readily be so treated but hardly any of the Basic. The treatment of the various subjects in the Basic textbooks shows this, can easily be seen by a casual perusal of their pages. Take, for example, the description of the 155-mm. and A. A. guns; pages are devoted to minute details about the construction of the guns and carriages—as if any of the students (or the instructor for that matter) wanted to make one of them! As I understand it the Ordnance makes 'em and we try to shoot 'em. Maybe I am all wet about this though. I have driven my present car about 30,000 miles and have had only minor troubles (few of those) yet I couldn't tell you how many inches long is my running board nor what kind of iron is used in the engine block.

Well, anyway, leaving out the Advanced subjects for fear of getting prolix, many more details (for further information write to the author) could be adduced to show that a lot of the subject matter not only could but should be condensed. If you did this you would have to cut down the hours of classroom instruction, which, if you kept the total hours the same, would call for a corresponding increase in the hours of pure (or, adulterated if you will) drill. When, and if, you did this you would accomplish nothing but the boredom resulting from monotonous repetition.

Even if you did want more drill, the size of the corps, the few instructors, the small quantity of materiel (not that there should be any more) and the lack of space for indoor drills would prevent you from doing this. Whenever we have inclement weather on drill days during the outdoor season it's just too bad. I, particularly, as I know no funny stories nor any tap dancing, am at a loss to discover something to do to amuse several hundred students for an hour. Lack of imagination, undoubtedly, but I do not think that I stand alone there. At present, the large number of Basic course men compared with the available instructors, materiel, classrooms and drill halls makes it almost impossible to give proper instruction in a practical manner to any given student. Infantry drills and ceremonies are the only exceptions to this and these cannot be given during the months that weather conditions do not permit outside work. The size of sections for classroom instruction is such that fair marks can only be given when based on written work. No matter how simple the questions, when one instructor must read over and mark several hundred papers each week he doesn't do justice to many papers and he goes goofy at the end of the term.

My remedy for the situation as above set forth would be—it's quite revolutionary—cut the required Basic hours to one and the Advanced to three per week. The one hour per week for the basic classes should be sufficient to give the little instruction it would be desirable to impart at the same time keep these men exposed to a military contact through their instructors. The three hours for the Advanced men would be more than adequate to cover the more or less academic subjects in the course, provided that some highly technical subject be eliminated. Then, assuming the cadet corps to be greatly reduced by virtue of the elective feature, give almost all the practical work in a practical manner in three weeks summer camps at a permanent post, one camp to be attended at the end of each of the first three years.

There are a number of objections to doing this, the cost being the most important. However the cost of operating the unit at the college would be much reduced because of a reduction in the personnel, both instructors and students, and of equipment. Since most, or all, of the practical work would be given in camp nothing much in the line of equipment would be required at the college; perhaps a plotting room for the Coast Artillery and an indoor shooting gallery for the Infantry, nothing more. This would mean getting

rid of all cannon and small arms, except .22 caliber, at the institution. I can't see what benefit is derived from standing gun drill by a boy who can evisage only dimly, if at all, that he will ever use this knowledge. For that matter when our Advanced Coast Artillery students go to camp they man and fire the 12-inch mortars, but what college is equipped with one to drill on beforehand? I haven't noticed that the firing of the 155-mm. and A. A. guns is any more efficiently conducted because of the students' previous drill with these latter at the college. The only answer is, obviously, to send all (or as many as can be persuaded) students to a camp each year where they will be able to use each bit of practical knowledge previously gained.

To sum up, then, it is my belief that if the compulsory feature of military training be eliminated, credit in the Basic course be given for service in the Regular Army, National Guard and C. M. T. Camps, the number of summer camps increased to three with a corresponding reduction of hours of work and change in the type of work at the college, and the cadet corps reduced in size we would have a more efficient R. O. T. C. here.

COMMENTS

The above article was referred to two officers on duty at different R. O. T. C. units for their comments. The first one states as follows:

"The writer has presented some of the difficulties encountered by an officer assigned to duty with the R. O. T. C. As such these are matters of interest and warrant consideration, whether or not we agree with the writer's proposed solution of the problem involved. The difficulties cited are, in general:—

1. The matter of Basic course credit for prior service in the Regular Army, National Guard, or C. M. T. C.
2. The matter of compulsory enrollment in the Basic course at institutions which are not essentially military in character.
3. The matter of the general character and operation of the prescribed Basic course of instruction.

The question of the advisability of Basic course credit for prior military training does not warrant much discussion at this time, since such credit is not permissible now under the terms of section 47c, National Defense Act. The point at issue is a matter of law and any change therein, if in fact any change is advisable, must be sought through legislative action. Similarly legislative action must be sought if we desire to reduce the period of duration of the Basic course as now prescribed in Section 40a, National Defense Act. But the other questions presented by the writer are primarily matters of "regulations" and as such are readily subject to suitable revision at any time.

Except in those institutions which are essentially military in character and which are conducted strictly as military schools, compulsion has no place in peacetime military training in the United States. Compulsion is in direct opposition to all American tradition, for our people as a nation have always been opposed to any form of compulsory military service or training in time of peace. But if there is to be any compulsory military training it should be universal in its application. Why limit it solely to college students, and then only to the students of land-grant colleges? Those particular students are bound to feel that they have been made the victims of discrimination and therefor will bear resentment against any form of military training. This resentment in turn will certainly defeat the purpose of R. O. T. C. instruction, which is intended to interest the college-trained citizen in the matter of national preparedness. We can build up a far better R. O. T. C. through the vountary enrollment of only such students as possess a real interest in military training. These voluntary enrollments can be readily obtained if we can show the college student that we have something of value to offer him, something that is of value to him and to his country. If we can do this, we can build the R. O. T. C. upon a solid foundation and can make it just as large as the governmental appropriations will support, and just as prominent a feature of any college as the policy of the college administration will permit.

Probably every officer on R. O. T. C. duty has realized that the Basic R. O. T. C. course is not all that it should be and they have been more or less impressed with the apparant futility of the present prescribed course of instruction. The primary mission of the R. O. T. C. is to produce training officers for the lower grades of the Officers' Reserve Corps. But this can be accomplished only by so interesting the Basic course student in the matter of military training upon the completion of his basic work. In short the success of the R. O. T. C. depends entirely upon securing and stimulating the interest of the college student in military matters while he is in the Basic R. O. T. C. course. But the present prescribed course of instruction for Basic R. O. T. C. is not designed to arouse or stimulate anybody's interest in military matters, for it is a mere tedious grind of dry technical matter that pertains solely to the duties of the private and the corporal. To attempt to produce second lieutenants by four years of R. O. T. C. instruction in college and to devote two of these four years to instruction in the technical duties of the private and the corporal seems most illogical. But the solution of the problem will not be found by reducing the amount of time now allotted to Basic instruction. Merely eliminate the most of the present prescribed dry instruction matter of the Basic course and substitute for it instruction in such subjects as will arouse and stimulate the interest of the college student in military affairs in general, and in military preparedness in particular. It would seem that the R. O. T. C. requires a Basic course that will give special emphasis to such subjects as the true history of the various wars of our nation, the past and present military policy of our country, the study of the development of the art of war, and analysis of some of the principle campaigns of modern times. One of the announced purposes of the R. O. T. C. is to add to the educational resources of the various institutions of learning, but the present prescribed Basic course does not accomplish this purpose, for the pres-

ent Basic training would be of doubtful material value in later life to either the student or to the nation even if this training could be effectively accomplished. It is not surprising that many of the officers now on duty with the R. O. T. C. are dissatisfied with the meager results now accomplished in the Basic R. O. T. C. course.

Close-order drill, particularly, in the R. O. T. C., has for its purpose, not only the disciplinary training of the student in ranks, but also the development of leadership qualities in the cadet officers and cadet noncoms. When the lack of a drill hall prevents the conduct of drills during inclement weather there are still means available for exercising and developing leadership qualities. A properly supervised course of company instruction, conducted indoors by the cadet officers and cadet non-commissioned officers in accordance with a carefully arranged training program, will prove effective in developing in these students such qualities as initiative, resourcefulness, loyalty, and attention to duty. This substitute for drill will also afford an excellent opportunity for building up the company spirit in each organization and thereby will aid materially in promoting the morale of the cadet corps as a whole. Of course the problem is one that must be adjusted to the conditions existing at each particular institution, but its proper solution is not to be found by discarding the drill period during the inclement season, nor by reducing the limited amount of time now allotted to the Basic Course.

It would seem that the real difficulty encountered in the conduct of almost every R. O. T. C. unit is but the direct result of the War Department's attempt to secure uniformity of pedagogical work throughout a nation wide chain of colleges and universities. Through its rigid R. O. T. C. training program, the War Department has virtually centralized direct control over the R. O. T. C. teaching work in seventy or eighty vastly different institutions scattered throughout the nation. This War Department directive absolutely controls not only the general character of all R. O. T. C. training, which it should, but also the detailed subject matter and the number of classroom hours to be devoted to each, which it should not. This policy is unsound, for it ignores the fact that local conditions such as: the character and kind of school, the type of students, the academic courses they are pursuing, and the general facilities available are not the same in any two R. O. T. C. institutions. R. O. T. C. units are not *army* units subject to the usual rules for absolute uniformity and standardization. These units are integral parts of their own colleges or universities and as such are just as distinctive in character as are their respective institutions. The ordinary practices and procedure of one institution cannot fit the situation at some other entirely different institution. Since our various R. O. T. C. units are essentially individualistic in character we cannot expect them to function satisfactorily under a blanket scheme of nation-wide uniformity of operation. Until this fact is fully appreciated and amply provided for, serious difficulties will always be encountered in the conduct of each and every R. O. T. C. unit. The solution of the problem must be sought in the promulgation of a War Department training program for the R. O. T. C. which will be sufficiently broad in scope to permit of adjusting the character of the instruction at each particular institution so as to effectively meet the local situation. Such a broad directive, in conjunction with a change of policy as to the character and purpose of the Basic course will permit us to establish the R. O. T. C. units upon a solid foundation as valuable adjuncts to their respective institutions."

The second commentator is not so restrained. He chooses to pin the responsibility on the individual who relates his experiences. He states:

"The author's thirst for accurate expression ends with his title: The Inside Dope on One R. O. T. C. Unit. The article is an illuminating exposition of a deplorable condition which should be remedied. As a bit of reasoning applicable to the R. O. T. C. problem, in general, it is to be discarded by all the laws of logic, since the author argues from a particular case to a universal conclusion.

I wish to criticize the paper categorically, after agreeing with the statement of purpose of the R. O. T. C., as a limited statement. The R. O. T. C. has, also, the mission of developing in students the spirit of civic obligation to defend our country.

As an academic question the government does not get the full, theoretically possible returns from the money spent any more than it does from the money spent on other National Defense projects for which money is appropriated. Whether or not the full, practically possible, return is made depends upon the Regular Army personnel at the institution.

Again, if great difficulty is experienced in getting twelve to fifteen men for the Advanced course from a unit of over three hundred, it is my crude suspicion that the fault lies, not with the system, but with the manner in which the system is operated by the responsible personnel. The percentage of men excused—48 per cent—from the compulsory Basic course is evidence that the P. M. S. & T has abdicated to a lukewarm faculty powers inherent in his position.

The author, infected by the undiciplined spirit of the day, evinces a sympathy for the spirit of resistance to compulsory attendance. The compulsion itself is of priceless value in forcing to the thoughtless and undeveloped under graduate mind a consideration of the American's duty to his country. Any amount of inviting, or of pleading, for such attention would be useless. There is a consequent duty devolving upon the instructor personnel. That is to introduce into the student mind a reasoned comprehension of the need of compulsion, and of the country's right to act upon that need. We have at this institution a compulsory discipline that my predecessor told me would result only in mutiny. Instead, it is generally popular. The students, with a few exceptions, take pride in it now; and will continue to do so as long as we maintain it upon the dual plane of reason and duty. Less than 1 percent of the two lower classes are excused, and then only upon my approval, and because of a physical defect such that the student would be actually endangered by the course or useless to the course. We have no "stirr-

ing of trouble by malcontents'' of sufficient proportions to reach my notice; the student body handles any such automatically.

Here, at least, National Guard and C. M. T. C. training is not equivalent to the training given in the R. O. T. C. course. For that reason we make no exception for either. On the other hand, the National Guard men who have the advantage of our course quickly become key men and the backbone of their National Guard units. The local National Guard authorities would be the first to oppose our making any concessions for National Guard experience. If, in the author's unit, so little artillery knowledge is imparted during the Basic course that a man with a little N. G. or C. M. T. C. training can enter the Advanced course, all I can say is that the instruction is not being properly given.

I agree that there should be a thorough overhaul of the Basic course. But there should be no reduction in the hours of either Basic or Advanced courses. The Basic course should be reorganized, weeding out useless subjects which are drudgery. There is no space here to develop the details of that. However, any rearrangement of either course should be done, not with the idea of reducing hours, but of making a portion of the present available time of use in imparting instruction sorely needed by the reserve officer.

This unit is so situated that bad weather means to it, also, loss of an hour's infantry drill. The author indicts himself when he says he is at a loss to utilize such an hour. Here we have a course of lectures on subjects outside the purview of the prescribed course and every officer knows, when drill is called off, just what he is to talk on, where, and to which class. His notes are prepared and ready to his hand.

It is impossible for me properly to characterize the proposal to eliminate such a subject as Tactics from the Advanced course. The author shows that he fails entirely to envisage the great purpose of the course—to make officers. The students here consider the course in Tactics one of the most absorbingly interesting subjects in the whole college. All that is required is to teach it with spirit and imagination.

When the author proposes a series of three weeks' camps instead of one long camp it is apparent that he has been in contact with the college for four years for no purpose. In every land grant college the majority of students must earn money in the summer. The greatest obstacle to enrollment in the Advanced course is the one camp we have at present. To increase the number would end the R. O. T. C. in land grant colleges.

The author wishes to get rid of certain material at institutions. To do so would deprive the R. O. T. C. of a valuable stimulus to interest, a means of giving the course a certain amount of versimilitude, and a basis for valuable instruction in the physical co-ordination essential to the serving the materiel. The absence of this materiel would materially reduce the substantial character of the course, and necessitate the lengthening of Advanced camp to introduce therein a subject readily disposed of during the institutional year.

In conclusion, I fear the author fails to understand the fundamental spirit of our system of National Defense. Certainly, his principles as an officer consecrated to the National Defense are not securely rooted, else he would not so easily sympathize with resistance to military training—a resistance born not of conviction, but of our inherent national laziness and indifference toward civic duty. One of the most vital functions of Regular Army personnel on R. O. T. C. duty is to dissipate such resistance in such a fashion as to teach civic obligation, and develop friends of national preparedness.''

R. O. T. C. Unit, University of Delaware

Official Warning

By Undine

HAVE you ever been warned of the probable approach of a tidal wave? Warned, that is, officially, "For such action as is deemed necessary?" I have been, twice. The resulting emotions were conflicting.

The first time, my knowledge of such phenomena being extremely sketchy, I spent the entire morning on the beach in order not to miss one unusual ripple! A domestic lecture, re-enforced by excerpts from the encyclopedia and various text-books of geology, rapidly changed my outlook on the matter. The second occasion was of a different kidney.

Admiral and Mrs. ———— were dining with us at seven. They were late, albeit enjoying a reputation for promptness. Fifteen minutes later they arrived, a trifle breathless, with apologies that they had been delayed by a tidal wave—that is, by the official report of its approach:

"Kilauea Volcano, Hawaii, March 6, 1929.

"Severe earthquake 2270 miles distant dismantled seismograph here. Tidal wave may be expected about 10 P. M. Take every precaution."

Dinner came on, the soup a bit curdled, the salad a bit warm but the four of us in high spirits with no undue nervousness. The topic of tidal waves was avoided, either studiously or otherwise. We talked of Europe, of oriental travel, of Japanese prints, of mutual friends, of a recent local murder case. Everything was so normal, so familiar—the candles burned no higher, no lower than on other nights; the new man made the regulation number of mistakes in the service; the hot biscuits were of the accustomed feathery crispness. Surely nothing so startling, so unheard-of as a tidal wave would dare make chaos of all this! Here we were four average American citizens doing our three years of foreign service in a place so Americanized, so touristized, so much a part of the mainland that foreign happenings were unthinkable. Why tidal waves simple don't happen on American soil!

But *do* they? *Could* they?

At nine forty-five Admiral ———— telephoned for information. There was no further news. I insisted that T———, my husband, call the Adjutant to find out whether or not the authorities expected to let Ft. Kamehameha go to a watery grave without a struggle. Personally I thought the army people had as much right as the navy folk to say their prayers (if any.)

He came back from the 'phone to say that the Artillery-Engineer officer was calling every family to give the same report that the navy yard had received.

Mrs. ———— jumped up, "Listen! What is that noise?"

What was it? Do tidal waves have a characteristic sound?

"Whatever it is, I'm going home!"

"But Pearl Harbor is just as low as Kamehameha."

"We can climb the tower. Will thirty-six families make it too wobbly for safety? No matter—the Commandant can tell us what to do."

They were gone.

My husband yawned and put the cat out.

I sat down. As my protector, as my lord and master, it was up to him to save me. He didn't. With maddening calm he blew out the candles, opened windows, wound the clock. He even suggested looking at Mutt and Jeff, that sacred family rite with which nothing is allowed to interfere.

"Well!" said I abruptly, "Do you intend to let me drown?"

He laughed and offered to share the paper.

"But darling, why were we warned if there's no danger?"

"Merely to be on the safe side."

"How can we be on the safe side if we don't take the warning?"

"Oh, nothing's going to happen."

"How do you *know?*"

"I just do." (Masculine logic!) "The earthquake is too far away. I'll read you all about Krakatoa."

With that he produced the ITA to KYS volume.

> "Not less manifest and far more serious were the effects of the successive explosions of the volcano upon the waters of the ocean. A succession of waves was generated. * * * * * The greatest disturbance reached a height of about fifty feet." (A fifty-foot wave would be exactly twenty feet above the roof of our bungalow-quarters.) "The destruction caused by the rush of such a body of sea water along the coasts and low islands was enormous." (Low islands! The fringe of Oahu is at sea-level and seemed in my mind's eye to be sinking.) "All vessels lying in harbour or near the shore were stranded, the towns, villages and settlements close to the sea were entirely destroyed and more than 36,000 human beings perished." (Settlements close to the sea!) "I could hear the murmur of the Pacific at our back step." "The long wave reached Cape Horn 7818 miles away and possibly the English Channel 11,040 miles distant. The shorter waves reached Ceylon and perhaps Mauritius, 2900 miles."

Said I scathingly, "Thoughtful husband soothes hysterical wife at moment of danger! Did the report say the center of disturbance is 2200 miles from here?"

"Yes, that must put it in the Aleutian Islands. Now let's see"—He fluttered the pages leisurely.

"Lives in danger from tidal wave and he reads the encyclopedia. This must be done correctly at all costs!"

He must have noticed the sarcasm in my voice.

"There's really no danger."

"Then why were we officially notified?"

"To be on the safe side."

"But *are* we on the safe side if we do nothing about it?"

He had no logical answer to that thrust, of course, so he said, rather testily I thought, "Well let's get in Ishmael and drive up Red Hill."

"You don't want to go."

"No, I'm tired and sleepy and I want to go to bed."

I was scornful.

"You are always talking about science. Now you have an opportunity to apply it. We have scientific pre-knowledge of a natural disaster and you sit calmly and read of the devastating effects of unpredicted calamities. Do you think that shows the scientific mind?"

"Oh, well, I'll put on civies and we'll go."

Yes, thought I, by all means finish the volume and then leisurely change clothes.

Aloud I asked, "Will you take your dearest possessions? What *shall* we take?"

"Hamlet and Ophelia."

Hamlet and Ophelia are our only surviving cats.

I glanced around with my mind's eye. What could I pile in the back seat of Ishmael? The silver!—lovely, gleaming, beautiful stuff. It might come in handy to pawn one day. But compared to human life it was of no importance. That was it! Shouldn't we take Nomba? Wave or no wave servants are hard to find. Besides, it would be unmoral to leave him all unknowing to meet his fate. "Let the poor devil sleep," said T———. Not the silver, then, or Nomba,—but books! Which ones? Why the encyclopedias of course so T——— could read up on how one starves properly on a mountain top.

He was ready, at last, to go. I looked hastily around my room, perhaps for the last time, picked up my watch and a coat and out we went into the night to the garage.

Off we chugged in the darkness. We looked a bit sheepish as we stopped at the sentry-gate.

Ishmael was forced to take some of the road in low. Surely safety awaited us at the top! We sat there in the soft darkness, the lights of Honololu far below. Cars whizzed past us.

"See," said I facetiously, "See how many are seeking higher ground!"

"They're going to Schofield," said my literal spouse.

"So they are, but isn't that higher?" (No denial.)

By and by it began to rain. What does rain mean in connection with a tidal wave?

Midnight. (As the movie captions say.) It was getting chilly.

I said feebly, "Do you suppose all danger is past?"

"I do." His tone was final.

Ishmael started slipping and skidding down hill.

"The brakes aren't much good. They need tightening." This from me.

"Then I was no doubt wrong about the danger being over."

Silence then, for a long time. We could still see Honolulu, the lights not yet dimmed by the fateful rush of water.

"Are you going to tell anyone about this?" I asked mirthfully.

"I shall volunteer no information, and I most certainly hope that you won't!"

But then, I'm only a woman.

The Foreign Military Press

Reviewed by Major Alexander L. P. Johnson

CHILE—*Memorial del Ejercito*—May-June, 1931.
"Panic in War," By Major Ernesto Salbach.

Panic, a frequent occurrence among troops in action, is in many cases explainable, according to the author, by predisposing conditions, such as poor discipline, lack or poor quality of food, insufficient contact between officers and men. Overwhelming superiority of hostile fire may also be productive of panic. These generally become so acute that all efforts of officers to regain control over the men prove futile. Frequently panics occur even among the best of troops without any apparent cause whatever. They are common in the early stages of a war rather than later, when troops have become adjusted to its trying conditions. The author attributes these panics to timid, neurathenic or poorly disciplined individuals, notably among reservists, whose spirit of self-sacrifice and even courage he regards as generally below that of first line troops. Panics, in the author's opinion, may be averted to a considerable extent by the vigilance of officers, who must know and watch closely all weak characters, timid souls and the like. Higher commanders can exert a wholesome influence by giving clear-cut, definite, confidence inspiring orders, by frequent personal appearance among troops especially at critical times and places.

COLOMBIA—*Revista Militar del Ejercito*—Sept., 1931.

On September 13, death removed a distinguished son and citizen of the Colombian Republic, Dr. Carlos Adolfo Urueta, Minister of War, and one time Envoy Extraordinary and Minister Plenipotentiary of his country to the United States. Born in 1880, in Mahates, in the Department of Bolivar, the deceased devoted a fruitful life to the service of his country. No less meritorious were the labors of the departed in the promotion of a better understanding among the nations of the Americas. "La Revista Militar del Ejercito" dedicated the September issue in its entirety as a tribute of the Colombian Army to the memory of its late lamented Chief.

CZECHOSLOVAKIA—*Vojenské Rozhledy*—Jan., 1931.

Since the first of the current year this ably edited periodical appears as a consolidated military service journal. In addition, each number carries a separately edited supplement, "Cvicébni Listy" (Exercise Pages) which, as the title indicates, presents tactical problems and exercises for solution and study. It bears some resemblance to the "Mailing List" of our service schools.

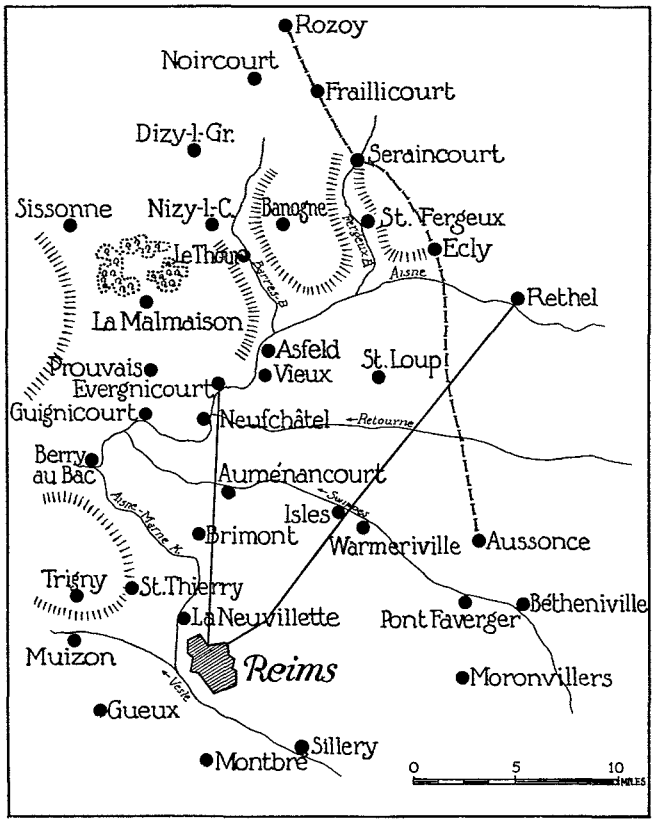
"A PROJECT FOR THE REORGANIZATION OF THE CAVALRY," by Colonel J. Eminger.

The author considers the reorganization of cavalry along modern lines imperative. He proposes a plan for such reorganization. He proposes a cavalry troop (escadron) of five platoons organized as follows: 1 reconnaissance platoon with six automatic rifles; 3 M. G. platoons with 9 medium type M. G.'s each; 1 M. G. platoon with 2 heavy machine guns. The proposed Machine Gun troop would consist of four platoons, as follows: 2 M. G. platoons with 4 heavy machine guns each; 1 A. A. platoon with 4 heavy machine guns; 1 cannon platoon with two 47 mm cannons. The author contemplates a cavalry regiment consisting of headquarters, 3 cavalry troops (18 automatic rifles, 27 medium and 6 heavy machine guns); 1 M. G. Troop (12 heavy machine guns, and 2 cannons cal. 47 mm); 1 auxiliary troop (communications—technical—and headquarters platoons); 1 Armored Car platoon, (3 cars carrying 1 M. G. and 1 cannon each.) The proposed Cavalry Division would consist of headquarters and staff; 1 cavalry brigade of 3 regiments; 1 "Speed Regiment" (motorized regiment) consisting of 1 cyclist battalion and 1 motorized infantry battalion; 1 artillery regiment consisting of one F. A. battalion of 75 mm guns, and 1 portée battalion of 10 cm howitzers; 1 Armored Car Troop (4 platoons); 1 Technical Company (Engineers); 1 Signal Company, and a motorized divisional train. The author believes that divisional cavalry should be separated from the "Army Cavalry" in time of peace.

FRANCE—*La Revue d'Infanterie*—July, 1931.
"The Japanese Infantry," by Captain Vautrain.

Constituting about one-half of the entire military establishment of the Mikado's empire, the Japanese infantry reflects the national character and traditions in its esprit, its training and indoctrination. All officers, irrespective of the manner of their original entry into commissioned ranks (corps of cadets, secondary schools, or corps of NCO's), are put through a course of training which produces a high standard of uniformity. Officers report at the barracks at reveille and work with their troops until retreat. All officers lunch at the Mess. Once a week, company officers lunch with their units; battalion commanders have their lunch with each company once a month. Relations between officers and men are more or less feudal in character, reminiscent of the days of shoguns and the samurai. The size of the standing army permits absorption of

only 18 per cent of the annual contingent arriving at military age. This allows the selection for active service of young men of the best type and highest intelligence. As a result, illiteracy does not exist in the Japanese army. In effect, the Japanese soldier represents the flower and cream of the nation. Those de-



General Map of French Maneuvers, 1931

sirous of a military career must signify their intention when they enter the service. They are then assigned to special training cadres which provide a reservoir for NCO personnel.

The essential characteristics of the Japanese tactical doctrine are: the spirit of resolute offensive, and the endeavor to attain the highest possible mobility. Well-trained Japanese infantrymen march easily 50 km. per day. Going into action, Japanese infantry takes up the approach formation only when it comes under hostile artillery fire. In order to reduce its vulnerability, Japanese infantry employs camouflage far more extensively than is done by other armies. Upon arrival within assaulting distance, the rear sections pass rapidly through the line and drive home the charge.

The defensive, according to the Japanese doctrine, is merely a temporary suspension of offensive action, which must be resumed at the first opportunity. Hence, in the defence of the main line of resistance, the Japanese infantry is taught to counterattack at the moment when the enemy assault wave reaches the barbed wire obstacle.

The Japanese make a specialty of combat at night. This they practice constantly and to an extent far beyond the generally accepted theories. They believe apparently in the practicability of maneuvre at night, and consequently provide for the employment of reserves in a night attack either to reinforce the assault echelons, or to pass through the line to continue the attack.

"Indeed, while we are applying the lessons of the war we have fought, the Japanese are preparing for a war which they believe will be quite different."

The organization of the Japanese Infantry in a general way conforms to that of western nations. Each of the 17 divisions consists of two brigades of two regiments each; a total of 68 regiments or 204 battalions. In addition, there are two independent regiments on the island of Formosa; 4 battalions on railway guard duty in Manchuria, besides the units stationed at Pekin and Tientsin. The Infantry regiment consists of headquarters, three battalions, one M. G. Company, and one Howitzer platoon. The battalion consists of headquarters and three companies of three platoons each. The M. G. Co. and the How. Plat. are apparently but training cadres for wartime expansion. It had been noted, that in maneuvers each infantry battalion had three rifle companies and one M. G. Co. of four pieces. The machine gun is of Japanese manufacture resembling the French Hotchkiss gun. Each company carries six automatic shoulder rifles of Japanese model. Six rifles per company are equipped for rifle grenades having a range of about 200 meters. Ammunition for rifles, automatic rifles and machine guns is interchangeable. The howitzer resembles the French 37 mm gun. The mortar fires a 70 mm projectile and has a maximum range of about 1,500 meters.

GERMANY—*Militär-Wochenblatt*—11 October, 1931.
"The French Maneuvers of 1931."

Mobilizing 50,000 men and 500 pieces of artillery—corresponding to half of the German Reichswehr and four times its total artillery—the French army held its maneuvers in the general area northeast of Reims. The line Rozoy-Ecly-Aussonce represented the boundary between two states at war, Blue, west and Red, east. Its mobilization still incomplete, the Red army invaded Blue territory with immediately available forces, (VI A. C. comprising the 12th Div.; the 4th Cav. Div. and the 7th Separate Cav. Brig.), to prevent Blues II A. C. with 3d and 9th Divs.) from completing their defenses still in course of construction. Blues organized for defense along the line: Brimont-Guignicourt-Sissone, with covering detachments along the imaginary frontier charged with the mission of delaying Reds sufficiently to permit completion of the defensive works. On September 10, the 4th Cav. Div. (Red), on the right, advanced on a broad front between Fraillicourt and St. Fergeux to the Aisne. The 12th Division, less one regiment, advanced in a more compact formation in contact with the cavalry. Both elements were to drive back the Blue covering detachments, and to reach the Barre-sector. At the same time, the 7th Cav. Brig. (2 mounted regiments, 1 motorized Regt. of Dragoons, and 2 battalions of artillery) advanced south of the Aisne in the general direction of Neufchatel to secure the Aisne bridges at that place. The 12th Div. effected a crossing of Fergeux Creek and made considerable

progress south of Banogne. The 4th Cav. Div. encountered little resistance and, in spite of its overextended front, reached the line, Noircourt-Banogne.

The Red plan of attack for the following day assigned the main effort to the interior flanks of the 12th Div. and 4th Cav. Div. The Dragoons and light How. Bn. were ordered to move by truck via Rethel to support the spearhead of the attack. Similarly the 150 Inf. of the 12th Div., which had been made available at Verdun, was directed to move by truck to Seraincourt so as to arrive there at 2 p. m. This regiment experienced unforeseen difficulties. The truck-train included a new type of charcoal-burning motors. A considerable number of these stalled on the road. Moreover, one battalion got lost during the night. At the appointed hour only 34 out of 114 trucks were able to reach their destination. Only one-half of the command had arrived by 5 p. m. The hour of the attack had to be postponed, and as a result the element of surprise was lost. When the troops finally arrived, they were fatigued from the prolonged trip. This unexpected delay also enabled Blues to complete the organization of their defenses.

The desire of the umpires to preserve the scheduled development of the maneuver, made it possible for the Reds to capture Le Thour in a comparatively short space of time, and to effect a crossing of the Barre. The 7th Cav. Brig., south of the Aisne, took Asfeld and Vieux, but failed to cross the Aisne. By evening, Reds were in contact with the Blue outpost line of resistance north of the Aisne. The plan of attack for Sept. 12, directed the 4th Cav. Div. to deliver a holding attack on a broad front. The 12th Div., reinforced by a Tank regiment, was directed to penetrate the Blue position, on both sides of La Malmaison, while the 7th Cav. Brig. was to push forward astride of the Aisne, behind a smoke screen laid down by the air force, as far as the line: Prouvais-Guignicourt, covering the left flank of the 12th Div. The attack progressed as planned. In six hours Reds had penetrated the Blue position to a depth of 10 km. on front 14 km. wide.

The second phase of the maneuver (Sept. 14-16) was based upon a new situation, and had no connection with the first. The VI A. C. with the 3d, 9th and 12th Divs. and the 4th Cav. Divs. represented the left wing of the Red army advancing from the north, echeloned in great depth, to locate and destroy hostile forces east of Reims to enable the Red main army to cross the Aisne west of Reims. The Blue army was represented.

The maneuver concluded with formal parades and reviews in the vicinity of Reims. Thirty representatives of 21 nations attended these exercises, among them the Chief of Staff of the United States Army.

Events Overseas

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

The League in Manchuria

JAPAN'S sudden coup in Manchuria, September 18, confronted the League of Nations with a problem rightly regarded as the most serious in the history of that body. Its powers of persuasion—and coercion—over small Powers has been proved sufficiently, but never before has it faced a major Power. How seriously the League Council regards the issue between Japan and China is clear from the speeches before that body in its memorable October 23d session, when that issue was characterized as "the pivotal point of the world political situation, its solution essential to the approach of nearly all the great problems which the Occidental nations are facing." It bears directly on the question of world disarmament, on the whole efficacy of international machinery for preventing war; it thrusts forward all the questions of security, of boundaries, and of the sanctity of international treaties. A British speaker went so far as to state that the world cannot hope to deal soundly with the economic crisis until the Manchurian mess has been cleaned up.

Contrary to the misgivings widely expressed in the world press, the League Council boldly attacked its problem. Three lines of approach were open,—the League Covenant, the Nine-Power Treaty, and the Paris Pact. At the very outset, the Council avoided the possible snarl involved in separate courses of action by the League and the United States, after our Secretary Stimson had opened the door for such collaboration. Joint deliberation, if not joint action, was assured on all questions arising under the Paris Pact. Mr. Prentice Gilbert took his seat with the Council as American representative, over the protest of the Japanese delegate, Kenkichi Yoshizawa, and the Japanese and Chinese representatives were given their day in court. Japan insisted in effect that the problem could be solved only through her direct negotiations with China; and declared that the presence of any outside Power in the negotiations would make a solution impossible. China in turn demanded League intervention to require the withdrawal of Japanese troops within the boundaries demarked by the Portsmouth Treaty, prior to any negotiations. In the face of that deadlock the Council, not unmindful of continued aerial bombings by Japanese aviators, adopted on October 23 a resolution under Article XI of the Covenant, which virtually demands the withdrawal of Japanese troops to within the Treaty zone by November 16. Japan's single vote against the resolution renders it technically ineffective,

in that a unanimous vote is necessary. It does not abate the moral pressure brought to bear on Japan by the Council's action, as well as by the almost unanimous voice of world opinion. Moreover, it does not affect Japan's obligations under the earlier action of the Council, September 30, in which Japan joined in a unanimous vote for pacific procedure. The Japanese Foreign Office has drawn a sharp distinction between those two votes, refusing to recognize the validity of the October 23d resolution.

Hopes of peaceful settlement were lessened by the report of the three-hour battle November 4, at the Nonni River Bridge between the Japanese and General Mah Chan-Shan's Manchurians. That clash followed hard on the heels of Briand's announcement that China had complied in detail with four of the five provisions of the October 23d resolution; and with respect to the fifth, covering the validity of the 1915 treaties, had announced that she respected the validity of all treaties under the League of Nations. Briand indicated that it was now Japan's turn to make clear her pacific intentions by conforming to the League's wishes. In the fact of the new crisis Briand has summoned a special meeting of the League Council for November 17. That session and its aftermath will go far to inform the world as to the efficacy of the League in handling a major problem.

The British Empire

"England yet shall stand."

Philip Snowden's quotation of Swinburne's lines at the moment when the whole edifice of British credit was collapsing, was more than prophetic. It became a challenge to the radical socialism which the vast body of Labor's adherents had come to espouse, a guidepost to the voter who was to determine whether or no British destiny was to be drowned in the public feeding-trough. And even as Henderson and his adherents chanted:

"They're starving men and women there
For the saving of the pound,"

the British voter gave his verdict.

His choice is the harder road. It means higher taxes, a ten per cent cut in the dole, a substantial tariff involving the definite abandonment of the free trade corner-stone of Britian's one-time dominant position in world trade. It ends the slipshod casualness which has given the name of revolution to every socialistic gesture in Parliament since 1924. In short, it may be called counter revolution.

There can be no quibbling over the following returns (November 3, with 5 constituencies undecided):

NATIONAL GROUP	
Conservatives	471
National Liberals	68
National Laborites	13
Total	552
OPPOSITION PARTIES	
Labor	52
Lloyd George Liberals	4
Irish Independents	2
Total	58

In summary, Labor lost 214 seats and gained none. Among the discards are practically every leader of the old Labor group, all of the small coterie which had joined Oswald Mosley last year in his New Party, and the faint fringe of communism in the person of S. Saklatvolla. Lloyd George has lost even the shadow of his once proud estate as former premier and Liberal Leader. Reelected himself, he no longer has a party. The bulk of the Liberals, adhering to the Nationalist coalition, retained some of the substance of a party, then selected Sir Herbert Samuel as their leader. Ramsay MacDonald chose the path of courage in standing for reelection in his home (Seaham) district, a Labor stronghold, and was rewarded with a substantial majority. Snowden and Thomas, his closest colleagues, fared equally well.

The top-heavy Conservative majority over all other parties apparently ensures that group a full five-year tenure of office. Even as MacDonald confers with the King on his choice of a new ministry, it appears obvious that eventually he must be shelved in favor of a Conservative leader. It is probable that the tariff issue will compel such a parting of the ways.

A brief resumé of British domestic politics since 1925 will show the present situation in proper perspective. In that year a Baldwin ministry, displacing a short-lived Labor government, chose to impound British wealth behind a dam whose foundation was the pound sterling stabilized at par. So long as the dam held, British investments abroad, valued at $20,000,000,000, were payable in gold at face. But England faced grave difficulties; free trade against world-wide tariffs, high living standards against low, and a heavy burden of social services. Maintenance of prestige and desire to hold the lucrative invisible export, which was worth $250,000,000 yearly to the world financial capital, made the effort seem worth while.

Within three years she found herself collecting from her debtors in currency revalued at an insignificant fraction of its contract figure while paying her debts at face. With the world depression, her income shrank, while her social expenditures multiplied. Taxes inevitably remained high, almost at war levels. So too, costs of production, while trade became anemic. Labor's return to power had served to hasten the process of disintegration. It needed only the Quixotic effort of last summer to save Germany and Austria from collapse to undermine finally the British financial dam. The torrent broke through, the flight from the pound was on. In twenty-four days $158,000,000 gold left the Bank of England. During August $100,000,000 more was exported in spite of protective credits of $650,000,000 supplied by Paris and New York.

Unable to agree upon remedial measures, the Labor cabinet gave way to a coalition government, pledged to balance the budget and foreign trade. Bolstered by a vote of confidence and plenary power to act by fiat, Philip Snowden brought in a supplementary budget for 1932 and a proposed budget for 1933. Economies were effected by cuts in all social services, government salaries, and in the military, naval, and air forces. Ad-

ditional revenues were created by increased taxes. Debt conversion furnished the remaining necessary funds.

Immediate results were a violent break between Mr. MacDonald and his party, disorderly demonstrations in London, mob rule in Glasgow for 48 hours, and, most alarming of all, mass insubordination in the Navy. Parliament was warned by a delegation of bankers September 17 that these had so shaken confidence that panic was threatened and that no further credits were available. In the following three days $165,000,000 gold took flight. On September 20 the world was shocked by the fall of the pound from the gold standard.

It now remained for the National government to balance foreign trade, unfavorable by $1,000,000,000 in the first eight months of 1931. A protective tariff was essential and recourse to the country necessary. How gravely the situation was viewed by the government is apparent from the orders to military reservists to stand in readiness for mobilization in the event of post-election outbreaks. Surprisingly, the election and its aftermath were taken calmly by the public.

CANADA.

Premier Bennett is urging the early reassembly of an Imperial Conference. The death of British free trade removes the most serious obstacle to a strong economic integration of the British Commonwealth of Nations. In short, a system permitting relatively free interchange of Empire products between units of the Commonwealth, while checking with tariffs the inflow of foreign goods, has drawn appreciably nearer.

Western Europe

League of Nations. Interest in the twelfth Assembly of the League of Nations, which concluded its sessions September 29, centered on the coming World Disarmament Conference. Fighting the oft-repeated predictions of past months that the Conference is already doomed, Briand in an impassioned speech before the Assembly urged the nations not to allow war "in any case, for any cause, or in any circumstance" and pledged France's word that the conference would take place February 2, 1932, as scheduled.

To many observers it now appears probable that the real issues in that Conference will be masked behind the discussions of matters of detail, none of which would offer difficulty if there could be an agreement on fundamentals. The Continental press sees the United States and France booked for the leading roles, principally because of their diametrically opposed views. Security is, and always will be, the cardinal point of French foreign policy. To that end she built her cordon sanitaire against Russia, acquired hegemony in the Balkans, and now maintains the world's outstanding military machine. And no other Great Power, least of all the United States, will promise her the absolute security which might make her willing to scale down substantially that costly defense system. She raises that point by calling attention to the fact that as yet no proper provision has been made for the enforcement by common action of international obligations. So long as she takes this view, hopes of a successful conference must be held in abeyance.

Italy, speaking through Dino Grandi, sought to create a favorable atmosphere by proposing a one year truce in armaments, effective November 1. On that date only 31 nations out of the 63 invited, had accepted. When postponement seemed inevitable, Washington kept the issue alive with the announcement that it would consider the truce in effect, such action to be contingent upon acceptance later by the other major Powers.

France—Franco-American cooperation toward stabilizating the world monetary situation is assured. That step became necessary as country after country toppled from the gold standard, and suggestions of a substitute standard were multiplied. Holding between them more than 65% of the world's monetary gold, France and the United States must of necessity avert the devaluation of that commodity. A first fruit in the furtherance of that plan appeared promptly in the cessation of the heavy shipments of gold from New York to Paris.

The latest French effort to secure a naval accord with Italy has again fallen on deaf ears, Rome insisting that the French offer differs so far from the March 1 Italo-French accord as to preclude Italy's going along. Meanwhile, the French Chamber of Deputies is expected to authorize at the next session of Parliament the construction of a 23,300 ton cruiser.

At recent army maneuvers General Weygand stated that he was particularly interested in tractor drawn ammunition vehicles for Infantry units, and that in his opinion they should be assigned to the regiment.

Spain—"No official state religion shall exist." With this pronouncement, the National Assembly disestablished the Catholic Church in Spain on October 13. While the vote was overwhelming (227-41) the debate on the measure was accompanied by violence and disorder. Christianity has existed in Spain since the 2d Century. Each of Spain's Bourbon Kings has been "His most Catholic Majesty." Even under the Republic of 1873-75, Mother Church was not molested. But the present Cortes was to go further. By a vote of 178 to 59, that body wrote into the Constitution an Article expelling the Jesuits and barring education under Catholic auspices.

President Alcala Zamora resigned in protest, and after 50 Basque and Navarra deputies had walked out of the National Assembly, War Minister Manuel Azava was elected in Zamora's place. The new Provisional President announced that there was no intention of persecuting the Church, but instead that religion was to be placed in the same position as in America.

Less spectacular than the act of disestablishment, was the action of the Cortes in granting the franchise to women who had attained the age of 23. It will have the effect of doubling the electoral vote, raising it to 10,000,000. Following that step, the Cortes decided by a vote of 150 to 130, that Presidents will be chosen by an electoral college elected by direct suffrage, voting in joint session with an equal number of Deputies from the Cortes.

Central Europe

Germany—The Bruening government continues to lead a charmed existence. When Dr. Curtius, Foreign Minister, failed at Geneva in achieving the Anschluss with Austria, the government wabbled insecurely for a space. Curtius was forced to resign. Then, after a brief flurry of reorganization, the Bruening government resumed control.

When Hitler succeeded in uniting Hugenberg's Nationalists, the Steel Helmets, and the Peasant League with the Nazi, defeat again threatened the Bruening government. Hastily, President von Hindenberg summoned Hitler for a secret conference. As soon as the Reichstag convened, the no-confidence motion came to a vote, with the Bruening government emerging as the victor by the slim margin of 25 votes (295 to 270 with 3 not voting). With the Reichstag adjourned until February, government by decree will be the order until that time. Meanwhile, the Nazis bide their time, confident of ultimate success, as local elections indicate their increasing popularity.

The makeup of the reorganized cabinet indicates the government's preparations against internal disorder in the coming winter. The vital portfolios of the Ministry of the Interior, with its control of the state police, and the Ministry of Defense have been entrusted to General Wilhelm Groener. Such a concentration of authority ensures prompt mobilization of the State forces.

Several bright spots appear on the German political horizon. While the intangible results of the visit of Laval and Briand to Berlin are stressed as the more important, much may develop from the plan formulated for the economic exploitation of the Balkans and Eastern Europe, with France furnishing the capital and with Germany supplying the labor and the factories. Von Hindenberg has appointed an "Advisory Economic Council" consisting of 25 leaders of business and labor to devise means to stimulate industrial activity. And above all, Germany's war-debt creditors are giving active consideration to her clamors for a scaling down of reparations.

The League of Nations arms statement now lists the German defense personnel at 120,000 for the Army, 16,500 for the Navy, with the naval armament below the margin set by the Treaty of Versailles. Nothing appears as to the various auxiliary forces capable of immediate induction into the Army in the event of emergency.

Austria—Chronic unrest and active fomentation of civil disorder continues. Austria's extremely straitened financial situation forced the entry of the League of Nations, under the terms of the 1922 international loan, placing Austrian finances under League supervision. Economy proposals dictated by the League financial committee, and accepted by Austria, include the reduction of the Army from 30,000 to 20,000.

Italy—Amidst a troubled Europe, Italy remains relatively calm. The recent trouble with the Pope has been amicably settled. The Catholic Action Society will no longer meddle in politics. While this appears to be a triumph for Mussolini, actually the Fascist state made a far-reaching concession when the Church was given full freedom in administration of religious matters.

To combat shrinkage in government income Mussolini has instituted a tariff increase of 15% and has authorized new cuts in wages. The fighting forces, which suffered a 10% reduction in pay last year, will probably receive another cut of 8%. Despite these financial difficulties, Italy is rapidly advancing her aerial development. A comparison of the expenditures for the Air Force in 1931 and 1923, 783,758,695 lire as against 95,000,000 lire, is significant. So too, the flight of General Italo Balbo, Air Minister, leading 24 planes to New York in November, and thence around the world. The quality of Italian military planes is attested by her increasing exports, Turkey having just purchased 28. Formerly, Angora bought its planes in France.

Eastern Europe

A Russian moratorium in the near future has become probable. From Germany comes the word that no funds will be available to meet Russia's foreign obligations aggregating at least $100,000,000, due December 1. The terrific "tempo" of the Five-Year Plan necessitated increasing purchases of foreign machines, tools, and other finished products. It entailed the hiring of a growing army of foreign engineers and foremen. To meet the financial drain, Russia depended chiefly on the funds realized from the sale of her raw materials abroad.

With the fall of world prices, Russia's raw materials became a drug on the market. In the first eight months of 1931 the nation's trade balance was unfavorable by $105,000,000. Shipment of gold in quantity was out of the question, in view of the already dubious metallic reserves supporting the nation's currency. Moscow's suggestions that foreign credits be renewed and that additional credits be extended fell on deaf ears. Meanwhile, with Stalin finding it necessary to raise the national standard of living by providing an increased supply of consumer's goods in the Soviet stores, word comes that the 1931 wheat harvest is appreciably lower than last year's, and inferior in quality. And in spite of the frantic efforts to bring laggard industries, notably coal mining and transportation, abreast of the "*piatetika*" requirements, there is little improvement. Under such circumstances it is easy to understand the closing of ten Esthonian and Latvian factories, due to their inability to discount Russian bills abroad. Russian credit, never strong, has vanished for the time being. Moscow, however, denies any intention of demanding a moratorium, realizing that such a demand would halt the Five-year Plan in midstream, at the same time opening the dam to no end of unpleasant domestic repercussions.

Compulsory military service has finally been inaugurated for the basic nationalities of the Central Asian Republics. Not since the days of Tamerlane have those peoples known the meaning of compulsory service. Their furnishing of voluntary contingents had previously been accepted by Czarist and Soviet regimes as proof of their loyalty.

NATIONAL GUARD NOTES

Preparation for Service School

WITH a view to preparing officers to better pursue the courses for National Guardsmen at the Coast Artillery School, the commandant of that institution has had the courses examined in the light of the newly revised Army Extension Courses.

As a result of this survey he has recommended that officers who contemplate attending the Coast Artillery School should complete certain sub-courses of the extension courses. They are divided into two categories; those considered essential for admission to the resident courses at the school and those which will serve to assist the student in the pursuit of the course. They are listed below:

FIELD OFFICERS' COURSE (GUNNERY SECTION)

Essential.

Subcourse 20–1 Fire control and position finding for seacoast artillery.
Subcourse 20–4 Basic gunnery for seacoast artillery, or—
Subcourse 20–7 Basic gunnery, fire control and position finding for antiaircraft artillery.

Assistance.

Subcourse 30–5 Applied gunnery for seacoast artillery, or
Subcourse 30–6 Applied gunnery, fire control and position finding for antiaircraft artillery.

(Tactics and Technique Section)

Essential.

Subcourse 10–3 Organization of the Army.
Subcourse 10–4 Organization of the Coast Artillery.
Subcourse 10–8 Map Reading (Part I, only).

Assistance.

Subcourse 30–3 Organization of the Infantry Division.
Subcourse 30–4 Combat orders and the solution of problems.
Subcourse 30–8 Technique and elementary tactics for seacoast artillery.
Subcourse 30–9 Technique and elementary tactics for antiaircraft artillery.

BATTERY OFFICERS' COURSE (AA SECTION)

Essential.

Subcourse 10–6 Weapons and materiel.
Subcourse 20–7 Basic gunnery, fire control and position finding for antiaircraft artillery.

Assistance.

Subcourse 20–2 Identification of aircraft.
Subcourse 20–8 Signal Communications for all arms and services.
Subcourse 30–6 Applied gunnery, fire control and position finding for antiaircraft artillery.

BATTERY OFFICERS' COURSE (SEACOAST SECTION)

Essential.

Subcourse 10–6 Weapons and materiel.
Subcourse 20–1 Fire control and position finding for seacoast artillery.
Subcourse 20–4 Basic gunnery for seacoast artillery.

Assistance.

Subcourse 10–2 Coast Artillery ammunition.
Subcourse 30–2 Orientation.
Subcourse 30–5 Applied gunnery for seacoast artillery.

In publishing the recommendations of the commandant, the Militia Bureau has not specifically directed that officers must have completed the subcourses specified but it is expected that officers detailed for the courses will have done so. Those who do not will find themselves seriously handicapped in their school work.

Field Training Camps Best of All Time

"THE 1931 National Guard field training camps were successful beyond comparison." This is the conclusion that has been arrived at throughout the country. It comes from those who had to do with the conduct of the camps, from officers of the Regular Army sent out from Corps Area Headquarters to inspect National Guard units and from civilians who observed the operation of the camps.

Never in the history of the National Guard was the attendance percentage so high. This is due in part to the economic conditions, but that is not the sole reason. The National Guard is attracting a higher class of young men in their ranks—men who are interested in the military profession; interested in the National Defense, and are willing to devote their time to it where the training is conducted on an efficiency basis and their efforts bear fruit. In many of the States the enlistment of recruits was stopped at least two months before the opening of camp. This insured the new Guardsman a minimum of eight armory drill periods and eliminated much of the recruit training at the field camps which heretofore consumed so much time of officers and noncommissioned officers.

Training programs and schedules indicated a step in advance over previous training periods. They were better prepared this year and included much tactical training, musketry and combat firing. Rifle marksmanship was, in general, limited to units which have no range at their home station and was pushed to completion in a minimum time.

Every unit of the National Guard is inspected during the field training period. For the first time, this year the inspection was conducted by a board of three officers of the Regular Army sent to the camps for the purpose by the Corps Area Commander. It was tried out last year in three of the Corps Areas and worked so successfully that it was given nation-wide application this year. The reports indicate that the National Guard is well pleased with the system and there is no doubt but that it gives Corps Area Commanders and the Militia Bureau a clearer picture of the progress of the citizen soldiery and the state of availability of organizations for service in case of an emergency.

With the vast amount of camp construction that it has been possible to accomplish with the million dollars made available by the last Congress under the unemployment relief program, the National Guard

camps have better and more complete facilities for training than they have ever had before.

The reports to the Chief of the Militia Bureau indicate that the National Guard fared better with the 45 cent ration than they have heretofore fared with the 50 cent ration. In many of the camps where standard bills of fare were made out and adhered to it has been stated that the 45 cent ration of 1931 was equal to more than a 55 cent ration of last year. This cut in the ration was made on the representation of the War Department that the actual cost of food stuff had been lowered more than 20 per cent. The data on the subject was secured from the Department of Commerce whose survey extended all over the country.

Plans are now under way for the 1932 camps and it is fully expected that they will surpass those of 1931.

The Brothers Contest

THE "Brothers Contest" in the National Guard goes on apace. Some time ago the commanding officer, Company K, 181st Infantry, Massachusetts National Guard, announced that he had seven sets of brothers in his outfit and inquired if any other unit could surpass that mark. This started the ball a-rollin'.

"You aint heard nothin' yet" observed Lieut. Col. Byron Beveridge, who is the editor of the Wisconsin National Guardsman, as he proceeded to set forth the position of his state in the brothers contest. He states:

"Company 'I', 127th Infantry, Neenah, Wisconsin, has twelve pairs of brothers, among them two lieutenants, four sergeants and four corporals. Battery 'D', 120th Field Artillery, of Stevens Point, Wisconsin, has eight pairs of brothers. Company 'M', 128th Infantry, of Plattsville, Wisconsin, has also eight pairs of brothers, in addition to a father and son, the father being a sergeant and the son a first sergeant. Battery 'B', 121st Field Artillery, Green Bay, Wisconsin, has a father who is a first sergeant, and his three sons who are respectively: sergeant, corporal and private, first class. No classification is stated for the mother! Battery 'C', 120th Field Artillery, of Chippewa Falls, Wisconsin, has five brothers, two sergeants, two corporals, and a private, first class."

Then comes the returns from Iowa which indicate that there are 14 sets of brothers in the service company of the 168th Infantry stationed at Council Bluffs, Iowa. Included in the number are several sets of three brothers with a total of 31 men in the outfit who are so related. The Headquarters Co., 168th Infantry, reports ten sets of brothers on the rolls of that unit.

Bakers and Cooks School Details

EVERY now and then the question of sending officers and enlisted men of the National Guard to the Bakers and Cooks Schools maintained by the Regular Army comes up.

This class of military training is not included in the project of school courses listed by the Chief of the Militia Bureau because it involves essentially civil rather than military instruction. In the first place the school course normally covers a period of three months training as a baker or cook and only those men who show exceptional promise are given the opportunity to continue on with the mess sergeants course. This latter would be the only thing of special value to the National Guard.

The whole course would be spread over a period of six months and would not be of a value commensurate with the cost.

The Chief of the Militia Bureau has not looked with favor on National Guardsmen taking these courses and the applications have to be returned disapproved. There are no funds available without taking them from other school projects which are considered more essential to the progress of the National Guard service.

In view of the facts considered here all applications for these schools should be stopped at the first office of entry and save further correspondence on the subject.

Appreciation of Community Interest

THE City of Hornell, New York is the home station of Company K, 108th Infantry, New York National Guard. Under the leadership of Captain Arlie B. Conover, the Company Commander, the people of the community have given the organization their whole hearted support. As a consequence Company K is one of the city's respected institutions.

Information of this community cooperation has come to Major General William G. Everson, who has addressed a letter of appreciation to the Mayor of the city as follows:

"The Honorable, The Mayor,
Hornell, New York.

My dear Mr. Mayor:

It has come to the particular attention of this office the Militia Bureau, War Department, Washington, D. C., that the civilian community of the City of Hornell has been of great assistance in the development and well-being of Company "K", 108th Infantry, National Guard of the State of New York, located at Hornell; that this assistance has been rendered not only in a material and financial way, but through display of an appreciative, friendly, supporting attitude.

It is extremely gratifying to encounter a public spirit such as that of your city, so patriotic and favorably disposed toward a local organization of the National Guard.

Progress in training and administration of a National Guard Company is not easy of accomplishment. It is felt that the helpfulness displayed by the citizens of Hornell toward Company "K", undoubtedly assists to a very material degree in the successful accomplishment of its training and administration.

With deep appreciation of your city's fine public spirit, I desire to express not only my personal thanks but the thanks of the Militia Bureau, for its attitude, supporting as it does the general scheme of national defense of our country.

With sincere regards, I remain
Very truly yours,

Wm. G. Everson,
Major General,
Chief, Militia Bureau."

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. J. C. Ohnstad, Colonel, C. A. C., President.

Projects Completed During September-October

No. 850. Military Characteristics of an Intermediate Caliber Automatic Antiaircraft Cannon.—The Coast Artillery Board has submitted specifications for an intermediate caliber cannon for antiaircraft. This gun is to act as an intermediate piece for use in covering areas beyond ranges of the .50 caliber machine gun and below the ranges of the 3-inch antiaircraft gun. The type of gun desired is one firing a shell weighing between 1½ and 2 pounds. The length of the gun should be 50 calibers, and the muzzle velocity of about 3000 feet per second. Because of the difficulty experienced in adjusting fire of the 37-mm. gun by means of tracers alone, a time fuze is desired in the new gun. The gun should be so mounted as to permit going into action without delay when on the march. At present it is desired to experiment with both trailer mounts and self-propelled mounts. Other specifications were included relative to the type of vehicle employed in its transport. The Coast Artillery Board recommended the construction of one self-propelled mount and one trailer mount.

Projects Under Consideration

No. 681. Test of Fast Towing Target.—During the period November 16-25 the Coast Artillery Board will conduct firings at Fort Story in which antiaircraft guns controlled by the M-2 Director will be fired at a high speed target towed by a destroyer. Some firings will also be held at the high speed target by the 155-mm. G. P. F. batteries. These firings should result in determining the ability of antiaircraft guns to engage fast naval vessels as targets and also in determining what type of fire control is most suitable for secondary armament in general. In addition, the 3-inch antiaircraft truck mount, T-1 will receive further tests.

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

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

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

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

No. 817. Time Interval Apparatus for Mobile Artillery.—Recommended that further study be given to the construction of this apparatus to facilitate firing on intervals used by major caliber Coast Artillery armament.

No. 827. Temperature Tests of Height Finders.—Test completed.

No. 829. Instruments for Training of Stereoscopic Observers.—This project reopened for test of visual acuity board, interpupilary distance gauge an dstereoscopic trainer.

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

No. 860. Test of Air Corps Machine Gun Pedestal Mount, Type A-3.—Under test by 12th Coast Artillery.

No. 863. Test of Army Hoisting Vessel, H-1.—Under test.

No. 864. Organization and Functions of Fort Signal Stations.—Under study.

No. 865. Test of Buzzers, Type TG-5-T1.—Under test.

No. 866. Test of Field Service Folding Tables.—Under test.

No. 867. Test of Charging Slides for Browning Machine Gun, Caliber .50.—Material received and issued to troops for test.

No. 871. Azimuth Pointer for 12-inch B. C. M1917.—Awaiting test at Fort Hancock.

No. 873.—Service Test of Long Distance Seacoast Data Transmission System T-6.—Awaiting receipt of material.

No. 875. Automatic Sponging of Seacoast Cannon with Liquid Carbon Dioxide.—Under study.

No. 877. Test of Electric Primer Testing Set.—Under study.

PROFESSIONAL NOTES

Air Compressor Units for Maintenance Work

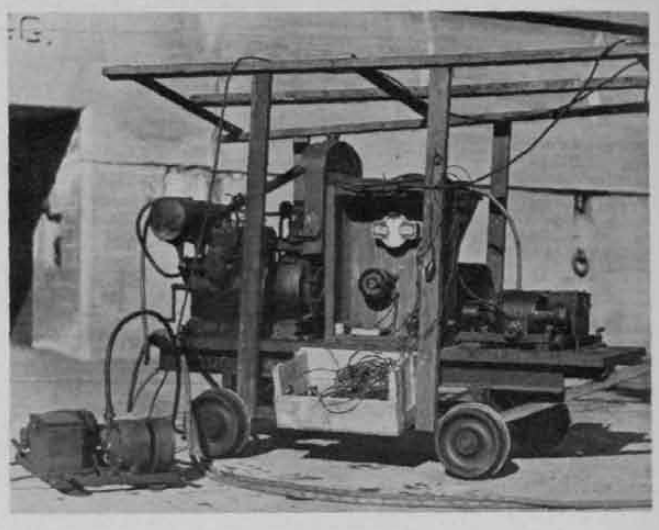
By 1st Lt. James F. Pichel, C. A. C.

IN spite of protests from many Coast Artillery officers now on maintenance duty that the amount of work to be done on armament can not be performed properly by the small number of men assigned to this duty, there appears to be no hope that this personnel will be increased except possibly in a few special cases. On the other hand the amount of work appears to be increasing. The situation in a harbor defense on a maintenance status is one which has the officers assigned for duty constantly on the defensive. Each inspection party from higher headquarters points out a hundred and one things which should be done. The Signal Corps inspectors have voluminous instructions for work which should be performed *right away* to telephones, switchboards, headsets, cables, terminal boxes, radio installations, etc.; the Ordnance Department inspectors mention numerous necessary overhauls of D. P. F.'s, telescopes, powder tests, ammunition modifications of various kinds; the Engineers record work which should be done on stations, emplacements, power plants, etc. Besides the work on the armament there is that under the Quartermaster Department in the maintenance of barracks, quarters, water systems, etc. All the time these special jobs are being performed the routine work of maintenance must proceed in order to avoid deterioration of valuable materiel. This situation presents a very interesting problem—one which requires the introduction of methods out of the ordinary for its solution.

The Chief of Coast Artillery and his assistants during their inspections of materiel have constantly recommended the use of labor saving devices wherever possible, "such as paint spraying equipment, sand-blasting devices, motor-driven wire brushes for cleaning metal and similar equipment. * * * Where such facilities do not exist, purchase thereof should be made from available maintenance, preservation and repair funds or obtained by transfer from surplus stocks."

In this article, it is desired to describe just one job where labor saving apparatus was used to good effect. It is believed the same problem will occur in any harbor defense on maintenance status. In these harbor defenses (the Harbor Defenses of Boston) the paint on the guns and carriages was in such condition as to be noted by a considerable number of inspectors with result that nearly all reported every one of the 23 batteries, ranging in size from 3 to 16-inch guns, in need of paint. The guns were covered with paint so far as the prevention of deterioration was concerned. Since there had been so many coats of paint applied from year to year, so much touching up of spots, it was decided that for appearance sake the only solution was to completely chip each gun and carriage down to the bare metal, apply red lead, and repaint.

First, the old methods which had been used for years were tried. Chipping hammers, scrapers, blow-torches, etc., were furnished and the maintenance detachment started in on this job when good weather opened this spring. It soon became apparent that the job was a bigger one than appeared at first thought. Scraping paint is hard labor for the man and it is also tedious and non-interesting. It was estimated that to chip



and scrape all paint from the guns in the harbor defenses might require three or four years with the present personnel. Naturally labor saving devices were considered and pneumatic chipping hammers and electric motor-driven wire brush were obtained.

The pneumatic and electric driven aparatus for scraping metal is well known in ship-yards and other industrial concerns which have been using them for years. As a matter of fact the harbor defenses Artillery Engineer had been using pneumatic hammers and rotary wire brushes with excellent results for the past year. However, the apparatus used by him, while very effective, was too complicated, expensive and cumbersome to be used by the handful of enlisted men comprising the maintenance detachment. The harbor defense Ordnance Officer immediately took measures to rig up similar apparatus utilizing largely equipment already available and with an effort to reduce the cost as much as possible. What was required was an outfit which was economical, portable, easy to operate, and did not require too much time or labor to set up at the various places where it was to be used. We began by removing the small gasoline generator set with the air-compressor and tank from the ordnance machine shop

truck which is standard equipment and available in the harbor defense. These were mounted on a small four-wheeled cart which was discovered at one of the forts. A set of switches, rheostats and fuses were likewise found on the post and mounted on a home-made power panel. The entire set was then hooked up.

There was some difficulty in procuring pneumatic hammers. Those supplied with the Ordnance machine

shop truck were too large and were not suited for the work desired. A small light pneumatic hammer known as "Dallet Tool 1-inch size" and sold by the Vulcan Tool Manufacturing Company of Quincy, Mass., was finally selected. The tool cost $16.00 and the chisels for it 35 cents each. The air hose cost 15½ cents per foot and the miscellaneous couplings, nipples, etc. for all hammers about $5.00. The air-compressor hose on the machine shop truck was not suitable due to the fact that it is wire-wound, very heavy and cumbersome and is usually in a poor condition. In climbing around over the guns and carriages a light flexible hose is needed which should be at least 50 feet in length for each tool used.

The motor-driven wire brush unit consisted of a ½ h.p. D.C. motor, a 7-foot flexible shaft and two wire brush heads, cost about $120.00. If funds cannot be obtained for the brush outfit this can be dispensed with since it is much less necessary than the air hammers. In operating the hammer set it was found that the power plant compressor and tank had power enough to operate two pneumatic hammers intermittently or one hammer continuously. The power-driven wire brush may be operated by current from the generating set. Using this apparatus four men working daily completely scraped, red leaded and painted seven 12-inch mortars and carriages in a period of approximately seven weeks. It was estimated that by hand scraping and chipping a period of seven *months* would have been required. Furthermore, regardless of the difference in labor and time, the pneumatic chippers were better suited to remove all paint and scale from the hundreds of small cavities, recesses, etc. which are very difficult of access and involve slow and back-breaking labor. Another example is given of a job at Fort Warren on which two men working intermittently and assisted occasionally by small details completely scraped, chipped, red-leaded and painted two 10-inch disappearing guns and carriages in seven weeks. The original estimate was one year for this job.

The use of these labor saving devices is not only worth while because they are faster and more efficient, but also for the morale effect on the men. Any soldier would rather use a machine of some kind than to chip away all day with hand tools. The operators use the pneumatic hammers all day without fatigue and seem to take a great deal of interest in the work. There are other advantages in the use of the apparatus described above. The generating set is portable, easy to run and economical. Five gallons of gasoline, costing 35 cents, runs the set the entire day. For interior work, such as in the magazines and passageways where light is required, this small set can readily furnish the power for lighting without requiring the 25 K.W. set to run as has been the case heretofore. Certain types of scraping is more readily done by machine than hand such as projectiles, iron railings, stairways, over-head trolleys, etc. The Artillery Engineer, who has been using pneumatic hammers and wire handle brushes for the past year, estimates that one man with the pneumatic tool is equal to eight men working by hand. The cost of operating for gas and oil has been approximately $10.00 per month.

If a large capacity set can be utilized the large set used by the civilian employees of the Artillery Engineer secured from Raritan Arsenal is very suitable.

It is a large gasoline driven air compressor unit capable of operating six air hammers. The Artillery Engineer also uses power-driven wire brushes and a paint spraying apparatus which was purchased locally. In procuring the necessary parts for these devices the officers in charge of maintenance work have been very fortunate in having the full cooperation of the Commanding General, 1st Coast Artillery District, the Corps Area Ordnance and Engineer Officers and the Harbor Defense Commander.

War Department Policy in Selecting Officers to Attend Army War College

THE Secretary of War has approved the following policy for the selection and apportionment of student officers to attend the next course at the Army War College:

Apportionment to arms and services—

Infantry	23	Adjutant General's Department	1
Cavalry	8	Quartermaster Corps	3
Field Artillery	9	Medical Corps	2
Coast Artillery	7	Ordnance	2
Air Corps	4	Chemical Warfare	1
Engineers	3	Selected by the Secretary of War	10
Signal Corps	2		

Student officers selected will be field officers or captains who possess the following qualifications:

Who will be less than 52 years of age on September 1, 1932. At least one-half the quota of each arm or service will be less than 44 years of age.

Are on the General Staff Corps Eligible List or are second year students at the Command and General Staff School or are graduates of the Army Industrial College or members of the present class.

At least 50 per cent of the quota of each arm will consist of officers who, upon graduation, will be available for detail to the War Department General Staff. Preference in selection will be given to officers who have served not less than 3 years as instructors at the Command and General Staff School.

The requirement of a two-year interval between attendance at the Command and General Staff School and the Army War College has been removed.

Examinations for Reserve Officers

THE following may be of interest to reserve officers who are about to take examinations to determine qualification for appointment or for certificate of capacity.

The War Department announces that in a case where an applicant for appointment or for certificate of capacity has prepared himself for examination under Army Regulations, dated June 15, 1925, and where he would be at a disadvantage if required to qualify under the Army Regulations published this year the Corps Area Commander may authorize his examination in whole or in part under the old Regulations.

This substitution is authorized for examinations occurring prior to July 1, 1932.

New Training Film on the 155 G. P. F.

A NEW training film showing the tactical employment of the 155-mm. G. P. F. battery was completed during the summer. The Chief of Coast Artillery has attended a preview of the film and considers it highly instructive, interesting, and well photographed. This film should be available at Corps Area Headquarters when desired by instructors.

Captain Lawrence C. Mitchell, 51st Coast Artillery, prepared the scenario for this film, spending some time on temporary duty in the office of the Chief of Coast Artillery in contact with Captain A. P. Fox, Signal Corps, who directed the picture. Captain Mitchell and Battery B, 51st, starred in the picture.

Data Transmission for Searchlights

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

THE following is a description of an improvised data transmission system for use with the Sound Locator T-1 or T-2 in conjunction with the AA Searchlight M II, using the G. E. Distant Electric Control. This information is furnished so as to enable any interested party to construct a similar device.

The idea underlying this system is to make the transmission of data from the sound locator by some silent means and at the same time utilize the advantages of the distant electric controller. To accomplish this end the searchlight azimuth and elevation are transmitted to the sound locator where they are compared with the sound locator settings. The searchlight is then reset to correspond to the sound locator settings by signals sent from the sound locator to the distant electric controller.

The improvised apparatus consists of an indicator mounted on the distant electric controller. This box is divided into four compartments, each of which contains a miniature incandescent lamp. The compartments are closed by celluloid windows on which arrows are drawn. The upper right arrow points upward, the lower right downward. The upper left points left and the lower left right. The right pair of lamps is connected by means of an improvised three-conductor cable (field telephone wire braided) to a double throw switch of the type used in telephone switchboards. The left pair is similarly arranged. A storage battery furnishes the lamp current. The transmissions of azimuth and elevation are accomplished identically, hence only one will be described.

Six men are required to operate the system, three for azimuth and three for elevation. Take as an example the elevation detail. The reader at the searchlight stands in such position that he can see the elevation scale. He is equipped with a telephone and his duties consist in calling off the searchlight elevation periodically into the transmitter. The comparator is stationed at the sound locator and he is equipped with a helmet type telephone receiver which is connected to the reader's phone. In his hand is the switch connected to the right side of the indicator. He stands so as to see the elevation scale of the sound locator. He "compares" what he sees with what he hears and by means of the switch in his hand he makes what he hears agree with what he sees. If he wants the searchlight to go up he pushes the switch up, and vice versa. The controller's duties are simple. When he sees the "up" arrow illuminated he raises the controller handle, and vice versa.

After the first few seconds of action, the searchlight and sound locator will be found to be in step. The system works rapidly and the improvised apparatus can be constructed from material usually available at any post.

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery
MAJOR GENERAL JOHN W. GULICK

Executive
COLONEL W. F. HASE

Personnel Section
MAJOR G. F. MOORE
MAJOR S. S. GIFFIN

Materiel and Finance Section
MAJOR R. E. HAINES
MAJOR J. H. COCHRAN
CAPTAIN F. J. MCSHERRY

Organization and Training Section
MAJOR J. B. CRAWFORD
CAPTAIN J. H. WILSON

Plans and Projects Section
MAJOR G. R. MEYER
MAJOR R. V. CRAMER

General Gulick Honored Guest of the Pittsburgh Chapter, U.S.C.A.A.

AT THE invitation of its President, Captain Paul O. Langguth, the Chief of Coast Artillery, Major General John W. Gulick, visited the Pittsburgh chapter on November 17 and was the guest of honor at the banquet held in the evening at the Pittsburgh Athletic Association. Almost one hunderd officers were present.

A number of talks were made, some at the unexpected request of the toastmaster, Captain T. F. Ryan. General Gulick addressed the meeting on the present status of the Coast Artillery and its outlook for the future. He commented especially upon developments underway today which will increase the accuracy and efficiency of gun fire.

The hospitality of the Pittsburgh chapter was beyond anticipation. The excellent and well planned arrangements for the Chief's reception and entertainment were due to the efficient work of the committee appointed by the President. Captain C. H. Fleming headed this committee and was ably assisted by Colonel J. S. Ervin, commanding the 508th C. A. (AA), a member of the Executive Council of the Coast Artillery Association.

During the day General Gulick visited the Pittsburgh R. O. T. C. unit, under the direction of Lt. Col. E. J. Cullen, P. M. S. and T. At the Chief's special request no ceremonies were scheduled but the routine work of the unit was observed with interest and approbation. After his inspection of the unit General Gulick called upon the Chancellor of the University and expressed his gratification for the cooperation existing between the Military Department and the Faculty of the University.

The Coast Artillery Reserve headquarters also was visited under the guidance of the unit instructor, Major H. LeR. Muller. The success of Major Muller as unit instructor of the Pittsburgh units is well known not only for the efficiency with which the instruction is given but for his ability to secure team work and generate esprit. The Chief of Coast Artillery expressed his appreciation for the manner in which Major Muller has conducted the Pittsburgh office and secured the high regard of the officers of the 503d and 508th.

Concerning General Gulick's visit one reserve officer writes, "You know how difficult it is to keep these young officers pepped up and it is occasions such as this that help maintain their enthusiasm and interest."

The Coast Artillery School

SEVERAL important changes in the School program were effective with the beginning of the present School year. Equitation for both the Advanced and Battery officers, classes was reduced from two to one period per week. The additional time will be devoted to artillery subjects and the probable result will be fewer casualties to reduce the class room attendance as in previous years.

For the Advanced course the time devoted to Seacoast and Antiaircraft Materiel, Gunnery and Firing has been extended from eight weeks to nine weeks and in addition, a two-day practical exercise at Fort Story.

For the Battery Officers' Course, Orientation has been increased 7.5 hours. Motor Transportation has been increased 25 hours; Submarine Mining has been increased 10.5 hours, and a two-day practical exercise at Fort Story added.

The beginning of the Special Course for National Guard and Reserve officers was advanced to the second week of school so that this class may have antiaircraft firing with the Advanced class, thus materially reducing the troop requirements.

In the absence of antiaircraft tests or exercises at

Aberdeen Proving Ground during the school year the classes will not receive the benefit of a visit to that place as formerly. However, an opportunity was furnished for the students to attend the important technical searchlight tests and exercises held at Humphreys in September and October.

Consideration is being given to the matter of again conducting a battle practice at Fort Story and a minor joint exercise with the Navy. The School personnel, both students and instructors, participated in those held last year and gained valuable instruction which constituted an important addition to the School program and provided a desirable relief from class room work. In addition to battle practice, terrain exercises and tactical rides were conducted to afford practical application of the principles and doctrines of war.

The Advanced Engineering Course has been extended two weeks to provide time for additional instruction in Submarine Mining, Care of Storage Batteries, and Orientation. It is probable that arrangements will be made for this class to make visits of inspection to the following establishments during the School year.

Sperry Gyroscope Co., Brooklyn, N. Y.
American Telephone and Telegraph Co., New York, N. Y.
Bell Laboratories, New York, N. Y.
General Electric Company, Schenectady, N. Y.
Frankfort Arsenal, Philadelphia, Pa.
Naval Gun Factory, Washington, D. C.

The Advanced Gunnery Course started December 1 and will comprise fifteen weeks of instruction at Fort Monroe to be followed by four weeks of instruction at Aberdeen Proving Ground. It is probable that this class will also have the opportunity of visiting the Naval gun factory at Washington.

The Advanced Motor Transportation Course has been discontinued.

School and post activities have again returned to normalcy, after an interruption caused by the Yorktown Sesquicentennial celebration. The Coast Artillery School was closed for each of the four days of the celebration and for the day preceding. All line organizations at Fort Monroe were encamped at Yorktown, for several weeks, small detachments only being retained at the post to take care of the necessary guard and fatigue. Commissioned and enlisted personnel, of the School, staff and the post laid books and work aside and entered whole-heartedly and enthusiastically into the task of making the celebration a success. The celebration required long hours and difficult and unfamiliar work for the School and Post personnel (Our wives were wishing Cornwallis never had surrendered), but it was a unique and valuable experience for all.

Present Conditions at Corregidor

By 1st Lieut. G. F. Heaney, Coast Artillery Corps.

CONDITIONS have changed completely at most of the Coast Artillery posts in the States, so that an officer returning to a post at which he served a few years ago will find himself a complete stranger. On foreign service the changes have not been so complete, but nevertheless some are noted. The following notes are on changes at Fort Mills, as noticed by an officer who returned there recently after a short absence.

Officers: The officers of the 59th, 60th, and 91st live at Topside or Middleside according to rank. The officers of the 92nd live at Kindley Field. The Guard Battalion officers live at the Stockade Level. The officers of this battalion formerly were supplied from the infantry scout regiments at Ft. Wm. McKinley, but now they come from the regular artillery officers.

Outpost Duty: Fort Wint is on caretaking status. Fort Hughes, garrisoned by the 59th C. A., has two officers. Fort Drum, also 59th C. A., has two or three bachelor officers. Fort Frank, garrisoned by the 91st C. A., has one officer. Duty on these outposts is not limited to four months, as it was formerly, but is for an indefinite period, sometimes eight or nine months. Duty with the guard battalion is considered outpost duty. The tour with this battalion is usually for six or three months, depending on the proximity of target practice. Newly arrived officers are frequently assigned to guard battalion or outpost duty immediately upon arrival in the defenses.

There are quarters enough for everyone. In most cases, newly arrived officers can go directly into their own quarters and start housekeeping. The harbor defense commander insists on having all vacant quarters painted, and furnished with bedding and mess equipment, before a transport arrives. However, the old custom still persists, of having all newly arrived families taken care of by friends on the post. The quarters have all been furnished with the new QM dressing tables, bureaus, and mirrors. Electric stoves have been purchased, but are not yet installed. Electric refrigerators are not now contemplated.

Junior officers will be glad to know that the custom of turning off the water on Middleside has been discontinued. All quarters have water at all times.

Cars are no longer a luxurious rarity. At least a third of the officers have cars. The roads have been improved, and garages are being built. An automobile is a necessity for officers at Kindley Field, and a convenience anywhere else, especially at the Stockade Level. Those who contemplate buying a new car, with the intention of selling it here on completion of their tour, should get an "export" model; that is, with right hand drive, as traffic keeps to the left here. An export car brings more money at resale.

Gen. Kilbourne's articles in recent issues of the Journal described the post improvement work he has been conducting. The principal work has been in building cement sidewalks, lawns, and terraces. The roads in the ravines have been paved. Hedges and trees have been planted all around the post. The cocoanut trees planted in 1926 are now quite large, and make the post look more tropical than it did.

The new pool at the Club was opened in July. The locker rooms and showers will be completed in a few months. The Malinta Cove beach has been turned over to the enlisted men. Plans are being made for improvement of the Kindley Field beach, as an officers' beach.

The street car service has been speeded up. Cars now make the run in thirty minuts instead of forty minuts. The safety switches installed after the accident of 1925 have been cut out. The track has been extended around the golf links to the end of the Club porch, so that Middlesiders attending dances can step from the car to the club without getting soaked by a typhoon.

There are now two boats on the regular Manila run. The "Hyde" leaves Corregidor at 8 a. m. and leaves Manila at 4 p. m. The "Miley" leaves Manila at 10 a. m. and leaves Corregidor at 4 p. m.

Merchants here have not heard of the Depression. Prices are as high as in 1927, insofar as food and clothing are concerned. Prices on Chinese goods, however, have declined from 30-60 per cent.

The radio programs are excellent. There is only one station, KZRM, which can be heard at Corregidor. During most of the day, they broadcast phonograph records, with very little interruption for advertising talks. (Post electrical service is 110 volt 60 cycle.)

Coast Artilleryman Wins Praise

ONE Coast Artilleryman known to many Journal readers has received a commendation somewhat out of the ordinary. He is Lieutenant Joseph S. Robinson detailed with the War Mothers during last summer's pilgrimage. This "commendation" comes from one of the War Mothers in a letter to the Secretary of War recently published in the *Quartermaster Review*. Extracts are quoted.

> Lieutenant Robinson! I wish I could do him justice! I wonder if he will always be as charming as he is now? Then, and always, throughout the Pilgrimage, on hand to tell when we were approaching something of interest—explaining things we did not understand—under that boyish interior and unassuming mien such a thorough knowledge of French history—such a perfect mastery of the French language—such infinite patience and courtesy in explaining military tactics, at times, to a bunch of interested but stupid old women—the older the stupider, the better he liked them!
>
> How touching to see the interest he aroused in our oldest member—an Irish woman 73 years of age—when he appeared at the door of the compartment on the journey to Paris and said:
>
> "Now watch for the next large town—Lisieux—we are due in about ten minutes. There is a large shrine built on a hill to some little nun who lived and died there. I think they call her a little flower."
>
> "Little Flower," said Mrs. G., rousing up, "shure an' a great saint she is!" And the old lady seated herself by the window and watched earnestly—her rosary beads slipping quietly through her fingers—and was rewarded by an excellent view of the shrine of the little saint."
>
> What a delightful way to travel! No timetables, no tickets, no worry about baggage, no racing for trains, not having to lift a finger.' Like the lilies of the field we toiled not neither did we spin, yet Cleopatra in all her glory but traveled in a canal boat compared to us, or *grand* us. * * * And who was Marc Anthony, I'd like to know, compared with that slender figure in neat khaki on the front seat, his boyish face alight with enthusiasm as he explained to a group of faded old women the history of the great country which has been a battle ground off and on, for thousands of years and in which now the tragedy of their own lives is written?"

Lieutenant Robinson must be a gentleman of varied accomplishments. He is the same Lieutenant Robinson who used to run a reserve officers' mess in the 52d at Eustis which was said by the trenchermen to be "the best mess they had ever seen in the army."

61st Coast Artillery (AA)
Fort Sheridan

EARLY in September the regiment with all but three of its officers and all available enlisted personnel, marched to Camp McCoy, Wisconsin, for 15 days field training at that camp. The training included pistol practice, disciplinary drills, field inspections, critiques, and the following tactical problems:

(a) Rear area defense—Defense of assumed supply establishments on Camp McCoy reservation; location and installment of all elements except communications.

(b) Installation of communications for the above.

(c) Rear area defense—Defense of assumed supply establishments at Sparta, Wisconsin; reconnaissance and selection of positions of all elements; plans for supply, communications, and care of sick and wounded; issue of field orders for occupation of positions.

(d) Defense of a corps concentration—Reconnaissance and selection of positions for defense.

(e) Defense of a corps during an advance—Reconnaissance and selection of positions and issue of field orders.

On the march, the regiment was divided into an advance section (including the searchlight units), four battery sections, and a repair section. The march each way, a distance of 256 miles, was made in four days. Assembly for reveille was at 5:15 a. m., the entire regiment being on the road by 7:15 a. m. Every unit was always in camp by 3:00 p. m. daily. There was one minor motor accident only, and no injuries to personnel. Searchlight demonstrations were held at Sparta, Kilbourne, and Madison, Wisconsin.

The regiment returned to Fort Sheridan during the latter part of September. Only the target practice of Battery A (Searchlight Battery) remained to be completed before cold weather set in. A sector was selected near Barrington, Illinois, and by the second week of October the battery was ready for preliminary practices. Two Air Corps planes arrived on October 12 and, as usual, furnished excellent cooperation in flying the courses. Neither of these officers had flown before for searchlight practices and were considered interested in the effects of the lights on flying. During the period, weather conditions were very poor with

frequent low ceilings and rain and one record practice remained to be completed in November.

Four new G. M. C. prime movers arrived early and have been greatly admired. So far there has been no opportunity for test of these vehicles but as soon as practicable they will be given a road test with the standard prime mover load to determine their hill climbing ability and close country maneuverability.

Major General Frank Parker, commanding the Sixth Corps Area, visited the post on October 15 for the purpose of making his annual garrison inspection. The regiment was commended upon the appearance of the personnel, materiel, and buildings.

The 62d Coast Artillery (AA)
Fort Totten

THE regiment, under the command of Colonel Edward Kimmel, left Fort Totten September 30 bound for Aberdeen Proving Ground, Maryland, to participate in the Army Ordnance Day Program. It arrived at Aberdeen Proving Ground October 2. Due to the coordinated efforts of the personnel of the convoy and the police motorcycle escorts furnished enroute the march was accomplished smoothly and without serious accident. Overnight stops were made at Raritan and Frankford Arsenals and at each station facilities for parking and shelter were excellent.

At Aberdeen Proving Ground, now considered an old camp of the regiment, conditions were ideal both for weather and local facilities. From October 3 to 7 camp duty and preparation for the Ordnance Day Exercises, held October 8, were the principal occupations. In addition to furnishing a traffic direction detail the regimental participation consisted of firing 80 rounds from 3-inch AA guns by Battery C, and caliber .30 and .50 machine gun firings by Battery E at towed targets. The demonstration was considered excellent. The projected night demonstration consisting of the illumination of and firing upon a towed target was not enacted on account of rain. The regimental band played a luncheon and dinner concert for the entertainment of the numerous visitors.

While at Aberdeen Battery C, 62d CA (AA) fired its 1932 target practices; October 9—1st Record Practice (night); October 12, 2d Record Practice (day); October 13, 3rd Record Practice (day). A complete analysis and report was made on the ground.

On October 12 the 2d Battalion, with the regimental band, left Aberdeen Proving Ground to return to Fort Totten. A halt was made at Frankford Arsenal for the night October 12-13 and march resumed October 13. The Battalion arrived at Fort Totten the same day.

On October 15 Battery C held AA Firings for the War College. After the firings the party inspected the equipment, guns and instruments with manning details at posts.

Preparation for the return march to Fort Totten was made during the period October 16 to 18. The 1st Battalion having completed its mission departed on October 19. The column bivouacked the night of October 19-20 at Frankford Arsenal and completed its march to Fort Totten the next day.

Battery A did not leave the Proving Ground until October 21, having remained to complete the 1932 searchlight practice. The practice was accomplished October 19 and the battery arrived at Totten on October 22.

The regimental commander is much gratified on account of the manner in which the regiment has passed through a busy and trying training season.

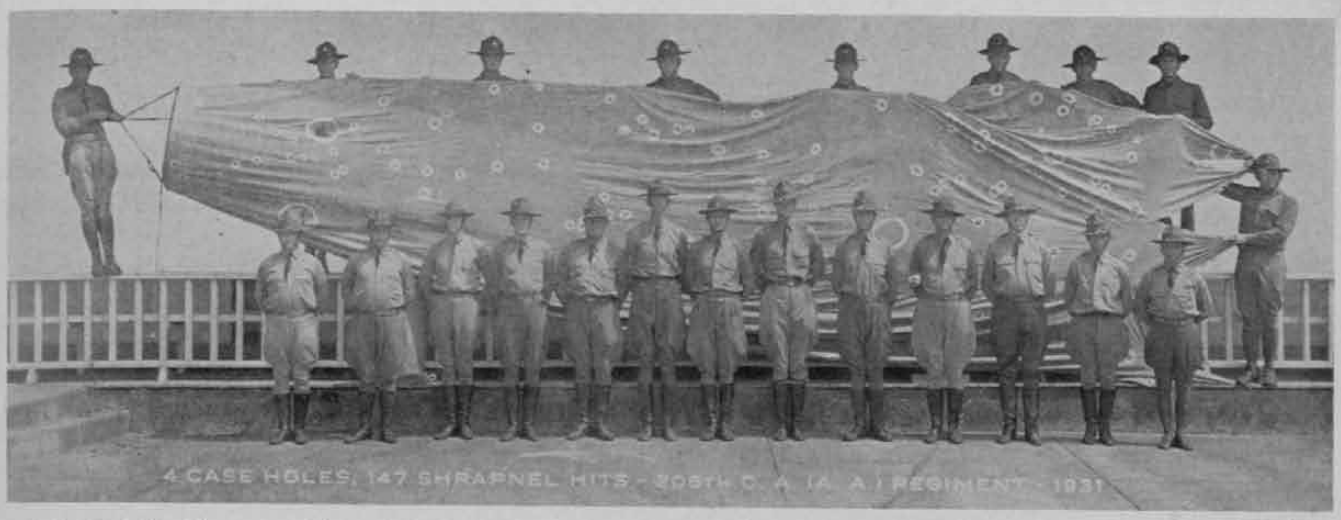
The 206th Coast Artillery (AA) (Ark. N. G.)

By Captain Linton Y. Hartman, C. A. C.

IN a recent number of the Journal General Hagood made the remark, "the National Guard is wonderful." The work of this regiment during the last period of field training, August 16-30, bears out this statement. Last summer a radical change in the training system of the regiment was undertaken. Briefly, an attempt was made to combine the tactical and technical training for the year by devoting one week to tactical training at Camp Pike, Ark., and one week to target practice at Fort Barrancas.

The first step of the tactical training was the mobilization of all units of the regiment under their own power at Camp Pike. In this connection it should be remembered that the units of this regiment are scattered all over the state. It is a tribute to the caretakers and motor mechanics that these vehicles of an average age of fifteen years could successfully withstand this test. The distance from Camp Pike to the home stations of the various battery ranges from 80 to 200 miles. The best run was made by Battery G, Fort Smith, which left its home station at 12:30 a. m. on August 16, and covered a distance of 165 miles, arriving at Camp Pike at 7:30 p. m. the same day.

On August 20, after conducting a number of field problems, the regiment left Camp Pike enroute to Pine Bluff, 55 miles away, where it bivouacked and put on a searchlight, machine gun, and gun demonstration. On the march several attacks were launched by the 154th Observation Squadron, Arkansas National Guard. During the bivouac at Pine Bluff a rigid test of discipline occurred. The field chosen for the bivouac was



Left to right: Lieutenant Clarence E. Lenley, Lieutenant James H. Hutchinson, Lieutenant Alga H. Boyd, Lieutenant Marc A. Stice, Captain Edward K. Hooper, Lieutenant Ralph C. Wisner, Major Harry W. Smith, Captain Louis F. Fishback, Captain Bernie S. Hargis, Captain Harry E. Eldridge, Lieutenant James T. Philipps, Lieutenant Charles T. Kramer, Captain John G. Buerkle.

flooded by a heavy rain just as the regiment arrived. Colonel Elgan C. Robertson, the regimental commander, quickly chose another spot no drier but less muddy. After waiting several hours for the water to run off, shelter tents were pitched and bales of straw issued as a protection against the soggy ground. That night it again rained heavily and the camp was deluged. Water stood ankle deep on the ground. Clothing and bedding were soaked. The regimental commander quickly arranged for billets in public buildings of the city and the movement took place immediately, greatly assisted by light from the searchlights. Trucks were stuck in the mud and every opportunity existed for chaos to reign, but Colonel Robertson brought order out of this confusion and soon his men were housed and all equipment taken care of. There was never a murmur from the men on account of these hardships. The movement back to Camp Pike was begun promptly the next morning at 7 o'clock.

On August 22 the regiment entrained at Camp Pike for Fort Barrancas. Camp was established there the next day and all units were ready for artillery drill on Monday morning. Some doubt existed as to the possibility of reaching a qualified state of drill and completing preliminary and record target practices, all within a week, with any degree of success. These doubts increased when it was found that the newest 3-inch gun, with Vickers Director and Stereoscopic Height Finder were to be used. This equipment was at Barrancas in the hands of Captain McMorrow and his detachment of the 69th C. A. (AA). The hearty support and cooperation of Captain McMorrow were a great assistance in the successful completion of the practices. During the previous year the gun batteries had fired the 3-inch, model 1918 gun, using the R. A. Corrector and altimeters. At that time Battery C, Captain Harry Eldridge, commanding, made a score of 154.1 and was rated "excellent," being one of only four National Guard antiaircraft batteries to receive that rating. Prior to 1930 the 75-mm. gun, truck mount, was used. None of the officers or men had seen the latest equipment but all were anxious to use it and the results obtained show that they learned well in a very short time. Batteries C, D, and B, used one gun each, obtained 24, 15, and 12 hits respectively.

On August 27 after actual drill and target practice of only four days all units had fired the ammunition allowance and were ready to return to Camp Pike from whence they departed to their home stations.

The machine gun battalion should not be left out of the picture. Battery F with 160 holes, H with 120 holes, E with 103 holes and G with 60 holes to their credit can feel that while they did not produce anything so startling in the way of a record yet have nothing to be ashamed of.

The 1st Battalion Headquarters and Combat Train qualified 100 percent of its men in pistol marksmanship and in addition won the highest efficiency standing in the regiment for the training year.

The photograph accompanying this article supports the story told by the record. The tail of the target was shot away by a burst which occurred directly on the target according to all observers and the pilot. The group of officers standing in front of the target is from the 1st Battalion. Captain Eldridge who stands fourth from the right made "excellent" last year with 12 hits. He will probably repeat the rating this year since he has double that number. Captain Buerkel commanding Battery D stands immediately in front of the absent part of the tail of the target which he claims he shot away. Captain Hargis who made 12 hits is on Captain Eldridge's right.

Three planes of the 154th Observation Squadron, Arkansas National Guard, accompanied the regiment to Fort Barrancas and furnished towing service. The arrangement of having National Guard planes tow for units of the State is most satisfactory.

There are several elements which contribute to the success of the National Guard in Arkansas. Community spirit and cooperation are very strong. The State is proud of the Guard and legislation favorable to the Guard goes through without dissension. Its units are

composed of the highest type of officers and men. The officers of the gun batteries of the 206th are men who are or have been college instructors. Men from the colleges of the State fill the ranks. A professor at Monticello A. & M. is a private of Battery B. Fayetteville, the home of the University of Arkansas, has two units which draw their men largely from the University. Battery C at Jonesboro and Battery B at Monticello have waiting lists of about one hundred college students each to fill vacancies.

The regular army instructors who attended camp with the regiment were Major Ralph W. Wilson, Instructor Missouri National Guard, Captain Rolla V. Ladd, Senior Instructor, 206th Coast Artillery (AA), until August 25, Captain W. H. Steward, C. A. C., who relieved Captain Ladd, and the writer. A policy of instruction without interference was in effect during the encampment. This policy lends itself admirably to the success of the Guard's undertakings.

While instructing is normally and primarily the duty of the regular army officer with the National Guard it has been my personal experience that the officer so detailed may enhance his own education, both military and general, through the contact.

Coast Artillery Reserve of New York

Col. F. W. Stopford, C. A. C. (D. O. L.), Executive

Troop School: For a long time the most difficult problem of reserve instruction in the Metropolitan area has been the difficulties of organizing regimental classes in order that the individual might receive instruction appropriate to his grade. The principal difficulties have been due to lack of instructors and suitable facilities. The plan under which we are now operating calls for a short general session with all regiments assembled followed by a meeting by regiments where regimental affairs are discussed after which each officer reports to his assigned class, which may contain representatives from all regiments.

The number of classes is dependent upon facilities but this center is fortunate in being extended the courtesy of the use of a sufficient number of rooms in the Engineering Societies Building to organize all necessary classes appropriate for each individual. The following classes are conducted, the number of the appropriate extension course being indicated:

Basic Gunnery (AA), 20-7—For second lieutenants.
Basic Gunnery (SC), 20-4—For second lieutenants (SC).
Applied Gunnery (AA), 30-6—For first lieutenants (AA).
Applied Gunnery (SC), 30-5—For first lieutenants (SC).
Orientation, 30-2—For first lieutenants who have completed applied gunnery.
Tactical Employment of AA Artillery, 40-4—For Captains (AA).
Tactical Employment of Artillery (SC), 40-3—For Captains (SC).
Tactics and Technique of the separate arms, 40-5—For field officers.

The following were selected as instructors:

Major S. Strumer, 910th	Capt. J. R. Melish, 602d
Capt. F. S. Taggart, 908th	Capt. A. W. Haskell, 530th
Major A. Oberndorfer, 607th	Lt. H. A. Gray, 533rd
Capt. H. Myers, 607th	Major H. Ridgway, 533rd
Major C. I. Clark, 909th	Capt. A. Baird, 533rd
Lt. F. W. Cording, 909th	Major H. C. Campfield, 619th
Capt. J. W. Arnold, 602d	Major Will I. Levy, 530th

This plan of instruction has the enthusiastic cooperation and support of everyone. The regimental meetings so useful in maintaining esprit are still held and in addition each officer feels that he is attending a class where he has an opportunity to acquire the particular knowledge which he needs. The first meeting under this plan was held on October 19 with an attendance of 197.

The C. M. T. C.: Three regiments of this district were concerned with C. M. T. C. training during the past summer: the 521st, commanded by Col. J. E. Nestor; the 908th, commanded by Major A. C. M. Azoy; and the 619th, commanded by Maj. E. L. Meyer. Major Azoy conceived the idea of a reunion of the three regiments and the C. M. T. C. candidates who had attended camp with them. The reunion was held on October 3 in the form of a trip to West Point, sponsored by the 908th. Through the cooperation of Captain Ridgely, commanding the Coast Guard District of New York, the C. G. Cutter *Champlain* was placed at the disposal of the party for the trip up the Hudson. The *Champlain* arrived in time to witness the review of the Corps of Cadets. After visiting various points of interest they were guests of the Corps of Cadets at the football game at Michie Stadium between the Army and Knox College. Lunch and dinner were served aboard the *Champlain.* About 40 officers and their wives and more than 100 C. M. T. C. lads enjoyed the outing. Major Azoy and the members of the 908th deserve much credit for this novel and enjoyable method of "following up" the C. M. T. C. Among the C. M. T. C. there is much valuable officer material. The maintenance of personal contact with the C. M. T. C. is not only desirable but of extreme importance in developing an important source of reserve officers for the future.

The 521st: Colonel J. E. Nestor commands this regiment. Its personnel is located for the most part in northern New Jersey. It will hold its troop schools this year in Elizabeth, Newark and Montclair, in turn. The officers residing in these towns sponsor a regimental dinner held at the place of meeting prior to troop school. Major R. W. Oakley, recently promoted, made the arrangements for the dinner and meeting held in Elizabeth on October 21. The meeting was well attended and Major Oakley is to be congratulated upon its success. He has been closely associated with the regiment for a considerable time and is always active in its affairs.

The 530th: Lt. Col. Ernest J. Oglesby, having transferred to the Third Corps Area, the regiment is under command of Major Hazen L. Hoyt, an officer of World War service and who has been regimental executive for the past two years.

The 539th CA: Colonel H. D. Cushing has signified the desire of the regiment to undertake the training of the C. M. T. Camp at Fort Hancock during the 1932 season.

The 602d CA: Colonel Azel Ames, commanding, has started the training year with much enthusiasm in evidence. A regimental dinner was held at the Columbia University Club prior to the general conference on Oc-

tober 19. Nineteen officers and three enlisted men attended classes.

The 607th CA: Colonel Robert S. Allyn has enrolled his officers in large numbers in the monthly extension school conferences and in addition has organized a weekly regimental extension school conference at 39 Whitehall street. The instructors are 1st Lieut. F. Gladzik, and 1st Lt. D. B. Wilson. Prior to the conference on October 19, the regiment held a dinner at the Happiness Restaurant, 6 East 39th St. Twenty-seven officers and two enlisted men attended classes. Major Abbott Oberndorfer is now P. & T. officer. Captain V. A. Lane is regimental adjutant.

The 620th: Lt. Colonel Hyland R. Johns held a regimental dinner on October 19, at the Ware Tea Room, 54 W. 39th Street. Twelve officers later attended classes.

The 533rd CA: Colonel F. R. Stoddard turned out with twenty-one officers present at the first Troop School meeting. They had dinner together preceding the meeting. Colonel Stoddard, who spent two weeks at his own expense at Fort Hancock the past summer, is one of New York's leading attorneys and an active regimental commander.

The 621st: Colonel A. E. Tanner, commanding. On September 25, Major W. M. Cravens, C. A. C. (D. O. L.), reported from Leavenworth for duty at Wilmington, Del., replacing Major Meade Wildrick, now on duty in New York City. The regiment held its first two conferences on October 6 and 13 at the State Armory, 13th and DuPont Streets. The subject was the analysis of the target practices held by the regiment at Fort Hancock during the past summer. 1st Lieut. Geo. H. Seitz, Jr., was the instructor and his performance was excellent. Nineteen members of the regiment were present at the first, and twenty-two at the second conference. Regimental troop schools will be held at the State Armory on the first, third and fourth Tuesdays of each month. Troop schools will be conducted in 30-4, (Combat Orders and Solution of Map Problems) 30-5 (Applied Gunnery for Seacoast Artillery) and 40-3, (Tactical Employment of Seacoast Artillery). Instructors will be appointed for each several lessons covered at each conference.

Up State New York Units—Major J. C. Haw, Instructor: The first troop school meetings were those of the 522d in Rochester and Buffalo, on October 8 and 9, respectively, with a total attendance for the two meetings of twenty-seven. Nearly all the Coast Artillery reservists living within twenty-five miles of the two cities attended. Monthly meetings will continue throughout the season.

In Schenectady, the enrollment for weekly meetings is twenty-five. At these meetings, two classes are being run simultaneously, one for promotion to first lieutenant and one for promotion to captain. The attendance at these meetings has been nearly 100 per cent of the enrollment.

The first monthly troop school meeting in Schenectady was held October 20 with excellent attendance (27). At these meetings, also, there will be two courses running concurrently.

Beginning October 27 the weekly troop schools will be increased to two per week. There is every prospect of a greatly increased attendance at these meetings.

Coast Artillerymen in Schenectady are participating in rifle and pistol target practice. Captain Frank A. Droms (Congratulations, *Captain*), 514th, Secretary-Treasurer of the Schenectady chapter, U. S. Coast Artillery Association, is representing the Second Coast Artillery District in the special course at the Coast Artillery School.

San Francisco Chapter, U.S.C.A.A.

MAJOR W. R. Miller, 250th C. A. (T. D.) (Cal. N. G.) reports a very successful organization meeting of the San Francisco chapter, held in the State Armory on September 30. At this meeting 106 officers were present and formally adopted the Constitution submitted by the Constitution and Nominating Committee. Thirty-two of the officers present were from the Regular Army, sixty from the 250th, and fourteen from the Reserve.

The following officers were elected:

President—Colonel H. G. Mathewson, CA-Res.

Vice President—Major R. C. Garrett, C. A. C.

Directors—Colonel R. E. Mittelstaedt, 250th C. A., Major W. W. Breite, C.A.-Res., Captain C. D. Hindle, C. A. C.

Secy.-Treas.—Major W. R. Miller, 250th C. A.

Brig Gen. James H. Reeves, U. S. A. commanding the Ninth Coast Artillery District was elected Honorary President.

The formation of the San Francisco chapter will be viewed with considerable satisfaction by the United States Coast Artillery Association. San Francisco is a Coast Artillery city due not only to its vulnerable location but also to the cordial relations which have always existed between its citizens and the troops that guard its Golden Gates. The success of this chapter can be predicted with certainty.

213th Coast Artillery (AA) (Pa.N.G.) Allentown

DURING the summer training camp of the 213th at Mt. Gretna, Pa., a two-day Rear Area Defense problem was conducted calling for the location of battery positions for nine 3-inch gun batteries and twelve machine gun batteries which formed the theoretical A. A. Brigade designated in the problem.

Captain L. C. Atwood and 1st Lt. H. B. Dieter, both of Battery C, were impressed with the idea of locating these battery positions by a means of aerial reconnaissance. Through the cooperation of Major Sidney Owens, commanding the 28th Division Observation Squadron, two planes were placed at the disposal of these officers to enable them to test the practicability of this idea. The gun positions were approximately located on maps previously. It required about one and one half hours for reconnaissance by this method. In order to check up, automobile trips were afterwards

made requiring four hours for the selection of the positions for one regiment only. Information obtained from the air was nearly as accurate as that obtained by automobile.

Due to the speed of the planes, it was necessary to fly over some of the positions more than once. The observers had some difficulty in keeping oriented due to inexperience, but with practice it is believed that aerial reconnaissance in connection with antiaircraft artillery is practicable and has the great advantage of saving time. Captain Atwood believes that the Autogiro, which has received much public attention recently, would be ideal for this work due to its ability to hover over a position practically motionless as well as requiring only limited landing space for its operation.

250th Coast Artillery (Calif. N. G.)

THIS regiment, a 155-mm. tractor drawn unit under the command of Colonel R. E. Mittelstaedt, was in the field from July 11 to 25. During this period a problem in beach defense was solved. Motorized units were rated this year on three points, each of equal weight: Transportation, Communications, and Target Practice. A Board of Inspectors was present and rated the regiment on each point.

Colonel Mittelstaedt made his preparations for the training period with these features in view. The guns and tractors, travelling as a battalion heavy column covered the distance of 120 miles to camp, going into firing position at the end of the trip. No troubles of any consequence occurred during the march. This is the seventh consecutive year the regiment has travelled to camp under its own power. The battalion light columns, following a shorter route over mountain grades travelled a shorter distance of 85 miles. Each column had one bivouac camp enroute.

The camp is situated on a broad expanse of open coast line with nothing established but pier mounts for base end instruments. New gun positions are selected each year so that although the base lines are the same and serve as a starting point there is considerable orientation work to be done. The communication net must be established and no pre-camp work is permitted other than the overhauling of equipment kept in the Armory. The net this year consisted of the three battalion nets and the regimental net. In addition thereto radio stations were established on the tug, at the spotting station, at the battery area and one in the observing plane. Aerial observation was furnished by the 40th Division Observation Squadron. No failure of communications occurred during any of the firing although one battery resorted to emergency lines previously prepared.

All units fired Case III at a range of approximately 6,000 yards. The target moved at an average speed of 6½ knots. A total of 124 record shots were fired by the regiment resulting in 61 hits at a rate of 22.6 second per shot per gun. Battery A fired the complete practice without relay with a time of 17.8 seconds per shot per gun which was less than par (T. I. Bells rang at 18 second intervals). Scores were as follows:

Battery E	93.8	Battery C	66.5
Battery A	87.8	Battery B	43.4
Battery F	77.7	Battery D	23.2

Spotting was by unilateral terrestrial observation and by airplane. These two systems were compared and found to be unusually close. The airplane system had many advantages since it was fast, gave readings directly in Overs and Shorts in yards and was less likely to errors than the terrestrial which must of necessity go through several hands before it can be set up in yards deviation. In the analysis no errors were found sufficiently large to be charged against any observer.

The 977th Coast Artillery (AA)
Los Angeles

ON August 15 the 977th held an exercise believed unique among reserve units. One of the officers of the regiment possessing a lodge (Oliver Lodge) near Malibu Lake, California, had originally proposed to assemble the regiment for a strictly social affair here, thirty-one miles from Los Angeles. On further thought the possibilities of holding a military problem in connection with the meeting were perceived and the original purpose became a secondary consideration, although the geographic features of the terrain were not ideal for the purpose.

Field orders were issued and mailed all officers specifying a rendezvous, the order, time, and rate of march. The regiment assembled in automobiles in Hollywood under the command of Lt. Col. E. A. Evans, who gave instructions to his staff and battalion commanders after which the regiment proceeded to Camp Oliver where the regimental C. P. was established.

No maps of the area being available the battalion commanders reconnoitered the area after their arrival and designated the general location of batteries and in turn definite dispositions were directed by battery commanders. Battery commanders furnished sketches to their battalion commanders showing location of guns, camp for enlisted personnel, motor park, kitchen and latrines.

Actual telephonic communications were installed at regimental headquarters, first and second battalion headquarters and at one outpost at the entrance to camp. This installation was due to the courtesy of the commanding officer, Headquarters Company, 160th Infantry, California National Guard.

The bivouac consisted of battery officers sleeping at their respective positions with battalion and regimental staffs at their CP's. All entered into the spirit of the occasion.

Following the indicated solution of the problem a critique was held by the regimental commander. The remainder of the evening was devoted to social diversions, one being a mock trial at which several deserving members were tried. Since the regiment had just completed the subcourse on Military Law and several of its members were lawyers by profession, the trials were not only entertaining but also instructive.

One of the principal results of a maneuver of this

kind, aside from the knowledge gained is the opportunity furnished for officers to become better acquainted. The regular summer monthly meetings are not so favorable for this purpose since the entire time is devoted to lesson assignment work. Sixty-five officers of the regiment attended.

West Point Branch, United States Coast Artillery Association

THE West Point branch of the United States Coast Artillery Association held its first fall meeting on October 15.

Major James B. Crawford, Office Chief of Coast Artillery, addressed the meeting on "What Is Happening In The Coast Artillery." Being closely in touch with the latest developments, Major Crawford's remarks were of particular interest to all and were enthusiastically received.

The meeting was well attended, practically every Coast Artillery officer on the post, as well as numerous officers of other branches, being present.

Major Charles Hines, 1st Lieutenant Raymond Stone and 1st Lieutenant D. J. Bailey were appointed a committee to handle the next meeting which will be held on December 8.

Houston Antiaircraft Chapter, U. S. Coast Artillery Association

COAST Artillery activities have taken a considerable spurt in the Eighth Corps Area under the supervision of Major William S. Fulton, C. A. C., and the cooperation of the Chief of Staff, 90th Division. Last summer, for the first time, Coast Artillery Reserve officers received training within the corps area at Fort Crockett, Texas. The reports received indicate that the training given at Galveston by a detachment of the 69th Coast Artillery (AA), was of the highest order and was carried out in a very efficient manner under the supervision of Major Fulton and Major Glenn P. Anderson, C. A. C., Commanding Officer, Harbor Defense of Galveston. The Coast Artillery R. O. T. C. unit established this fall at the Agricultural and Mechanical College of Texas is well under way with Major William C. Washington, C. A. C., as Senior Instructor of Coast Artillery.

Although Coast Artillery Reserve officers in Texas are widely scattered over a considerable extent of territory an antiaircraft chapter of the United States Coast Artillery Association has been established with quarters in the Chamber of Commerce Building, Houston, Texas. Lt. A. A. Lesikar C. A. Res., Secretary and Treasurer, informs us that the first meeting was held on October 5 with a good turn out. This chapter charges a small local membership fee and issues a local chapter membership card. The funds so collected are used in covering incidental expenses, principally of social affairs to be held during the year. At this first meeting a committee was appointed to arrange for the procurement of a regimental insignia for the regiment. The Reserve conferences held in Houston are attended by officers of all arms. The conference held on October 7 was in charge of the Antiaircraft Chapter United States Coast Artillery Association. This is the first time that any particular arm has had charge of these meetings.

The second meeting of the Houston chapter was held on October 26 at which time a film showing the activities during the two weeks camp at Fort Crockett in July was shown. The number of Coast Artillery officers in Houston is comparatively small. Yet with this small number a chapter of the Association has been formed and from the activity shown there is every indication that it will be one of the most active in the country in spite of the small number of officers in Houston.

EDWARD ALLEN-4 FT. 11 IN. AND RANSOM COWAN-7 FT. 2 IN.
-11th Coast Artillery Regulars, Fort H.G. WRIGHT, N.Y

Thanks to Mr. Ripley for the above. This shows what can be done by selective recruiting. As a gun pointer it is said that Private Cowan is able to dispense with the usual gun pointer's platform and can disappear as the gun disappears after firing. Private Allen is able to infiltrate into a twelve-inch gun like a ferret and as a result there are no cleaner bores than those in the 11th Coast Artillery.

COAST ARTILLERY ORDERS

Colonel William H. Monroe, duty with Org. Res., Portland, Oregon, to Fort Lewis to Army retiring board for examination.

Lt. Col. Willis G. Peace, Org. Res., Los Angeles, promoted colonel, October 1.

Lt. Col. Clarence B. Ross, from office Assistant Secretary of War, Washington, to Philippines, sailing New York, April 29.

Lt. Col. Horace F. Spurgin, instructor, Ft. Leavenworth, to Army retiring board for examination.

Major Harvey C. Allen from G. S., Washington, to Philippines, sailing New York, April 28.

Major Benjamin N. Booth, from G. S., Washington, to Philippines, sailing New York, April 29.

Major Joseph F. Cottrell, from Pilgrimage of Mothers to 3d, Ft. Rosecrans, Calif., sailing New York, November 4.

Major Cyril A. W. Dawson, from duty on U. S. A. T. "Cambrai," N. Y., to duty on U. S. A. T. "St. Mihiel," October 27.

Major Henry W. T. Eglin promoted lieutenant colonel, October 1.

Major Otto G. Pitz, from instr., N. G., Allentown, Pa., to Org. Res., Milwaukee, Wisconsin.

Major George Ruhlen, jr., instr., N. G., San Diego, promoted lieutenant colonel, October 1.

Capt. Adam J. Bennett, 52d, Ft. Hancock, to Philippines, sailing New York, January 13.

Capt. Aaron Bradshaw, jr., 62d, Ft. Totten to Panama, sailing New York, March 10.

Capt. Evans R. Crowell, from 6th, Ft. Winfield Scott, to R. O. T. C., University of Alabama, University, Ala., October 10.

Capt. Leon C. Dennis, from the Philippines to 6th, Ft. Winfield Scott.

Capt. Charles S. Denny from Panama to 9th, Ft. Banks.

Capt. John H. Harrington from Philippines to 52d, Ft. Monroe.

Capt. Benjamin F. Harmon from Philippines to 12th, Ft. Monroe.

Capt. William D. Hohenthal from Philippines to 52d, Ft. Monroe.

Capt. Harry W. Lins, 13th, Ft. Barrancas, to Philippines, sailing New York, January 13.

Capt. Edward B. McCarthy, sailing from New York for Philippines, April 29, instead of January 13.

Capt. George C. McFarland, from Philippines to 12th, Ft. Monroe.

Capt. Albert Mossman promoted major and retired October 31, physical disability.

Capt. Wade W. Rhein, previous orders revoked. Relieved 6th, Ft. Winfield Scott to 13th, Key West Barracks, sailing San Francisco, January 16.

Capt. George T. Rice, 13th, Key West Barracks, to 52d, Ft. Hancock.

Capt. Verne C. Snell from Philippines to 14th, Ft. Worden.

Capt. Edward H. Taliaferro, jr., from R. O. T. C., University of Alabama, to Omaha, as aide to Major General Johnson Hagood, U S. A.

1st Lt. Harry S. Aldrich from student, Peiping, China, to 63d, Ft. MacArthur, Calif., March 9.

1st Lt. Milo G. Cary from the Philippines to R. O. T. C., University of Illinois, Urbana, Ill.

1st Lt. John S. Crawford (Q. M. C.), Baltimore, promoted captain, September 10.

1st Lt. Charles H. Crim from Philippines to 62d, Ft. Totten.

1st Lt. Joseph V. deP. Dillon, to sail New York for Hawaii December 8, instead of December 1.

1st Lt. Edward Arthur Dolph, resignation accepted November 2.

1st Lt. Karl C. Frank, 63d, Ft. MacArthur to Panama, sailing San Francisco, February 26.

1st Lt. Porter T. Gregory from Panama to 62d, Ft. Totten.

1st Lt. George J. Kelley, resignation accepted.

1st Lt. Emmor G. Martin, 13th, Ft. Barrancas, to R. O. T. C., Miss. A. & M. College.

1st Lt. John D. Robertson, 14th, Ft. Worden, to 11th, Ft. H. G. Wright, sailing San Francisco, November 3.

1st Lt. Joseph S. Robinson to Panama, sailing New York, March 10, instead of January 7.

1st Lt. Joseph H. Rousseau, jr., from Hawaii to R. O. T. C., University of Alabama, University, Ala.

1st Lt. Samuel Rubin, from Philippines to 7th, Ft. Hancock.

1st Lt. William B. Short, from 14th, Ft. Casey, to Hawaii, sailing San Francisco, November 25.

1st Lt. Horace Speed, jr., from the Philippines to 69th, Ft. McClellan.

1st Lt. William A. Weddell, 69th, Ft. McClellan, to R. O. T. C., A. and M. College, Miss.

1st Lt. James L. Whelchel from detail in Signal Corps and from Ft. Monmouth, N. J., to student Q. M. C. School, Philadelphia.

2nd Lt. Albert S. Baron, sailing New York for Hawaii December 8, instead of December 1.

2nd Lt. Harold A. Brusher, West Point, promoted 1st Lt., September 18.

2nd Lt. James T. Darrah, from 61st, Ft. Sheridan to Philippines, sailing New York, November 4.

2nd Lt. Edward C. Franklin, Ft. Monroe, promoted 1st Lt., September 1.

2nd Lt. Oliver H. Gilbert from Philippines to 11th, Ft. H. G. Wright.

2nd Lt. Arthur D. Gough, 12th, Ft. Monroe, to Philippines, sailing New York, January 13.

2nd Lt. William H. Harris, 11th, Ft. H. G. Wright, to Panama, sailing New York, March 10.

2nd Lt. Grant E. Hill, 61st, Ft. Sheridan, to Philippines, sailing New York, January 13.

2nd Lt. John H. Kochevar (A. C.), from detail in A. C. and Ft. Sam Houston to 52d, Ft. Monroe.

2nd Lt. Charles A. Lynch, transferred from Infantry, and from Ft. Howard, Md., to Coast Artillery Corps and to Philippines, sailing New York, December 5.

2nd Lt. William L. McCulla, from Philippines to 61st, Ft. Sheridan.

2nd Lt. Herbert W. Mansfield, 14th, Ft. Worden, to Philippines, sailing San Francisco, February 4.

2nd Lt. William F. Niethamer, Ft. Rodman, promoted 1st Lt., September 1.

2nd Lt. Wayland H. Parr, from Hawaii, to 13th, Ft. Barrancas.

2nd Lt. Calvin L. Partin, from Panama, to 14th, Ft. Worden.

2nd Lt. Pasquale F. Passarella, 52d, Ft. Hancock, to Philippines, sailing New York, January 13.

2nd Lt. Everett D. Peddicord from Panama to 14th, Ft. Worden.

2nd Lt. Paul D. Perry, 6th, Ft. Winfield Scott, orders to the Philippines revoked.

2nd Lt. Grosvenor F. Powell, 14th, Ft. Worden, to Philippines, sailing San Francisco, February 4.

2nd Lt. August W. Schermacher, from Hawaii, to 52d, Ft. Monroe.

2nd Lt. Richard S. Spangler, 13th, Ft. Barrancas, to Philippines, sailing New York, January 13.

2nd Lt. F. J. Stagliano (Ord. Dept.), Watervliet Arsenal, promoted 1st lieutenant, October 1.

2nd Lt. William M. Talbot from Panama to 69th, Ft. McClellan.

2nd Lt. Milan G. Weber, 11th, Ft. H. W. Wright, to the Philippines, sailing New York, January 13.

2nd Lt. Robert J. Wood, 69th, Ft. McClellan, to Philippines, sailing New York, January 13.

W. O. Raymond M. Ashwill, first mate, A. M. P. S., from Philippines to Ft. H. G. Wright.

W. O. Irving S. Hansen, first mate, from Ft. H. G. Wright to Philippines sailing New York, January 13.

W. O. James W. Green, master, A. M. P. S., from Ft. Worden to Philippines sailing San Francisco, February 4.

W. O. Erik H. F. Lundblad, master, A. M. P. S., from Philippines to Ft. Worden.

Mast. Sgt. Francis Boichot, 6th, Ft. Winfield Scott, retired, September 30.

1st Sgt. Frank Allen, 8th, Ft. Preble, retired, October 31.

1st Sgt. Jozsef Barno, 63d, Ft. MacArthur, retired, October 31.

1st Sgt. Wilson A. Boyd, 7th, Ft. Hancock, retired, October 31.

1st Sgt. Charles H. Dailey, 69th, Ft. McClellan, retired, September 30.

1st Sgt. George W. Grove, 52d, Ft. Monroe, retired, September 30.

1st Sgt. Fred R. Rice, 65th, Ft. Amador, retired, November 30.

1st Sgt. Halvor Tiegan, 63d, Ft. MacArthur, retired, September 30.

1st Sgt. James S. Wiggins, 55th, Ft. Ruger, retired, October 31.

Sgt. Lewis J. Murphy, U. S. A. P. "General E. O. C. Ord," Brooklyn, retired, October 31.

YOU TELL EM

How to Keep Them

THE following is taken from *The Reserve Officer,* the official publication of the Reserve Officers Association, and is a reprint from the *San Francisco Reserve Officer.* It covers the very vexing problem of how to get more interest among reserve officers.

THE BIG SHOT

Mr. I. B. Careless was a "Big Shot." Leaning well back in an office chair scientifically designed to relieve the strain of momentous decisions as well as the tension of an expanded lower chest line, he rang push-button 14-A. Secretary 14-A responded briskly, a sheaf of neatly tabulated reports in his hands.

"Here are the sales reports for the territory!" Secretary 14-A recited snappily the progress of the various salesmen. "All of the force are even with or above the sales quota, which is 40 carloads per year or 200 carloads in five years. That is, all but one man, Mr. Al Ibi."

"What's the matter with him?" snorted the "Big Shot". "I told him when I gave him the job that he would have to sell 200 carloads in five years and that I wanted the rate of sale of 40 carloads a year kept up."

"He has been pretty busy the last four years," replied the secretary, endeavoring to smooth the ruffled feelings of the "Big Shot," but at night, when he could be selling his quota, his wife wants him to play bridge. Besides, he's moved several times, so the letters that we sent to assist him in making his sales didn't reach him."

"Why on earth didn't he notify us that he moved? Does he think we are mind readers?" The "Big Shot" got very red in the face and hammered on the desk. "Write him a letter and tell him that he has got one year more to cover his sales quota of 200 carloads, and if he doesn't come through we'll put him on the shelf. The rest of the force are doing their share. I don't see why he can't!"

A year later Secretary 14-A again recites the sales accomplishments to the "Big Shot", who reclined majestically in a still bigger and better office chair, which has been purchased to match the new offices of the firm in their new location.

"Salesman Al Ibi didn't sell anything at all this last year either, but we got a letter from him saying that he was still interested and asking for a raise in pay." Secretary 14-A ducked as he made the reports.

"—! —! —! XXXX.! Want's a raise, eh?" gasped the "Big Shot". "I'll raise him. Raise him to hell out of the organization. The idea of being with my outfit for five years, doing nothing, and then have the nerve to ask for a raise. Take this letter! !"

A letter was mailed to Major I. B. Careless that day from the War Department, telling him that his appointment as a Major in the Officers' Reserve Corps had terminated and that he would not receive a reappointment with full privileges because he had not gained his required quota of 200 credit hours in the five-year period, a rate of 40 hours a year. He never got the letter because he had forgotten to inform the W. D. of the fact that his address had changed. When Major I. B. Careless, the "Big Shot" finally found out that he was no longer a Major in the Officers' Reserve Corps, he was very, very mad and wrote a letter to the War Department telling them so and asking to be a Lieutenant Colonel.

People are funny, aren't they?

Perhaps there is some not very carefully veiled sarcasm in the above. Perhaps it is just a little rough on Major I. B. Careless. He may or may not represent a cross section of those reserve officers who have been reappointed "without." Perhaps Major Careless's Colonel or his unit instructor ought to have a modicum of the blame shifted to their shoulders. Napoleon claimed that there were no poor regiments—only poor colonels. It is obvious that Major Careless wasn't interested but when a theatrical producer puts on a show and it flops with a sickly thud, no one blames the public. The producer just failed to get by with it. So it is with the Colonel of the reserve unit and the unit instructor who backs the show. It isn't all done with push buttons or mirrors and if the show is good enough the customers will be crowding the box office.

Just to show that all regimental commanders and unit instructors are not shot through with dry rot it is a pleasure to publish the following (also from *The Reserve Officer*):

The Reserve Officer desires to compliment Lieutenant Colonel John Lee Holcombe, C.A.C., (D.O.L.), the unit instructor of the 543d Coast Artillery (A.A.) at Hartford, Connecticut, on the effective manner in which he gains and maintains the interest of newly commissioned officers. The following letter, by Colonel Holcombe which has come to attention, appears to be a model of good sense, courtesy and salesmanship, and we commend it to all concerned:

"Your records have been received at these headquarters this date and you will be assigned to the Regiment within the next few days. Upon assignment by District Headquarters it is planned to assign you as Executive and Adjutant of the

2nd Battalion with headquarters in Pittsfield, Mass., thereby relieving Captain Haggerty who will assume command of the Battalion. For your information there is enclosed herewith a roster of the 543rd and 904th, C. A. Regiments which will give you information as to the various assignments of the officers of the regiment and with particular reference to officers residing in Pittsfield and vicinity.

Some time ago you applied for active duty training with the 904th C. A., which application was referred to the Third Coast Artillery District for the necessary action; however, as you are now assigned to the 904th C. A., it is suggested that you re-submit an application direct to these headquarters (Application form enclosed herewith).

It is noted that you will be eligible in point of service for promotion to the grade of Captain, CA-RES., on September 16, 1931, and that your record of credit hours show only a credit of 210 hours earned prior to October 1, 1930. Under regulations to come into force on or about October 1, 1931, officers must complete certain subcourses which entitle them to a certificate of capacity for promotion to the next higher grade. If you feel that you could complete a subcourse between now and October 1, 1931, you may enroll and complete the first subcourse of the prescribed course which is "Orientation." In case you desire to do this, there is also enclosed herewith an application for enrollment. The remainder of the course consists of the following subcourses:

30-1—Mobilization
30-3—Organization of the Infantry Division
30-4—Combat Orders and the Solution of Map Problems
30-6—Applied Gunnery, Fire Control, for AA Artillery
30-8—Technique and Elementary Tactics for AA Artillery

It is hoped that I may have the pleasure of meeting you personally at Camp this summer, I am,

Very cordially yours,
JOHN LEE HOLCOMBE."

Asked for further information as to how he handled such matters, Colonel Holcombe replied as follows

"As a general proposition on the assignment of any Reserve officers to one of my units, I go over his records to see what talents and experience he has, *i. e.*, when he is due for discharge; what credits he needs to continue his commission in force; when he is due for promotion, and what credits he had towards promotion and what he needs to get his promotion. I do this from the point of view of the Reserve officer trying to find the easiest and shortest way to continuation of his commission and also eventual promotion. The result of this study together with information regarding his unit; brother officers in the community, is embodied in a letter and sent him. These letters are not from a stock letter but each is written to fit the individual case. I have found that it pays dividends as witness in little over a year here we have gained from a strength of 48 officers to 72 officers assigned and from 3 to 20 attached for training and from an annual production of 300 lessons to upwards of 1,000 lessons.

"However, the secret is an old one. Loyalty comes from the top down; it is something that superiors give their subordinates and not something which subordinates hand you."

EDITOR'S NOTE:—The above is published without Col. Holcombe's consent.

In Case You Are Thinking of This Detail

The Editor, THE COAST ARTILLERY JOURNAL.
Dear Sir:

If you have a friend or know of any officer who wants the Japanese language detail, my comments are: No officer whose income is less than that of the 3rd pay period should come to Japan. He will be unable to live on less. We know from three year's sad experience, and all other officers here agree on that point. The Japanese language is discouragingly difficult but there is comfort in the fact that the Japanese themselves usually have one hell of a time trying to put anything definite across in their own language. A new language officer ought to arrive in Japan with as few preconceived ideas as possible and with the expectation of having to work harder on the language than he has ever worked on anything before. A fixed determination to accept living conditions in Japan cheerfully, come what may, will help an officer and his wife to be happy. Every winter we have longed for as lovely and comfortable a home as the bitterly cold and inconvenient parlor, bedroom and sink up under the roof in the attic at our last station. An officer's marital status? Well, bachelors here agree that Japan is no place for a married officer, bachelors and married officers without children agree that Japan is no place for officers with children, officers with children admit that tuition and medical fees handicap them badly, some married officers claim that bachelors do not make as good students as the benedicts, and other married officers advocate that only bachelors be given this detail.

Sincerely yours,
Lieut. C. A. C.

The Editor, THE COAST ARTILLERY JOURNAL.
Dear Sir:

I discontinued subscription to the COAST ARTILLERY JOURNAL last year because of the fact that the contents thereof were almost all too technical for the average Reserve officer and the magazine itself had become nothing more or less than an advanced correspondence course. A few good articles are beneficial, but to interest the average Reservist there should be something of a more general nature.

Sincerely yours,
TCH.

BOOK REVIEWS

PRACTICAL CHINESE, by First Lieutenant Harry S. Aldrich, Coast Artillery Corps, U. S. A. Henri Vetch, The French Bookstore, Peiping, China. 1931. Two volumes. Cloth. 662 pages. $15.00 Mex.

In these two volumes we have the latest and without qualification, best, texts on elementary Chinese yet written. "Practical Chinese" is an excellent title and describes accurately the author's objective to which he has adhered closely and with great success. His preface states in part "This textbook represents as closely as limited time and ability have permitted, that unfound guide, philosopher, and friend the author sought when he himself was a struggling and somewhat perplexed beginner. The policy followed herein is based upon the belief that if there is any method by which the study of Chinese may be made easy, it is by making the student as intelligent as possible about it from the beginning."

Lieutenant Aldrich departs from tradition in his method of explaining in English in his text many of the peculiarities and complexities of Chinese which hitherto have been left to the student to learn by dint of repetition, trial and error. Explanations by the most competent native teachers are often of no avail since the instructor has no knowledge of the student's language and hence of his thought processes. Furthermore, a student will have laboriously crossed many of the pitfalls, successfully or otherwise, long before he has sufficient vocabulary to understand grammatical explanations in Chinese. The author has braved the criticism of his colleagues in an admirable attempt to make clear many paradoxes and difficulties of the language upon which little agreement exists among advanced Chinese students. He is right in his premise that some explanation, however controversial in its technical aspects, is far better than none. "Practical Chinese" presents a shortcut which should immeasurably lighten the burden of any student about to enter the mysteries of the Chinese language.

Volume I contains fifty graded lessons which introduce and make familiar 1200 single Chinese words and 1500 combinations or terms of every day usage such as counting, shopping, traveling etc. Each new word is given in its Romanized form (i. e. spelled out in the English alphabet) together with the Chinese character itself. The text of the lessons, which are in the form of dialogues, are also given in the Romanized form and are followed by their English translations. The Chinese text for the lessons appears in Volume II, opening from the back in Chinese style.

Hence the student who merely wishes a small working vocabulary without going into the study of Chinese characters may use this text with the same facility as one who contemplates mastering the written language.

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has presented in Volume II a topical dictionary containing 5000 useful expressions listed alphabetically under some sixty headings. Thus the student, be he or she army officer, housewife, missionary or doctor, etc., may supplement the vocabulary of the prepared lessons with special terms peculiar to his or her needs.

It is amusing and contemporary to note that under the dictionary heading "Political and Governmental Terms" appear such expressions as "anarchy," "anti-Japanese," "to assassinate," "foreign running dog." Other topical headings include vocabulary pertinent to such activities as: cooking, military terms, missions, rickshas, schools, newspapers, geography, trades, etc., etc.

For the student who intends making a thorough study of the language, there are excellent chapters dealing with character writing, radicals, phonetics, Romanization.

H. E. Mr. Nelson Trusler Johnson, United States Minister to China, himself an adept in the language, has written an appreciative foreword to these volumes.

Lieutenant Aldrich makes numerous acknowledgements of help and encouragement to many of his associates in China. Particular appreciation is justly shown to Messrs. Hsiu Yü-sheng, Chin Shu-yen and Wu Han-chang who collaborated in the preparation of the work. To these loyal teachers is given special credit for the Chinese texts. The work is dedicated to the Chinese Staff of the Office of the American Military Attache in Peking and to other Chinese teachers of foreigners.

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TACTICS AND TECHNIQUE OF COAST ARTILLERY. Edited by Lt. Col. Robert Arthur, C. A. C., and others. Two volumes, Basic and Advanced. 2060 pages, 1005 illustrations. Coast Artillery Journal, 1931. $10.50 per set.

For something over a decade, the lessons learned from the World War, and the resultant advances made in modernising the heavy artillery arm, have been slowly worked into numerous Army Regulations, Training Regulations, Special Texts, and service manuals.

Meanwhile, it has perhaps occurred to every Coast Artillery Officer that these various sources of information ought to be assembled under one cover. Now, that prevalent idea is an accomplished fact. Two volumes entitled "The Tactics and Technique of Coast Artillery" are just off the press of the COAST ARTILLERY JOURNAL. These volumes may be described as a gold mine of knowledge, the shafts of which explore the deepest recesses of artillery lore and logic.

Volume One: "Basic," is prefaced with a description of "Army Organization," and the well known treatise: "Management of the American Soldier." This book contains elementary artillery technique of guns and carriages; ammunition; mechanical maneuvers (covering cordage, blocks and tackle, jacks, and mounting and dismounting). Armament description, care and adjustment of guns and carriages, and service of the piece, are treated in detail for medium artillery and antiaircraft weapons. The latest technical data is given in Signal Communications. Position Finding embraces the operation of methods and ap-

proved instruments and devices used in fire control. The characteristics and methods of identification of sea and air targets. complete the Basic artillery technique.

Part II, of this Volume I is devoted to general military instruction in Drill and Command. It stresses the practical application of leadership in military units. Infantry drill is exhaustively treated, so that the junior officer has not alone the essentials of his artillery duties, but also the details of infantry drill. This subject ranges from "School of the Soldier" to regimental formations; the technique of small arms; ceremonies, in detail; individual infantry equipment; and tent pitching. The volume concludes with a valuable summary of advice to instructors, and with sections devoted to physical training, courtesies, administration, rifle marksmanship, military hygiene, camps, and marches. The Automatic Pistol and Manual of the Saber are added as appendices. In short, the basic book constitutes a rather complete syllabus of the junior officer's duties.

Volume II covers the tactics and technique of Coast Artillery for battery and higher commanders. Briefly, it contains Coast Artillery organization; position finding systems; gunnery; data on land, sea and air targets; orientation; artillery tactics; field engineering; selection and occupation of artillery positions; military law; military history of the United States; Administration; discipline; and mapping. In the form of appendices, this volume carries gunnery and orientation tables, a glossary of artillery terms, and advice on schedules, programs and methods of training.

A feature of these volumes (especially interesting to the citizen soldier who is pursuing Extension School courses) is found in a series of questions covering the key topics of each subject.

Tactics and Technique of Coast Artillery are indispensable to every officer in our branch of the service, as source and reference books. This is particularly true of National Guard and Reserve Officers, who in order to have access to such information, must otherwise purchase a long list of pamphlets, or depend upon Extension School texts loaned for the duration of a subcourse study.

After a study of these volumes, we venture to predict that this work will be the criterion for consolidated and condensed technical and tactical service texts. This symposium of information should be in the professional library of every Coast Artillery Officer. It will prove invaluable to the professional soldier; indispensable to the citizen artilleryman.—H. LeR. M.

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LYAUTEY BY ANDRE MAUROIS. Published by D. Appleton and Company, New York, 1931. 359 pages. Price $3.00.

The author commences his work with a very complete description of the Lyautey family. The importance of this is brought out clearly in the succeeding chapters, because without the background furnished by the history of the family, the reader would find it difficult at

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times to understand the ideas and actions of young Lyautey.

The routine garrison life of a Cavalry officer was monotonous to a grandson of two Generals of the first Napoleon. Time and again he was on the point of resigning from the Army and entering politics. A fortunate circumstance, however, sent him out to Indo-China. There he came under the influence of Colonel Gallieni, and from that time began the development of the future great Colonial soldier-administrator. Freed from the petty restraints of bureaucracy his latent talents were allowed full sweep, and under the guiding hand of the experienced Gallieni, he made a record that was later to cause an harrassed Government to send him to Morocco.

Lyautey was at his best when he had an absolute free hand. A re-reading of the first page of the book explains the reason! As a subordinate he fought for freedom from restricting higher authority. As "a higher authority" he was willing to let subordinates have the requisite power to function successfully. If he was given responsibility, he had to have complete authority, otherwise he failed. He could not compromise with officialdom. It was this inability to compromise—so dear to the heart of the politician—that made him resign as Minister of War. It was his genious for planning and his enthusiasm for executing, when freed from official hampering, that made him so successful in developing the great colonial empire of Morocco. The World War kept the bureaucrats busy in France!

Not only is this an entertaining biography of an unusual man, but it is also interesting for the glimpses it gives of the work involved in the formation of a great empire. Too many people in thinking, or speaking, of a colonial empire think only of England—after reading M. Maurois' book they will also think of France. Herbert Lyautey well deserved the stars of a Marshal of France!

A splendid biography of a most distinguished son of France.

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THE STORY OF THE HUNS BY MARCEL BRION. Published by Robert M. McBride and Company, New York, 1931. 286 pages. Price $3.50.

The Chinese called them Hiung-Nu, the Huns. From out of the bleak and unknown fastness of the storm swept plains of Mongolia they would swoop down upon the defenseless Chinese bringing death and destruction. The warm and fruitful provinces of the Chinese Empire offered an irresistible temptation to these nomad raiders. Only well organized and large Chinese armies, kept under arms in a constant state of preparedness, preserved the Empire and localized the raids. Under exceptionally strong and wise Tanjus, such as Me-Te and Attila, the numerous tribes of Huns were welded into a single nation, and the raids became planned and successful conquests.

They were cruel and bloodthirsty people. Their homes were in tents of felt. Their clothes were stiff and greasy furs. Bathing was not even thought of, and about them always was a nauseating stench of decayed body filth. Small wonder the daintily reared

Chinese princesses hated to be sent into the steppes of Mongolia as brides of war-successful Tanjus! Fighting was their very life. Peace for any length of time was distasteful and only tolerated for the purpose of recuperating from a disastrous or too-prolonged war.

In the year 243 B. C. Shih-Huang-Ti mounted the throne of China. In order to rid China of the constant threat of the Hiung-Ny he decided to take the offensive against them. A scholarly general, Meng-Tien, was selected for the task. The mission was most difficult, but Meng-Tien was finally successful. In order to consolidate his victories he established a great line of military posts and fortresses along the frontier and kept them well-garrisoned. The Emperor carried the idea one step further and constructed what is now known as the Great Wall of China. Against the impregnable wall, with its alert garrisons, the nomads of the north were powerless.

With the rich pluckings of China denied them they turned westward seeking new lands to conquer. For years past they had been hearing stories of the wealthy and powerful Roman Empire. Led by curiosity, and an insatiable appetite for conquest, they started this huge migration to the valley of the Danube. The milder climate and the richness of their new land held them quiet for a time, but soon the old urge for war gripped them again. The wealth and attendant corruption of the Roman Empire intrigued them—and they were off to new wars. Their new wanderings brought them to the ramparts of Paris and of Constantinople. Under such Tanjus as Attila and Baian they brought Rome to her knees, and terrorized and devastated Europe, from the Black Sea almost to the Atlantic Ocean, and from the Arctic Circle to the Mediterranean Sea.

Finally the resistless progress of the world was not to be denied, and these wild and nomadic riders of the steppes were ruined by their own characteristics—which in a ruder age had been their strength. Charlemagne almost exterminated them. By this time they had settled in what is now Hungary, and were known as Hungarians, or Hunugars. About 950 A. D. a spasmodic effort to terrorize Europe in the good old fashioned way was nipped in the bud by a hardy ferocious Mohammedan cavalry in the employ of the Emperor Conrad. In 955 A. D., a coalition of practically all the Christian Princes of Europe decided once and for all to utterly crush these wild descendents of the old Asiatic Huns. The battle was fought near Augsburg. The coalition was successful and the two Hun, or Hungarian chieftains were captured and hung. "A few centuries later and all that was left of their Mongol ancestry were a few Hungarian words of unknown origin, in particular terms designating war, weapons, herds and the pastoral life, strange words brought from Central Asia in the hide covered chariots, and ancient legends telling of battles, migrations and victories, popular ballads recalling forgotten cults and the glories of old."

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