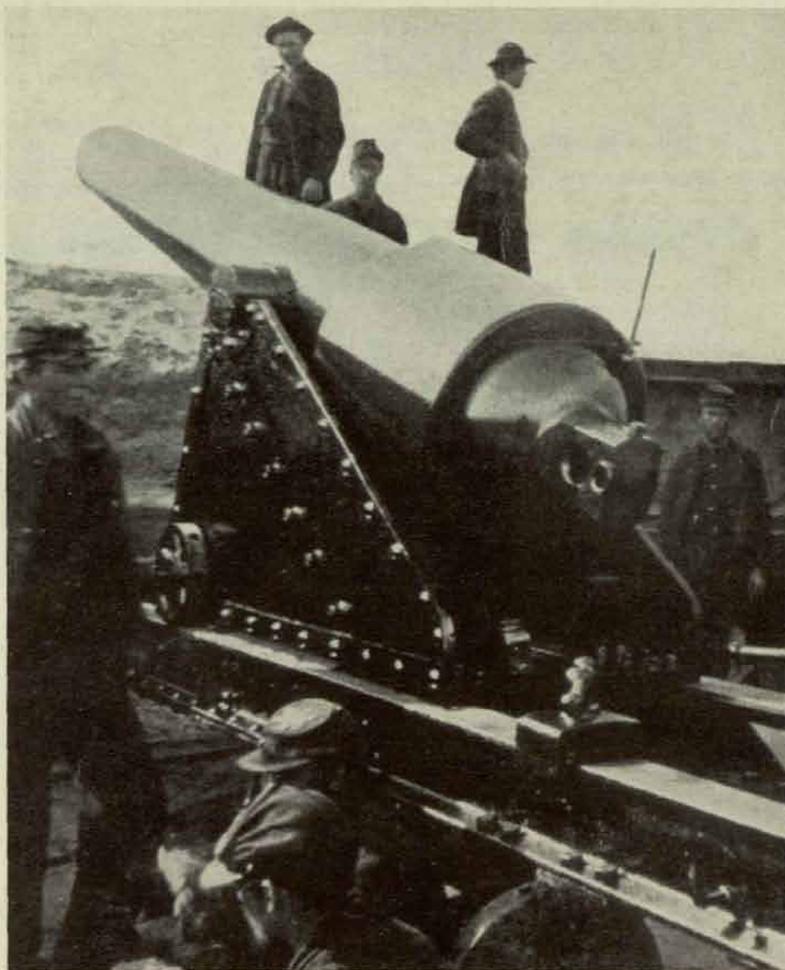


COAST ARTILLERY JOURNAL



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JANUARY-FEBRUARY, 1934

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The Coast Artillery Journal

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THE COAST ARTILLERY JOURNAL

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LIEUT. COL. E. E. BENNETT, C.A.C., *Editor*

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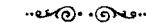
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The United States Coast Artillery Association



"The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of material and methods of training, and by fostering mutual understanding, respect and coöperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserve and Reserve Officers' Training Corps."



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MEMBERSHIP

"The Association shall consist of Active, Associate, and Honorary Members.

"The following shall be eligible for Active membership:

- a. Commissioned officers, active or retired, of the Coast Artillery of the Army of the United States.
- b. Commissioned officers, active or retired, of the Staff Corps and Departments of the Army of the United States who at any time have served in the Coast Artillery.
- c. Commissioned officers, active and retired, of the Philippine Scouts who have served in the Coast Artillery.
- d. Former commissioned officers of Coast Artillery of honorable records in the Army of the United States.
- e. General officers, active or retired, of the Army of the United States.

"The following shall be eligible for Associate membership:

- a. Commissioned officers and former commissioned officers in good standing of the United States Army, Navy, Marine Corps, Coast Guard and Public Health Service.
- b. Warrant officers and noncommissioned officers of the Coast Artillery of the Army of the United States.
- c. Members of the Coast Artillery Units of the Reserve Officers' Training Corps and Citizens' Military Training Camps.

"The following shall be eligible for Honorary membership:

- a. Civilians who have demonstrated their interest in national military preparedness.
- b. Persons who have rendered distinguished services to the Association or to the United States."

Notes of the Coast Artillery Association

Election of Officers

AS a result of the election which terminated on January 6, 1934, the Secretary of the Association announces that the following named officers have been elected to the Executive Council for the period 1934-36.

Colonel H. E. Cloke, C. A. C., vice Colonel H. E. Cloke, C. A. C.

Colonel Harry H. Morehead, C. A. N. G., vice Colonel R. E. Mittelstaedt, C. A. N. G.

Lieutenant Colonel Harry P. Newton, C. A.-Res., vice Lieutenant Colonel T. A. Scott, C. A.-Res.

Lieutenant Colonel W. T. Carpenter, C. A. C., vice Lieutenant Colonel F. S. Clark, C. A. C.

Lieutenant Colonel E. E. Bennett, C. A. C., vice Major S. S. Giffin, C. A. C.

Colonel H. E. Cloke was elected to succeed himself. Those members of the Association who had the privilege and pleasure of attending the annual meeting held at Fort Monroe, in 1932, will recall the great service rendered to the Association by Colonel Cloke and the officers on duty at Fort Monroe. While no meeting was held during 1933 because of economic stress it is not unlikely that a meeting will be scheduled for the early part of 1934.

Colonel Harry H. Morehead, C. A., California N. G., is the commanding officer of the 251st C. A. N. G. He has manifested a high degree of interest in all things pertaining to the welfare of the Association and the Coast Artillery in general. While distance renders it impossible for him to attend the meetings of the Association we know that he will do everything possible to further its best interests. His wise counsel and broad vision are valuable assets upon which the Council will draw for guidance in fixing policies and in planning for the future.

Lieutenant Colonel Harry P. Newton, C. A.-Res., hails from the nation's capital. Colonel Newton has been associated with the Coast Artillery since 1917. Ever since that date he has taken the keenest interest in reserve affairs and in the Coast Artillery Association. He is a graduate of the 1930 Fort Leavenworth special class for National Guard and Reserve officers. At the present time he commands the 917th C. A. (AA). Colonel Newton has given unstintingly of his time and talents to further the best interests of all things military. It is a fitting (but perhaps slight) token of appreciation that the members of the Association have elected him to a high office.

Lieutenant Colonel W. T. Carpenter, C. A. C., is well known to all the regular officers of the Coast Artillery and to a large percentage of the Reserve officers. At the present time he is a member of the War Department Gen-

eral Staff with station in Washington, D. C. His belief in, and devotion to, the Coast Artillery Corps is so well known as to require no further comment.

The outgoing members of the Council are Colonel R. E. Mittelstaedt, C. A. N. G., Lieutenant Colonel T. A. Scott, C. A.-Res., Lieutenant Colonel F. S. Clark, C. A. C., and Major S. S. Giffin, C. A. C.

Each of these officers has well earned the thanks and gratitude of the Association. Their wise counsel and leadership during their tenure of office has greatly contributed to whatever success the Association has enjoyed. We are sorry to lose them from the official family but it is believed that rotation in office is necessary for the success and development of any corporation or association. While they have ceased to be active members of the Executive Council we know that they will be only too ready and willing to give unstintingly of their time for the benefit of the Association whenever the occasion arises.

Trophies Awarded

DURING the year 1933 the Association trophy for the Organized Reserve was awarded to the 529th C. A. (AA). A full announcement of this was carried in the November-December issue of the JOURNAL. To the 51st C. A. (TD) goes the honor and distinction of winning the trophy awarded to the regular army regiment which had the greatest percentage of its active firing batteries rated excellent for the target practice year ending June 30, 1933. A more detailed account of this will be found elsewhere in this issue of the JOURNAL. At the time of going to press the award of the trophy to the National Guard has not been made public, but it is anticipated that official pronouncements will be made in the very near future.

Membership and Subscriptions

AT the close of the year the membership of the Association was 4,566. It is felt that there are yet many officers eligible for membership who have not applied. Inasmuch as there are no dues or initiation fee there is no good reason why the membership should not include all officers of the Coast Artillery branch of the Army. Action has been initiated to procure additional members.

The very best support that members can give the Association is a subscription to THE COAST ARTILLERY JOURNAL. While this is not a requirement for membership it is believed that no officer can keep abreast of the developments that are continuously taking place in the Coast Artillery Corps without a perusal of the JOURNAL, the official

publication of the Association and the one means by which officers can be kept informed on topics of vital interest to the Corps. The subscription list to the JOURNAL shows a slight decrease as compared to the close of the year 1932. Considering reduction in pay, reduction in funds for active duty training and the economic stress through which the country has passed, it is considered noteworthy that the decrease has not been greater. We hope that the ensuing year will bring about a betterment of conditions and that more Reserve and National Guard officers will favor us with a subscription. The goal that we hope to reach is "each member of the Association a subscriber to the JOURNAL". In return for this the Association stands ready to render all possible assistance to its members. The cooperation and tangible support of the members are earnestly solicited.

/ / /

Plans Under Way for Meeting of United States Coast Artillery Association

THE first convention and meeting of the United States Coast Artillery Association was held at Fort Monroe, Virginia, May, 1932. For what appeared to be good and sufficient reasons no meeting was held in 1933. Conditions have changed, the fiscal affairs of most of the members have improved and there now seems to be a strong sentiment in favor of a second meeting. The President of the Association has initiated plans for a meeting to be held in the vicinity of New York during the month of May, 1934, but they have not yet reached the point when definite pronouncements can be made; full details will be announced in the next issue of the JOURNAL.

The vicinity of New York seems to be a logical place for the meeting. It is accessible to Reserve officers residing in the New England and Middle Atlantic States and it will be comparatively easy to arrange for interesting and instructive demonstrations; besides, everyone can find some important (?) business in the metropolis.

This is advance information—we do not want to give away all of the secrets at this time. Also, such information as we now have will likely be modified before final plans are perfected. It is suggested that all members tentatively reserve May 18-20, 1934, for a trip to the big city and a general good time; also pass this information along to others so that all members of the military establishment may make their plans to attend.

/ / /

Dallas Organizes Chapter of U. S. Coast Artillery Association

THE Secretary of the United States Coast Artillery Association is in receipt of a letter containing the information that the latest addition to the Coast Artillery Association family arrived in Dallas, Texas, on November 15, 1933. Information indicates that the infant is doing well, and we sincerely trust that it will develop into

husky manhood. We hasten to extend a most hearty welcome to this addition to the family and we want to congratulate those responsible therefor.

The following officers were present, approved the constitution and by-laws and subscribed their names thereto as charter members:

Major J. M. Mozley, CA-Res.
 Captain George R. Prout, CA-Res.
 First Lieutenant J. L. Gatlin, CA-Res.
 Second Lieutenant G. H. Meffert, CA-Res.
 Second Lieutenant Clyde B. Smith, CA-Res.
 Major Vernon G. Cox, CA-Res.
 Major James Scrivener, CA-Res.
 Second Lieutenant George T. Coley, CA-Res.
 Major Frank F. Bell, CA-Res.
 Captain Carl T. Baer, CA-Res.
 Second Lieutenant Lewis Balbinnot, QM-Res.
 Second Lieutenant Wm. N. Petzing, Air-Res.

Officers of the chapter for the remainder of the year 1933 and for the ensuing year were nominated, seconded and elected:

President—Captain George R. Prout, CA-Res.
 First Vice-President—Major J. M. Mozley, CA-Res.
 Secretary-Treasurer—Captain Carl T. Baer, CA-Res.

The Executive Council consists of:

Major Frank F. Bell, CA-Res.
 Major Vernon G. Cox, CA-Res.
 Second Lieutenant Clyde B. Smith, CA-Res.

The Constitution was prepared and presented by Major J. M. Mozley, CA-Res., Captain George R. Prout, CA-Res., and Captain Carl T. Baer, CA-Res. Much of the preliminary work connected with the organization of the chapter was done under the supervision and direction of Lieutenant Colonel William S. Fulton, whose headquarters is in Austin, Texas.

THE COAST ARTILLERY JOURNAL and the Coast Artillery Association wish for the new chapter a long, useful and prosperous life.

/ / /

It Can Be Done

AT intervals there comes to the office of THE COAST ARTILLERY JOURNAL a communication from a loyal Coast Artilleryman proving conclusively that the family budget can bear the small expenditure of a subscription to the JOURNAL provided the will to do so exists. We take the liberty of quoting a letter of this nature:

"Yes, depression has caused me to study the investment of my few dollars more closely than in the past, but my economy measures will never permit me to withhold from our service publication. Frankly, I have not previously appreciated your financial situation. I feel that we should all be more than glad to make sacrifices in order to contribute to such a cause. My check is inclosed."

Major General Gulick Presents Trophy

Extract from the address of the President of the Association on the occasion of the presentation of the trophy to the 51st C.A.

AS one means of making effective the purpose of the Association, a trophy has been provided to be awarded annually to the outstanding Coast Artillery regiments of the Regular Army, the National Guard, and the Organized Reserves. It is evident that the conditions governing the award of the trophy must be different when applied to the several components of the Coast Artillery Corps of the Army of the United States. The conditions governing the award of the trophy to the Coast Artillery regiments of the Regular Army provide that the award shall be made to the regiment which obtains the highest percentage of excellent qualifications in target practice in a given target-practice year. The Knox Trophy, provided by the Sons of the American Revolution of the Commonwealth of Massachusetts, is awarded annually to the outstanding battery of the Coast Artillery as determined by the score obtained in target practice. The trophy provided by the Coast Artillery Association is designed to emphasize the importance of regimental teamwork and to recognize superior regimental performance in target practice.

Target practice records for the fiscal year 1933 have been very carefully reviewed in the Office of the Chief of Coast Artillery and by the Coast Artillery Board at Fort Monroe. It has been determined that the outstanding performance is that attained by the 51st Coast Artillery in target practices conducted during the fiscal year 1933. The records show that Battery "A" obtained a score of 101.5 and 96.2 for the two practices held or an average score of 98.9, and that Battery "B" obtained scores of 157.0 and 101.0 or an average of 129.0 for the two practices held, all in the fiscal year 1933. It should be noted also that Battery "B," 51st Coast Artillery, was placed third in the Knox Trophy competition and that the 51st Coast Artillery was the only regiment in the Coast Artillery Corps which fired target practices in the fiscal year 1933, where all batteries were classified as "Excellent."

While the performance of the 51st Coast Artillery during the fiscal year 1933 has been rated as "Excellent," I believe that the performance is entitled to an even higher rating. I am quite familiar with conditions here at Fort Monroe where the troops of the Harbor Defenses, in addition to other duties, are charged with carrying out important missions for the Coast Artillery School, the Coast Artillery Board, and the Submarine Mine Depot. In addition to these duties a vast amount of labor has been performed by the garrison in improving living conditions, the appearance of the post, and making available essential and necessary recreational installations. The 51st Coast Artillery is also charged with the maintenance of



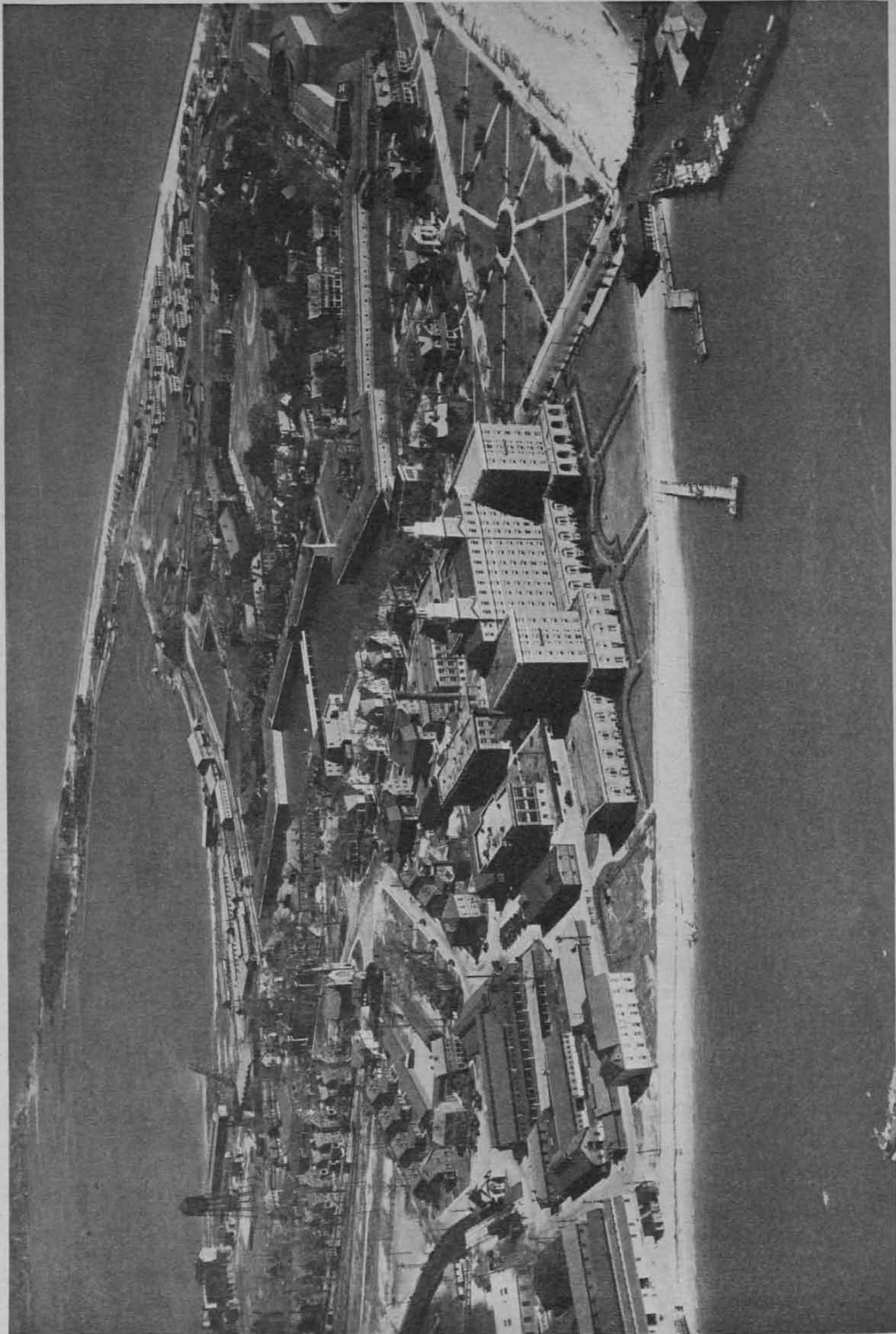
Major General Gulick presenting the trophy to Lieutenant Colonel Robert Glassburn

a number of the Seacoast Batteries, and from personal inspections I am aware that these batteries have been maintained in superior condition.

There is another phase of this performance which gives me satisfaction. In addresses here and elsewhere I have pointed out that an efficient organization of the Regular Army should not require a long period of training and preparation for target practice. I have also pointed out that the mobilization requirements of the Coast Artillery involving a great expansion demands that every officer should be trained and prepared to assume the duties of the next higher grade, and that the enlisted personnel must be prepared for the duties of prospective commissioned officers, noncommissioned officers, and the necessary keymen in the required expansion. I believe that these conditions have been met in the 51st Coast Artillery.

Taking all these conditions into account, it gives me great pleasure and satisfaction to come here today not only to present this trophy to the 51st Coast Artillery on behalf of the Coast Artillery Association, but also to indicate in this way my appreciation of the high morale and general efficiency of the Fort Monroe garrison as a whole. This general efficiency, I believe, is reflected by the outstanding performance of the 51st Coast Artillery.

I congratulate the Regimental Commander and the officers and enlisted men of the regiment who participated in the target practices which resulted in the award of this trophy. While the intrinsic value of the trophy is relatively small, it should be kept in mind that its real value lies in the recognition of an outstanding performance and in the inspiration of greater effort towards improvement in training and material. I sincerely trust that the award of this trophy will inspire you to greater efforts and that you will again win the award in the target practice year 1934.



FORT MONROE FROM THE AIR

Photo by 2nd Photo Section, U. S. Army Air Corps



The Role of Defensive Pursuit

PART II

INTERCEPTIONS

By Captain Claire L. Chennault, Air Corps

Photo by U. S. Army Air Corps

SUCCESSFUL air defense consists of three phases of operations: (1) detection and reporting; (2) interception by pursuit; and (3) destruction or repulse of the invaders by the combined action of all the weapons available to the defense. A fourth phase, the neutralization of the effects of hostile bombardment fire by application of detailed passive defense measures, might be included under this heading.

The agencies available for the detection of hostile aircraft include intelligence agents abroad, aerial observation, casual civilian reports, and a ground net of observation-listening posts. The last-named agency is the only one that can be relied upon at all hours and in all kinds of weather. The ground information net performs both functions, detection and reporting, and its operations continue on through the entire period of hostile invasion. The second phase, interception by pursuit, is simply a development of the action initiated at the beginning of the detection and reporting phase. The third phase begins when pursuit establishes physical contact with the enemy and continues until the objectives have been accomplished or he has withdrawn out of range of defense weapons. Its action may be completed before he reaches the target but may be continued in the vicinity of the target and during the withdrawal. Due to the indefinite length of the tactical action, the operation of the ground information net must continue until no single unit of the enemy remains within range of the net.

In this article the factors affecting the interception of

hostile bombardment *only* will be discussed. The interception of hostile aircraft of other types involves slight changes in technique, for whose discussion there is not sufficient space in this article. Pursuit can make interception of any slower type of aircraft which can be located within permissible time and space requirements. It can make interception of types with the same speed if the invader follows a flight path which permits defending pursuit to approach along "interior" lines. It can even intercept faster aircraft, but such an interception would be valueless as there would be no time for fire action.

The factors developed and discussed in this article are based upon equipment in use today. Time¹ and space values are figured rather closely, but they may be attained under service conditions by well-trained, properly organized pursuit units.

Technical progress within a very short time may make these values for time and space factors wholly obsolete. The principles involved, however, will remain constant until radically different aeronautical equipment is developed. Military intelligence reports furnish the figures upon which calculations of speed, climb and ceiling may be made upon any given date. During war, technical progress is quickly gauged by the enemy.

¹Extract from M.I.D. Report on British Air Maneuvers, 1931, dated July 31, 1931: "... raid warnings are received and plotted in the operations headquarters within half a minute. The interceptor squadron would receive its instructions within three minutes of a raid's crossing the coast and would be in the air within five minutes. It would then have to climb to 15,000 feet"



The fastest single-seater in the world

The principal factors which determine the ability of pursuit to make interception and to offer effective resistance to a hostile, invading, bombardment force are:

1. Number and disposition of pursuit units available for interception missions.
2. Type of equipment available.
3. The provision of means for the timely collection and transmission of accurate, continuing information of the hostile force.
4. Meteorological conditions.
5. Relative fire effectiveness of the two forces.

Of all these factors only "the provision of means for the timely collection and transmission of accurate, continuing information of the hostile force" will be discussed in this article. In the development of this subject it will be assumed that all the other factors are normal, i. e., not unfavorable to the intercepting pursuit force.

Experience has proved that an effective pursuit force cannot be maintained in flight at all times, or even at such times as will insure the interception of an invading force. Any attempt to maintain pursuit in the air in defense of a vital point over considerable periods of time must result in excessive expenditure of pursuit effort without accomplishing the desired objective.

Experience has also proved that pursuit airplanes on the ground in the vicinity of a defended point are unable to make interception and offer effective resistance to an invading force approaching at high speed and high altitude, if information of that force originates in the vicinity of the pursuit airdrome. In order to offer the most effective opposition, the pursuit force must meet the hostile force in the air at such distance from the defended point as will permit the pursuit force to apply effective fire before the enemy arrives over his target. The paramount interest of the defending force is to prevent the enemy striking the target with effective fire; the destruction of hostile aircraft during the withdrawal, while important, is secondary.

In order to meet the hostile force in the air at such dis-

tance from the defended point as will permit the pursuit force to apply effective fire before the enemy arrives over his target, there must be timely information of the approach of the hostile force. The distance from the pursuit airdrome to the point where this information must originate depends upon such factors as:

1. Altitude and speed of hostile force.
2. Rate of climb and speed of pursuit force.
3. Time required for pursuit to apply effective fire.
4. Time required for the collection of information from observers and the transmission of information and orders from the command center to the pursuit organizations.
5. Time required for the pursuit units to leave the ground after receipt of orders.

6. The ability of pursuit to make interception by the shortest line of flight.

Substituting known or accepted figures for the terms in the above factors, we can definitely determine the distance "out" of the point from which the first information of the hostile force must originate. Thus for the terms in "1" we may assume 15,000 feet and 180 miles per hour, or 3 miles per minute; for those in "2", 2,000 feet per minute at 150 miles per hour, or $2\frac{1}{2}$ miles per minute²; for "3", 5 minutes; for "4", 1 minute; for "5", 4 minutes; and we assume that pursuit will be able to make interception by the shortest flight line and from the most favorable direction. We now have concrete time and distance terms which can be set up in equations to determine the point in time or distance at which information must begin in order to enable pursuit to make timely interception of the invading force. Collecting the time terms involved in pursuit's leaving the ground and climbing to 15,000 feet, we have the following equation: $(1 \text{ plus } 4 \text{ plus } 15,000/200) = 12\frac{1}{2}$ minutes, of which $7\frac{1}{2}$ minutes apply to the distance factor. $7\frac{1}{2}$ minutes at 150 miles per hour = $18\frac{3}{4}$ miles of distance. Pursuit, at these speeds, requires $12\frac{1}{2}$ minutes' warning in order to meet the hostile force head-on at a distance of $18\frac{3}{4}$ miles from its airdrome. The time term, 5 minutes, involved in factor 3 is satisfied by the distance of $18\frac{3}{4}$ miles, provided that distance is straight away from the defended point, because at 3 miles per minute and with a release point about 1 mile from the target it will require $17\frac{3}{4} \div 3 = 5.9$ plus minutes for the hostile force to arrive at the release point for bombing. In order to obtain the distance or space factor, we set up the following equation: $(12\frac{1}{2} \times 3) \text{ plus } (15,000/2000 \times 2\frac{1}{2}) = 56\frac{1}{4}$ miles. The first information of the hostile force must originate at least 56 miles in advance of the pursuit airdrome if pursuit is to make interception head-on. Time and space factors can be thus

²This is the climbing speed of pursuit and is not to be confused with the maximum level speed, which is not a factor in this problem.

determined for any particular situation if the values of the terms involved in these equations are known.

The mere collection of information of the hostile force is not sufficient, however, to insure interception. That information must be transmitted to a central authority, evaluated and acted upon. In order to prevent the hostile force from avoiding interception by changing course or by splitting up into a number of units after passing the first observation point, successive observation points must be established. The information of the enemy must be continuous, or, at least, received at frequent intervals. Changes in strength, course, altitude and disposition should be reported as they occur. These changes must be made known to the pursuit force in the air. Therefore, a means for the transmission of information from the central authority to the pursuit force in the air must be established.

Considering these requirements in the order in which they are presented, we find that there are at present two agencies which are capable of collecting and transmitting timely information at frequent intervals. They are: aerial observation and the ground intelligence net. The transmission of information from aerial observation airplanes has the advantage in that it may originate from hostile territory or in advance of surface stations. It is also more likely to be accurate in respect to such details as type, disposition, altitude, course, and numbers of the hostile force.

However, it has the following disadvantages:

1. All information must be transmitted by radio. Radio is subject to break-down and interference, particularly over hostile territory.
2. The observation airplane is vulnerable to the attack of hostile aircraft. It may be driven off or destroyed if discovered.
3. Continuous surveillance of hostile airdrome areas must be maintained in order to insure against surprise attacks. This problem has never been attempted in service and may prove more difficult than it appears to be.
4. Meteorological conditions may prevent the successful operation of observation aircraft or personnel.

The ground intelligence net has the disadvantage that it requires a considerable force and an immense amount of equipment for its operation. This disadvantage is more apparent than real, however, when it is considered that operating personnel may be drawn from the ranks of men unfit for more active military service, and that many women can be employed. Also, in nearly every situation, existing civilian telephone and telegraph equipment can be utilized. Still, under the best conditions, a number of trained men and officers in the military service must be provided to install and supervise the operation of the net, and a considerable quantity of specialized equipment must likewise be provided by the military.

The transmission of information of the hostile force to



Photo by U. S. Army Air Corps

A pursuit force on the ground cannot defend against hostile aerial attacks unless it receives timely information of the enemy

pursuit in the air must continue until pursuit has established visual contact with the enemy. Reports from one or two stations are not sufficient. The enemy may change his course or altitude at any moment and avoid an interception begun on early information. A striking illustration of this requirement occurred during the Fort Knox exercises. A small bombardment formation was reported by three stations located on successive bands as flying "high". A pursuit squadron attempting an interception south of the station on the inner ring encountered clouds at medium altitudes. The leader believed the cloud mass to be local and climbed above it while the "enemy" passed beneath it. Shortly after the two forces passed each other, the pursuit leader heard the following radio message from a cavalry patrol post: "five bombers seen flying high, southwest". Knowing that bombers could be *seen* from the ground only if they flew beneath the clouds, he dived through and made an immediate interception. Bands or rings of observation-listening posts located fifteen to twenty-five miles apart cannot fulfill this requirement for timely information until visual contact is established by the pursuit force.

The information net must cover the *entire* area to be defended. In practice, experience indicates that it should extend well to the rear and out on the flanks of the defended area. Bombardment may fly at high altitudes or above clouds over the outer posts of a net and escape detection or exact location until quite near the target. When in the vicinity of the target, it must descend to observable altitudes in order to orient itself and to attain accuracy of fire. It may approach or withdraw by a round-about route so as to avoid the information net, or so as to fly over the net the minimum of time. The portion of the net in the vicinity of the ground defenses is of the greatest value to those defenses. Information from posts within ten to twenty miles of the ground guns reveals the true direction of approach, altitude and disposition of the hostile force. Information from posts as far as fifty miles out is of no tactical value to ground guns.

The ground net, once installed, has the advantages of permanence in all weather, continuous operation without exhaustion of matériel or personnel, comparative freedom from hostile attacks, and direct telephone communication. It also provides for reports at more frequent intervals than would be practical by radio from an observation airplane. While the information collected by the ground net might not be as accurate as that from a trained aerial observer, it should be sufficiently accurate to serve its purpose. Accuracy of information may be increased by requiring operating personnel to engage in frequent peace-time maneuvers, which is the practice in most European countries.

The transmission of information from collecting or observation posts to intelligence centers is, normally, by direct telephone. Radio should be provided to supplement this service and for use by isolated ground or marine posts.

The next problem, the evaluation of this information, presents no special difficulties. Final evaluation should

occur at the central command post, where competent personnel will be available for this duty. Considerable evaluation will necessarily be done by the pursuit leader in the air.

Action upon information of the hostile aerial force can be directed only by the central authority, who should have under his command and control the means for collecting and evaluating information, and the means for opposing the invasion of the hostile force. In accordance with the theory that "the airplane is the most effective weapon for opposing hostile aircraft" and the principle of "paramount interest", the central authority should be the commander of the air force responsible for the aircraft defense of the point or area. It is certain, from the experience of the British in the defense of London, that any division of authority in the central command will result in loss of invaluable time and in ineffective aerial operations.

The means for continuing the transmission of information to pursuit in the air are provided by establishing a powerful radio sending station at the central command post and equipping all pursuit airplanes with receiving sets. Since the tactical action will occur over friendly territory, the central command post transmitting station can be assured priority and freedom from interference by other stations during the period of the emergency. Voice transmission can usually be used because the tactical action will occur within relatively short range of the transmitting station. However, where only one authority is made responsible for the defense of a large area, re-broadcasting stations should be established at suitable distances throughout the area.

Another means for transmitting information of the hostile force to pursuit in the air is to require each observation post to display a colored arrow or other easily seen marker pointing in the direction of the point where the hostile force is estimated to be at the moment friendly pursuit comes within visual range.

Antiaircraft artillery, if present, can assist pursuit in locating the enemy by firing prearranged signal bursts.

The defense of an island or a point on a seacoast requires a net of a different character from that required for the defense of an inland area. Observation-listening posts must be established at sea as well as on land. These marine posts must extend out from the defended area as far as the minimum distance required to satisfy the space factor requirement. Submarines, coast guard boats, and civilian boats of all types may be employed for these posts. Even though the enemy has control of the sea, he cannot clear it of surface craft within range of an active land-based air force. These marine posts may be slightly farther apart than land posts, due to the fact that the sea bears none of the topographical features which so often limit both visual and auditory observation on land. Communication from marine posts must be by radio, and will have to be carefully worked out in order to prevent interference at a critical moment.

Unless marine posts are established for the detection and reporting of hostile aircraft, such areas as Oahu, the Panama Canal, and all of our coast cities cannot be defended from aerial attack by pursuit. The presence of hundreds of pursuit airplanes around New York City, for instance, could not prevent the bombing of the city by a squadron of hostile bombardment approaching from the sea, if land posts are relied upon for the first reports of the approach of the enemy. A pursuit airplane, or any number of pursuit airplanes, on the ground, cannot be used to oppose the action of bombardment at present speeds and bombing altitudes. This requirement of the time factor is of the greatest importance and is seldom appreciated.

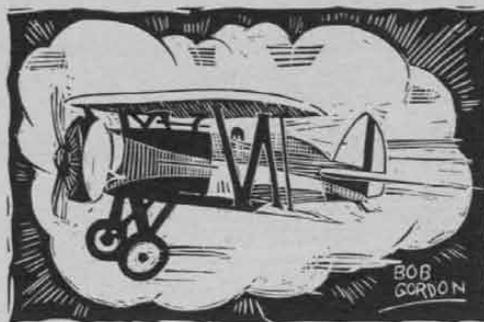
Before concluding the discussion of the information net it would be well to examine our own requirements. A survey of the systems proposed for the aircraft defense of Italy, France, and England reveals certain striking similarities of detail. While the problem is slightly different for each country, all agree upon the following essential features:

1. The establishment of an efficient ground information or intelligence net.
2. The employment of pursuit.
3. The employment of antiaircraft artillery.
4. The use of searchlights for night operations.
5. The employment of extensive passive defense measures by both civil and military authorities.

It is a recognized principle in all these national systems of defense that intercepting pursuit can operate effectively only when furnished with timely, accurate and continuing information of the enemy. If we accept this principle we are in position to determine the form which our own information net for use in defense against aerial attacks should take.

Our geographical location is entirely different from that of any other country. With present-day equipment we are safe from attacks launched from overseas. Aircraft must be brought within range of our shores and employed either from a floating airdrome or a land base. This fact simplifies our problem to some extent, but we have numerous centers scattered over a wide area which might be objectives for hostile aerial attacks. We find such centers in the northeast, the middle Atlantic states as far south as Virginia, through all the Allegheny Mountain and lake states, and along the entire length of the Pacific Coast. Even the southwest and southeast might be selected for initial invasion for the purpose of establishing land bases for hostile aircraft. The West Indies, Cuba, and Mexico are all suitable for such bases, and modern airplanes so based can reach vital national centers. Our area is too vast and, in many sections, too little development has occurred, to contemplate the establishing of a network of observation posts and intelligence centers,

equally effective everywhere, such as have been established in Italy and England. Our need is a mobile intelligence system which may be transferred rapidly to any threatened sector and which may be divided and readily expanded to cover two or more sectors simultaneously. It is improbable that any hostile force can launch aerial attacks against our vital centers of population and industry, or in support of landing operations, without disclosing its intentions sufficiently far in advance to enable such a mobile system to cover the threatened area with an effective reporting net.



The requirements of a mobile net of the type suggested could be met by the immediate organization, equipping and training of a new military organization, which may be designated "The Air Defense Information Group." To cover our present needs and to fulfill the requirements of peace-time training

and the war-time requirement of immediate expansion and division, the A. D. I. Group should be composed of four squadrons and a headquarters detachment for administration only. Its tactical operation, in all cases, would be under the command and direction of the Air Force Commander. Its initial equipment should consist of sound-locating instruments, course-plotting instruments, communications equipment of all types, and other specialized equipment. Its training should be continuous; squadrons should be assigned to our present wing and group airdromes for continuous training, and the entire A. D. I. Group should participate in annual Air Corps maneuvers. These maneuvers should be held in different sections of the country each year. Special efforts should be directed toward the procurement and testing of marine observation-listening posts.

The intelligence plan should contemplate the utilization of present civil wire lines and installations and the employment of a number of the personnel engaged upon civil communications duties.

The A. D. I. Group should provide for close coöperation with the antiaircraft artillery and with all other military and civil agencies concerned with active or passive measures of defense against hostile air raids.

Its fundamental organization should be similar to the nets planned for Germany and England, a network of observation-listening posts connected to information centers and all information centers connected to area defense headquarters. Adjacent defense areas should have direct connection with each other.

The military arm must organize, develop and control this service. It is not within the limits of reason to imagine that our civilian population could be aroused in peace-time to the danger of aerial invasion to such a point that individuals would contribute the time and money required to establish and operate such a net.

(To be concluded)

What Should the Soldier Eat?

BY MAJOR REUBEN NOEL PERLEY, INSPECTOR GENERAL'S DEPARTMENT

DIET planning is a woman's job—in the home. In the army (which is feeding hundreds of thousands of men each summer) it is a man's job. As the health of the country is involved, it would be desirable if a considerable number of young officers selected practical nutrition as a hobby.

The Army's dietary practices have improved by leaps and bounds in recent years. However, there is room for improvement, principally in the direction of codifying correct practices, or, to use a military phrase, of consolidating the position already gained. The purpose of this brief article is to outline certain facts and principles which should be always at the mess officer's finger tips.

It is desirable for good health that the nutrients entering the bloodstream be in the approximate quantities and proportions required by life processes, otherwise the organs of elimination are overworked in disposing of unneeded substances. Persistent overload cause these organs to malfunction with a resultant impairment of health.

The bloodstream is slightly alkaline, therefore the diet should be slightly alkaline. Sulphur, phosphorus and certain other minerals are acid forming. Calcium, potassium, magnesium, etc., are alkali forming. Which of these predominate in a food will determine whether it will be acid or alkaline in ash residue. In practical nutrition we need only know that—

- a. Proteins—i.e., meats, fish, fowl and eggs—are acid;
- b. Cereals—breakfast cereals, breads, flours, meals, corn, rice, wheat, hot cakes, macaroni, plain cakes, etc.—are acid;
- c. Fruits (except prunes which are slightly acid), d vegetables and e. milk are alkali.

Obviously the nutrient content of fruits, vegetables and milk should exceed that of meats and cereals.

These considerations throw a new light upon the following rules of diet:

- Rule 1. Standardize upon a definite and moderate amount of meat per day.
- Rule 2. Serve three vegetables at dinner and two at supper; favor green and yellow vegetables.
- Rule 3. Eat one uncooked vegetable each day.
- Rule 4. Serve fresh fruit (or their juices) for breakfast and a second fruit during the day.
- Rule 5. Serve "protective" foods on an organized schedule of frequency.
- Rule 6. Drink a minimum of one pint of milk per day.
- Rule 7. Eat plentifully of butter and eggs.
- Rule 8. Consume no one nutrient to excess.
- Rule 9. Do not serve *in the same day*, all (or a majority) of the following cereal foods, viz.—hot cakes, toast, breakfast cereal, corn (as a vegetable), rice pudding, bread, macaroni, corn bread, and cake. They are all acid-forming.
- Rule 10. The milk, fruit, and vegetable content should

exceed the meat and cereal content of the diet.

Rule 11. Eat about the same quantity per day and this quantity should not vary unduly in liquid content.

Rule 12. Do not eat to excess.

It is desirable that the total bulk consumed per day be approximately constant, assuming an unchanging work program, and this includes a reasonably uniform distribution between liquid and solid foods. The foods on the table should evidence plenty of color especially of green and yellow.

It is not necessary to memorize much about proteins (meats). They are consumed in body growth and repair. A great variation in the day by day consumption of protein is more harmful than a uniform excess. A heavy meat dish for dinner, a light meat dish for supper, and eggs for breakfast are normal. Proteins are acid forming due to their high sulphur and phosphorus content. They are practically devoid of roughage.

Carbohydrates and fats may be dismissed from consideration as separate nutrients in practical nutrition by regulating the total caloric value of the diet. Neither should be consumed in excess. Pure fat is more than twice as fattening as pure sugar. (Fat officers take warning.) Carbohydrates and fats alike are consumed in furnishing energy and heat to the body. Surplus of these nutrients is deposited as adipose tissue to the embarrassment of many, especially the ladies.

Vitamins are as important as they are minute in quantity. They are essential growth factors and essentials to compounds of which the body is constructed. In a practical nutrition, knowledge of deficiency diseases is not as important as knowledge of the principal "protective" foods which supply the vitamins, as follows:

Principal protective foods:

Milk.

Butter.

Eggs.

Protective meats:

Liver (and other visceral organs).

Best protective fruits (or fruit juices):

Oranges.

Grapefruit.

Bananas.

Best protective vegetables:

Tomatoes (any form).

Spinach (any form).

Cabbage, raw.

Lettuce, fresh.

Green peppers (not popular).

Peas (any form).

Carrots (any form).

Green Beans (any form).

For maximum health security the above protective foods

Day of Week - - Monday
 Date - - - - 2nd Day
 Number Being Fed 100
 Value of Ration - \$10.00 (40 cents per man)

PERLEY'S

Blank Form for Menu Development -or Analysis

Index Captions A-13-30-85
 For Use In B-30-35-82
 Permanent Filing C-04-20-82
 Of Menus D-30-00-80

Classification of Food Stuffs — Index to Tables of Food Values	MENU	Cost and Quantity Data				Nutrient Content Data—For Critical Nutrients Only												
		Quantities Required by 100 Men — See Tables	Quantities Required by Actual Strength of Men	Cost in Money	Cost in Valuations (As per cost of 100 Men) (See Tables)	Figures Show What Percent (%) of Daily Requirements the Indicated Foods will Contribute to the Diet										VITAMINS		
						ALKALINE BALANCE	ACID BALANCE	NUCLEIC WEIGHT	PROTEIN	CALORIES	CALCIUM	PHOSPHORUS	IRON	Figures Show Only the Relative Strength of Vitamins				
1	2	3	4	5	6	7	8	9	10	11	12	13	A	B	C	D	E	
BREAKFAST																		
(1) Fresh Fruits	Bananas and Sugar	100 Bananas 5 lbs. Sugar	2/3 bunch 5 lbs.	2.32 .46 per lb.	4.00 0.85	Alk Non	5.0 0.5	1.0 —	2.5 2.0	1.3 —	2.0 —	3.0 —	3.0 —	2	1	2	—	—
(2) Cereal Milk (Pint) Sugar	Cornflakes Sugar Fresh Milk	7.5 lbs 5 lbs. Sugar 100 pints	8 15-oz. pkgs. 5 lbs. 12.5 gallons	.69 per pkg. .95 per lb. .20 per gal.	2.10 0.63 0.25	Acid Non Alk	0.9 0.8 11.7	1.8 — 9.4	0.9 2.0 7.0	0.5 — 26.4	2.2 — 14.1	4.3 — 8.5	— — —	—	—	—	1	1
(3) Toast and Butter	Toast and Butter	15 lbs. Bread 6 lbs. Butter	15 1-lb. loaves 6 lbs.	.617 per loaf .269 per lb.	0.64 4.04	Acid Non	1.9 0.8	4.2 —	2.9 4.7	1.2 0.5	2.1 6.2	3.0 0.5	—	1	—	—	—	—
(4) Coffee Evap. Milk Sugar	Coffee, Evap. Milk Sugar	8 gallons	8 gallons	.11 per gal.	2.20	Alk	7.5	1.1	2.8	4.2	1.7	0.6	—	2	—	—	1	1
(5) Protein Combination	Creamed Chipped Beef French Fried Potatoes	8 1-lb. cans 50 lbs. Potatoes	8 1-lb. cans 50 lbs.	2.21 .018 per lb.	5.50 1.50	Acid Alk	1.6 3.5	6.8 1.5	2.6 2.0	10.5 1.3	6.0 2.6	9.3 8.9	—	3	2	—	1	1
DINNER																		
(1) Appetizer Cocktail Soup or Fruit Cup	Fruit Cup Grapefruit Pineapple Apple	1 No. 10 Can Each	107 ozs. each	1.76	4.40	Alk	2.5	0.2	1.8	1.0	0.6	1.5	—	2	2	2	—	—
(2) Protein (Meats, Etc.)	Baked Loin of Lamb Mint Sauce	50 lbs. Lamb	50 lbs. Loin	9.40	23.50	Acid	5.9	28.1	9.8	1.7	16.1	19.4	—	1	—	—	—	—
(3) Vegetables a. Starchy b. Watery c. Protective	Browned Potatoes Onions Spinach, plain	35 lbs. Potatoes 30 lbs. Onions 40 lbs. Spinach	35 lbs. 30 lbs. 40 lbs.	0.81 0.63 2.50	2.85 1.58 7.00	Alk Alk Alk	4.1 3.5 4.7	2.2 1.4 2.4	4.7 1.4 0.8	1.5 2.1 3.1	3.1 2.1 4.1	6.8 2.1 60.2	—	1	2*	—	—	
(4) Salad	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(5) Bread and Butter	Bread and Butter	15 lbs. Bread 6 lbs. Butter	15 1-lb. loaves 6 lbs. Butter	.617 per loaf .269 per lb.	0.64 4.04	Acid Non	1.9 0.8	4.2 —	2.9 4.7	1.2 0.5	2.1 6.2	3.0 0.5	—	1	—	—	—	—
(6) Beverage	Coffee, Evap. Milk Sugar	8 gallons	8 gallons	.11 per gal.	2.20	Alk	7.5	1.1	2.8	4.2	1.7	0.6	—	2	—	—	1	1
(7) Dessert	Onstard Pudding	ACM Formula	ACM Formula	1.20	3.00	Alk	1.6	3.9	2.6	9.4	4.5	3.8	—	3	2	—	1	1
SUPPER																		
(1) Protein Combination	Liver and Bacon	20 lbs. Liver	20 lbs. Liver	4.40	11.00	Acid	5.7	16.0	10.4	2.1	7.6	42.1	—	2	1	1	—	1
(2) Vegetables	Lyonnais Potatoes Lima Beans	30 lbs. Potatoes 4 No. 10 cans	30 lbs. 4 No. 10 Cans	0.59 1.07	2.23 2.88	Alk Alk	4.1 3.1	2.1 3.0	3.2 1.9	1.7 2.3	2.9 5.4	6.1 12.1	—	1	2*	—	—	
(3) Bread and Butter	Cinnamon Rolls Butter	1 gallon sweet dough 6 lbs. Butter	29 lbs. Ingredients 6 lbs. Butter	1.40 1.61	3.50 4.05	Acid Non	3.4 0.7	0.5 0.2	8.5 4.5	5.5 0.8	2.3 0.2	5.0 0.5	—	3	2	—	1	1
(4) Beverage	Hot Tea Evap. Milk Sugar	7 gallons	7 gallons	0.70	1.75	Alk	6.6	1.1	2.8	4.2	1.7	0.6	—	3	2	—	1	1
(5) Dessert	Lemon Meringue Pie	18 9-in. pies	18 Pies	2.39	7.23	Acid	2.9	5.0	5.0	7.3	4.1	4.6	—	3	2	—	1	1
RECAPITULATION																		
Totals for Breakfast					27.79	Alk	34.1	25.3	30.7	55.6	30.9	43.4	—	3	2	2	1	1
Totals for Dinner					48.61	Non	32.5	45.5	32.5	39.5	34.5	97.7	—	2	2	3*	1	1
Totals for Supper					32.42	Non	26.5	35.9	36.4	28.0	24.2	70.3	—	3	2	2*	1	1
Aggregate for Day					108.82	Alk (51%)	93.1	105.2	99.6	116.0	89.6	211.9	—	3	2	3*	1	1
STANDARD REQUIREMENTS																		
Optimum Totals for Dinner					34.2%	30%	28%	33%	40%	20%	20%	3	3	1	2	1		
Optimum Totals for Breakfast					40%	45%	40%	41%	31%	40%	40%	3	2	3	1	1		
Optimum Totals for Supper					25.8%	27%	29%	28%	29%	31%	20%	2	2	2	1	1		
Optimum Totals for Day					100%	100%	100%	100%	100%	100%	100%	3	3	3	2	1		

NOTE: This blank form is designed for use in building a permanent and indexed file of accurately balanced menus. It may be used to analyze existing menus, or to develop new menus. In either case, all necessary tabular data, except market prices, is to be found in the "Tables of Food Values" accompanying "Practical Nutrition," a handbook for mess stewards. All data for nutrients are expressed as percentages of daily requirements. One food item with the corresponding data is selected from each table of the book, after All Rights Reserved.

which, if each and all columns of this form total 100%, the diet is in biological nutrient balance. Column 4 is computed from column 3. Column 5 is computed from column 4 and the market price of products listed. Additional copies of this form or of the book "Practical Nutrition" can be secured from the publisher, or from the author, Major Reuben Noel Perley, Army Building, Omaha, Nebraska.

* Uncertain

Illustrated Ten-Day Basic Menu

*Signifies one of Perley's Principal Protective Foods.

†Signifies one of Perley's Principal Protective Foods as an ingredient of importance.

	BREAKFAST	DINNER	SUPPER
1ST DAY SUNDAY	Blackberries Cream of Wheat *Pint of Milk Bacon and Eggs *Buttered Toast †Coffee	Thin Soup (Chicken) Roast Stuffed Chicken †Cream Gravy Mashed Potatoes *Carrots *Peas Peach Salad and Mayonnaise *Lettuce Base Bread and Butter †Coffee	Curry of Beef Fried Sweet Potatoes *Green String Beans Baking Powder Biscuits †Hot Chocolate Plum Pudding & Sauce †Ice Cream
2ND DAY MONDAY	*Bananas Cornflakes *Pint of Milk †Cream Chipped Beef French Fried Potatoes *Buttered Toast †Coffee	*Fruit Cup Baked Loin of Lamb Mint Sauce Browned Potatoes Onions *Spinach Bread and Butter †Coffee †Custard Pudding.	*Liver & Bacon *Lyonnaise Potatoes Lima Beans Cinnamon Rolls †Hot Tea †Lemon Meringue Pie
3RD DAY TUESDAY	Cantaloupe Puffed Rice *Pint of Milk *Scrambled Egg & Bacon *Buttered Whole Wheat Toast †Coffee	Puree of Potato Beef Steaks Water Gravy French Fried Potatoes Corn on the Cob Radishes Pineapple Salad 1000 Island Dressing Bread & Butter †Coffee	Chicken Salad Potato Chips Baked Squash *Hot Corn Bread & Butter Lemonade Apple Cobbler & Lemon Sauce Coffee Cake
4TH DAY WEDNESDAY	*Oranges Puffed Wheat *Pint of Milk *Three Minute Eggs Toast & Butter †Coffee	*Tomato Juice Braised Baked Ham Candied Sweet Potatoes Boiled Parsnips *Green String Beans Pear Salad *Lettuce Base French Dressing *Bread & Butter †Coffee	Macaroni & Cheese *Carrot & Pea Salad *Stewed Tomatoes *Rye Bread & Butter †Hot Chocolate †Marble Cake Jello
5TH DAY THURSDAY	*Bananas Oatmeal *Pint of Milk Pork Sausage & Batter Cakes Syrup †Coffee	†Cream of Tomato Braised Beef Baked Potatoes Beets *Cold Slaw Peach Salad *Lettuce Base *Bread & Butter †Coffee	†Mutton Pot Pie Apple & Celery Salad *Lettuce Base †Sour Milk Biscuits †Coffee †Cocoanut Cream Pie †Sponge Cake
6TH DAY FRIDAY	Delicious Apples Corn Meal Mush *Pint of Milk Pork Sausage †French Toast & Syrup †Coffee	†Puree of Split Pea Stuffed Baked Halibut †Tomato Sauce †Creamed Potatoes *Carrots *Spinach *Canned Grapefruit Salad *Lettuce Base *Bread & Butter †Coffee	Salmon Salad *Lettuce Base Kidney Beans & Rice Beets *Cheese Biscuits & Butter Iced Tea & Lemons †Corn Starch Pudding Apple Pie
7TH DAY SATURDAY	Cantaloupe Boiled Rice *Pint of Milk Ham & Eggs *Whole Wheat Toast & Butter †Coffee	†Oyster Stew Vienna Sausage Baked Beans Pickled Beets *Cold Slaw Peach Salad *Lettuce Base *Bread & Butter †Coffee	Cold Meats Potato Salad Asparagus Tips *Apple Rolls & Butter Ginger Ale *Custard Pudding †Pumpkin Pie
8TH DAY SUNDAY	*Grapefruit Bran Flakes *Pint of Milk *Scrambled Eggs & Bacon *Buttered Toast †Coffee	*Fruit Cup Pot Roast of Beef Water Gravy Mashed Potatoes Baked Hubbard Squash *Tomato Salad *Lettuce Base *Bread & Butter †Coffee	Bologna Sausage Baked Idaho Potatoes *Cold Slaw Stollen & Butter Near Beer †Bread Pudding †Orange Ice
9TH DAY MONDAY	*Canned Grapefruit Shredded Wheat *Pint of Milk *Tomato Omelet *Buttered Toast †Coffee	Apple Sauce Roast Pork Brown Gravy Browned White Potatoes Onions *Stewed Tomatoes Asparagus Salad *Lettuce Base *Bread & Butter †Coffee	*Liver & Bacon French Baked Potatoes *Peas *Hot Raised Rolls & Butter †Cocoa †Pumpkin Pie Doughnuts
10TH DAY TUESDAY	*Orange Juice Oatmeal *Pint of Milk Pork Sausage Buckwheat Cakes †Coffee	†Tomato & Rice Soup Chicken Fricassee *Cream Gravy Au Gratin Potatoes Fried Egg Plant *Green Peppers *Fruit Salad *Lettuce Base *Bread & Butter †Coffee	†Irish Stew *Head Lettuce Salad Mayonnaise *Parker House Rolls & Butter †Coffee †Brown Betty †Quick Cake

should be scheduled in ten day cycles. Milk, butter and eggs should be served daily, limited only by the appetite (or pocketbook) in quantity. No ration savings should be effected on these items. It is to be hoped that some time the ration allowance of milk and eggs will be substantially increased. Milk is the principal source of calcium. Men who will not drink milk at meal times often will drink it in the forenoon or before retiring.

Liver should be served perhaps twice in ten days. Of the protective fruits and vegetables listed, a selection of not less than two, in rotation, should be in each day's diet. Scheduling protective foods over ten day periods will aid in insuring variety and will permit of purchasing standard quantities of many items at the beginning of the month.

Referring to the sample menu accompanying this article, observe that generally a food is selected for each caption in the menu form. This practice makes it permissible to ignore all nutrients for which data is not given in the form. Menus can be balanced without this form, but not readily. The reader should study the menus herewith with some attention. Many lessons in nutrition are to be learned by observing the peculiarities of the several foods as emphasized by the figures.

Each mess officer should prepare for his mess sergeant a *basic menu* covering ten days or any multiple thereof. The purpose of this menu is to schedule those foods the consumption of which he deems it desirable to control. This practice insures health protection as well as variety and economy.

These basic menus shown here are illustrative only. Purposely the writer has selected combinations not effecting perfect nutrient balance so that the reader may see which foods are responsible for the excess or shortage of the several nutrients. The ration allowance was 40 cents when the prices given actually obtained in the market of Omaha two years ago, and the menus required 46.4 cents per ration at that time. The excess cost is principally in the items of milk and eggs.

Nutrient and cost data of the menus are taken from the writer's own food tables, which present all data as percentages of the average soldier's daily requirements. The nutrient standards upon which the data are based have been approved by national authorities in nutrition and may be accepted as reasonable.

Good menus should be permanently filed. The author has several thousand such menus in an index file and recommends this system for its simplicity in locating menus featuring such particular foods as may be desired.

Provided one pint of milk and two eggs are served per soldier per day, one half of all money spent for food is expended for the following fifteen items. They are entitled to the mess officers' preferred attention accordingly in the order given. They may be purchased or ordered at one time at the beginning of the month and charged off against the ration allowance in one operation. The con-

sumption of all may be standardized by a basic menu:

- | | |
|------------------|-------------------------|
| 1. Milk, fresh | 9. Milk, evap. |
| 2. Butter | 10. Lard, or substitute |
| 3. Eggs, table | 11. Bacon |
| 4. Eggs, cooking | 12. Flour |
| 5. Potatoes | 13. Catsup |
| 6. Sugar | 14. Onions |
| 7. Coffee | 15. Tomatoes |
| 8. Bread | (Condiments total 5%) |

The remainder of foodstuffs may be classified as meats, fresh vegetables, and fresh fruits. These three groups are "specials" for each day. By determining a standard average money allowance for each group per day, (less items in preceding paragraph) the problem of keeping within the ration allowance is greatly simplified. The second half of the ration allowance pays for these three groups.

Men live on their stomachs whether in the woods or in garrison. Officers conducting messes for the C.C.C. in the woods have a special problem not unlike that of troops in the field. Cooking facilities are limited. There is a shortage of dishes and kitchen implements. This is excuse for serving more stews and other composite foods. However the ingenuity of mess officers is overcoming many of the camp handicaps and the better camps are not unlike garrison as far as the menus are concerned. It is not essential that the entire dinner be heaped upon the mess pan at one time. Meals are readily divisible into integral parts such that the men can visit the kitchen two or more times with the same mess pan. As a rule vegetables should be served free of liquid in camp, except in a stew.

In the C.C.C. camps with which the writer is familiar the problem of supply ranges all the way from proximity to slaughter houses and modern food stores to remote situations dependent upon infrequent visits of supply trains (i.e. Ford mail truck nearly worn out). The average mess officer desires to purchase meats, fruits, vegetables, milk, eggs and butter locally with authority to claim increase in ration allowance on items of which the local price is higher. The advantage is a more dependable supply of perishables.

Food preservation is a serious problem but here again ingenuity has prevailed. Vegetable cellars, cold cellars, improvised ice boxes, and regular ice boxes are found in many camps. Ice supply is impossible in many locations, hence forcing resort to side hill cellars. Even these are denied to those on flat barren wastes.

It is suggested that the reader build up his own basic menu patterned after the one shown here, but adapted to the supply available to him and conforming to the dietary principles outlined herein.

[EDITOR'S NOTE: *The author, a graduate of the Q.M.C. Subsistence School and an experienced mess officer, is a recognized authority on the economics and nutrition of foodstuffs. His texts on practical nutrition have the indorsement of recognized national authorities including the Surgeon General of the Army.*]

Who Lost the Keg of Beer?

BY CAPTAIN FRANKLIN H. SPENCER AND CORPORAL L. J. REILLY, 240TH C. A.

LAST July the 240th C. A., Maine N. G., had its annual encampment at Portland, Maine. The first battalion (Harbor Defense) had a new projectile and powder charge to use.

This projectile (870 pounds) was lighter than any used before and called for a powder charge developing a mv. of 2,300 f.s. The powder tag indicated that it would develop 2,400 f.s. To make things more interesting, according to the Firing Tables for the 870-lb. projectile at a range of 20,000 yards, the p.e. in range would be 210 yards and 10 yards in deflection. Of course all of this caused everyone to expect almost anything but hits.

The 240th C. A. is very fortunate in having for its Senior Instructor, Lt. Col. J. S. Dusenbury, a man who is always looking on the bright side of things and trying to make others do the same. He conceived the idea of offering a keg of beer (3.2) to any battery if the target was actually hit during target practice.

The day of target practice finally arrived, July 12, to be exact. The men of Battery D were in fine fettle and anxious to demonstrate what could be done with the big guns. The day was hot (for Maine), long hours at the emplacement increased the heat and with it the thirst of the gunners. In fact the latter grew to such proportions that the keg of beer took on greatly exaggerated size and importance in their imagination. Also, it is to be remembered that the amber beverage had been absent (officially) from the Pine Tree State for nearly 50 years.

Sweet anticipation is a great incentive at times. To the men of Battery D anything seemed possible if only that keg of beer could be changed from a promise to a reality. On top of the parapet stood the senior instructor seemingly secure in the belief that the keg of beer was safe, at least for the present. Soon a whispering campaign was under way. No one was permitted to erase from his mind the prospect of the prize. Some resorted to chanting while others are believed to have resorted to silent prayer.

Finally the long-awaited command to commence firing was given. A shout went up from the emplacements. Cast-iron projectiles disappeared into the throat of the

giant to be next accounted for by huge splashes some 20,000 yards away. Everything happened according to schedule until shot No. 7, the shot that was heard all over Maine, sailed away into the great unknown. It must have had a couple extra prayers attached to it because in a very few seconds the airplane observer reported "direct hit." This was followed almost immediately by one of the observers shouting, "There goes the target." Some one else was heard to remark faintly, "There goes my keg of beer."

Then other things began to happen. The battery commander by almost superhuman efforts was able to stop a chew of tobacco just before it passed his tonsils. The head of the first sergeant, who by the way stands six feet five inches in his stocking feet, was heard to come in contact with the top of the B. C. station. Later reports indicated that the roof is still intact. While these things were happening the few remaining shots had given themselves up and were on their way to Davy Jones' locker. To the everlasting credit of those concerned the keg of beer and plenty of pretzels made their appearance the following evening; to the accompaniment of many high-powered toasts they disappeared into the great beyond.

The target now adorns the wall of the battery day room, the hole in full view as a monument to the memory of the mighty men of Battery D. We are hoping that next year the ante may be raised to a full barrel in place of a keg. The men are convinced that with a little luck they can make ten holes in the target in place of one. If these hopes and expectations are realized there should be plenty of beer for all the regiment. A taste of glory (and of beer) acts as a great stimulus to greater exertion in the accomplishment of difficult tasks. To what heights Battery D will attain at the next target practice will remain a mystery known only to the gods.

EDITOR'S NOTE: Battery D, 240th C. A., Maine National Guard, fired Battery Foote 12" Barquette Mount at Fort Levitt. The practice was conducted at an average range of 20,500 yards with a score of 105 for the practice.



Sweet anticipation is a great incentive at times.



THE POLITICAL IMPORTANCE of any state depends upon its military capacity.—
VON BERNHARDI.

Micro Waves and Their Application for Military Purposes

By DR. IRVING J. SAXL, CONSULTING PHYSICIST, RADIO RECEPTOR COMPANY, INC.

EDITOR'S NOTE: It is considered desirable to publish the following article on micro waves, not for its worth as demonstrated by accomplishments to date, but rather as indicating the trend of probable future developments.

It is believed that the claims made or implied by the author anticipate subsequent developments, but experimentation has proceeded to the point where it is reasonable to predict that at a later date micro waves will be used as a means of communication for short distances under certain specific conditions. However, careful investigation indicates that the necessary auxiliary apparatus for the transfer of messages from radio to metallic circuits would, in the case of a multiple circuit installation, make the cost of the new apparatus exceed the cost of metallic circuits. This naturally suggests that at the present time it is more economical and more satisfactory to continue the use of submarine or land cables than it is to adopt short-wave radio communication. The latest information indicates that the cost of the tubes has been greatly reduced and further reduction in cost is to be expected as a result of quantity production. It is worthy of note that the cost of the apparatus does not increase with distance as is the case with metallic circuits.

The United States Army Signal Corps Laboratory is now investigating several different kinds of tubes. If and when an efficient "optical" wave-length tube of reasonably long life appears on the market it will undoubtedly be used in special cases for short-distance military communication. To predict that the micro wave never will be developed to a point where it can supplant or replace the telephone as a means of communication, would indicate almost a complete lack of vision.

Information at hand indicates that tests made before authorized representatives of the Army have not conclusively demonstrated the worth of the instrument and its adaptability to the needs of the military service. Progress is being made and future developments may bring about a change in the situation.

IT IS agreed by all military authorities that the usefulness and effectiveness of an instrument of war is greatly increased if the personnel operating the instrument can be kept fully informed, by means of reliable and secret communication, as to what is being accomplished. Also, it is necessary that orders be transmitted swiftly and surely, not to mention the great advantage which occurs from the speedy transmission of enemy intelligence.

This applies particularly to the desirability of intercommunication between harbor defense batteries—transmitting messages from the commander to the various units of his command—establishing communication between the observer on land (or in air) with the battery so as to best direct its fire—communication between ships—communications from ship to shore, and many other similar conditions.

While a great number of communication systems are in use today, not one of them is able to fulfill all of the following requirements which should be expected from a nearly perfect system, namely:

1. It must be easy to transport.
2. It must be operated easily under the various exacting conditions of warfare.
3. It must work with speed and certainty over rough and difficult territory.
4. It must be secret.

5. No time should be lost in establishing communication.
6. It must not be tapped or intercepted by the enemy.
7. It should be difficult for the enemy to destroy.
8. It should be capable of operation without attracting enemy attention.
9. It should be simple and inexpensive in its operation and maintenance.
10. It should be simple in its construction.
11. It should be reasonably free from the necessity for repairs.

While communication systems have been known in history since the earliest times, one or more of the above-mentioned requirements have not been fulfilled. Take for instance flag signalling. This certainly is a simple means, but it has the disadvantage that it cannot be used in fog or at night. The signaller is in most cases visible, not only to his friends, but to the enemy as well, who may read the message or shoot the signaller. In addition, the signals are visible for only a short distance, which makes this method impractical for present-day long-range artillery fire with the observers often far removed from the guns.

Communication by telephone has been the most common means employed in recent wars. This has the disadvantage that lines may be destroyed by the enemy. This applies also to submarine cables which often have been destroyed, not only in war, but under ordinary commercial usage. Bombs dropped from airplanes, even anchoring ships, are a menace to telephone cables. Cable repairs, whether submarine or aerial, are slow and costly. In addition, they may be tapped and orders intercepted. The construction of a telephone line under enemy fire and other adverse conditions often makes it necessary to wait for the approach of night, and often enough cannot be accomplished secretly; besides considerable danger is entailed to the personnel engaged in the construction.

Now radio enters the field of communication devices. The apparatus used heretofore had the decided disadvantage of *broadcasting its position* to anyone who wanted to listen. Not only could the battery hear the observer's signals, but the enemy also could intercept them and by means of loop antennæ locate the sender. Frequently the sending station was placed in the neighborhood of headquarters, which by the same means could be located by the enemy. This brought about the placing of the sending station at some distance from the head-

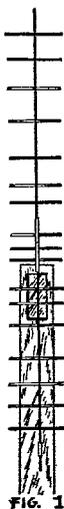


FIG. 1

quarters which it served, thus further complicating and delaying the transmission of messages. In addition, these radio systems are comparatively heavy and require the use of considerable electrical energy and special means for their transportation.

THE INVISIBLE, INDESTRUCTIBLE TELEPHONE LINE

What is needed for a practical communication system for the Army, Navy, and Aviation is a system that is *secret, invisible, and directional*. The advance of the electronic sciences has made possible this feat using micro waves.

Before we enter the practical side, let us consider first what micro waves mean in the realm of physics.

Micro waves are very small electromagnetic waves of a few centimeters in length. In the experiments to which we will refer, a wave length between four and ten inches has been used. We already know that very short electro-magnetic waves, which we call light, can be reflected, for instance, by the mirror of a searchlight. If we should try to reflect the usual radio waves of the communication and broadcast band, such mirrors would have to be many hundreds of feet in diameter. This would be impractical as the mirror always has to be many times the size of the wave length. By making the waves very small we can reduce the diameter of the mirror and still keep the ratio between mirror and wave length constant. Moreover, other reflecting and resonating systems can be designed which have *practically a negligible size* and do not resemble a mirror in any way.

SMALL CONCENTRATORS USED

Figure 1 shows such a concentrator used in the recent experiments. It consists of one center rod with a specifically calculated curvature. To this rod small crosspieces are attached, that have a definite mathematical relation to each other due to their size and position. It is thus possible with a properly designed device of this type to collect centimeter waves into a small, narrow bundle which can be concentrated and thrown in any desired direction, instead of radiating them all over the field as is done with the usual radio equipment. No signal can penetrate in any direction other than that toward which the reflector points, and it is thus possible to *establish an absolutely secret communication between two stations*. At the receiving end, an equivalent concentrator system is used with which the rays are assembled in the focal point and made perceptible by special detecting devices.

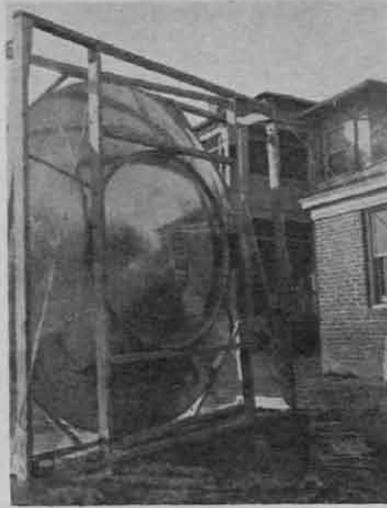


Figure 2

The transmitting reflector of the size which was necessary in the experiments across the English Channel before the development of the power tube.

POLARIZED APPARATUS

In addition to being able to concentrate micro waves into a beam which travels entirely in one direction, there is another means of increasing their secrecy, i. e., the transmitter can easily be regulated to *send out only polarized waves*. In addition to transmitting such signals, therefore, in one particular *direction*, the position of the transmitter can be adjusted, if desired, in such a way that reception can be established only in *one single plane*.

MULTIPLE TRANSMISSION

Due to their unusually high frequency, a very broad band of wave lengths can be used, and therefore this communication system is of the *highest quality and selectivity*. The width of the wave band, together with the freedom from static, makes the micro waves the ideal means, not only for secret and directional communication, but also as a carrier wave for telephotography, television, high-speed teletypewriters, etc. As a matter of fact, the width of the available micro wave channels is so big that it is possible to have more than one communication band going over the same transmitting and receiving set. A number of messages can be transmitted, therefore, over the same beam simultaneously.

What does the use of those centimeter waves mean for military purposes and the communicating engineer in general? Not only that such waves are being reflected by small concentrators and *transmitted in one direction only* but, moreover, it can be said that *they do not travel appreciably beyond the horizon*.

In this connection it is of importance to consider the factor of the wave length. While in recent press dispatches it was stated that Marconi was able to receive signals somewhat below the horizon, it must be kept in mind that he is working at a wave length of 65 centimeters. At a wave length of 18 centimeters or less, no signals have been received as yet beyond the optical distance.

SECRET COMMUNICATION

It is now possible, for the first time, for the commander of a battle fleet to issue his orders with the certainty that they will not be received by the enemy. By regulating the height above sea level of the transmitter, attached (for instance) to the mast of the battleship, and by tilting the concentrators, the total distance within which micro waves of a few centimeters wave length can be received can be controlled at will. In addition, the direction in which they travel can be selected. It is possible to transmit within *one sector*

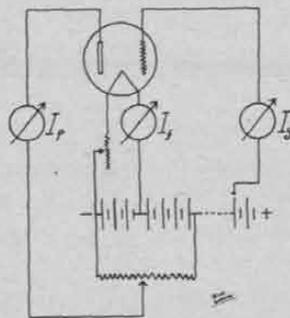


Figure 3
Schematic Wiring Diagram

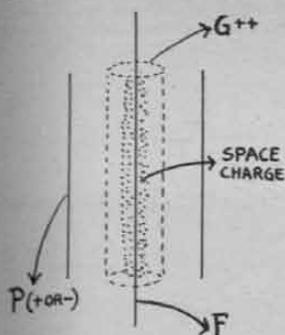


Figure 4

Schematic cross section through triode working under BK principle.

only over a wider angle, or to broadcast with micro waves simultaneously in all directions

Many difficulties have been encountered in the production of micro waves of any considerable power. The newly developed micro wave tube of the Radio Receptor Company is the first tube that gives power at low wave lengths. While transmitting across the

in which "L" is the self-inductance of the oscillating system, "C" its capacity, and "v" the velocity of light.

It will be understood readily that the minimum of self-inductance and capacitance is a single, straight wire connecting plate and grid. With this straight wire as short as possible, *no wave length can be produced below one meter* with any degree of output efficiency. A wave length of one meter, however, is still much too long to be considered of use in directional reflecting systems. Therefore, an entirely different circuit and tube were developed, in which the effect of capacitance and inductance of outside circuits is practically eliminated.

B-K CIRCUITS

Figure 3 shows schematically a wiring diagram of this Barkhausen-Kurtz principle (called B-K Circuit). A specially constructed triode, consisting of a plate, a grid and a filament, is connected in such a way that the maximum positive voltage is not on the plate, but on the grid. The plate has a negative or a very small positive voltage.

Electrons emitted from the filament will travel toward the electrode with the highest positive charge which in this case is not the plate but the grid.

Figure 4 shows schematically what actually happens in the tube according to the present theories about the origin of these oscillations. The filament, "F", emits a cloud of electrons which is immediately attracted to the grid, "G". Due to their velocity, however, these electrons are not fully absorbed by the grid, but they travel through the openings between the meshes of the grid toward the plate, "P". Here they are partly repelled from the plate due to the braking action of its potential; at the same time they bombard the plate and liberate secondary emissions.

This electronic cloud, which was produced upon the plate by the electronic bombardment, travels again toward the electrode of higher potential, "G". It passes it once more, goes to the filament, is repelled again, and thus a pendular action of the electrons occurs, creating electro-magnetic oscillations, the wave length of which is determined by the time which elapses for the center of gravity of the electronic clouds to travel to and from the grid.

Interesting effects of potential distribution occur, and in addition new sources of losses at these frequencies have to be avoided in an efficient tube construction. They occur almost solely at ultra high

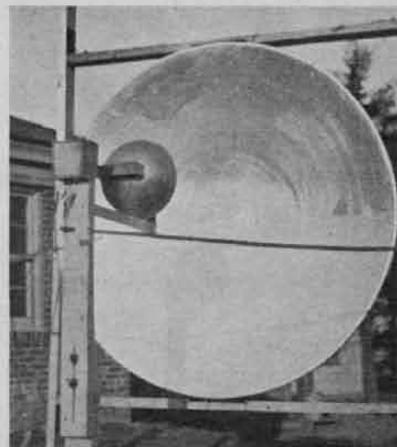


Figure 5

A Transmitting Reflector

English Channel, reflectors had to be used which were ten feet in diameter (of the type shown in Figure 2). The newly developed tube, due to its greater power, *does not require such large reflectors*, and the resonating system shown in Figure 1 is all that is necessary for satisfactory communication.

The danger of detection by the enemy, always present with long waves, is eliminated with the introduction of this system. In addition, for the first time, a small and transportable outfit has been constructed for micro waves with which it is possible to establish directed telephone or code communication between two points within an optical distance of more than ten miles.

SMALL TRANSPORTABLE OUTFIT

The entire system is operated by one storage battery or a 35-pound portable plant. Due to its special construction, this is the only system which does not need high voltage or large current supply, and thus *can be handled without danger* to personnel or property. This is of great importance, as other systems, despite the fact that they transmit only a fraction of the power used in the system mentioned above, require the use of potentials up to 1,500 volts, need power lines and are not readily transportable. They are dangerous to handle, particularly upon wet ground. On the other hand, the system discussed in this article *uses only one storage battery*. While it can be operated also from power lines if desired, this source of energy can be replaced by a battery; thus it is possible to transport the equipment into territory inaccessible to other sources of power. This is of particular importance for inter-trench communication, inter-island communication, communication between observer and battery, and many other conditions.

How does the micro wave system work? Use has been made of a discovery by Barkhausen and Kurtz which makes it possible to produce radio waves a few centimeters in length. These cannot be produced in regular triode circuits of the regenerative, feed-back type, as there is a limit set in the wave length of ordinary transmitters. In a regular oscillating circuit the wave length " λ " is determined by

$$\lambda = v \cdot 2\pi\sqrt{LC} = 1,885\sqrt{LC} \times 10^9 \text{ (meters)}$$

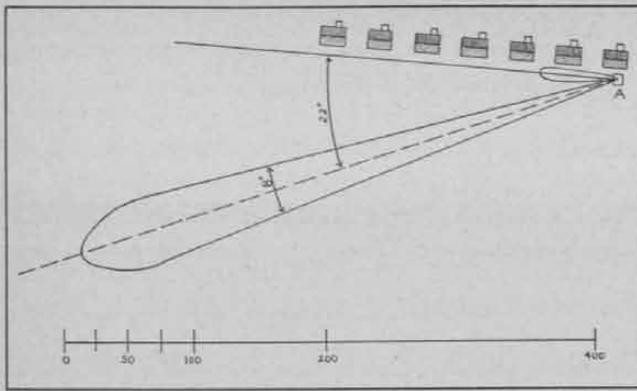


Figure 6
The Angle of Radiation

frequencies and have to be eliminated before the tube is to act as a powerful transmitter. In the tube used in our experiments, oscillating current of more than seven milliamperes at 300 volts can be generated. This compares favorably with the two or three milliamperes at 200 volts which were formerly produced only with difficulty.

Certain constructional details bring about a maximum efficiency of this tube at approximately fifteen centimeters wave length. As mentioned before, the wave length created is dependent more upon the time of traveling of the electrons within the space between the electrodes than by any outside electrical dimension of the oscillating circuit. Therefore, an *unusual stability* of this system can be produced under the most diversified conditions, as it is inherently *stabilized by its internal construction*.

Using small reflectors, successful experiments recently have been made. Figure 5 is a picture of the transmitting reflector. The receiving reflector stood about three-quarters of a mile away and could be seen with difficulty even in very clear weather. With this system, perfect directional telephone communication could be carried on. While at that time no greater distance was available for the experiments, the results proved clearly that more than ten times this distance can be bridged. This is more than sufficient under practical operating conditions, for inter-battery communication, or communication between ships, lighthouse-to-shore telephony, harbor defense, fire control, etc.

If the reflector is raised, as for instance upon a tree or on top of a ship's mast, 20 to 30 times this distance can be covered in any direction, thus giving practically a means of secret communication in any direction and for any desired distance.

THE ANGLE OF RADIATION

The high degree of secrecy of this system becomes clear if measurements are made of the angle of radiation. For this purpose the transmitter is turned upon a protractor. Figure 6 shows the intensity of radiation, drawn in a polar coordination system and shows the intensity for each degree of radiation. As the diagram shows, the maximum of radiation up to a falling off of the same to 50 per cent of its initial value is *rather narrow*. In our experiments it

was approximately eight degrees. Since then it has been reduced to less than half this size for distances of ten miles or more.

This means that the beam of micro waves can be thrown in a very narrow angle, narrow enough so as not to be intercepted by the enemy, but still not too critical so that precision adjustments, which are still essential in transmitters for visible light and infra-red rays, are unnecessary.

These micro waves travel under conditions where light could not penetrate. *Fog, snow, or rain are no hindrance* or disturbance for these rays. This shows their advantage over infra-red or light transmitters. Moreover, about ten feet of brushwork (Figure 7) was put before the receiver, and perfect reception established, showing that this type of high intensity micro wave can *penetrate* considerable distances in *woods and underbrush*. It is thus possible to put the micro wave transmitter behind a door, hide it in the branches of a tree, or establish it in the edge of a forest, so that the apparatus and the man handling it can be screened from view.

THE REFLECTION OF MICRO WAVES

There is one more thing of interest on the micro waves that may open for them a new field of application. As we have seen in Figure 6, the intensity of the micro wave transmission goes down to zero at about eight degrees; at 22 degrees another signal suddenly occurs. It was interesting to note in this connection that the signal received at 22 degrees was not coming from the transmitter directly, but was *reflected by the walls* of a house and its metallic contents. It may thus be possible not only to use this system for communication but perhaps for the *location of objects*, not only houses, but it may be possible to develop this system for locating ships in any weather. Indirectly, by locating the position of a number of objects, it is naturally possible to find the position of the transmitting equipment in a most exact way and thus to determine its own position. With similar apparatus such a system could be used for collision avoidance, geodetic survey, etc.

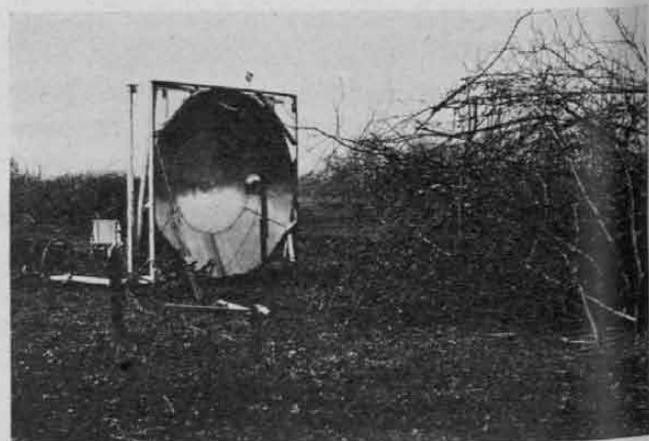


Figure 7

The Micro wave transmitter working behind approximately ten feet of brushwork.

Many tasks that can be performed by photo-electric cells or infra-red light can be accomplished more satisfactorily with the micro wave equipment. For instance, in guarding a strait or a channel, the micro wave beam has the great advantage over light beams and photo-cell control, in that it *operates irrespective of weather* conditions and that it is invisible at night or day to the enemy. Signals between a micro wave transmitter placed on one side of a channel and a receiver on the other will be interrupted immediately if an object should pass between them. This interruption may be used to determine the presence of trespassing vessels.

For means of communication, this *invisible, indestructible, phantom line* gives unusual possibilities. In addition to the ones discussed already, the following may be mentioned:

Communication between forts or between islands and the mainland.

Inter-island communication, saving expensive cables, repairs and maintenance, and avoiding the danger of being tapped by the enemy or destroyed by his depth bombs.

Lighthouse to shore communication.

Ship to shore communication.

Communication for Coast Guard and patrol boats.

Communication between an airplane carrier and its airplanes. The airplane carrier could send out messages on micro waves without enemy detection. In thickest weather orders could be given to the planes, and on the other hand, the planes could locate their mother ship or their landing field under all conditions.

Communication may also be between airplanes in flight. The Commander could talk to his squadron. An airship could communicate with the main fleet, or with another airship *without such signals reaching the ground*.

Ships approaching docks in foggy weather could be in constant micro wave communication with the shore, greatly facilitating their maneuvering.

Another use of considerable importance is the control of artillery fire from airplanes.

Naturally also, these easily movable micro wave systems are an ideal means for communicating over desert areas, swamps, ice, etc.

As a directional beam for steering through mine fields and a beam along which airplanes can fly, these highly penetrating micro waves may find another outlet in the near future.

There are many additional uses not mentioned here to which this new equipment can be put advantageously.

Micro waves are free from static; they are not influenced by electrical storms, running internal combustion engines, automobiles, airplanes, etc. They are also free from fading.

As a means, simple in its operation and maintenance, of the highest reliability and applicability under many more conditions than any communication system used heretofore as a means of secret directional communication, as well as for the broadcasting over a limited and definite area, and as a means of locating objects, this new apparatus promises to be of the greatest value for the many purposes of Army, Navy and aviation as well as innumerable commercial activities.

Address Changes

SUBSCRIBERS are urged to notify us promptly of each change of address. The infrequency in publication of the Army List and Directory has proved this medium as unreliable, due to changes made between dates of publication. Leaves of absence and temporary addresses on changes of station are missing from War Department orders. Notices of change of address furnished by the Post Office Department in many instances are illegible or incomplete; such notices, formerly furnished publishers free, now require payment of 2c postage by the publishers.

We earnestly request each subscriber to advise us immediately when he moves or is transferred. Just send us a postal card, giving:

Name-----

Old Address-----

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Looking Humpward

A LIEUTENANT'S EYE VIEW OF PROMOTION

THE old retired officer snorted: "You think promotion is slow these days? Why, when I joined my first troop as a shavetail, the Old Man of the other troop on the post was a captain who had his own son for his lieutenant. And then, a few months later, a brand new second lieutenant arrived for duty with that same troop. He was the Old Man's grandson!"

The Oldtimer has probably produced an all-time record of infinitesimal attrition, but, barring the accident of war and the resulting promotion boom, the late '40s and early '50s of this Century of Progress are going to produce lieutenants whose fathers are Captains.

If my son has inherited his father's abilities (I hope his mother doesn't read this) he will serve as a second lieutenant a couple of years while I am a captain, and I was commissioned nine years before he was born. Then, too, I know of a class godson who can put in about eight years as a lieutenant, about three of them as a first lieutenant, while his father marks time as a captain. To strain the family tie still more, this first lieutenant might even become an adjutant: "Sir, I report as New Officer of the Day, you damned brat!" "Usual orders, father, and no more of this inspecting the guard five minutes before reveille the way you've been doing as long as I can remember!"

Don't laugh, such fantastic situations may actually be ordinary not many years from today.

The single promotion list has now been functioning for some years, and during this time much has been said and written about the plight of the World War "hump." As a lieutenant below the "hump," the writer was curious to see what it looked like. A piece of cross-section paper was obtained, one thing lead to another, and the result was a chart,

Going back to the promotion list published in January, 1923, we find the situation in the Army just after the "big bust" of December 15, 1922. This list was split into year-groups, each year-group headed by the senior man of the West Point class graduated that year. Other promotion lists were then plotted as published in July, 1925, '27, '29, '31, and '33, and we have a series of graphical ladders of promotion.

The positions of certain West Point classes have been indicated on the ladder for 1933. Somewhere in the long black riser headed by the class of April, 1917, there is buried the West Point class of August, 1917. Likewise, the year-group headed by the class of June, 1918 contains the two classes graduated on November 1, 1918. Between the June, '18 year-group and the June, '20 group there is a little block of less than 100 files. It is headed by and contains a couple of "submerged captains."

How many second lieutenants today know what a "submerged captain" is? They were frequently mentioned

about a decade ago. Ask some grizzled first lieutenant; he'll tell you all about them, and he may even let fall a hint that he would not have minded being "submerged" himself.

A comparison of the January, 1923, ladder and the July, 1933, ladder shows that the three large year-groups containing the World War officers have lost about 1,150 files in the interim. Many of these officers must have estimated their chances of ever attaining suitable rank with their increasing ages, and found the estimate discouraging. This, coupled with the fact that they could see no prospect of ever being able to cash in on their meager earned equity in retired pay short of the age of sixty-four, must have caused a great majority of the 1,150 to quit the army while still young enough to start a new career in civil life.

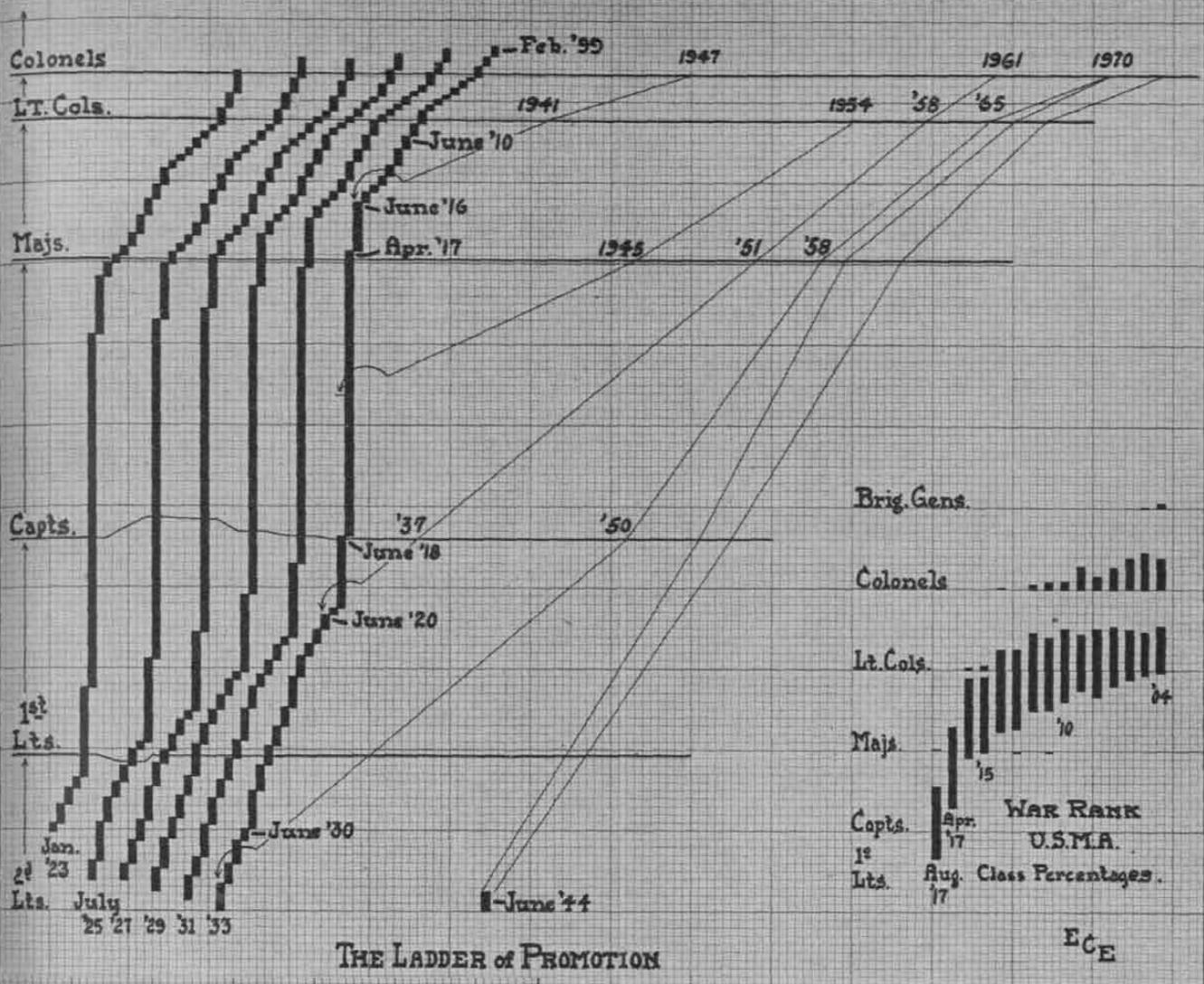
In recent years, the Chief of Staff, has often referred to the bleak promotion outlook facing our present lieutenants. After thumbing through hundreds of pages in the files of the *Army and Navy Register* and the *Army and Navy Journal* for these authoritative figures, we may draw a few lines on the chart, and read the future.

The senior surviving member of the U.S.M.A. class of June, 1916, will become a lieutenant colonel in 1941 and a colonel in 1947, but probably a year earlier in each case.

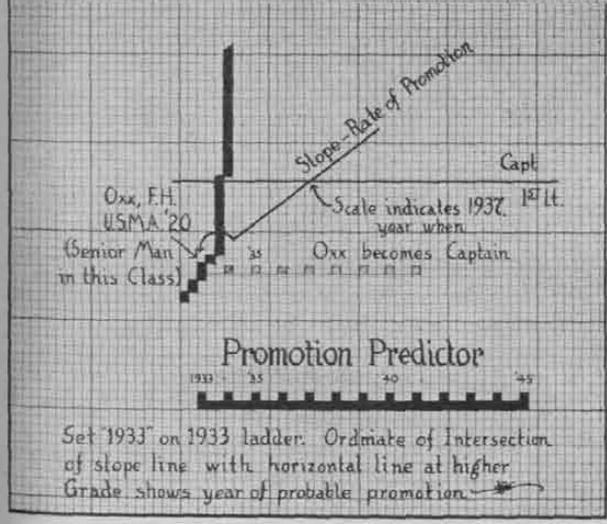
An officer in the middle of the "hump" will get his majority in 1945, and he may have his oak leaves silver-plated in 1954. He will never have to buy eagles, however, because he will be retired for age too soon.

The U.S.M.A. class of June, 1920 will be lucky. The average age of the members of this class is two years less than usual for a West Point class. Thus armed with youth, the senior surviving member of the June, '20 class will become a captain in 1937, a mere recruit with seventeen years of service as a lieutenant. After fourteen years more, in 1951, he will realize his oft-intoned wistful wish, "Gee, but it must be great to be a major!" In 1958 he will become a lieutenant colonel. In 1961 he will attain the rank of colonel just a year or two before he retires for age.

So much for the senior surviving member of the class of '20. An officer in the same class, but a mere goat a hundred files lower on the list, will complete seventeen years of service and will lose the difference in pay between the third and fourth pay periods, about \$78.00 a month (arithmetic not guaranteed), while he is waiting six months or so for his promotion to captaincy. Perhaps he will get his majority in '52 or '53. Maybe he will be promoted to lieutenant colonel in 1962 or '63, but at any rate there is an excellent chance that he will never become a colonel, in spite of his advantage of two years in age.



THE LADDER OF PROMOTION



To estimate the year of a future promotion it is necessary to draw a sloped line conforming to the other lines given on the chart. This line will intersect the horizontal line which indicates the bottom of the next higher grade. Counting spaces horizontally from the 1933 ladder to the ordinate of the intersection of the slope line with the horizontal line will give you three times the number of years which will intervene before the year of promotion.

Prospects for our lower ranking lieutenants then improve. The senior surviving member of the U.S.M.A. class of 1933 will rise in rank almost rapidly, a captain in 1950, major in '58, lieutenant colonel in '65, and a colonel in 1970.

The question now arises, who will be the generals and chiefs of branches from 1953 to 1963, positions to be filled by officers with four years yet to serve? At present writing, I do not know, but it seems to me the only

way a now "senior" lieutenant can ever hope to obtain stars for his shoulder straps is to prove to the Adjutant General that he was born some years later than his own parents claim.

It has been pretty generally agreed that the *ideal* promotion rate for our army would make an officer a captain in about nine to ten years' service, a major after fifteen to seventeen years, lieutenant colonel in twenty-two to twenty-three years, and a colonel after twenty-six to twenty-eight years of service. This would leave an officer a reasonable length of time to serve as a colonel and also be available for the highest positions in the army.

Suppose we apply the *ideal* rate of promotion to the hypothetical West Point class of 1944. We discover that the senior surviving member of the class of '44 will become a colonel in 1970, the same year that the ranking

officer from the class of '33 will attain that rank under the existing rate of promotion. There you have, in years, the difference between the two rates of promotion.

Compare the slopes of the lines representing the *ideal* promotion rate with the slopes of the other lines on the chart which show the rate of advancement of the officers selected as horrible examples. It is immediately apparent what a haphazard flow our present rate of promotion produces.

The writer hesitates to draw further doleful conclusions from his chart, but any reader may pick his own position on the 1933 ladder of promotion. He may then draw a line conforming to the slopes of adjacent lines, and read his own bad news. The horizontal scale of the chart is three small divisions to one year.

Most of us have been shown in the past six months of experience with the CCC just how valuable a man a plain ordinary private is. The realization is now growing in the service that lieutenants, too, are capable of assuming responsibilities, and command much above that usually accorded them. Records also prove it.

Cullum's Register affords a convenient means of ascertaining the highest rank attained by young West Pointers in the World War. Officers of similar service, commissioned in the regular army from other sources, gained as much or more promotion, but their records are more difficult to tabulate, so we will only consider certain U.S.M.A. classes which were graduated in 1917, or earlier.

The diagram shows that certain members of the classes of 1904 and 1905 became brigadier generals. These of-

ficers had had less than thirteen years of commissioned service when we entered the war. Today, there are over a thousand lieutenants in the Army with more than thirteen years of service. In case of emergency, will some of these thousand lieutenants advance rapidly to the command of fighting brigades? Personally, I can name you a dozen potential brigadiers in one breath—some other fellows, not me—but I think the War Department has fully answered this question in detailing selected lieutenants to Leavenworth.

This action of the War Department is encouraging, and it definitely disposes of the rumor that the real "forgotten man" is a lieutenant.

The future may not seem rosy to lieutenants today; in fact, it is difficult to imagine how it could be worse, but it must be remembered that anything done to affect promotion is bound to make things better for lieutenants. Now that the battle-hymn of the republic has become "Who's Afraid of the Big, Bad Wolf?" and the regular advance of the Century of Progress is being resumed, we may rest assured that the War Department and Congress will shortly give us an improved promotion system.

So-o-o-o! Be of good cheer, Lieutenant Ducrot! Something approximating the *ideal* promotion rate is just around the corner!

P. S.—While I would not counsel lieutenants to rush out and buy captain's bars and get three-year options on heavy gold oak leaves, I am optimistically considering writing a lullaby for the use of lieutenants who are fathers, beginning "Don't cry, little one, don't cry Daddy will be a major, bye-and-bye!"



IN TIMES OF STRESS a nation's voice is heard in international affairs in proportion to its land and sea strength plus position. Conversely, the attainment of strength plus position is largely dependent upon the statesmen who conduct international affairs and their recommendations to government and people. Also the attainment of position plus strength for sea power often depends on land power and, again conversely, land power depends frequently on sea power to give it strength or position or both. Sometimes one is to the fore and sometimes another, but to attain great results all three must work together for the common cause.—CAPTAIN C. C. GILL, U. S. N.

The Grand Strategy of the World War

From the Viewpoint of an "Easterner"

BY CAPTAIN GORDON GORDON-SMITH

PART III

WHILE the Serbian contingent was, as described in my second article, carrying out the operations which culminated in the capture of the Kaymakchalan, the giant mountain of the Moglene range, thus permitting the Serbs to debouch on the plain of Monastir, important events were taking place in Salonica.

On the right of the front the Bulgarians had begun an offensive, invading Greek territory in three main groups. On the eastern sector they advanced south from Demir-hissar, the Greek troops withdrawing before them. The Greek forts of Lise and Starshiste surrendered without offering the slightest resistance. Two days later it was announced that the Vrundi Balkan (or Sharteya Planina) had been crossed and that the Bulgarians were advancing on Seres. In addition, on the eastern frontier, the Bulgarians crossed the Nestor (or Mesta Su) and sent forward an advance guard to reconnoiter the road to Kavala. Further west, in the central sector of the Vardar, the troops under General von Winckler pushed forward. For some time the enemy was held in check by the British troops, but after destroying a number of bridges these fell back to the Struma-Lake Tachinos line and left the task of defending Eastern Macedonia to the Greek Army.

Kavala was the Headquarters of the Fourth Greek Army Corps. The 6th Division, under the command of General Bairas, was stationed at Seres. In the temporary absence of that officer the Division was under the command of Colonel Christodoulou. The advanced fort of Phea Petra, on the road between Demithissar and Krusavo, was the first to offer resistance to the Bulgarian armies. The Commandant of that fort, Major Kondhilis, refused to surrender it and lost his life in the attack by which it was captured. This gallant action on his part was not without its effect on the garrison of Seres. Colonel Christodoulou and the men of the 6th Division put up a good fight, inflicting heavy losses on the Bulgarians. The Greek losses were two officers and over 100 men.

When the news of this reached Athens, King Constantine immediately telegraphed orders that the Greeks were to cease all further resistance and Colonel Christodoulou was relieved of his command. The latter, how-

ever, succeeded in reaching Kavala with two regiments and there embarked on the British and French warships off that town.

The Commander of the Fourth Army Corps, General Khatzopoulos, obeyed the orders from Athens and surrendered his whole command, 8,000 men, to the Bulgarians. This Army Corps was first interned in "honorable captivity," as the Germans described it, in Seres and later transferred to Goerlitz in Germany, where it remained until the end of the war.

This fresh act of betrayal by King Constantine was more than even the population of Athens could stand and a dangerous excitement made itself manifest in the Greek capital. In order to calm this and to conciliate the indignant but long-suffering Allies, the pro-German Chief of the General Staff, General Dousmanis, who had given the actual orders for the surrender at Kavala, was given 45 days leave of absence and his Assistant, Colonel Metaxas, was relieved of his functions.

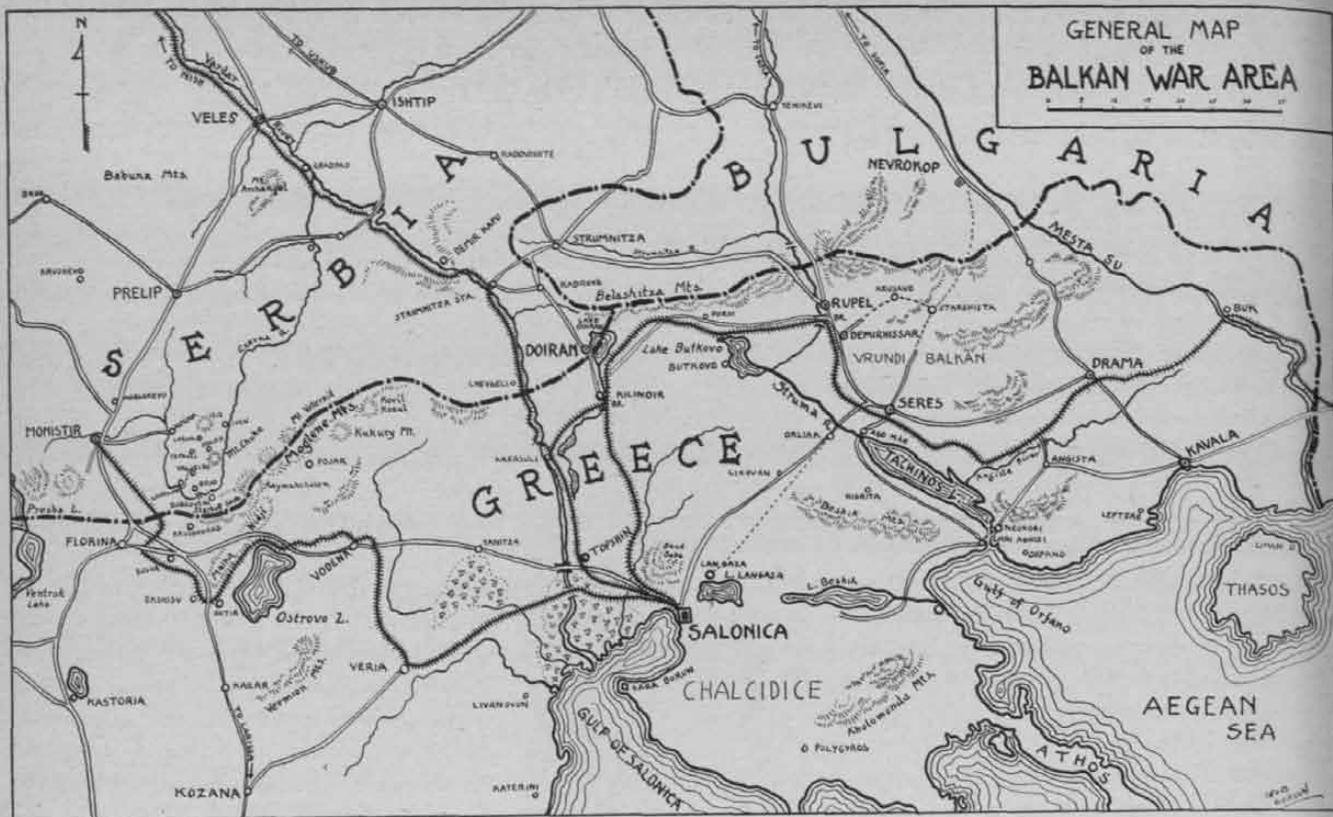
The excitement, however, still continued and M. Venizelos and other patriotic leaders made violent protest against the King's action. M. Venizelos warned him that he and his friends would take steps to prevent the approaching catastrophe. He with General Danglis and Admiral Koundouriotis then left Athens for Crete where they proclaimed a revolution.

In Salonica the excitement was even greater than in Athens. Indignation meetings were held daily at the White Tower and on August 30th things came to a head. The Cretan gendarmerie and other military forces revolted, proclaimed a revolution and took over the city. The Greek regiment in garrison surrendered and was disarmed and shipped off to Athens. Two days later M. Venizelos, General Danglis and Admiral Koundouriotis arrived in Salonica, took over the Provisional Government and declared war on Bulgaria, thus becoming the ally of the Entente Powers.

This greatly clarified the political situation in Salonica but there was unfortunately no great improvement in the military and strategic situation. It was notorious that in London and Paris diametrically opposing views were held regarding the Salonica front. The British Imperial Staff regarded it as one of secondary importance to be



The Prince Regent Alexander,
Commander in Chief of the
Serbian Army



held down to a minimum. Military writers in London referred to it contemptuously as "the Salonica side-show". Things had even reached a crisis at an early stage when Lord Kitchener, on his way home from an inspection of the Gallipoli position, paid a visit to Salonica and on his return to London, flatly advocated the evacuation of Salonica. It required the energetic intervention of Marshal Joffre in London to prevent this disastrous proposal being carried out.

With a view to killing all interest in the Salonica front the British authorities ordered all the English newspaper correspondents to leave, with the exception of Mr. Ward Price, representing the Associated Newspapers of London, and Mr. Ferguson, the correspondent of Reuter's Agency. They were "personally conducted" in British staff cars when visiting the front and their dispatches were severely censored. On arriving in London these were censored a second time and sometimes entirely suppressed. This had the result that the Salonica front practically disappeared from the columns of the British press. The "man in the street" knew nothing of it and cared less. Reinforcements were reduced to the absolute minimum, making Salonica the "Cinderella" of the war fronts. On account of the weakness of the Army of the Orient no success could ever be followed up.

Then there was trouble in the French High Command. During the operations at Florina there had been such a violent dispute between General Sarrail and General Cordonnier, the commander of the French contingent, that the latter handed in his resignation and left for Paris, where he laid his views before the Government.

General Sarrail, however, having the cable at his disposition, got his views in first, so that the Government found itself in a complete quandry, being in possession of two diametrically opposing reports on the situation in Salonica.

In order to obtain first hand information, the Government instructed General Roques, the Minister of War, to take ship for Salonica and examine the situation on the spot. No hint of his journey was allowed to transpire with the result that he arrived at Headquarters in Salonica "like a bolt from the blue". He at once began his investigation. With General Sarrail he visited the whole front and heard his views. His decision was, on the whole, favorable to General Sarrail but he informed him at the same time that the Allies expected results and warned him, if he wanted to retain his position, that he would have to justify the existence of the Army of the Orient by some success.

The French Commander-in-Chief thereupon decided to capture Monastir, the most important city in the hands of the enemy. He asked Prince-Regent Alexander if the Serbian Army would undertake the task. This Prince Alexander consented to do on condition that the Serbian Army was reinforced by a French division and the Russian contingent and that the supreme command of all these forces should be in the hands of Field Marshal Misitch, one of the most brilliant soldiers in the Serbian Army.

The task was a difficult one. It meant dislodging the enemy from strongly fortified mountain positions with a force inferior in numbers. This series of operations was

one of the most brilliant in the whole military campaign. They began on October 11, 1916 when Field Marshal Misitch's army crossed the Czerna Reka between Dobroveni and Brod. On October 17 the villages of Voljesdo and Brod were captured. Two days later the capture of Bardilovo threatened to cut off the Bulgarian retreat and they fell back precipitately, pursued by the Serbian cavalry, uncovering the route to Monastir. But until the enemy was driven from the mountain positions to the west it was useless to try to profit by this success.

The first Serbian Army then pushed north from Gardilovo, capturing a number of guns and over a thousand prisoners. On November 9 the Serbs captured the heights of Mount Chuke and the village of Polog. A Bulgarian counter-attack failed completely, the Serbs taking nearly 1,000 prisoners, mostly Germans. The village of Iven, further north, was then taken, followed by the capture of Tepavci and Chegel and the victorious Serbs pushed forward to the 1212-meter hill, the key position, on which the fate of Monastir depended. This was carried by an attack with the bayonet by the Serbs and the 2nd Regiment of Zouaves of the French division.

This success rendered Monastir untenable and twelve hours later the German-Bulgarian Army was pouring across the Czerna Reka at Novak in full retreat. The victorious French, on November 11, marched into Monastir with bands playing and colors flying. The Serbs, however, wanted to share in the honor of the capture and the 4th Regiment of Cavalry swam their horses across the Czerna Reka and galloped to the town, the dripping troopers entering it from the north at the same moment that the French entered it from the south.

This closed as brilliant a series of operations as was fought on any side in the World War. But, unfortunately, with this effort the Army of the Orient had "shot its bolt". It had no reserves to follow up the fleeting enemy and turn their retreat into a rout. King Peter's gallant army had again fought itself to a standstill. The men of the First and Third Armies had, by five weeks of ceaseless mountain warfare, reached the limit of human endurance.

As a consequence the enemy retreated, practically unmolested, in the direction of Prelep, where they again proceeded to entrench themselves and the whole weary game of trench warfare began afresh. The war on the Salonica front had again resolved itself into a position of stalemate which was, on account of the conflicting views of the Allies, destined to last nearly two years.

Meanwhile a similar condition prevailed on the other fronts of the World War. On the western front the struggle swayed back and forth, each side losing enormous masses of men in an effort to break through the line of hundreds of miles of blood-drenched trenches. On the Russian front the Germans and Austrians had bent back but had not broken the line in Poland. On the Isonzo front the Italians, after eighteen months of fighting, had hardly pushed forward a score of miles into enemy territory, the strong Austrian positions along the mountains

Scenes from the Serbian retreat through Albania



effectually checking the Italians' further advance.

In Palestine General Allenby, aided by the Arabian revolt engineered by Colonel Lawrance, was just holding his own against the German-led Turkish forces. The war had resolved itself into one of attrition, without any prospect of either side scoring such a decisive victory as would enable it to force the surrender of its adversary.

The life-line of the Central Powers was the Berlin-Constantinople railway. Scores of German functionaries had been sent to Serbia, Bulgaria, Roumania and Asia Minor. The whole territory had been cut up into divisions like a chess-board and from these a stream of food-stuffs and raw material was being poured into Germany, to support the armies in the field. The famous copper mines of Bor in Serbia and the chrome mines near Uskub were being worked night and day to keep the Krupp Works in Essen supplied.

The possession of the Dardanelles enabled the Central Powers to maintain their stranglehold on Russia and completely isolate that Empire from all communication with her Allies.

Only one front, that held by the Army of the Orient, was in a position to strike a mortal blow at the Central Powers and cut the life-line between Berlin and Constantinople. But that front, because of the failure to reinforce it, was reduced to the same position of stalemate as the others and the war dragged on month after month.

Some four months after the capture of Monastir I was with the Staff of the Morava Division, in the village of Iven, perched among the snow and ice on a wind-swept mountain summit, when Colonel Panta Grouitch, the commander of the Division, received notice that the Prince-Regent, accompanied by General Terzitch, Minister of War and Field Marshal Misitch, who were on a tour of inspection, would visit the Headquarters the next day.

After lunch in the mess tent the following day I was speaking with General Terzitch regarding the campaign and asked him, "Are we going to have an energetic offensive this spring, General, and break the enemy line"? At this point Prince Alexander broke into the conversation and said: "No, no, that is not the intention of the Entente Powers. The Salonica front is regarded as a front of secondary importance. Its mission is to draw down as many enemy troops as possible, immobilize them and prevent their being used elsewhere. There is no intention of taking the offensive."

"That, Your Royal Highness, seems to me a most curious point of view", I replied. "In my opinion there is no front in the whole war where such tremendous re-

sults, strategic and political, would follow a successful offensive."

Prince Alexander laughed. "I see that and you see that, but try and get the Imperial Staff in London to see it. When I was in London I discussed the whole question with Lord Kitchener and Sir William Robertson, Chief of the Imperial Staff, for two hours. They listened to me very politely but maintained their point of view. Since then I have sent telegram upon telegram, dispatch upon dispatch, but without effect".

Some days later I was called to London on urgent private business. Before I left I had another interview with the Prince Regent and offered to do my best to find out what were the reasons for the British objections to the Salonica front. The question was rendered the more acute by the fact that Lord Northcliffe's paper, the *Daily Mail*, had on, January 18, 1917, published an article proposing the evacuation of Salonica by the British

forces. As this article had been passed by the British military censor, it caused the worst possible impression in Paris.

On my way to London I stopped at Paris, where I had lived for years before the war, in order to inform myself thoroughly of the French attitude towards the Salonica front. Here I discussed that front with M. Stephen Pichon, former Minister of Foreign Affairs and then editor-in-chief of the *Petit Journal*, with Senator Humbert, President of the Committee on Military Affairs of the Senate, with General Malterre, the famous French military writer, with the Russian General acting as liaison officer at the Inter-Allied Headquarters, and with a score of other important Frenchmen. I found them unanimous in favor of an energetic offensive by the Army of the Orient and equally unanimous in deploring the shortsightedness of the British military authorities.

Finally I had an hour's talk with M. Aristide Briand, the French Prime Minister. When I urged to him the importance of the Salonica front he smiled and replied, "my dear Mr. Gordon-Smith, you are 'preaching to the converted'. It was I who sent the Army of the Orient to Salonica and have kept it there. If you see Mr. Lloyd George in London you can tell him from me that I am more convinced than ever of the importance, strategic and political, of the Salonica front." It was therefore clear that there was a complete conflict of views between the French and British General Staffs.

A few days later I was in London and found myself face to face with a stone wall. The public knew nothing about the Salonica front and cared less. Except for an occasional paragraph all mention of it had disappeared



Fieldmarshal Buyovitch,
Serbian Chief of Staff during the Salonica
Campaign

from the public press. Strange to say, the only man in public life who seemed to have a proper comprehension of its importance and possibilities was Mr. John Dillon, the leader of the Irish Party in the House of Commons. He had made a strong speech in the House, denouncing the inaction of the Army of the Orient and the attitude of the British military authorities toward it. I imagine that it was the presence of the Irish Division at Salonica which had aroused his interest in that front.

The only organ of public opinion which dared to reproduce this speech was the *New Europe*, edited by Dr. Seton-Watson, one of the few men in England who had a thorough knowledge of the Balkan situation and a realization of its importance in the strategical situation.

One of my first visits was to Lord Northcliffe. Though the war policy of the *Times*, the *Daily Mail* and the other journals he owned had been completely "Western" and had completely ignored the Salonica front, Lord Northcliffe was a man who was always willing to hear both sides. I had several talks with him. As a result of these he consented to have an editorial written for the *Times*, pointing out that there was a Salonica front on which were 400,000 men and asking what were its *raison d'être* and the reasons for its non-activity. Beyond this, however, he would not go. I, therefore, proposed that he should let me write a letter to the Editor of the *Times* and state the case for the Salonica front. To this he consented and this I did in terms of extreme moderation. Two days later, however, I received a note from the Editor of the *Times* stating that my letter would first have to be submitted to the War Office. The next day I was informed that it had been suppressed from the first line to the last and returned to the *Times* with the intimation, "not to be published" stamped on every page.

My final interview was with Lord Milner, Minister of War. As Lord Milner had been for years British High Commissioner in Egypt, he knew the Near East well and could thoroughly appreciate the importance of the Balkan Peninsula in the

struggle. He advanced many of the stereotyped arguments of the opponents of the Salonica front, its excessive demands on tonnage for forwarding reinforcements and supplies, the danger from submarines, the unfavorable climate, etc. But reading between the lines it was soon evident where the real difficulty lay. It was at that time an open secret that, on account

of the flagrant mistakes of Mr. Asquith and the other political men in charge of the war, they had completely lost the confidence of the nation at large and that the conduct of the war, not only militarily but also politically, had passed completely into the hands of the soldiers. The War Office and the Foreign Office were completely at loggerheads and the Imperial General Staff turned a deaf ear to all the counsels which did not square with its preconceived views.

General Sir William Robertson, Chief of the Imperial Staff, and all the men surrounding him were out and out "Westerners" and refused to listen to any proposals for undertaking an offensive anywhere except the Western front.

When Mr. Lloyd George succeeded Mr. Asquith as Prime Minister he saw that it was absolutely necessary that the civil power should regain the political conduct of the war. It was, however, only after weeks of sapping and mining that the civil power was able to assert itself once more. Mr. Lloyd George planned in secret the organization of the Supreme War Council at Versailles. It was arranged that he and M. Clemenceau and Signor Orlando, the Italian Premier, should meet every fortnight at Versailles to take counsel on the conduct of the war.

When the organization of this council was intimated to General Sir William Robertson he at once, in protest, tendered his resignation which (probably much to his surprise) was promptly accepted. Colonel Repington, the military writer, formerly of the *Times* but then of the *Morning Post*, who was generally regarded as the spokesman of the Imperial Staff, an out and out "Westerner", to whom the Salonica front was anathema, rushed into print with such a want of moderation of language that both he and Mr. Gwynne, the Editor of the *Morning Post*, were promptly haled before the courts and fined a hundred pounds each under the Defence of the Realm Act. Then General Sir Frederick Maurice, Chief

of Operations, entered an equally violent protest, which cost him his position.

General Sir Henry Wilson was then appointed Chief of the Imperial Staff. He had for years been a close friend of Marshal Foch, and he saw that the only means of winning the war was to have a supreme Commander-in-Chief and create a complete unity of command. He, therefore, soon proposed Marshal Foch for the



Fieldmarshal Misitch, who commanded the operations leading to the capture of Monastir

post and the proposal was accepted by all the Entente Powers.

One of the first results of this was a complete *volte-face* in regard to the treatment of the Army of the Orient. The new Commander-in-Chief knew that the Balkan front was the "Achilles' heel" of the Central Powers.

He recalled General Sarrail and replaced him by General Guillaumat, an officer known for his energy, his decision of character and his powers of organization. His orders were to prepare the Army of the Orient for an immediate offensive. The necessary reinforcements and supplies were sent out and in a few weeks General Guillaumat was able to report that everything was in readiness.

As soon as this news was received Field Marshal Foch sent General Franchet d'Esperey, one of the most brilliant commanders in the French army, to take supreme command. An energetic offensive was at once ordered.

The chances of its success were greatly increased by the fact that the United States had entered the war and disembarked several hundred thousand men in France. As a consequence the German armies on the Western front were so hard pressed that they could not detach a single army corps to reinforce the Balkan front.

As before, the chief attack was entrusted to the Serbian contingent. Reinforced by several French Colonial Regiments they attacked, with splendid *élan*, the Bulgarian entrenchments on the Dobra Polje, drove in the centre and then rolled the opposing army up right and left. Through the breach thus made poured the British, French, Italian and Greek contingents, the retreat became a rout and in five days the Bulgarian army capitulated.

The Serbs continued their victorious advance, the Berlin-Constantinople Railway was cut and the Army of the Orient pushed forward to the Danube. In a fortnight's time Turkey collapsed, the Dardanelles were opened and the Allied fleets entered the Black Sea. Austria-Hungary, menaced by the attack of the victorious Army of the Orient and the Italian armies in the Trentino, saw the game was up and sued for peace in her turn.

As soon as the German Imperial Headquarters received the news that the Bulgarian line was broken it realized that the end had come. In the first days of October, 1918, General Ludendorff sent Major von dem Busch to Prince Max von Baden, the Imperial Chancellor in Berlin, to inform him that defeat was impending and told him to apply at once for an armistice. General Ludendorff stated that the troops on the Western front were still capable of resistance but as the Army of the Orient, plus the Italian Army on the Isonzo front, were marching on Germany, that empire would be attacked on the rear without any possibility of defense.

On October 12 the demand for an armistice was presented to President Wilson through the Swiss Legation in Washington. This was referred to the Allies but its terms were not deemed satisfactory and it was refused. As a consequence hostilities on the Western front continued until November when a second armistice was proposed and this time was considered satisfactory and it was signed on November 11, 1918.

Thus, by the victory of the Army of the Orient, the World War, which began in the Balkans, for the Balkans, ended in the Balkans.



THAT A MAN shall serve his country in time of war is noble, brave, and patriotic; but that a man shall properly prepare himself in time of peace to serve in war, is all of these things and more. It is noble with nobility that is real, not sham. It is brave with a bravery which assumes in time of unemotional peace many burdens; not the least among them that of bearing the lack of appreciation of those who do not consider preparedness or training necessary. It is patriotic with a patriotism more compelling than the fires which burned in the breast of Leonidas at Thermopylæ.—
BULLETIN, THIRD C. A. DISTRICT.

Why Not a Command Eligible List?

BY LIEUTENANT COLONEL BERNARD LENTZ, INFANTRY

IT has at times been seriously proposed to create a Command Eligible List. We have a General Staff Eligible List. If the latter why not the former?

A Command Eligible List could be brought about by amending the National Defense Act. Following closely the construction of the General Staff Corps Eligible List law such an amendment might read something like this: "After the completion of the initial *Command Eligible List*, the name of no officer shall be added thereto, unless upon graduation from the (here enter the school desired as an intellectual hurdle) he is specifically recommended as qualified for command duty, and hereafter no officer of the Command Corps shall be assigned to (here enter the size of command deemed suitable) unless he is a graduate of the (here enter another, a higher, school as a hurdle) or his name is borne on the initial Command Eligible List. The Secretary of War shall publish annually the list of officers eligible for command duty and such eligibility shall be noted in the Annual Army Register."

Of course if a Command Eligible List were established, there would soon be found proponents for an Administrative Eligible List and a Technical Eligible List and maybe some other Eligible Lists. But no matter how many Eligible Lists were established, by law or otherwise, there would no doubt always be some not on any list whatsoever unless they went, by a process of elimination, on the Class B Eligible List.

In these days when so many officers serve such long periods on other than command duties it is considered fitting to dwell somewhat at length on the importance of this class of duty.

Hannibal was a commander. Hannibal used elephants against the Romans with telling effect; this was so because Hannibal was Hannibal. Alexander the Great, too, was a commander. The Persians' use of elephants against him proved worthless; this was so because Alexander was Alexander.

In Simes Military Guide published in 1776 we read: "The more generals there are at the head of our troops *capable of commanding*, the more formidable they are. It was not the number of soldiers that gave us those laurels during the last war under the commands of Ferdinand, Wolfe, Granby, Albemarle, Amherst, Hodgson, Moncton, Murray, Draper, et cetera, it was owing to their military capacities to form, and resolution to execute the greatest designs—their penetration to discover and activity to defeat, the greatest machinations and to the unshaken confidence of a few troops—that obtained those glorious, surprising and complete victories."

Napoleon emphasized the importance of command when he made the observation that any fool can make an obvious strategic plan but that the capacity of the strategist is seen in the power to carry it out.

In the report of the Inspector General ending June 30, 1931, we read: "There is a growing tendency in the Army to recognize school service as of greater value than duty with troops. There is a danger that the present practice, whereby officers remain away from all contact with troops for years while they are successively students and instructors in one school after another will result in the development of a professional class of instructors more eloquent in the exposition of military theory than expert in the practical duties of command and leadership."

I have been unable to find anywhere statements in behalf of General Staff work that can approach in conviction the volumes of testimonials that have been written on the importance of command duty. In view of this, I suppose we should almost jump to the conclusion that having a General Staff Corps Eligible List we should, by all means, have a Command Eligible List. But let us not draw conclusions too quickly, at least not until we say more about the General Staff.

It is true that for a generation after the Austro-Prussian and the Franco-Prussian wars the Germans glorified the General Staff, and some of the glorification spread to other countries. And there was real reason for some of the glorification. Count Helmuth Karl Bernhard von Moltke had been a great Chief of Staff. The Austrians and the French had been defeated with ease. The story, how old von Moltke (awakened from his sleep about 1:00 a. m. and told that war had been declared) directed the assistant to get certain papers from a certain drawer of a certain file case and follow the instructions given therein and then turned over to sleep until morning, spread near and far. No doubt since Moltke could do this, other aspirants for high military honors in Germany and in other countries felt that they could do likewise, and so the General Staff idea gained tremendous momentum in almost all military circles.

But let us recall the picture a little more vividly. Von Moltke was Chief of Staff to King William of Prussia. The King was reputed to have been a modest man and to have known the limits of his faculties. The story was told that he once said to his brother, "If I had not been born a Hohenzollern I should have been a sergeant major." Whether or not the story was true there was hardly a doubt that the King needed a good Chief of Staff.

From a book *The Brains of an Army*, written several decades ago by Spencer Wilkinson, we get an interesting history of the development of the General Staff idea. The author shows that the General Staff idea took form in Germany a long time ago. He points out, for example, that the Prussians fighting Napoleon had no Napoleon to pit against him. That the best they could do was to put Blücher in command, with Scharnhorst, and after Scharnhorst's death Gneisenau, to keep him straight. He adds that it might perhaps have been better to have

given Scharnhorst and Gneisenau the actual command.

The above-mentioned cases as well as other later ones, were probably in General von Seeckt's mind when he said: "The necessity for giving powerful support to these hereditary Generals became self-evident."

All this recalls the observation made in a recent volume on Richelieu: "When the master is incompetent it is of great value to the servant. When the master recognizes his own incompetence, it is more valuable still." I am convinced that at least one important reason for the development of the General Staff idea in Germany was the incompetence of the hereditary masters.

It is my opinion that the Austrians and the French were defeated so easily because the elder Moltke was first and foremost a great commander, who, in addition to filling the job of Chief of Staff, was "doing the driving from the rear seat" with the King "at the wheel." And I further believe that there were a lot of other German General Staff officers who as "rear seat drivers" really did the commanding.

Now let us shift the scene. In 1914, Helmuth Johannes Ludwig von Moltke, nephew of the Elder, was Chief of the German General Staff.

Von Kuhl, the capable Chief of Staff of von Kluck's army, says: "The 1914 campaign in the west was lost through faulty leadership. . . . not the system, the personalities who lead—failed." And von Seeckt brings out a similar thought when he comments: "Perhaps in an age when so much was done to develop the General Staff too little was done to extend the training of commanding officers."

I have no intention of criticising the General Staff idea; it's good, it's absolutely essential for modern armies. But there is such a thing as over-emphasizing "staff," which may result in under-emphasis on "command". A General Staff Corps Eligibility List may bring this about and to even things up, again, we might jump to the conclusion that there should also be a Command Eligible List. I think this is what its proponents have in mind.

All preferred lists, no matter how enviable their intent, have inherent something of the nature of mechanized procedure. Such mechanized procedure, in attempting to measure the human being, often becomes the end when it was only intended to be a means to an end. As time goes by too many on the preferred list may get the idea that they are "sitting pretty" and may be content to rest on their oars.

John Quincy Adams in his interesting diary describes one man by saying: "the mediocrity of his talents has been one of the principal causes of his success"; and another as, "a man of good breeding, inoffensive manners and courteous deportment, rather than one with the genius of Shakespeare, the learning of Bentley, the philosophical penetration of Berkley or the wit of Swift." Such men as Adams described will inevitably be found on preferred lists when such lists are—as they must be—the result of mechanized procedure.

I have long thought that making our schools the hurdles for General Staff Eligibility was a mistake, for the

reason that the student is likely to feel that he had better accept what is given out as doctrine or he may find himself not on the eligible list when the course is over. The measure of a school is not in what the student does in school so much as what he does after he leaves school—the result of the stimulation of his thinking machinery received while a student. Our schools should be divorced from all special eligibility provisions as an encouragement to true education.

By way of defending the above opinion, let me quote from some written advice which was given by an honor graduate to prospective students for his alma mater: "Consider the school as a game. Learn its rules and procedure and play it just as you would any other game. Hand back in your map problem just what has been handed you from the platform."

Ambition has been defined as the desire to do two things at once; first, to achieve; and second, to gain the reputation for achievement. Were the aforesaid adviser and advisees thinking mainly of the first? Was their main objective achievement in the field of real military education? Or were they visioning the second—the reputation for achievement, as linked to "eligibility" and the recording of the fact of graduation from school where all might read?

How does the above quoted advice to prospective students harmonize with the ideas of the late General John F. Morrison as expressed many years ago? In his introduction to *Seventy Problems* (1914) he said: "The main need of our officers is a knowledge of the fundamental principles of tactics and how to apply them. The knowledge is to be gained not by studying rules, formulæ or normal schemes but by practice in solving problems. Such practice combined with knowledge of human nature and *common sense* is what makes the tactician." One of his former students told me that General Morrison used to add to the above "And the last named—common sense—is rather rare."

Special eligibility lists also tend to lower the value of our efficiency reports. On this point I recently wrote, "the efficiency report will not be the worthy document that it should be until we make it the one and only report to which we turn whether we are trying to determine Class B or are considering a fine detail, even one to the General Staff."

My answer to the question propounded in the title to this article is—repeal the General Staff Eligibility Law. When this is done sufficient emphasis will shift to "command" so that a Command Eligible List will not be needed.

In conclusion, I want again to make clear my position. I'm not favoring "command" above "staff" nor "staff" above "command." My solution—no eligibility laws—is based on a text from the Sermon on the Mount: "By their fruits ye shall know them;" not alone by the fruits—the eligibility plums—gathered in schools but also by the fruits which have been picked in the orchard of practical experience.

Winning the Trophy

By LIEUT. COL. ROBERT GLASSBURN, C.A.C.

THE winning by the 51st Coast Artillery (TD), of the annual trophy of the United States Coast Artillery Association for the year ending June 30, 1933, was determined by the target practices fired in early October, 1932. Since target practice is almost exclusively a matter of technique, it does not seem quite fair that I should step out in the spotlight and take the bow on this occasion, for the bulk of the credit for this achievement goes rightfully to the officers and men of the active batteries of the regiment. About all a regimental commander can do is to create and maintain an atmosphere favorable to success, within which the technical performance is to take place.

Due to the heavy demands upon the garrison of Fort Monroe, caused by the training of the civilian components, the requirements of the Coast Artillery School, and of the Coast Artillery Board, the regiment had small opportunity to perform on its own account. When I arrived on the scene, in late August, I found all the officers and men looking forward eagerly to firing their own target practice and thus having an opportunity to compete with the other regiments of the Coast Artillery. They were keen to demonstrate to the rest of the Corps what they all firmly believed, that the 51st was the best regiment in it. It is hard to beat an outfit in such a state of morale. As I saw my job, it was to direct their enthusiasm without dulling it. In other words, I tried to keep ever before them the fundamental principles that, win or lose, the primary purpose of target practice is training for war; that gunnery methods must be sound and capable of application in action; that no starry-eyed gadgeteer be permitted to clutter up the material with a lot of mechanical whimsies impracticable in war; and that none of the very limited time available for training be lost. Finally, I tried not to take unto myself any of the responsibility which is the proper burden of the subordinate executives.

Happily there were no gadgeteers to be coped with. The only articles not standard were introduced by First Lieutenant John H. Featherston, commanding "A" Battery. They were a movable index applied to the sight to permit the making of individual lateral corrections at the gun, and the introduction of a loud-speaker at the firing battery to convey his voice to it at a minimum expenditure of lung tissue. The first device has been discussed in some previous number of the JOURNAL, and is, I believe, about to be sprinkled with the holy hyssop of the Coast Artillery Board.

Device number two was of very great value during the training of the battery, enabling correction of individual faults to be made instantly and with a tonal emphasis which was truly awesome. During the practice the loud-speaker uttered a few frightened squeaks and retired from

further competition with the roar of the 155's. From then on, Featherston did very nicely, thank you, with a megaphone, ten-gallon size. However, the loudspeaker used was rigged up from material on hand not designed for the shocks and alarms of artillery firing. If made sufficiently rugged for that use, I have no doubt it would be a very desirable adjunct to training. So we may consider that Featherston's gadget percentage is well over .500, one for which any officer may well praise Allah and be thankful.



Col. Glassburn

Due to purely local conditions only twelve hours for the gun crews and twenty-four hours for the range sections were available for training before the firing. Nearly 50 per cent of the men in the gun batteries had never participated in a target practice. In "A" Battery, two of the three officers had just graduated from West Point the previous June. Under such conditions I insisted that the qualities to be developed in our few days of intensive training were accuracy of individual performance, and smoothness of teamwork, letting speed develop as the natural issue of those qualities.

The only place where speed was emphasized was in what the men dubbed "the Rockne shift". The target practice memorandum required fire by platoons. The batteries lacked the men to present two complete platoons each, but each could produce one complete platoon, with sufficient men left over to lay data on the guns of the platoon not manned. Consequently, all guns were kept laid on the data. When the guns of the first platoon had fired their share of the practice, their crews, less the gun pointers and elevation setters, shifted on the run to the guns of the second platoon in an effort to fire those guns on the next data and without relay. This was accomplished without a hitch in all four practices. All training, either drill or ex-caliber firing, was done as a simulated target practice, using hypothetical spots.

The new officers in A Battery spent all their spare time playing with the hit bag to perfect themselves in the principles of fire adjustment. Orientation of guns was a function of drill. Recheck of orientation occurred at every opportunity offered by a delay, however caused. At the time the practices were fired, this duty, so essential when the lateral danger space for the bow-on target is no greater than the width of the crosshair on the sight, had become an ordinary reflex. At the beginning of the training period, unilateral observation was established, through the courtesy of the Pennsylvania Railroad, on a ninety-foot floodlight tower at the freight terminal at Little Creek. From there two-way radio telephone communication was established and admirably maintained throughout the training and the firing, by Technical Sergeant James Reardon and Corporal Clarence Moore, both of the Head-



All dressed up for inspection

quarters Battery. They used a standard SCR-136 radio set mounted in a radio truck, Type SCR-124.

Communication was direct with the plotting room of the firing battery. Relay of spotting data was avoided by establishing remote control from the truck to the spotter's perch on the observation tower. Spots were received at the plotting rooms almost at the instant of the splash. Spotters were trained to designate their spots as "short", or "over" or "near short" or "near over". In case of doubt, guessing was positively forbidden.

Settling shots were fired prior to the first practice by each battery. "A" Battery fired its four at a towed target in order to test the teamwork and accustom the new men to firing service charges. "B" Battery fired its settling shots at a fixed point in order to calibrate the guns laterally. These data were used to close the battery on No. 3 gun. It was not found necessary to change the closing data throughout the two practices. Captain Henry D. Cassard, commanding the battery, reached the conclusion that such a calibration will overcome hidden errors which may remain after even the most exacting adjustments of sights. The conclusions seem to me to be sound.

Turning to methods of fire adjustment, full latitude for the personal predilections of battery commanders was encouraged within the limitations established by the sound principles of gunnery and the requirements of the target practice memorandum. Since the latter prescribed range adjustment by bracketing, the only variations could occur in the methods of adjustment for direction. Both battery commanders corrected for the full amount of the lateral deviation of the salvo center of impact. In "A" Battery, however, the movable index on the sight was employed to correct any tendency of a gun to wander.

In both batteries, bold initial corrections were made to secure a range bracket, after which corrections were made cautiously and with excellent judgment by both range officers. These officers, 1st Lieutenant Robert H. Krueger, and 2nd Lieutenant Laurie J. Hillberg, showed admirable equipment for their jobs. They never got excited.

Both during the training period and the practices, their plotting rooms were models of quiet and calm order.

Equal commendation goes to the emplacement officers, Second Lieutenants Charles E. Wheatley, Jr., and Louis D. Vickers. There was such a complete absence of confusion and lost motion in the firing batteries at all four practices, the "Rockne shift" was executed with such precision, that the commendation of General Tracy was elicited on the spot.

It is difficult not to wax lyric over these four practices. There were no relays. Timing between shots, in each salvo, was uniform, and as near perfect as possible. The hits and score speak for themselves. Careful preparation of men and material preceded the practices. Nothing that could be foreseen was left to chance. Luck can never be entirely eliminated but it can be circumscribed by efficiency and courage. After three perfect practices in a row I watched the opening of the fourth with some inward perturbation. It seemed to me that the chances were considerable that someone might crack under the strain and his eagerness to be sure of a fourth practice of equal quality with the three preceding. But no one did, which is a tribute to the high state of training developed.

Guns are guns and powders are chemicals. It's the men that make results. The winning of the trophy is directly due to the spirit of the officers and noncommissioned officers of the batteries, to their pride in themselves and their organizations, and to their success in infusing the same spirit and the same pride into the personnel, whether young or old in the service. There it not an officer or man in the outfit who has not a generous share in the success of the regiment.

Finally, all members of the regiment join in acknowledging the cheerful help received from General Tracy and Colonel Cloke, in adjusting the administrative requirements of the Post and Harbor Defense to the needs of the regiment; and in acknowledging the assistance of Captain Creighton Kert, the Artillery Engineer, who was tireless in his efforts to promote the success of the practices; and in acknowledging the ever-ready cooperation of the local representatives of the Ordnance Department, headed by Major Ira A. Crump and First Lieutenant E. H. Harrison. Also I wish to acknowledge the debt we owe to Lieutenant Colonel Gilmor, CAC, whom I succeeded in command of the regiment.



"A" Battery, 51st Coast Artillery

Searching for the Better Way

BY CAPTAIN G. H. RAREY, INFANTRY

ARE we overlooking anything of value as we go about our business of preparing to defend this nation?

In this preparation, are we taking full advantage of the collective ability and experience of the individuals who serve in and with the United States Army?

Are we satisfied with the progress being made in the development of army equipment?

Allowing the reader to answer these questions in his own way, it is the belief of the writer that we should not be satisfied with the progress being made; that we are not taking advantage of the collective ability and experience of our forces; and that we are overlooking a valuable source of progressive ideas.

Progress and improvement are only achieved by the exercise, on the part of some individual, of that rare quality known as *initiative*. Those individuals who have the courage of their convictions and who, being endowed with a willingness to do extra work on their own time in an effort to improve their own situation, instead of drifting with the tide, will take the initiative, if they are properly encouraged to do so. They will grasp opportunities, or make them; they will study their jobs and their equipment with a view of improving both; they will work out improvements and present ideas which, in a great many cases, will bring forth real progress.

Elbert Hubbard once said: "The world bestows its big prizes, both in money and honors, for but one thing—and that is 'initiative.'" If Mr. Hubbard had said that the *commercial* world bestows its big prizes for initiative, the statement would have been more nearly accurate. His statement, as made, is not strictly applicable to government service.

We do not properly encourage the exercise of initiative among the rank and file in government service, and this is the reason that, excepting those who are assigned to this kind of work, only a comparatively few are thinking and working for improvement. This is especially true in the matter of the development of better equipment.

We have, to a large extent, ignored the fact that there is a great potential power for improvement in any large organization such as the United States Army. We have failed to realize that unless we train and encourage individuals to use initiative, to think and work for progress, and, that unless we take advantage of all usable ideas and suggestions produced by individual initiative, the potential force for betterment in our service will lie dormant and be of no practical value.

At the present time we have no well-organized plan, in the military service, for utilizing this potential force in our development work. It has been our custom to delegate the bulk of this work to one or more technical branches of the service. This policy is correct but it is inadequate. For best results this policy should be com-

binéd with one that seeks the coöperation of and suggestions from the man who handles and uses the equipment. The way to secure these suggestions and new ideas from the individuals in a large organization is to have an organized system or method for collecting and acting upon the ideas and suggestions so that the presentation of a new idea will be considered the usual or routine thing, and not the exception.

As one officer, who has given a good deal of thought to the subject, has said: "In many cases the man with a good suggestion does not know what to do with it after he gets it. I have seen many good ideas in improvised equipment or changes in equipment being worked out or used locally in certain posts that should be taken up officially with a view to adoption. There should be more publicity on this subject."

The mere acceptance by the government of an occasional idea, or improvement, after the originator has worked up the details often at his own expense, is not the way to encourage men to think and work for progress. This method may be termed a passive form of encouragement. In reality it will influence the average individual to do only what he has to do, and no more.

On the other hand, a well-organized plan for encouraging the use of initiative and the presentation of ideas results in stimulating the creative ability which most people have to a certain extent; brings to the individual a realization of his own abilities (as a natural result of a closer study of his job and its possibilities); incites in the individual a better spirit of coöperation and a greater interest in the group activity, whatever it may be. Applied to the government service, such a plan would result in economy in the development of the equipment needed by the service and in the elimination of uneconomical practices and methods that have grown up with and become a part of the service.

A well-organized plan for active encouragement in this matter takes into consideration the element of *self-interest* of the individual. This we will have to do before we can take full advantage of the potential force for betterment inherent in our organization.

The above conclusions are based upon a study of problems connected with the development of army equipment and upon the results of an examination into the modern development methods used by some of our commercial industries.

It has been found that many of our civilian industries have a definite plan for stimulating the use of initiative among the workers, with a view of securing their assistance in the development of better tools, better machinery and equipment of all kinds, better methods of manufacture, and the elimination of waste of material, effort and time. They make it profitable for the worker to think

and to work out better ways for doing the job assigned to him. The engineers and technical staff employed by these industries cooperate in working out the ideas and suggestions passed on to them, but they do not exercise control over the development policies.

These companies provide a small but efficient and *sympathetic* group of officials to control their suggestion system. The officials in charge of the system test and, if necessary, help develop the idea handed in. They determine its value to the company. If it is adopted, they see that it is put into practice. They also see that the originator of the idea receives the credit for, and such financial reward as is allotted to, the suggestion. These companies have harnessed and are using the "thinking ability" of the individuals in their organization. To sum it up in a few words, *they are searching for the better way*, instead of merely accepting it when it is brought to their attention.

A few examples of the benefits derived from the use of the suggestion system are given below:

THE OAKLAND MOTOR CAR COMPANY

Mr. Gordon Lefebvre, Vice President in charge of manufacturing, has stated that as a result of their campaign against waste, the workers of the company will effect projected savings of approximately one million dollars annually.

Prizes of over twelve hundred dollars were offered for the purpose of discovering new methods of processes for cutting down time and material costs. Of the suggestions turned in, 35% evaluated at the time of the report will effect a projected saving of \$542,000 annually, and they expected to effect a similar saving from the remaining 65% of the suggestions yet to be considered.

The grand prize was awarded for a suggestion which saved the company about \$33,000 a year in fuel costs, in the operation of their engines on the test line before the engines were assembled in the car. One of the major prizes went to a girl working on the hood line in the punch press department.

Of course many of the suggestions received were valueless, but when a saving of \$542,000 can be shown from 35% of the ideas turned in, there can be no question as to the value of the policy in this case. Keen interest in the campaign was evidenced by outside manufacturing concerns, who sent representatives to see how the war on waste was conducted. Mr. Lefebvre stated that the campaign is to be continued indefinitely, a series of prizes having been offered to every worker who turns in a plan of practical value. The amount of the prize will depend upon the worth of the suggestion to the Oakland Company.

THE NATIONAL CASH REGISTER COMPANY

In response to a request for information concerning their suggestion system, this company forwarded one of their regular suggestion bulletins which are posted on all

of their factory and office bulletin boards. The bulletin forwarded offered prizes of \$2,000 for suggestions during a period of six months. This bulletin admonishes the individual to:

"THINK: Turn your thoughts into suggestions."

"SUGGEST: Make your thoughts pay you dividends."

The rules of the contest, the nature of the suggestions desired, the method of handling the suggestions and the prizes to be awarded are given. The following extracts from their letter of explanation give the details of their system:

"Our suggestion system was organized in 1894 and it has been in almost continued operation since that time. At present we are holding two contests each year and approximately \$2,500 are awarded at the close of each contest. Around six thousand suggestions are being received each year, or an average of one per employee per year. Between 25 and 30 per cent are adopted.

"Suggestion blanks are furnished to all employees and the suggestions are sent to the Suggestion Department through the factory mail or are deposited in locked boxes provided at the entrance of all buildings and are collected by a member of the Suggestion Department. The suggestions are then copied, omitting the name of the suggestor, and referred to the division affected. The head of the division then submits a duplicate report to the Suggestion Department. If it is not satisfactory a further investigation is made by the Suggestion Department.

"We have found it essential to have the head of every department in sympathy with the suggestion system, they being in close touch with the employees can do much toward making the system a success or failure. We make every effort to see that every department head appreciates and believes in the advantages of the system to themselves as well as to the company.

"The policies of our system are decided by a committee consisting of our factory superintendent, comptroller, chief engineer, executive secretary, assistant sales manager, chief inspector, efficiency engineer, supervisor of the assembling division, supervisor of the machining division, research engineer, one man from the rank and file, and the head of the suggestion system.

"Our system has proven to be very profitable. It has resulted in giving us an improved product, better factory and office systems, new selling and advertising methods, better health and safety features, saving thousands of dollars in the cost of production, and in fact, benefiting every phase of the company's business. Another feature that should not be overlooked is the benefit the suggestor receives in addition to the monetary prize, that is, *the increased knowledge gained by working out his idea*. It also leads to promotion and increased pay."

THE GENERAL ELECTRIC COMPANY

The following information is taken from the annual report of this company. That part of the report in which we are now interested is headed: "Suggestion System"

and following the heading is the statement, "There is always a better way."

Extracts from the report follow:

"Suggestion systems have been in operation for a number of years in most of the large factories, some of the smaller ones, and in many of the offices of our company. *The system is designed to stimulate the initiative of employees and encourage suggestions for better ways of doing things.* Suggestion awards are limited to employees whose duties are not of a supervisory character, and who are not specifically employed to make improvements in products or methods.

"Suggestions are invited particularly for improvements that will result in better service to customers; better product, shop methods or equipment; lower cost of production; improved clerical methods or labor-saving devices; safety, welfare, or improved working conditions; prevention of waste, etc.

"Suggestion boxes are located throughout the plants, and every suggestion deposited therein is passed upon by a committee of experts who confer with the individual making the suggestion, and appraise it, sometimes assist in working out details of application and, if the suggestion is accepted, see that it is put into practice, not only at the point where it originated, but in other places throughout the organization where it may be applicable.

"Response from the employees has been gratifying and the number and *the quality of the suggestions have steadily improved.* The highest single award has been \$1,200, and there have been many of from \$50 to \$500. In one year, \$62,381 was paid to factory employees for suggestions. During that year 18,077 suggestions were received. *Thirty-one per cent of those submitted were adopted.*

"During the last six years, since the plan became systemized, awards amounting to \$263,800 have been paid to factory employees in cash or General Electric Securities Corporation bonds.

"For outstanding accomplishments, either within this group or within the group which is ineligible for suggestion awards, Charles A. Coffin Foundation awards are made. This foundation was created by the board of directors in 1922. According to the report, the following awards were made in 1928:

"\$1,000 to Employees Benefit Association, Puget Sound Power and Light Company of Seattle.

"\$1,000 to Employees Benefit Association, Virginia Electric and Power Company of Richmond.

"Twenty-six certificates of merit, carrying with them honorariums in cash, to employees for meritorious work and distinguished service. Among them were ten workmen in the shops, five foremen, six engineers, one construction foreman, and four members of the commercial and administrative organizations.

"Eight Charles A. Coffin fellowships to college graduates who desired to carry on postgraduate research work and who needed and were found worthy of assistance."

UNITED STATES STEEL CORPORATION

The large group of companies known as the U. S. Steel Corporation has found the suggestion system to be a valuable plan for obtaining ideas from their employees. In response to a request for information upon the subject, Mr. C. L. Close, manager of the Corporation's Bureau of Safety, Sanitation and Welfare, states: "At most of our plants a suggestion system is in force, and this plan of obtaining suggestions and ideas has proved generally successful." He inclosed a copy of the notice posted within their Lorain works giving the details of the plan in force there, which is similar to the methods used by their other companies. Extracts from this notice follow:

"The company wishes to encourage among its employees the practice of making suggestions for improvements in methods and machinery, and at the same time to have the advantage of such suggestions as may be found useful. It is believed that many of the operatives of this plant, by reason of their close contact with the work, can suggest changes in methods or equipment, or additions to machinery, or special tools, or other appliances, *which would not occur to those not having their opportunities.*

"This also applies in a special manner to suggestions that tend to the safety and well being of fellow employees, and to prevent accidents; as well as the safety and care of the machinery and property of the company.

"For the above purpose, cash prizes will be offered every six months until further notice, and the plans of distribution will be as follows: Suitable locked boxes are provided and placed in accessible places. Any employee, with the exception of those noted hereafter, may offer a suggestion in writing which he thinks the company could use, and deposit it in the box, without signature or other mark to disclose the identity of the one offering the suggestion.

"The number of prizes to be awarded, will depend upon the number of suggestions of value received and which are, in the opinion of the judges, of such merit as to warrant the award. The amount of the prize will depend entirely upon the value of the suggestion to the company, and will be in proportion to this value; in no case, however, exceeding \$100 for any one suggestion.

"When the judges have considered the suggestions offered, they will list them in the order of their value, and post them where they can be seen by all concerned. The employees who have offered the suggestions for which prizes are awarded will then each present to the judges a duplicate of his own suggestion, signed by himself, and he will then receive the prize to which he is entitled.

"Officers of the company, superintendents, general foremen, mechanical, electrical or civil engineers, draftsmen and others who may be employed in designing, are not eligible to compete for these prizes.

In a paper on the subject of "Waste Prevention and Salvage," Mr. Frank Parrish, Supervisor of Inventories, U. S. Steel Corporation, makes the following statements

regarding the use of the suggestion system: "One of the most valuable adjuncts is a suggestion system. Workmen should be encouraged to submit ideas on the elimination and prevention of waste, as well as on all other worth-while matters, because the employees in shops and offices have been found to constitute a rich field of practical ideas. Once installed, the system should be continued throughout the year.

"Campaigns of this kind (waste elimination and suggestions for improvement) are undoubtedly of great value. Their chief benefit comes from the encouragement of individual initiative, and the opportunity given each member of the organization to present suggestions to the central management without fear of possible reprisals by superiors who might regard some suggestion as a reflection upon their methods or ability. *Inventions rarely come from centralized supervision or as the result of suggestion from headquarters.* With each man put on his own initiative in a competition where good work brings appreciation and reward, many ideas will come to light that otherwise would not."

Concerning a certain campaign against waste conducted by the company, Mr. Parrish said: "It would be next to impossible to measure in money the savings that will result from the acceptance and operation of the suggestions which gave promise of saving money; but this saving, great as it might be, would very likely be less than the intangible benefits resulting from the *increased inquiry, efficiency, carefulness and loyalty which the campaign induced.*"

Mr. Parrish closed a very interesting and informative paper by the following statement which constitutes a challenge to all industrial managing staffs, and it may, perhaps, be scrutinized with profit by military staffs as well: "Economists have divided the responsibility for industrial waste under recent conditions as follows:

Waste for which management is responsible, 67.3 per cent; waste for which labor is responsible, 17.1 per cent; total for which management and labor are responsible, 84.4 per cent; waste due to external causes, 15.6 per cent."

While many other examples can be given to show the benefits that accrue from taking advantage of the ability and experience of personnel, it is believed that those described sufficiently demonstrate the fact that the modern suggestion system is a most effective and economical aid in stimulating initiative, improving equipment, improving methods and elimination of waste in material, effort, time and money.

It is the writer's belief that no good reasons exist which would prevent the successful operation of a modified form of suggestion system in the military service and, that, as far as the development of military equipment is concerned, this factor in the preparation for national defense could make more progress and cost less if we were organized to take full advantage of the ability and experience of the individuals who serve in and with the United States Army, than is possible under our present methods and policies.



IN THE GERMAN OFFENSIVE of March, 1918, everything then known in modern warfare was used by the Germans. A most remarkably accurate staff plan had been prepared, weeks had been consumed in the detailed methodical preparation so well understood by the Germans, and many mechanized maneuvers were here displayed to the greatest advantage. It was the great opportunity for mechanized warfare as then understood. The attack failed. Not because the Germans had made a mistake nor because their soldiers would not fight, for no braver have ever marched under any flag. One thing alone was responsible for checking this cataclysmic advance, and that was the British Infantry. The Germans had underestimated the ability of manpower to stand its ground and had ignored the spirit which transcends other conditions of battle.—NORMAN DOUGLAS DEAN.

I Will Gladly Pay Tuesday for a Hamburger Today

BY LIEUTENANT PAUL B. KELLY, C.A.C.

YOUR battery, which is undoubtedly one of the best at your station and probably in the Army, is a going concern principally because it is run according to certain basic truths, regulations and traditions that time have proved most efficacious for the management and training of the individual soldier and of soldiers in groups. It is true that your own ability to command and administer has added a final polish and degree of excellence that has been perfectly apparent to you in every battery in which you have served, but taken by and large the accepted rules for running an organization are sound and you have been willing enough to conform to them. So true is this that if one of your civilian acquaintances asks casually, "What does a soldier get out of his Army service?" you will launch with some enthusiasm into a dissertation on the merits of a healthy body, a disciplined mind, educational opportunity, wholesome recreation, neatness and order in all things, etc. And you will be convincing because, in the main, you will be right. But should the civilian be inclined to ask questions and to inquire into matters that are important from the civilian point of view, you should avoid any detailed discussion of the battery collection sheet. It might, possibly, spoil the picture.

The battery collection sheet is the ledger on which is written the evidence to prove that the Army teaches and encourages young men to spend their money before they earn it. Let me hasten to say that the habit of contracting debts up to the full amount of the pay-day check is not peculiar to the enlisted men of the Army, but it seems a pity that an institution that concerns itself so paternally with the welfare of the newly joined should be so inconsistent in the financial particular.

"Jawbone" is bad, perhaps not wholly bad, but certainly unsound as a system. It is frequently costly to the organization and always costly to the individual. Prospective deserters seldom neglect to stretch their credit to the limit, and it is usually necessary to drop some part of this bad debt as a dead loss to the battery fund. The battery fund, of course, having gone into the credit guarantee business, must protect itself against these occasional losses by charging a collection fee which is eventually passed down to the individual soldier and operates to raise the price of his haircut and the cost of having his breeches pressed.

Of course the battery barber and the battery tailor ordinarily stand their own losses in cases of desertion because they, poor devils, are so dependent upon your good will that they would never think of insisting upon compensation for the mistake you have made in authorizing pre-desertion credit. But in most posts the post exchange is not so forgiving, and the battery fund pays for the beer and tobacco with which the deserter has strengthened himself for his journey over the hill. In the last analysis Smith, the good soldier, must pay ten per cent more for

his tailor and barber work in order that Jones, the worthless soldier, may desert or be eased out under Section VIII without any loss in the long run to the battery fund. This is manifestly unfair and wrong, but there it is. When you authorize Jones \$5.00 credit at the post exchange you are, in effect, guaranteeing payment of Jones' \$5.00 debt, which is suspiciously close to making Jones a time loan of \$5.00 from the battery fund. Of course my logic here must be faulty because we all know that anything that smacks of loaning money from the battery fund is against the regulations.

But enough of this peering into the sordid dregs of petty finance. Let us wing our way up to a higher, brighter and more abstract plane. You are now the wise and careful father of your organization, strict and fair but ever watchful to raise the standard of living and the civic worth of your men. You know what I mean—the sort of man that every garrulous old sergeant had for a first battery commander. Well, tomorrow morning young Willie Somebody will report for duty. Willie is just 18 and, unemployment being what it is, Willie and his parents have decided that an enlistment in the Army will do a great deal to straighten him up, help him find himself, and start him out on the right road in life. At once a number of excellent things begin to happen to Willie, but some time during the first day or two he is called into the battery office and told that he has \$5.00 credit at the post exchange, \$2.00 credit with the battery barber, \$2.00 credit with the battery tailor, \$2.00 credit with the local clothes-cleaning establishment, and \$2.00 credit for pool in the day room. He may even be given a much larger post exchange credit and be told to provide himself with certain additions and embellishments to his uniform that the high standard of your organization requires. Willie does not question the wisdom of this procedure; it has been early indicated to Willie that there is little use and some danger in questioning the wisdom of what he is told in the Army. So out he goes to use his credit, i.e., to spend the major portion of the pay that he must labor for the next month to earn. At the end of the month he receives a dollar or two across the pay table, but God and the Government will provide food, raiment and shelter; and besides his credit is again extended for a month. He begins to see that the "pay as you go" lectures of his father and the nest egg that his mother is striving to lay away in the Home Savings Bank are quaint vagaries of an old-fashioned generation.

For three formative years he learns to live on "jawbone," that is, on the hope that he will just be able to settle his debts on pay day in order that he may go into debt again. This must be right because it is the Army system and because paternal you, sitting in the battery office, are its exponent. Willie gets out of the Army a clean, strong, upright specimen, able to handle himself

among men—and with absolutely no sense of financial responsibility. Willie stays in the Army—and never has the money to go home when there is sickness or death, nor to welcome the advent of the stork, nor to meet any other emergency. Hence the Sunday-morning visitor to your quarters with telegram in hand, hence the Red Cross loan, hence a good many desertions, hence a lot of other trouble. Even Samson, whose strength was not under his hair, knew that the jawbone of an ass was an implement of destruction.

But what is this fellow Kelly getting all worked up about, anyway? Doesn't he know that credit for necessities at the post exchange is better than cash to spend in the gin mills of the neighboring town? Doesn't he know that no soldier could hang on to haircut and pressing money for more than two days? What's the use of all this sob-sister stuff about character building when everyone knows that poker, crap and occasional petty thievery are the regrettable realities of life in barracks and the almost inevitable end of the soldier's pocketful of cash? Right you are. We couldn't very well give them their complete pay and expect them to spread it wisely over the coming thirty days. It would take time to educate them up to that. Can't you imagine yourself saying to Jones (he's our villain), "Jones, get your hair cut before Monday," and Jones' ready reply, "Sir, I haven't any money."

But why not sell him a barber card (something like a meal ticket that could be punched)? Why not, in a word, act as a selling agent instead of a collecting agent? Why not post a form on the battery bulletin board a few days before pay day on which each man could sign up for such pool, barber, tailor and post exchange cards as he (or you, in certain cases) might think necessary for the coming month? These cards would then be given him in lieu of so much cash at the pay table. He would write his name on them, bearing down heavily, to insure their safety. They would be numbered serially of course and be provided with amounts along the margin that could be punched as spent. They would be good until completely used up. You would turn over the cash equivalent to the post exchange and to the various company concessionaires—payment in advance. Of course the barber might die or desert, but you would have the comforting knowledge that every man in the battery would be financially interested in keeping him alive and on the job.

The post exchange should be able to handle this system

about as easily as the present credit-coupon system, and it might eliminate certain brokerage and gambling elements that the coupon system encourages. If Jones (the villain) deserted everyone would win instead of lose. The battery fund could charge a selling fee no greater than the present collection fee and show a greater balance due to the elimination of bad debts, or it could eliminate this form of graft entirely and force a corresponding reduction in prices among the battery concessionaires. The newly joined recruit would be somewhat out of luck, but the Government furnishes him with a toilet kit and the necessities of life. If he has some money he can use that for tobacco. If he hasn't a cent the chances are that three squares a day is an improvement over his previous condition. Give him a free haircut, keep him out of formations and let him worry along without luxuries until pay day—it will be good for his soul.

What do you think of the idea as outlined? Don't you think it might work with a little polishing up and working down of the rough edges? Of course its inauguration would be the signal for much wailing and some gnashing of teeth, but coming out of debt is always a painful process. For certain married men the transition might have to be gradual, but in the long run these same men would benefit more than the average. In the beginning the post exchange might lose some business, but before long the convenience and reasonable prices of a post exchange would tend to bring business back to normal, and the money loss due to the occasional over-extension of credit and the unauthorized extension of credit by post-exchange concessionaires would be eliminated. The bookkeeping of all concerned would be simplified—certainly nothing could be more complicated than our present collection sheets. And finally, the discharged soldier could present his various cards, indorsed by his battery commander, for a cash refund on the unused portions.

Of course you, as a battery commander, would run into lots of grief if you tried to do it alone. Perhaps a post commander could swing it, but it really appears to be something that could best be covered by Changes X. I don't know, perhaps all this is just tilting at windmills, but something of the sort that would put the enlisted man on a cash-and-carry basis should be a pretty good thing for the average young fellow in barracks and might do much to increase general contentment and military morale.



NO EUROPEAN WAR could replace the present unsatisfactory condition by something better.—HITLER,

Why Our Machine Gun Score?

BY CAPTAIN S. L. McCROSKEY, C.A.C.

THE November-December issue of THE COAST ARTILLERY JOURNAL contains an article entitled "A Machine Gun Scoring Formula." This article, which was prepared by Captain M. T. Whitmore, 202d Coast Artillery (AA), contains a criticism of the present machine gun scoring formula, together with a proposed new formula. The new formula, Captain Whitmore states, is simpler than the old one and is based upon more reasonable principles of scoring.

While I had no part in arranging the present machine gun scoring formula, I have often attempted the task of developing or modifying scoring formulae for other types of armament. Such work has proved to me that there are a great many difficulties involved in making correct mathematical evaluations of target practice results and also that these difficulties are not generally appreciated. We all have our ideas as to what a score should be. These ideas usually are most definite just after we have scored our own target practices under some system which probably was judged by us to be either "good" or "bad" depending upon how well we fared. Even when no personal gain or loss is involved, the error frequently made by an individual in judging the efficiency of a scoring formula is to base his judgment on the meager test afforded by one or two target practices. Such tests may sometimes make the best formula appear to be unfair.

This article is written in defense of the present scoring formula as opposed to that presented by Captain Whitmore, but let it be clearly understood that the writer does not believe that the present formula or that any other system of scoring so far published is such that it affords a thoroughly accurate comparative measure of all of the elements of a target practice. It is generally conceded fact that "lady luck" enters into or stays out of (usually the latter) most of our firings to such an extent that her influence is likely to be preponderant. We try to out-guess luck by applying certain laws of probability, but our so-called laws of probability are not in fact laws; within the narrow limits imposed by a target practice, they are merely indications of what is most likely to happen. They do not state that something vastly different from the expected cannot happen. To expect a mathematical score to sort out the lucky or the unlucky breaks from truly meritorious accomplishments and to grade them correctly, is to expect the impossible.

Before discussing Captain Whitmore's specific criticisms of the present formula, let us consider briefly the origin of that formula. Does it have a reasonable foundation or is it merely a haphazard mathematical potpourri designed to look mysterious and to be difficult of solution? Do we have reason to believe it will work fairly in most cases? The answer to these questions should have a direct

bearing on the necessity for adopting a new system at this time.

The present machine gun scoring formula was determined empirically. It is a fairly accurate mathematical expression of the curves showing the average performance of material and personnel in a large number of actual firings, including those conducted at the annual exercises formerly held each year at Aberdeen Proving Ground, Maryland. Because of the great variety of factors entering into the results, not all of them could be simply or completely evaluated. The mathematical expressions selected for the various components were simplified and certain reasonable approximations were made in order to render computations less tedious for battery commanders. The expression for the score finally deduced was such that it gives fair ratings to the practices used as the basis for the computation. It appears, therefore, that the basis for the present score is sound. The average of past performances is certainly the best indication of what should be expected in the future. Adjustments in the score from time to time are intended in order to keep it abreast of improvements in material and methods.

Therefore, in computing his score, using the present formula, a battery commander is in reality comparing his practice with the average results of a great many practices that have preceded it. In order to obtain a good score he is in no way expected to do the impossible. He is shooting in competition with "old man average" and in general his score will indicate his success.

The accompanying chart, designed for use in computing machine gun scores graphically, is a graphical representation of the various components of the score. The examples included on the chart afford sufficient explanation without including further details here. An examination of this chart will show the effect of various conditions of firing and also that the most difficult conditions carry with them the greatest credit in the score.

Despite the sound foundation discussed above, it is known and expected that occasionally the present formula will give a "freak score" or a score that is unfairly high or low. Any scoring formula will do so at times. However, in the case of the present formula, such freak scores should occur infrequently. In this connection it has been argued, and perhaps with some justification, that most of the freak machine gun scores that have been obtained in the past are ascribable, not to failure of the formula or to the success of "alert battery commanders" in pre-analysis of the formula, but rather to defects in the methods of conducting practices whereby organizations obtain many hits on slow, short range targets and yet get credit for those same hits on faster and longer range targets. It has also been asserted that in some cases holes in the

target have been artificially increased by the use of hobnails or similarly efficient instruments. I do not know how true those statements are, but, if they are true, the remedy for such chicanery lies in more conscientious supervision by group commanders and target practice officials and not in modification of the score.

Scores and scoring formulae have been criticized from many angles, but I believe that, all things considered, they have served their purpose very well. Past records indicate that the proportion of high, low and average scores has not been unreasonable.

Now to consider the specific criticisms of the present formula, made by Captain Whitmore. The present scoring formula is as follows:

Score for a course = $C_1 = B_h (B_D + B_S) + B_r$, in which

$$B_h = \frac{1500}{S} \left(\frac{h}{100} \right)^2 = \text{hitting component.}$$

$$B_D = \frac{D^2 + DR}{3} = \text{range component.}$$

$$B_S = 4D \frac{(S_g - 50)}{S_g} = \text{speed of target component.}$$

$$\text{and } B_r = \frac{30}{N} \times \frac{10}{N} \left(\frac{500}{r_1} \right)^2 = \text{rate of fire component.}$$

Captain Whitmore's criticisms of the above formula are:

a. Its mathematical construction is such that computation of the score is complicated and no analysis of the effect of the various modifying factors can be made.

b. The B_D (range) component of the score tends to penalize for the high angles of fire, and range is allowed to have too great effect on the value of B_D .

c. The formula for B_S (Speed of target component) is such that range has too great an effect on the value of that component.

d. A disproportionate penalty is provided in the formula for the B_r component since that component becomes negative when the rate of fire falls below 288 rounds per minute.

e. In general, the scoring formula is of such nature that alert battery commanders have learned to take advantage of the favorable factors of the score and "have influenced the flying of courses which would give them the best 'breaks' in the final score."

The first part of *a* reiterates the often expressed objection to the use of so much algebra to accomplish what seems such a simple job. This may be a justifiable criticism but it is my contention that the job to be accomplished is not a simple one and that a formula which accomplishes the purpose and which, at the same time, is very much simpler than the present one, will be difficult to find. As a battery commander approaches the computation sheet after a practice, he will doubtless feel a great desire for simplicity in required computation but that same or any other battery commander, as he later reads the Coast Artillery Memorandum on the results of target practice, will certainly be willing to forgive some lack of simplicity in favor of fairness. It is believed that the av-

erage Coast Artillery officer should have little difficulty with formulae no more complicated than the present one.

The criticism listed under the last part of *a* is, in effect, that the scoring formula is so complicated that no analysis of the effect of the various modifying factors can be made. The criticism listed under *e* is, in effect, that "alert battery commanders" (presumably through analysis of the various elements of the score) have learned to influence target practice features so as to gain the "best breaks" in the final score. If I interpret the above two criticisms correctly, they are directly contradictory. It is difficult to tell whether Captain Whitmore believes that scoring formulae should be capable of analysis by "alert battery commanders" or whether he believes that they should be so obscure that such battery commanders will just give up and fire without attempting to discover the most favorable conditions for obtaining a high score. One fact seems certain, and that is: whenever scores are used, some, if not all battery commanders will attempt to analyze the scoring formula beforehand, in an effort to shoot under conditions which are most favorable to obtaining a good score. This is as it should be. One of the chief values of scores is that they afford a means whereby the Chief of Coast Artillery can cause special stress to be put on any particular feature of firing as he may desire. An example of such action occurred a number of years ago when the rate of fire component of the seacoast scoring formula was emphasized. The result was a very material increase in the rates of fire of seacoast batteries. When those rates had been brought up to the desired standard the score was again modified so that no additional gain in scores accrued for further increases in rates of fire.

The objections listed under *b*, above, that the B_D component penalizes firing at high angles and that range has too great an effect on the value of B_D , seem to be based on the erroneous assumption that the difficulties of firing materially increase as the angular height of the target increases. Experience at Aberdeen Proving Ground has shown that the target most difficult to hit with a machine gun is the long range low angular height target. In the past, the greatest percentage of hits has been obtained on the short range, high angle targets. It is probably a fact that, so far as angular height is concerned, the easiest target is the one at 800 mils elevation. Both below and above this point, assuming a constant range, the difficulties of hitting increase to some extent. The difficulties are relatively greater for lower angular heights because of the reduced stability of the mount. In addition, the presented area of the target is less at low angular heights than it is when the target is more nearly overhead. The B_D component was designed to encourage battery commanders to extend their ranges to the greatest practicable limit and to give them due credit for hitting the most difficult of all machine gun targets.

The next criticism is that listed under *c*, above, to the effect that range is allowed to have too great an effect on

the value of B_{Σ} (speed component). B_{Σ} is not exactly a speed component; it is in fact a "lead" component. The true import of this component has apparently been overlooked. With a given ground speed, the greater the range the greater the difficulty of estimating leads. High angular travel at short ranges offers less difficulty to the gunner than the same angular travel at long ranges. Hence the present formula, in order to give credit where credit is due, includes the effect of slant range.

The criticism listed under d , to the effect that a disproportionate penalty is provided in the B_r component, is not believed to be sound. An organization should be penalized when its rate of fire falls below 288 rounds per minute.

At this point a brief summary appears pertinent. The case for the present formula, as I see it, is as follows:

a. It is somewhat tedious in computation but not more so than appears necessary to accomplish its purpose and its complications are certainly not beyond the capabilities of the average Coast Artillery officer.

b. It is a mathematical expression for the average results of many machine gun firings, a large part of which were held at Aberdeen Proving Ground where the attaining of a score was of no importance to the firing organizations. It is, therefore, reasonable to assume that it affords a fair "yardstick" for measuring all subsequent machine gun target practices, assuming, of course, that it is modified as needed to keep it abreast of improvements in methods and material.

c. All things considered, the criticisms submitted by Captain Whitmore do not appear to be serious indictments of the personal score if my analysis of them has been correct.

If the above summary is a fair statement of the case, it would seem illogical and unnecessary to consider the features of the proposed formula for the simple reason that a new formula is not needed at the present time. However, Captain Whitmore has presented a formula, so let us examine it. To effect a complete analysis of the proposed score is a task which would hardly interest the Journal reader, nor could it be contained within the limits of a single Journal article. I will attempt, therefore, only to indicate certain outstanding faults as I see them. Captain Whitmore's formula is stated as follows:

$$C_1 = h \times \frac{500}{A} \times \frac{D^2}{100} \times \frac{\epsilon}{600} \times \frac{S_g}{100} \times \frac{r_1}{500}$$

Where $h = .778$ times the number of holes.

$D = .01$ average slant range in yards.

$\epsilon =$ Average angular height in mils (not less than 600).

$S_g =$ Ground speed of target in miles per hour.

$r_1 =$ Developed rate of fire.

$A =$ Number of rounds fired on each course (not less than 500)

The general form of the expression, requiring all factors to be multiplied together, is not believed to be good.

Experience has shown that such form is likely to result in a greater number of absurdities than forms in which some components at least are additive. The reason for this is more or less obvious. The factor form may result in multiplying a bonus by a bonus or a penalty by a penalty.

Another feature of Captain Whitmore's score which I think is very objectionable is that all components of the score are multiplied by hits. This means—no hits, no score, and that is a severe penalty; especially when the battery may in fact be a good organization which has tackled a hard problem, out of the ordinary "groove," and failed to hit. Such a scoring formula would certainly discourage attempts to fire on courses where the probability of hitting is small. It is, of course, true that the obtaining of hits is the ultimate purpose of all guns. Targets are never destroyed in any other way. However, as all artillerymen know, in a short series there is a large element of luck in the obtaining of hits. We cannot control this luck completely but we can increase our probability of obtaining hits by training and by keeping our equipment in first-class operating condition. It is my contention that some credit should accrue to the battery that has thus increased its probability of hitting even though no actual hits are obtained on a particular course. Captain Whitmore's score will not give this credit. The present score will give credit when deserved because the rate of fire component (condition of material and manual dexterity of gunner in maintaining a good rate of fire) is additive and is therefore not affected by hits.

As a partial mathematical analysis of the proposed score, multiply the first, second and sixth terms together as follows. Assume that at least 500 rounds have been fired:

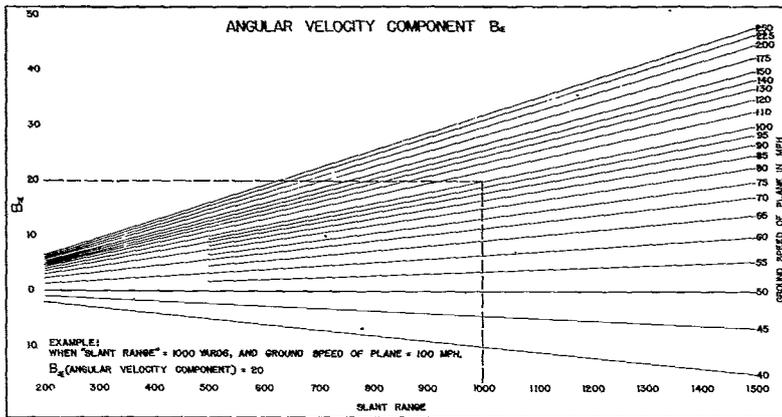
$$\begin{aligned} h \times \frac{500}{A} \times \frac{r_1}{500} &= h \times \frac{500}{A} \times \frac{A}{\text{guns} \times \text{min}} \\ &= \frac{h}{\text{guns} \times \text{min}} = \text{hits per gun per min} \end{aligned}$$

These three factors taken together, therefore, are a measure of nothing but hits per gun per minute. Neither rate of fire nor ammunition expended enter into the computation as such. This is indeed simple—perhaps even more simple than was originally suspected—but it does not appear that the factors measure what they were intended to measure.

Now consider each term separately:

a. The first term, "h", is simply hits, and when taken together with the second term and the last term disappears into a measure of hits per gun per minute.

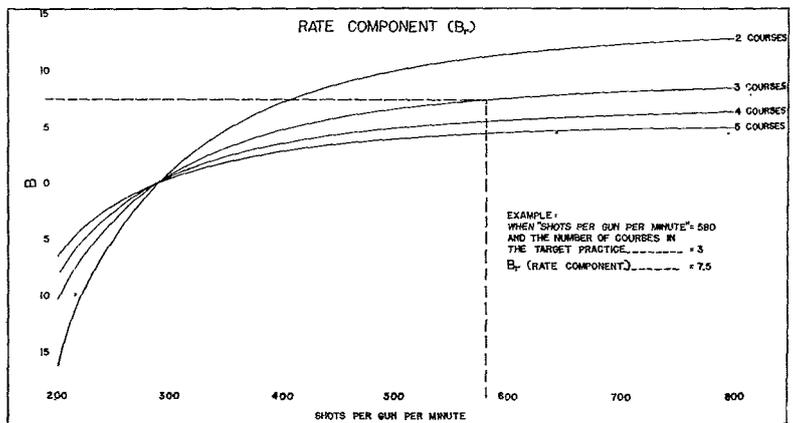
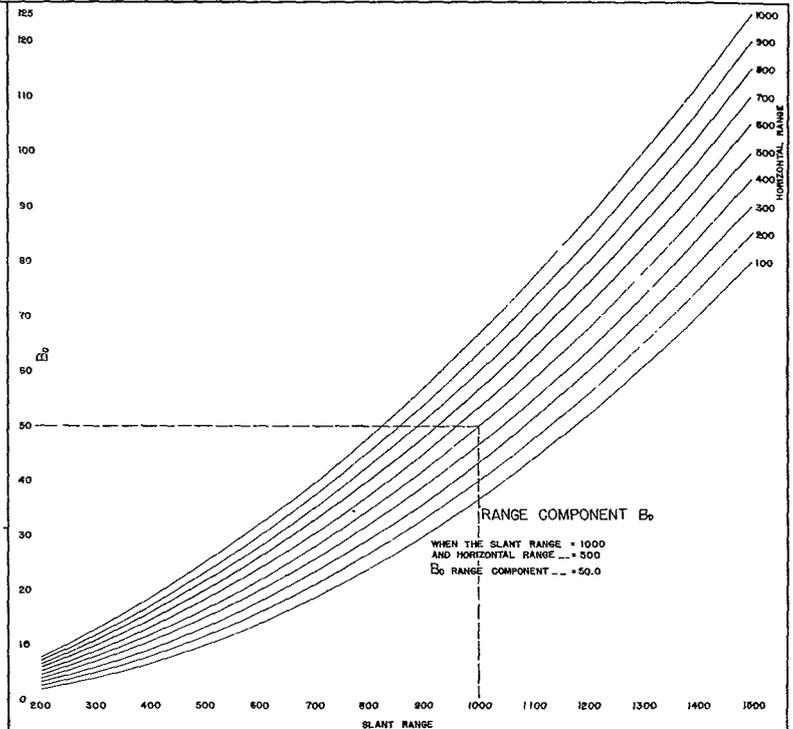
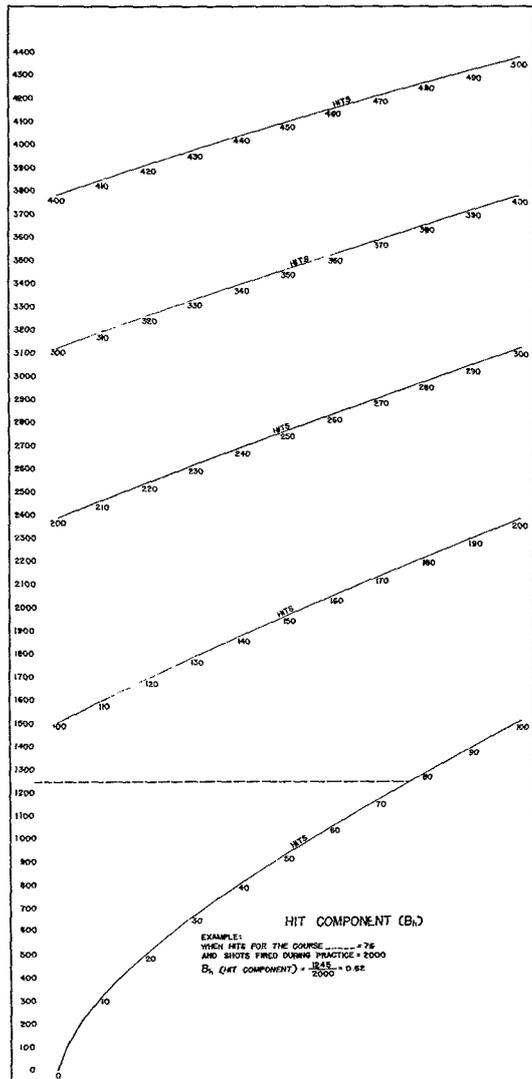
b. The third term is a range term. Captain Whitmore denounces the score now in use as giving too much weight to the slant range, but in the third term (B_r) of his proposed score he gives even greater weight to this factor than the present score does. He lets the whole score vary directly as the square of the range; whereas, the present



ANTI AIRCRAFT MACHINE GUN SCORES

GRAPHIC SOLUTION
OF
EQUATIONS
PAR. 37r. T.R. 435-55 DATED JUNE 30, 1930
THE COAST ARTILLERY BOARD
FORT MONROE, VA.
SEPT. 18, 1933 FILE NO. D-78

COURSE NO. 1 SCORE = $B_a(B_h + B_r) + B_r$
COMPLETE SCORE FOR ONE COURSE OF A THREE COURSE PRACTICE
WHEN SLANT RANGE IS 1000 YARDS, HORIZONTAL RANGE 500 YARDS,
AND SHOTS PER GUN PER MINUTE 580 IS:
 $0.68(50 + 20) + 7.5 =$
 $43.4 + 7.5 = 50.9$



score lets slant range enter as the square only in combination with horizontal range and in only one of four additive components.

c. The fourth term of Captain Whitmore's formula allows the score to vary directly with the angular height for angles above 600 mils. This subject was previously discussed to some extent. As stated before, it is the amount of lead required, and not the angular height of

the target, that controls, to a preponderant degree, the difficulty of hitting. Since angular height, per se, is not a direct element in the difficulty of machine gun firing, its effect on the score is best evaluated through the basic factors which compose angular height; i. e., slant range and either horizontal range or altitude, which factors also have effects of their own on the score.

I have no particular objection to the proposed speed

component (fifth term) except that it enters as a direct multiplier for all other elements of the score. It would appear that the rate of fire, at least, is independent of the speed of the target. To let the value of the rate of fire component vary directly as the speed of the target, as is the case when all factors are multiplied, is obviously wrong.

As explained above, the last component of the proposed score (rate of fire) disappears with the first and second terms into a hits-per-gun-per-minute component. In addition, its form is thought to be wrong. It makes the whole score vary directly as the rate of fire varies, and if used will encourage abnormally high rates of fire which, in turn, will result in damage to material. The present score gives very little credit for rates of fire in excess of the value proper to the material, but it penalizes at increasingly greater rates as the rate of fire falls below the accepted standard. Such is believed to be a much better method than that proposed by Captain Whitmore.

Because of the foregoing objections, I do not believe that the proposed formula would be a suitable one even if a new one were needed at this time. It would doubtless classify certain practices fairly accurately, but in the general case I believe it would fail, because it stresses the wrong elements and because it combines the components in the wrong manner.

Despite the fact that I have disagreed with Captain Whitmore's article, I feel that what he had to say is of real interest to Coast Artillerymen. Such articles are beneficial because they are constructively critical. They secure for us the blessing that was so ardently sought by the old negro preacher who invariably ended his prayers by the fervent and reverent request "Lawd, keep us from settling down."

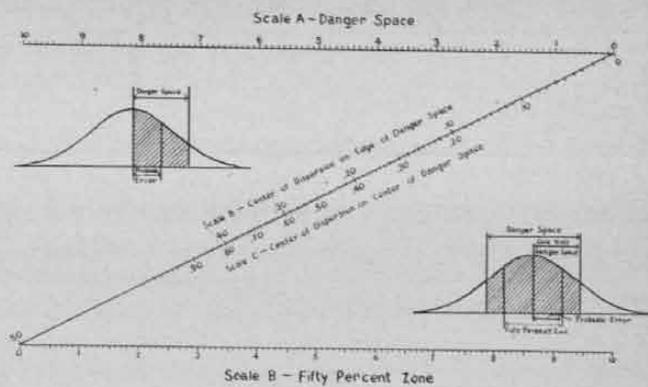
Instructions for Use of Alignment Diagram

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

THIS alignment diagram performs the operations described in paragraph 75, TR 435-280. It divides the length of the danger space by the length of the fifty per cent zone, or one-half the danger space by the probable error, and shows at once the probability corresponding to the resulting factor.

Scales A and B may be considered as graduated in yards, tens of yards, hundreds of yards, or any other units desired, but both must be considered as graduated the same.

When the center of dispersion is on the center of the danger space, hold a straight-edge so that it intersects scale A at the graduation corresponding to the length of



Alignment diagram giving probability of hitting

the danger space and scale B at that corresponding to the length of the fifty per cent zone. Where the straight-edge intersects scale C read the value of the probability. Or, on scale A, set one-half of the length of the danger space and on scale B the probable error, reading as before on scale C.

Scale D is graduated in values one-half of those on scale C. It is used when the danger space is not symmetrical with respect to the center of dispersion. If the center of dispersion is at the edge of the danger space, set the length of the danger space on scale A and the probable error on scale B. Read the corresponding probability on scale D.

If the center of dispersion is within the danger space but not at its center, use the diagram twice. First find the probability of hitting that part of the danger space which lies beyond the center of dispersion, using scales A, B, and D. Second, find the probability of hitting that part of the danger space which lies short of the center of dispersion, using the same scales. The sum of the results of these two operations is the probability of hitting.

If the center of dispersion does not lie in the danger space find, first, the probability of hitting between the center of dispersion and the nearer edge of the danger space and, second, the probability of hitting between the center of dispersion and the farther edge of the danger space. Use scales A, B, and D for these operations. The difference between the two results is the probability of hitting.

If the values set on scales A and B give unsatisfactory intersection with the diagonal scale, multiply both values by some number that will move them farther from the zeros of the scales. For example, 30 (030) and 120 will give poor intersection. If both are multiplied by 8 the products are 240 and 960. These values give the same result with a much better intersection.



IN MODERN WAR munitions are a far greater and more difficult problem than men.—SUMMERALL.

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 R. T. PENDLETON

Matériel and Finance Section
MAJOR R. E. HAINES
MAJOR O. L. SPILLER

Organization and Training Section
LIEUT. COL. E. E. BENNETT
MAJOR F. P. HARDAWAY

Plans and Projects Section
LIEUT. COL. G. A. WILDRICK
MAJOR G. R. MEYER
MAJOR R. V. CRAMER

The Hawaiian Separate Coast Artillery Brigade News Letter

BRIGADIER GENERAL R. S. ABERNETHY, *Commanding*
CHIEF OF STAFF, LIEUT. COL. F. Q. C. GARDNER, C.A.C.

G-1, LIEUT. COL. W. V. CARTER, A.G.D.
G-2, CAPTAIN E. T. CONWAY, C.A.C.

G-3, LIEUT. COL. A. G. CAMPBELL, C.A.C.
G-4, MAJOR F. A. MOUNTFORD, C.A.C.

By Lieut. J. R. Lovell, C.A.C.

THE brigade commander conducted his annual administrative inspection of the elements in the Brigade during the months of November and December and the results were most gratifying. The troops looked very well in ranks and the barracks have shown much improvement during the past year. The messes have been bettered and battery personnel have been well schooled in the art of mess management.

The outstanding feature noticed by the inspection party was the great improvement in the outside appearances at all posts. Colonel Harry L. Steele, at Fort Ruger, started where Colonel Harold L. Cloke left off, and if Colonel Cloke could visit his old station now, he would appreciate how the work has been carried on. The parade ground that has been an eyesore for years has been turfed, and what was once an ugly pile of stones, grass, and debris is now a beautiful garden. A new theatre is being constructed on Makapuu Avenue just across the street from the band barracks, and the present theatre will be made over into a gymnasium.

At Fort Kamehameha, where Colonel Homer B. Grant has been in command until quite recently, the addition of a new gymnasium building conceived, designed, and built by enlisted men, was the greatest improvement noted. Master Sergeants Arthur W. Holt and William Helmer, and the late Corporal Summerville were the masters in charge of the work. Several years ago, a coral and silt fill between Fort Kamehameha and the moun-

tains became dry and the prevailing wind carried huge, persistent dust clouds through the post. This fill has been entirely covered by duck-weed, buffalo grass, and other growth until now there hasn't been a dust storm in over a year. The "planting habit" has prevailed and many colorful tropical plants, smooth, verdant lawns and new trees are growing all over the post. Fort Kamehameha, the King's Post, is truly a paradise of beauty.

Fort Shafter has also been busy in spare time between training periods. Their outdoor athletic plant in the gulch is the finest in the Territory. The entire gulch on both sides has been beautified, and where there was once cactus, algaroba and wild grass, there may now be seen palm trees, flowers, park benches, and grass plots. The barrack areas have been beautified for some time under the direction of Colonel R. H. Williams. It is hoped that funds will be obtained to fulfill the housing program at Fort Shafter. The 64th Coast Artillery is living in old barracks constructed for use during the war, and it is a needless expense to spend so much to maintain these old buildings which should have been replaced years ago.

BRIDGE AND GOLF

Someone said they could beat someone else playing golf. The result is that every post in the Brigade has an officers' golf team. The fever spread to the Air Corps at Luke Field and the Navy at Pearl Harbor. We started out to keep a team score but the matches have been so

unorthodox and so numerous, that it has been impossible to keep any kind of a team standing. This certainty has been a fine way to meet other officers and get better acquainted. The idea was so popular that team bridge matches are being conducted. Now they all stop two afternoons a week and play golf and then play bridge till after midnight, and they're thriving on it. Luke Field, with Lieutenant Stunkard at the helm, is leading in golf matches.

THE FIRST GAS ATTACK

During the course of an inspection, the writer noticed an unusual British medal on the left breast of Sergeant Melville Johnston, the supply sergeant of Battery A, 16th Coast Artillery. It developed that this medal was awarded to all survivors of the first gas attack of the World War. Sergeant Johnston's story is very interesting and I'll let him tell it in his own words:

"I enlisted at Dundas, Ontario, for the First Infantry Brigade, Canadian Expeditionary Force, on August 9, 1914. We were sent to Valcartier Camp, and from there to England in October, 1914, eventually landing in France in February, 1915. It had rained for weeks in England and we were truly glad to leave. France, however, wasn't much better, except that we got to sleep in a farm house once in a while, which was better than the filthy, wet bell tents of Salisbury Plain. The first taste of action was around Fleur Bay in Belgium, when an occasional shell dropped in on us, with our artillery returning the fire less frequently. The British at that time had practically no ammunition, and were putting up a big bluff with the thirteen and eighteen pounders. We got our seasoning near Armentieres and by going in and out of the line in the Ypres Salient.

"We were in reserve on the afternoon of April 22, 1915, in front of Ypres. Trouble seemed to be brewing. The Germans had been shelling the city for three days. About 5:00 p. m. we noticed a cloud of greenish looking smoke coming towards our lines. Shortly after this the French Colonial troops who were holding the line in our left flank retreated in a rout, the gas having done its deadly work. We, in our trenches, didn't know that it was gas, but thought it some kind of surprise smoke screen the enemy was putting over. Our Brigade was ordered in to cover the gap left by the retreating

Moroccans, and it wasn't long before we also ran into what we thought was smoke. We soon learned of our mistake when the men who had breathed this deadly smoke were soon coughing and choking in a horrible manner. The word was quickly passed along that it was some sort of deadly gas, and an officer with a Montreal battalion (I don't remember his name except I know he graduated from a medical course at McGill University), won immortal fame and glory for himself when he identified this greenish smoke as chlorine gas and instructed the men in the use of an effective but none too æsthetic method of neutralizing the effect of this deadly gas. The fighting was most severe after the first wave of gas had passed over and grew worse as the day ended. During the night the enemy attacked repeatedly in massed formation, and our Brigade under General Mercer was called on to make at least three counter attacks in less than twelve hours. Sheer bluff and nerve saved the day for the Allies, and had the Germans known at the time how thinly our line was held, they would have perhaps broken it through sheer weight of numbers. It was almost ridiculous to listen to our two or three batteries of fieldpieces returning the heavy German artillery fire.

"A good many of our soldiers think gas instruction is a lot of bunk, but if they could have been in that first gas attack they would regard their training much more seriously."

NEW COMMANDING OFFICERS

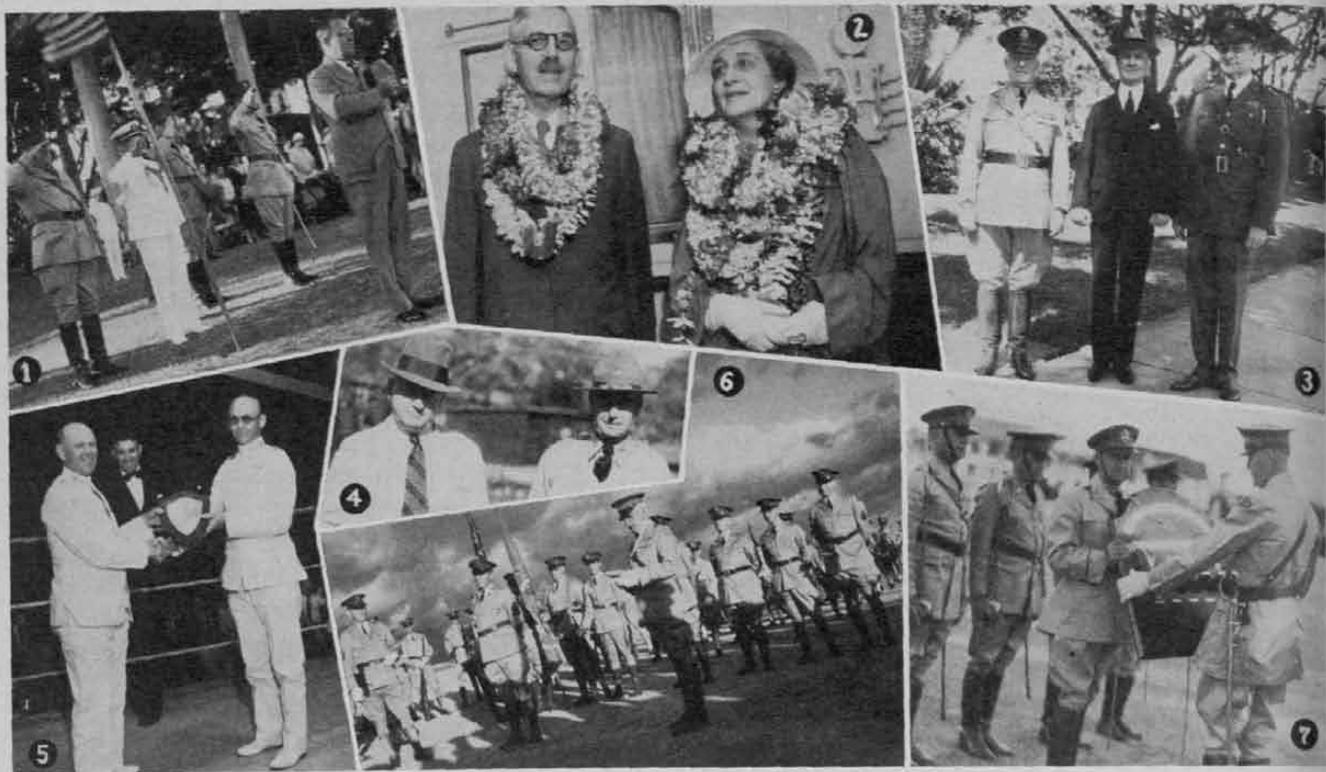
Colonel Avery J. Cooper and Colonel Willis G. Peace, with their families, arrived on the U.S.A. transport *Chateau Thierry* late in November to command Fort Kamehameha and Fort Shafter respectively. The officers and ladies conducted official receptions at the two stations, and officers and their families from all over the Department assembled to meet the new arrivals.

ENLISTED MEN'S REVIEW

Colonel Homer B. Grant was honored with a review by the enlisted men at Fort Kamehameha. There wasn't an officer in the formation, and even the warrant officer band leader was relegated to the sidelines. Noncommissioned officers of the first three grades commanded the regiment and battalions and took over the staff positions. First Sergeants commanded the batteries. It was a splendid show and it was exceptionally well done throughout. The



The Enlisted Men's Review in Honor of Colonel Homer B. Grant



(1) The Governor of Hawaii receives the review in his honor by the 64th C.A. at Fort Shafter. (2) Colonel and Mrs. Willis G. Peace arrive at Hawaii. (3) Major Generals B. H. Wells, Frank Parker, and A. J. Bowley. (4) Congressman Schrugam inspects antiaircraft matériel at Fort Shafter with Lt. Col. W. W. Hicks. (5) Colonel Harry L. Steele presenting interbattery boxing trophy to Captain Rodney C. Jones. Lieutenant John Cassidy, Post Boxing Officer, stands in the background. (6) The enlisted men's review in honor of Colonel Homer B. Grant. (7) Brig. Gen. R. S. Abernethy presenting Honolulu Athletic Supremacy Trophy to Lt. Col. W. W. Hicks. Left to right: Capt. A. V. Winton, Capt. J. R. Townsend, Colonel W. W. Hicks, and General Abernethy.

formations were well conceived, commands were well given, and those in the responsible positions gave a remarkable exhibition of smartness and military efficiency.

During the course of the ceremony the colors, guidons and acting officers were advanced front and center, and in the presence of and by those who have worked so loyally and diligently in his interests, Colonel Grant was presented with a testimonial of the high regard and affection in which he is held by his men.

After passing in review, the troops formed into a hollow square, and in the center, in front of the Harbor Defense colors, Colonel Grant thanked his men.

SHORTS AND OVERS

We all hope Gar Davidson will stress place kicking at West Point at the next spring practice and next fall. That 13-12 Notre Dame score didn't set so well out here.

Officers of the Brigade went to Schofield Barracks recently to hear Captain W. J. Giles, Chief of Staff of the 14th Naval District, give a lecture on Naval Operations in Hawaiian waters.

Major George F. Unmacht, Brigade Chemical Officer, has been conducting a series of chemical warfare schools in the Brigade with notable success. The instruction has been entertaining and interesting. Following is a list of officers who have graduated and received certificates:

Fort Ruger (Harbor Defenses of Honolulu), Second Lieutenant Gaspare F. Blunda, 16th Coast Artillery, Second Lieutenant Tom V. Stayton, 55th Coast Artillery.

Fort Shafter (64th Coast Artillery). Captain John H. Wilson, Captain Morris C. Handwerk, First Lieutenant Girville L. Field, Second Lieutenant Joe C. East, Second Lieutenant Robert F. Moore, 1st Lt. Edwin W. Chamberlain.

Fort Kamehameha (Harbor Defenses of Pearl Harbor). Second Lieutenant Gilbert N. Adams, 15th C.A., Second Lieutenant Robert C. Bard, 15th C.A., Second Lieutenant Francis A. Liwski, 55th C.A., Second Lieutenant Howard R. Martindell, 55th C.A., Second Lieutenant Stephen M. Mellnik, 55th C.A., and Second Lieutenant Roger W. Moore, 41st C. A.

Major Fred Mountford made a hole-in-one on the difficult Oahu Country Club course recently. General Abernethy, Lieutenant Colonel A. G. Campbell and Lieutenant Colonel W. V. Carter were the other members of the foursome.

Battery C, 16th Coast Artillery, has conducted several very interesting battery smokers during the past few months. Lieutenant Howard E. C. Breitung and Harry B. Cooper, the Battery officers, have arranged some very fine boxing bouts and their Hilly Billy orchestra is a sensation with the enlisted men.

Panama Canal Department News Letter

Department Artillery Officer
COLONEL PERCY M. KESSLER, C.A.C.

Fort Amador
COLONEL RUSSELL P. REEDER,
4th C.A. (AA)

Fort Sherman
COLONEL CLARENCE G. BUNKER,
1st C.A.

Fort Randolph
COLONEL RICHARD I. MCKENNEY,
1st C.A.

By Capt. P. W. Lewis, C.A.C.

WE have left off the fighting of sand crabs, sand flies and mosquitoes down here for the more interesting work of preparing for maneuvers and the conduct of gunnery schools. In the last issue was mentioned the school being conducted at Fort Amador in seacoast gunnery for all officers with less than ten years of service. All concerned took hold and a great deal of enthusiasm was displayed. Those lucky enough to have completed the course have a practical working idea of the gunnery problems of both the seacoast and antiaircraft services. Needless to say, all did not pass with an "A" in all subjects, but all passed with at least satisfactory grades.

A very wise allotment of the meagre allowances was made for an antiaircraft officers' school, where all officers of the regiment were given a chance to display some of the practical and theoretical knowledge gleaned from the classroom. For this school, Major Enrique Benitez was the senior instructor, with Frank Edgecomb, Parry Lewis, and Ed. King as his assistants. All battery officers of the regiment were divided into four groups which rotated from guns to director and vice-versa. All of the key positions at both the guns and directors were manned by officers. This approximates very closely the Navy's system of habitually firing an officer's problem before the regular practices.

The first drill and practice was conducted on a wartime railroad antiaircraft battery which we inherited from the Atlantic side. Data was furnished (Case 1½) by an R. A. Corrector. The acting battery Commanders and range officers were required to use the Lewis charts for their trial-shot problems. After a few clouds, rain and boats had interfered several times the actual shooting came off—but we're not going to tell you what the score was. After the boys absorbed all the knowledge from the R.A., they were moved to a battery equipped with the Sperry director with "Follow-the-Pointer" at the guns. Here they learned that merely because an excellent director is being used, is no reason that all shots will plot as hits. A little difficulty has been experienced here with the new director, primarily due, it is thought, to the terrific heat which is absorbed by the instrument during the time it is in use. Another contributing factor is that the fine machine oil tends to gum in this salty, dank air, and the delicately adjusted sliding members sometimes fail to slide. In one instance the fuze range disc stuck at

an inopportune moment during firing—result—some strange "way overs." I say strange, until the reason was found.

It is felt, by all concerned, that a great benefit was received by all and that the Government received full value for the cost of fifty rounds of ammunition. A similar firing school for seacoast is now being suggested for a date in the near future.

We were honored the other day by the visit of five Congressmen who were returning to Washington for the coming session. Those in the party were the Honorable D. S. Church of California, and the Honorable C. Cramer of the same state, Representatives C. I. White and T. C. Cotton of Idaho, and J. W. Mott of Oregon. The visitors were received with proper ceremonies at Pier 18 when the *Chateau Thierry* pulled in, and were escorted to Fort Amador, where a review was held in their honor. After the review they were escorted to Vernon Hall's barracks to see how a barracks should be kept, and were then shown the sights of the Fortified Islands. Phil Taliaferro and Parry Lewis put on the show for them there. They were then whisked up to the top of Ancon Hill to view the gorgeous scenery from that spot and then to Corozal to witness the functioning of the supply departments. Then the Air Corps came into play and flew them to the Atlantic side. There the story must end, as our Atlantic side correspondent did not include the itinerary in his squib.

Let's jump over there, anyway, and see what the First Coast Artillery has been doing:

The First Coast Artillery has no such major caliber, high altitude, high velocity, and what have you, press agents as the Hawaiian Separate Coast Artillery Brigade; however we mean to display no envy, but only wonder why it is that they are kept separate. In Panama the Coast Artillery has joined the mobile army, and if the remainder of our corps would follow suit that old puzzler of West Point plebes, "What constitutes the United States Army? Answer: The mobile army and the Coast Artillery Corps," would soon pass to the realm of archæology.

December 31, 1933, commemorates the first full calendar year since the demise of those venerable units, the P. C. A. D., and the P. C. Division, and the reorganization of this department into the Atlantic and Pacific Sectors. In the reorganization, the Coast Artillery and

Infantry regiments on each side of the Zone are "brigaded" together, reinforced by Engineers and Field Artillery. Some like it, some don't. The "likes" realize a great opportunity for a broader horizon of military activity, which will be of inestimable value, particularly to those individuals who are selected to attend that great institution of higher learning, the C. and G. S., at Fort Leavenworth, where the cold, northern blasts that sweep down the Missouri Valley even force the bronze statue of General Grant to assume the unmilitary attitude of sticking his hands in his pockets. The "don'ts" are furred or long-haired bipeds who display a calendar on the walls of their dens, upon which they daily mark off each passage of the sun, and long for the return to their native land, where they can join the C. C. C., or other of the popular alphabetical units now in vogue, or retire to some care-taking retreat where they can resume their beloved profession at arms on whose shield the bucket of hydrolene oil and a wad of cotton waste are the principal symbols. In Panama the Coast Artillery must be able to run, kick or pass.

Although during the last half of 1933 our copies of 435-55, 221 and 280 have become musty from disuse, the year has been a busy one. We not only qualified six of our eight firing batteries with the coveted "E" during F. Y. 1933, with the remaining two barely missing out, but at the same time taught our Infantry and Field Artillery associates how to juggle the data so as to get hits on the elusive cylindrical plinth. During the first half of January in Sector maneuvers we marched and camped a la doughboy, and traded boyonet thrusts and blank ammunition wads with that gallant regiment of infantry whose motto is, "On the Right of the Line." Then we were ready to display our doughboy skill in the Department maneuvers on the Pacific side, culminating with a spectacular review of all troops in the Department at Albrook Field late in February. Record target practices and obsequies for the late I. D. R. Tentative brought us to the end of June. With nothing to expend but N. R. A. funds since June, we have kept our G.P.F.'s, D.C.'s and AA's well greased and polished by constant drill, with *spare time* devoted to the beloved tactics of the Queen of Battles, scouting and patrolling and the tactical employment of the rifle company, and up. As 1933 was transferred to the dead file, we finished off a series of tests of training conducted by the Sector Commander, during which we demonstrated to the satisfaction of all our triple threat efficiency, and our readiness to begin again with the New Year the same old cycle during 365 days (plus leap years, less Sundays) of active outdoor training. And can we soldier? Brothers, if you would like to read your names on the active duty list, and retain a clear conscience, we cordially invite you to come to Panama and learn how to take it!

In that our training season down here only lasts about three hundred and sixty five days of the year (we really should have 400), it might appear that all work and no

play would make Jack a dull boy. However, we have a friend in the civilian group who has taken pity on the Coast Artillery of the Pacific side. That friend is affectionately known as the Duke of Balboa. The Duke threw a party recently which will go down in the permanent memory of all those who were so fortunate as to be among those present. For those who have not been to Panama recently, the old Century Club building has been turned into the Chagres Club and is quite a meeting place for those who seek good food and a little where-with-all to accompany it. It was here that the famous party was held. Those who remember the chef, Paul of the Mirimar Club, can form some mental picture of the gourmet delights placed before us that evening.

A great deal more of post life exists now under the guiding hand of our commanding officer and his energetic and enthusiastic wife, Mrs. Russell P. Reeder. The old gym has been the scene of many colorful and enjoyable festivities—Forty-niner party, cabaret party and many other kinds of locally generated *bailes*. Spud Spalding, as Secretary of the Club, has had no small hand in keeping the ball rolling.

The Field Artillery has recently moved from Camp Gatun to their new quarters at Fort Clayton. Due to the congestion on that post we have acquired two of the mule artillerists here. Lieutenants Pyle and Black have been added to our garrison. They have been put over the jumps in our antiaircraft and seacoast schools and have emerged with flying colors. The Field Artillery should be justly proud of them—we are.

We have acquired a new Colonel and a new Lieutenant Colonel in the Coast Artillery here, by operation of the tortoise-moving promotion list. We congratulate Colonel Richard I. McKenney and Lieutenant Colonel Kelley B. Lemmon on their acquisition of increased rank.

The outstanding athletic classic of recent date was the Department finals of the fistic sport. To quote from the local sports reporter of the *Star and Herald*: "The 1933 edition of the annual Department boxing carnival will go into the archives as a fistic episode featuring startling upsets, incompetent refereeing, flashes of the sensational, the courageous and the ridiculous. From the opening bout to the grand finale, spectators gave vent to their shifting emotions as Uncle Sammie's fighting nephews battled for honor, glory, and the mythical bauble emblematic of boxing supremacy in the military sector of the Canal Zone." In the flyweight class, Nick LaGreta of Randolph, was outpointed by his opponent from Clayton. George McKinley, Amador's Bantam was knocked out by Frank Biro of Sherman; the featherweight Jackie King of Randolph lost out to his opponent, while Joseph Sincavage, welter of Randolph was outpointed by his opponent. In a happier mood, Steve Kadash of Randolph came through with flying colors and Leonard Neely, Randolph's light-heavy knocked out the much advertised Spud Murphy of Clayton. John Daulbaugh, Randolph heavy, lost through a technical knock-out

The inter-battery baseball league has been temporarily held up, due to the continuous rains. It looks, from the present standstill, that Batteries G and C were in the final race. G Battery of the Fourth has lost only one game during the season and has no more to play, while C Battery has lost none, but has five more games to undergo. G Battery and I Battery were neck and neck in the Department elimination in the Volly Ball whirl. I Battery emerged, one game to the good, with G Battery as runner-up. Both teams will be presented with a cup.

Cort Schuyler is the instigator of an inter-post tennis league. A great deal of interest is being displayed by the officers concerned in this sport, but it is a little early in the game to predict the outcome.

Fort Monroe Notes

By Major J. D. Powers, C. A. C.

Brigadier General Joseph P. Tracy, Commanding.

Colonel H. E. Cloke, Harbor Defense Commander and Post Executive.

Colonel George L. Wertenbaker, Commanding 1st BN., 51st C. A.

Lieutenant Colonel Robert P. Glassburn, Commanding 1st BN., 2d C. A.

Major J. F. Kahle, Commanding 3d BN., 52d C. A.

DURING November and December the main efforts of the Harbor Defense troops have been expended in repairing the damage caused by the hurricanes last summer. The intensive work of processing C. C. C. enrollees stopped training in the spring; then lack of money for ammunition cancelled our target practices, and finally the hurricanes literally "washed us out".

Fortunately for Fort Monroe, P. W. A. and C. W. A. money is available this year. After years of being held down to dwindling army budgets, it was most cheering to find money available in millions of dollars, with orders to expedite expenditures.

The District Engineer is handling construction of the million-dollar sea wall. He is also rebuilding the Engineer Wharf and the Mine Wharf—work is in progress on both of these projects.

Captain Edwin C. Gere, the constructing quartermaster at Langley Field, is in charge of new construction. This is still in the stage of plans and letting contracts. With costs of material and labor going up, the original estimates were all too low, which meant asking for more money.

Late in November we received an allotment of \$300,000 of C. W. A. funds. Captain Harrington W. Cochran was appointed coordinator of this work. He is recorder of the Post Development Board, and so knew intimately the needs of the post. Fifteen officers were detailed as supervisors of this work, and each with a gang of civilian workmen started construction early in December.

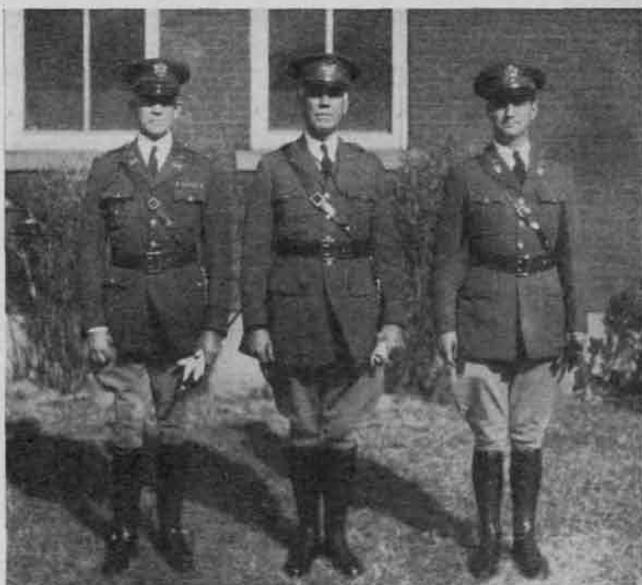
Major Dingley, assisted by Master Sergeant Lemaster, is building the new \$8,000 noncommissioned officers' club located on the water front opposite the east gate. It replaces the Old Point Club, a beach club built by the noncommissioned officers themselves, which was completely destroyed in the August storm. The new club will have furnace heat and attractive club rooms for winter, and screened porches and bathing beach for summer.

Major Hayden, assisted by Major McCain and Captain McGarraugh, is replacing the trees, shrubs, and hedges which were killed by the storm. Twenty-five hundred dollars was allotted for buying young trees and shrubs. The old cottonwoods are being taken down and replaced by pin oaks, scarlet oaks, live oaks, red oaks, white oaks, red Virginia cedars, willows, sweet gums, crepe myrtles, American lindens, and pecans. Dogwoods and redbuds are used to fill in. Hedges of tree box, old English box, American holly, and English holly are being planted.

For the past year every request to the Quartermaster for paint has been met by the answer: "No B & Q funds". One morning everyone was surprised when Lieutenant Durham announced that he had a force of sixty civilians and plenty of paint, and was ready to start painting quarters. Before he is finished we expect to have all the permanent quarters painted throughout.

Lieutenant Barber is supervising the preliminary work on a sewage disposal plant to be located along Mill Creek, northwest of Battery Bomford. The sewage disposal problem of the communities around Hampton Roads is becoming more serious every year, and it is hoped that Newport News, Hampton, and Phoebus will follow the Army's example and establish their own plants.

During the August storm the vines which covered the postoffice for many years were torn loose and killed. Lieutenant Goodall now has a gang of civilian laborers



Col. Cloke, Brig. Gen. Tracy, and Lt. Tarrant

cleaning and scrubbing the postoffice building. Since the removal of trees and vines the actual outline of many buildings can now be seen. Among them are the post-office, the Catholic Church, and the brick quarters on Ingalls Road near Randolph Park. From an artistic point of view, the sooner some of these outlines are concealed by new trees and vines, the better will be the appearance.

Lieutenant McGraw is laying a water main to the new Wilson Park located on the former site of Crisp Park. The storm destroyed the Crisp Park garages. The balloon hanger is being taken down to recover steel girders of its framework. The 51st and 52nd C. A. trucks are now operating from the post pool at the C. A. S. garage. Lieutenant McGraw is also supervising repairs to the temporary buildings in the summer camp areas. At first we expected that all these buildings would be torn down and the summer camps quartered under canvas—but the final decision was to repair all the buildings we could.

Even before the C. W. A. funds were allotted, Lieutenant Engelhart, with a detail of enlisted men and a ten-ton tractor, started to rebuild the beach club. The entire building has to be raised six feet so that it will be higher than the new sea wall, which will be thirteen feet above mean low water. The club will be turned slightly so as to be parallel to the sea wall, and will have a porte-cochère in the rear. The dressing rooms and kitchen will be connected by a runway the full width of the kitchen. The new porch, from which one may look out to sea, will be fifteen feet wide. At one end will be a bar connecting with the kitchen. The open-air dance floor will be from five to ten feet wider than the old one.

Four new tennis courts have been built at the beach club since the storm. The golf course was flooded with salt water and sand and will require much work to get it in shape. An outdoor concrete salt water swimming pool, to be built just inside the sea wall, will measure sixty by one hundred feet, and will be nine and one-half feet deep at the diving end.

Lieutenant Walbridge is building a suction dredge to remove the sand and mud from the moat. At low tide the moat is now practically dry, with pools of stagnant water. Dredging will allow the water to circulate and keep the moat clean and attractive.

Lieutenant Rasmussen is building a new band stand on the water front plaza. The old stand was the last relic of the old Hygeia Hotel at Fort Monroe. After it was blown down in the storm, its roof was still intact, and an attempt was made to rebuild it; but while raising the roof preparatory to emplacing new supports, it suddenly fell completely apart, like the well-known one-horse shay. The new band pavillion, designed by Captain Cochran, calls for a conventional octagonal stand provided with a full floor basement of reinforced concrete. This basement will contain storage space and several dressing rooms with toilets, washbowls, and mirrors. A trap-

door in the middle of the floor will enable the orchestra to appear on the concrete platform from the dressing rooms. The wooden roof will be supported by eight columns. Telephones and electric lights will be installed and special lighting provided for the soloists' platforms.

C. C. C. ACTIVITIES

The strain of C. C. C. activities has decreased considerably. At one time the Harbor Defenses had thirty-six officers and 210 enlisted men out in the field. At present there are five officers and sixty-four enlisted men still out.

Fort Monroe is still the home port for the records of some 5,000 of the C. C. C. men, and is also the supply point for regular Quartermaster supplies and rations for the companies in eastern Virginia. The finance officer at Fort Monroe pays all accounts of the C. C. C. companies in Virginia—some 15,000 men approximating a division in strength. It is too early yet to figure on demobilization of the C. C. C., but when that day comes and the Reserve officers are ordered to their homes and the men secure jobs once more, we anticipate that it will be the regular troops who will close up the camps, pack and store the property, and continue to answer the innumerable letters of inquiry that come in. When that time comes, the Fort Monroe troops will be ready to take over and complete the work.

3D BATTALION, 52D COAST ARTILLERY (RY)

At Monroe these days everything dates from "the storm", so at the risk of being considered antideluvian, the real history of recent activities of the 52d C. A. must start just shortly before that date. A rather wild tide in July, took out our first defensive line, the low sand dune in front of the railway mortar position. In order to save that position D Battery attempted to build a sea wall of railroad rails and logs, to replace the dune. The engineers objected, and produced much learned discussion, on the "history of erosion" until one wag in the outfit remembered having read somewhere that "yesterday is history tomorrow", and as no engineer sea wall could be produced the battery continued its efforts.

Then came "the day", and in twelve hours the labor of a month was spread from Mill Creek to Cape Henry. At noon on August 23rd we started digging ourselves out. Both mortar and gun positions had been ruined, and the guns submerged for about six hours. One paint and tool shed had completely disappeared with all its contents, and two of the base end stations belonging to the battalion had ceased to exist.

We gave emergency treatment to guns and carriages, then turned to, to dig out the post proper. As soon as traffic was able to move freely real care of armament was begun. Since that time eight fixed mortars have been completely dismantled, cleaned and reassembled, including springs and rollers, and to the credit of the outfit, no

pieces were left over and few were missing when the re-assembling was completed.

Two railway mortars have been cleaned, journals repacked and rollers cleaned, and all cars and guns of the battery cleaned and repainted. Two eight-inch railway guns were lifted, rollers cleaned, and guns and carriages chipped and repainted. All trucks on the battery cars were completely disassembled, cleaned, painted and re-assembled. Two ten-inch disappearing guns and the battery in which they are mounted were cleaned and repainted.

In our spare time, one of the old partially destroyed cantonment houses was moved from the Church area to the rear of Battery Anderson, where it is being rehabilitated to become the new Anderson Guard House.

As one husky recruit remarked "I just love this Coast Artillery, all their work is so kind of light and delicate."

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Corregidor Notes

A BRIGADE review was held September 12th for the purpose of presenting decorations to Major Alonzo L. Littell, Q. M. C., Corporal Seth L. Westbrook, Battery D, 60th C. A. (AA), Corporal Warren Workman, Service Battery, 59th C. A., Corporal Casimere Latorre, Battery D, 92nd C. A. (PS), and Private Eugene J. Rauenbuchler, Detachment Q. M. C. Colonel R. W. Collins received the review and Colonel C. B. Ross was commanding officer of troops.

The 59th Coast Artillery and the 60th Coast Artillery (AA) have had recent changes in regimental commanders, Colonels J. B. Taylor and F. L. Dengler having returned to the United States. The new regimental commanders are Lieutenant Colonel M. A. Cross, 59th C. A., and Lieutenant Colonel H. K. Loughry, 60th C. A. (AA).

Commander O. M. Read, U. S. N., and a party of six officers from the U. S. S. *Canopus* visited elements of defense and points of interest on Corregidor on November 9th.

While there will be no regular target practices this season a small amount of money has been made available for a few antiaircraft three-inch, six-inch and 155 practices.

This year the Philippines Baseball Association has but two Army teams, a Philippine Scout team and a Regular Army team, with players from all posts in the department, so Corregidor will have no post team this year. The post inter-company league has just begun to function, Headquarters Battery, 59th C. A., having done most of the winning so far.

The Corregidor Club's Annual Golf Tournament is

now in progress. The club champion will be one of five officers as determined by match play so far: Major Hartley, Captain Case, and Captain White, Lieutenant Lemnitzer, or Lieutenant Carroll.

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Fort Barrancas Notes

CIVIL works funds are working great changes in the Harbor Defenses of Pensacola. The garrison now and hereafter will enjoy flowers, shrubbery and trees as never before, due to the efforts of an expert landscape architect and a crew of men backed by money sufficient for the purchase of thousands of shrubs and flowering plants. When the project is completed Barrancas will be a post of surpassing beauty.

The approach road from Bayou Grande to the National Cemetery is being resurfaced and this, together with a new road being built along the front of the post, will give to the post and the public a scenic road difficult to equal in Florida. The new road will follow an arc on the lowland in front of the post, passing south of the ball field, thence through the grove of pines south of the commanding officer's quarters to a point fifty feet south of the glacis of old Fort San Carlos. Just east of San Carlos a large parking area is being paved, and from this point the view of San Carlos and of Old Fort Barrancas above it is unsurpassed and one that few people ever see. From the old forts the road continues west over the bluffs past the lighthouse to the vicinity of Barrancas Beach and then on west to the Gulf Beach Highway. The county is spending \$35,000.00 on this highway and hopes to pave it through-out.

Railroad construction is being extended on Santa Rosa Island to serve a new battery in the vicinity of Battery Cooper. Other engineer projects include sand-blasting and repainting searchlight towers and the construction of groins to protect the sea wall at Pickens. An optimist allotted twenty-one men to these projects and gravely charged them to complete the work in ninety working days.

The outstanding event in the garrison was the arrival of the new Harbor Defense Commander, Colonel A. L. Fuller. Lieutenant Colonel Clifford Jones, whom he succeeded, had been in command of the Harbor Defense and District "G" of the C. C. C. since the departure of Colonel Lincoln last June. An unfortunate accident cost Mrs. Fuller a broken arm just before Christmas. The reception arranged for the 28th was necessarily postponed and there were other disappointments. Nevertheless, Mrs. Fuller stoutly maintains that she is delighted with Barrancas. Colonel and Mrs. Fuller's son, Lieutenant William Fuller, was home for the holidays.



A HEROIC RECORD is not a reed to lean upon, it is a standard of achievement to be maintained.—W. A. SIRMON.

NEWS AND COMMENT

Knox Trophy Awarded to Battery E 69th C.A. (AA)

CONFORMING to a custom of long standing the Society of the Sons of the Revolution in the Commonwealth of Massachusetts awards annually to the battery of the Regular Army, Coast Artillery Corps, which has conducted the most successful target practice during the preceding year, a trophy to be retained permanently by the winner. This is the well-known Knox Trophy named in honor of John Knox, who is generally conceded to be the father of the U. S. Coast Artillery.

The award is made upon the recommendation of the Chief of Coast Artillery. The basis of the award is excellence in target practice. The award is not necessarily made to that organization which obtained the highest numerical score. If it were, it might easily happen that "lady luck" would play a too prominent part in the cast and possibly steal the show from other less fickle but more important actors and actresses; therefore, it is quite essential that all factors be carefully considered and evaluated. It is not our purpose to attempt to explain how this is done, but it is the bed rock upon which the structure known as the most successful target practice is built. Personnel errors, errors in applying the rules of adjustment, time out occasioned by avoidable causes, accuracy of spotting, and similar factors should be considered in the final determination of the award.

The Coast Artillery Association desires to take this opportunity to congratulate Battery E and the 69th C. A. (AA) for this most noteworthy and outstanding performance. They have won a most coveted prize, one that is eagerly sought by the entire Coast Artillery Corps. By winning this they have added luster and enduring laurels to their crown. The 69th is commanded by Lieutenant Colonel F. H. Smith, while Battery E was commanded during the target practice season by First Lieutenant Lloyd Shepard, now on duty in the Phillippine Department. The battery fired two .30 caliber antiaircraft machine gun practices and two .50 caliber antiaircraft machine gun practices. The scores follow:

		<i>Score</i>	<i>Average</i>
.30 caliber	1st practice—	173.29	} 130.73 Final average
	2nd practice—	88.18	
.50 caliber	1st practice—	250.17	} 145.96 161.17
	2nd practice—	72.18	

The actual presentation of the trophy will be made in Boston at a time to be designated by the President of the Society. It is unfortunate that Lieutenant Shepard cannot be present to receive the trophy on behalf of the battery which he so ably commanded.

Under date of December 15, 1933, the Chief of Coast Artillery addressed a letter to the Commanding Officer, Battery E, 69th C. A. (AA):

"I desire to express to all members of Battery E, 69th Coast Artillery (AA), my heartiest congratulations on winning of the Knox Trophy for the fiscal year 1933. The competition for the trophy was very keen and Battery E was announced as the winner only after the most careful study by the Coast Artillery Board of the target practices of all organizations of the Coast Artillery Corps. The splendid record made by Battery E in its target practices is a tribute to the high state of training of the battery and its fitness for battle. I am sure that all members of the battery will derive the greatest satisfaction from the realization that their efforts have been recognized by the award of the much coveted Knox Trophy."

Undoubtedly it will be of interest to know who the "runners up" were in the contest. The selection of the winner was no easy task and many factors had to be carefully weighed to properly make the award. The performance of the three leading batteries was so outstanding that considerable difficulty was experienced in placing the crown where it belonged and in designating the battery for second and third place. It was finally decided that second honors should be given to Battery B of the 15th C. A. (HD). The splendid record made by this battery in its target practice is attributed to its high state of training and its fitness for battle. The battery officers at the time of the target practice were:

Captain Valentine P. Foster, C. A. C.
First Lieutenant William H. Webb, C. A. C.
First Lieutenant William I. Brady, C. A. C.

The third place was awarded to Battery B of the 51st C. A. (TD). It will be recalled that this regiment won the United States Coast Artillery Association Trophy for the year ending June 30, 1933. A full account of the award is found elsewhere in this issue of the JOURNAL. The officers on duty with this battery were:

Captain Henry D. Cassard, C. A. C.
First Lieutenant Robert H. Kreuger, C. A. C.
Second Lieutenant Louis T. Vickers, C. A. C.

Knox Medal Award Goes to 69th C. A. (AA)

NOT being content with having won the Knox Trophy, the 69th C. A. (AA) has annexed other laurels in that Corporal Harvey B. Clifton, Battery A, 69th C. A. (AA), has been declared the winner of the Knox medal awarded by the Society of the Sons of the Revolution in the Commonwealth of Massachusetts to the enlisted student making the best record in the enlisted Specialists' School. The selection of the student to receive the award is based upon the following factors:

- Scholastic standing.
- Coöperation.
- Diligence.
- Conduct and attention to military duty.
- Military bearing and neatness.
- Character.

The presentation of this medal will be made at the same time the Knox Trophy is presented to Battery E, of the 69th. Our congratulations to Corporal Clifton and we hope that he will have a long and successful career in the Coast Artillery Corps.

Resumption of Target Practice

A PRONOUNCEMENT of great interest and importance to all Coast Artillerymen was issued by order of the Secretary of War under date of December 5, 1933. These instructions provide that all target practice, and ammunition allowances therefor, will be reinstated on a normal basis on July 1, 1934. Of equal interest and importance is the pronouncement that effective July 31, 1934, the calendar year will be adopted as the basis for ammunition allowances.

Coast Artillery organizations of the Regular Army may draw upon ammunition allowances during the period July 1—December 31, 1934, to the extent of one-half their normal annual allowances as authorized in AR 775-10, thereafter the normal annual allowance will be fired during each calendar year. This provision does not apply to the allowance made available to the Coast Artillery School, which is prescribed in terms of money value of the ammunition required.

Credit Where Credit Is Due

EDITOR'S NOTE: We take the liberty of reprinting the following letter from the Commanding Officer of the 57th C. A. (TD) We are in thorough accord with the writer that credit should be given where credit is due. Certainly the 57th C. A. (TD) is deserving of high praise and commendation, and we hope that their accomplishment will be an inspiration to others. The Editor will be glad if any other Regular Army inactive unit can show an equal or greater record of accomplishment; also, we believe that public acknowledgment for work well done is a great builder of morale. Comments from commanding officers of other Reserve units will be welcomed:

DEAR Sir: It was with much pleasure and sincere appreciation that I read in the November-December Journal the article with reference to the award of the

United States Coast Artillery Association Trophy to the 529th C. A. (AA), and the statistics accompanying same. It cannot fail to be of deep influence to all Coast Artillery Reserve officers in the respective corps areas.

The 529th C. A. (AA) is deserving of sincere felicitations from all brother officers, and the achievements of other regiments should serve to urge all those interested to higher attainments during the next school year.

However, in all candor, I must admit that it was with feelings of regret as commanding officer of the 57th C. A., composed solely of Reserve officers, that no mention was made of the extremely meritorious work and high grades earned by these officers under even more difficult circumstances than those of any of the regiments to whom well deserved praise was given.

For your information, the 57th C. A., as of December, 1932, was composed of 33 officers scattered over an area 1,000 miles long and 1,000 miles wide throughout the Ninth Corps Area. These officers worked out their problems entirely without personal assistance from the unit instructor or the opportunity to study or confer with each other, with the exception of seven living within the San Francisco Bay area, who were afforded the opportunity of attending troop school held regularly twice each month by this regiment.

Due to extenuating circumstances, five of these 33 officers (since transferred) were unable to do any extension work. Despite this fact, the remaining 28 officers, as of June 30, 1933, accomplished an average of 82.96 hours per officer. Using the entire strength of the regiment (33 officers) the average would be 70.04 hours per officer.

Seven additional officers were assigned to this regiment after December 31, 1932, and the records disclose, for the entire 40 officers, an average of 58.08 hours.

You will agree, I know, that this work is in keeping with your quotation, "Out West where they do things in a big way." I bring this to your attention because I desire that young officers of this regiment receive all credit deserved that they may be inspired to greater endeavor and resulting high marks; therefore I will deeply appreciate any publicity your columns may afford to the accomplishment of the 57th C. A. Personally, I feel that nothing is more destructive to morale than failure to give credit where credit is due.

Respectfully yours,
W. W. BREITE, Major, C. A. Reserve,
Commanding.

More Credit Where Credit is Due

THE November-December issue of the JOURNAL carried a reprint of some correspondence between the heads of several supply departments in the Panama Canal Zone. We are in receipt of a letter from Colonel John P. Hasson, Q. M. Corps, in which he advises that while

his name appears after several of the indorsements, the credit for the preparation of these indorsements should go to Mr. John McGroarty of his office. We wish to make due acknowledgement to Mr. McGroarty for his poetic ability and the fact that he contributed something which we hope furnished pleasure to our readers.

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Opening Date of Coast Artillery School

INFORMATION has been received from the Commandant, Coast Artillery School, which indicates that the opening exercises for the 1934-35 course at the School will be held on Saturday, September 1, 1934. Student officers will be directed to report to the Commandant of the School not earlier than August 27, nor later than August 31, 1934.

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Errata

ON page 403 of the November-December issue of THE COAST ARTILLERY JOURNAL it was erroneously stated that Lieutenant Colonel R. L. Cochran of Lincoln, Nebraska, is the Commanding Officer of the 507th C. A. (AA). This was taken from the best available records. We are indebted to the Chief of Staff, Artillery Group, VII Corps Area, for calling attention to the fact that Lieutenant Colonel Cochran has been transferred and that Lieutenant Colonel H. E. Pride is now the Commanding Officer of the 507th C. A. (AA). It will be recalled that this regiment was the "runner up" in the race for the United States Coast Artillery Association trophy. Our apologies to Lieutenant Colonel Pride.

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Supporting the Journal

THE Editor of a Service publication must continuously employ all proper means in an effort to increase the number of subscribers. It has previously been pointed out that the JOURNAL is not self-sustaining; it can only be made so by increasing the subscription list. At the present time the financial demands made upon junior officers are so great that even a modest \$3.00 contributed toward the support of such a worthy cause may, in extreme cases, constitute a hardship; but with few exceptions the stable income of all officers of the Regular Army can be budgeted so as to support their military association.

Our goal is 100% subscribers in the Regular Army and as many as possible from the other components. Officers cannot lead a life apart, they must pull with the team if there is to be real progress. Many officers are now withholding their support when the small item of \$3.00 would not be missed from the family budget. A slight reduction in the amount allotted to social and recreational activities would more than make up for the price of a subscription. In addition there would be the satisfaction

which comes from a knowledge of a duty performed. Unfortunately this cry in the wilderness probably will not come to the attention of the non-subscribers (although there is evidence that they share in the services rendered by the Association), but we hope that those who do subscribe will do a little missionary work among their non-subscribing friends and acquaintances. By this means you can render a real service and possibly boost the list of subscribers.

The JOURNAL desires your support and good will. It hopes to obtain this through its own merits. We believe it is worthy of your support. We hope that this support can be obtained not through sentiment or a sense of duty but because you will be getting value received for the money expended. A better JOURNAL can be produced if each individual feels some responsibility for its contents. The job of the Editor is to select the best available material from the manuscripts at hand. On this basis each subscriber should have an interest in furnishing suitable copy to the end that the best possible magazine can be turned out for the benefit of the subscribers who have a right to expect their money's worth. This is the editorial objective and we hope that each member of the Coast Artillery Corps will assist in reaching the desired end; first, by lending his tangible support in the way of a subscription and, second, by supplying timely articles on subjects of interest to Coast Artillerymen.

/ / /

51st C. A. (TD) Wins Association Trophy

IN carrying out the purposes of the United States Coast Artillery Association to promote the efficiency of the Coast Artillery Corps it was decided, shortly after the organization of the Association, to award annually a suitable trophy to a regiment of the Regular Army, National Guard, and Organized Reserves for outstanding performances in their respective fields. The Coast Artillery Association takes great pleasure in announcing that the award to the regiment of the Regular Army for the training year ending June 30, 1933, has been made to the 51st C. A. (TD). The trophy is awarded to the regiment having the largest percentage of active firing batteries rated excellent. The 51st consists of two active firing batteries. The scores made by these batteries are as follows:

	<i>Scores</i>	<i>Average</i>	<i>Rating</i>
Battery A— 1st practice	101.5	98.9	Excellent
2nd practice	96.2		
Battery B— 1st practice	157.0	129.0	Excellent
2nd practice	101.0		

From the above it will be noted that Battery B attained a very high average score, in fact it was the third battery in order of merit in the Knox Trophy competition. The Coast Artillery Association extends its congratulations to all the personnel of the 51st for this fine record, in which everyone connected therewith may take just pride.

COAST ARTILLERY BOARD NOTES

Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problems that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.

THE COAST ARTILLERY BOARD

COLONEL A. H. SUNDERLAND, C.A.C., *President*
MAJOR IRA A. CRUMP, O.D.
MAJOR A. F. ENGLEHART, C.A.C.
MAJOR C. E. COTTER, C.A.C.

CAPTAIN H. C. MABBOTT, C.A.C.
CAPTAIN S. L. McCROSKEY, C.A.C.
CAPTAIN C. S. HARRIS, C.A.C.
1st LIEUT. WALTER J. WOLFE, C.A.C.

SECTION I

Projects Completed Since the Last Issue of The Journal

PROJECT No. 958—DEVICE FOR CHECKING MOBILE ARTILLERY SIGHT MOUNTINGS.—The following concerning this device is quoted from the September-October issue of the JOURNAL: "Mobile artillery sight mounts are designed to correct for the error in azimuth due to cant of the gun. If they are not properly adjusted they fail to do this. As stated in the May-June issue of the JOURNAL, the device, submitted by Captain J. T. Campbell, C.A.C., is designed to determine the amount of azimuth error due to improper adjustment of mobile artillery sight mounts, and to indicate the adjustments that should be made."

This device might be described as a master sight, but the use of that name might confuse it with another instrument of that name and which does not include many features of the mechanism under discussion. This consists essentially of a panoramic sight supported on a frame which is, in turn, supported on a bore rest. By its use it is possible to cause the gun to elevate in the true vertical plane. If such elevation throws the gun sight off the aiming point an error in the gun sight is indicated, permitting corrections and adjustments to be made accordingly. In target-practice firing the maladjustment of the sight showed up most specifically in railway mortar firing because such cannon were fired in any given practice through wide ranges of elevation. The same maladjustment would be shown if other guns which, in elevating, departed from the true vertical plane, were fired over a wider range in elevation. Target practice reports indicate that railway mortars fired in salvos will start with nicely grouped patterns, but when there is any decided change in elevation these patterns may spread widely. It is hoped that the use of this instrument will serve to keep the guns together. The Coast Artillery Board recommended that this device be examined by the Chief of Ordnance and, assuming favorable action on his part, that a device be provided for each regiment or harbor defense so that

Ordnance personnel can make a check at least once a year of all sights on hand and correct those that are out of adjustment.

PROJECT No. 969—TEST OF FUZE SETTER M₂, MODIFIED.—As stated in the September-October issue of the JOURNAL, trouble had been experienced with the antiaircraft fuze setters M₂ and M₃, and a slight modification was made. One instrument was sent to the Coast Artillery Board for test. This particular instrument was broken during the test, but it was repaired and the test finally completed. The modification proved very satisfactory, and it was recommended by the Coast Artillery Board that all fuze setters M₂ and M₃ now in the service be modified and that all fuze setters to be manufactured in the future be designed to have the hand-wheel located as on the M₃; i. e., on the side.

PROJECT No. 970—TEST OF FIRING LOCK MARK I.—This lock is merely a modification of the M1903 firing mechanism. It is larger and heavier than that mechanism and cannot replace it without modification of the breech-block in each case. The two mechanisms differ in design to some extent. The electrical features of the lock seemed to provide better contact for electric primers than did the old, and the new lock provides for firing primers by percussion. The ignition problem itself, in the case of cannon, is no more than the ignition problem in the case of small arms, for in either instance the process is simply the ignition of a small quantity of fine-grain powder. However, the general problem is complicated in the cannon by the intensely important matter of safety and by the fact that the Coast Artillery Corps has never decided whether it wants electrical firing on the one hand or the percussion or friction on the other. The Mark I device is in the nature of a compromise and provides for both. Much has been written on this subject, but the question is not yet settled. In this particular case the Board recommended:

a. That a firing lock more positive in its safety features than the Mark I lock be designed and submitted to the Coast Artillery Board for test, and

b. That one hundred each simple electric and simple percussion primers (not combination) be furnished for the test of such firing lock, and that such project be given a high priority.

It would appear that using a firing lock that can take quickly either a percussion or electric primer, a primer can be changed to suit the occasion with no critical loss of time.

PROJECT No. 978 — TIME-INTERVAL APPARATUS, NEW TYPE.—The time-interval apparatus tested under this project is officially known as the type EE-85-T₃, and is a development of the Wallace-Tiernon principle. During the Board test the apparatus was run for nearly 300 hours and developed no defect. However, it is thought that by making some minor changes in the design the instrument can be made better suited for Coast Artillery use. The principle of operation is satisfactory, as are the time intervals provided. It was recommended that the Time-Interval Apparatus, type EE-85-T₃, be approved as a development standard and that a few of these instruments be obtained for issue to several mobile organizations, and to one or two harbor defenses, but that no final standardization of any time-interval apparatus be made until the development and test of a tone system to accompany it is completed.

PROJECT No. 982 — TRACKER T₁.—This instrument, mentioned in Section III of the Board Notes appearing in the November-December issue of the JOURNAL, was tried out in connection with the test of the Sperry Director T8E₃. The tracker is a simply-constructed offset device by which a target, either aerial or water-borne, is tracked. Data from the tracker is electrically transmitted to the director, which thus can be placed in a concealed protected position, leaving only the tracker and one or two men exposed. The device proved very satisfactory except in one feature. This involved the spotting correction device, which correction the Coast Artillery Board hopes to see inserted elsewhere in the system.

PROJECT No. 984 — PRIME MOVER T₉.—The T₉ prime mover is a six-wheel truck, with six-wheel drive. The spare tires may be added to the front wheels, making them dual tired. The other four wheels are permanently dual tired. The vehicle weighs 11,770 pounds and has a carrying capacity of 3,000 pounds. It is equipped with a six-cylinder, ninety-three horsepower engine. A special feature of this vehicle is the application of the so-called Hipkins traction devices. These devices are similar in principle to the ordinary Caterpillar tractor tread, and are applied to each pair of dual-tired rear wheels and to each of the front wheels when dual tired.

This prime mover was tested in connection with the new antiaircraft gun T8 on mount T₃. The vehicle was at Fort Monroe only two or three days and the test thereof was somewhat limited. It showed every promise of meet-

ing, after a few modifications are made, about all the requirements of a prime mover for antiaircraft guns and equipment. It is assumed that most of the readers of the JOURNAL are familiar with the terrain of Fort Monroe. In the test the prime mover took the new antiaircraft gun and mount in tow at a point between Batteries Parrott and Eustis. From there it proceeded through the dry, soft sand in front of or to the east of the line of batteries, to a point about 500 yards to the left flank of the northern mortar battery. This movement through this difficult terrain was made quickly and smoothly with no tendency to stall. The gun was put into position in deep, loose sand by the aid of the prime mover.

It is thought that a little added power with its corresponding additional weight would enable this prime mover to replace many of the caterpillar tractors now provided for mobile artillery. The traction devices are easily taken off and put on, and the several gear shifts available make the vehicle adaptable to artillery loads on hard roads or through sand or mud, while the flexibility of the bogies allows it to negotiate extremely rough terrain.

The board recommended that a prime mover of the power and type of the chassis of the Ordnance Mobile Machine Shop T₂ be procured for extended service test. It further recommended that a winch be provided on such vehicle. How many vehicles per battery should be provided with winches has not been determined, but in each battery it would appear that at least one vehicle with a winch is highly essential.

PROJECT No. 985 — SIMPLIFIED SEACOAST COMPUTOR (MEADOWS).—Lieutenant Meadows' design for a simplified seacoast computor was described under Project No. 979 in the November-December issue of the JOURNAL. Since the publication of that article the board has had an opportunity to study Lieutenant Meadows' work and finds that his suggestions are sound mathematically. The board feels that a satisfactory computor might be built on the principle he sets forth, but there are no outstanding advantages of his system over that of the Lewis-Trichel instrument.

The board recommended that Lieutenant Meadows design be referred to the Chief of Ordnance for his information and any use he may desire to make of the suggestions contained therein, and that the Chief of Coast Artillery commend Lieutenant Meadows. The following letter was written by the Chief of Coast Artillery to Lieutenant Meadows concerning this project:

WAR DEPARTMENT

OFFICE OF THE CHIEF OF COAST ARTILLERY
WASHINGTON

November 7, 1933.

Subject: Commendation.

To: 1st Lieut. John J. Meadows, C.A. Res.

1595 Macombs Road, Bronx, N. Y.

THRU: Commanding General, 2nd Coast Artillery District.

1. I am enclosing for your information a copy of Coast

Artillery Board Project No. 985 and of the indorsement showing the action of this office thereon.

2. It is hardly necessary for me to add to the comments of the Coast Artillery Board concerning the merits of your device, and the soundness of the principles involved.

3. I desire to commend you for the initiative, ingenuity and professional zeal which you have displayed in this work as well as in other ideas which you have contributed to this important field.

JOHN W. GULICK, *Major General,*
Chief of Coast Artillery.

PROJECT No. 961 — IMPROVISED MOUNTING, TELESCOPIC SIGHT, 155 MM GUNS.—This device, described in the November-December issue of the JOURNAL has been reported upon. While the Coast Artillery Board has had no opportunity to present to Colonel Taylor the modification made on his design for this sight mount, it feels assured that he will accept such modification. A test of the mount, as modified, was made.

The Coast Artillery Board concluded that there is a decided need for a sight that will permit Case II firing of 155 mm guns at all ranges within the limitations of the piece. The design tested permits such firing by utilizing the old telescopic sights, Models 1897 or 1898. There is a decided need for a sight that can be used with any one of the many designs of guns used by the Coast Artillery. The issue of such a sight would greatly reduce confusion and would provide for interchangeability. The development and issue of Colonel Taylor's device, if adopted, would add one more mechanism to the confused list. The board is therefore reluctant, regardless of the merits of the device tested, to recommend it for manufacture and issue. The board made its recommendations to the Chief of Coast Artillery in accordance with the above.

SECTION II

Projects Under Consideration

PROJECT No. 608-A — "DUCO" SURFACING FOR GUNS.—This project has been described several times in the JOURNAL, and it finally can be stated that a report is in preparation. The Board's conclusions are not very definite, excepting in the case of Duco. It is not believed that Duco is suitable as a gun paint, but it has been suggested that Dulux be given another test. If such is approved, the test will probably be made in connection with another new paint of promising characteristics, that has come to the attention of the board.

PROJECT No. 929 — EXPERIMENTAL FIELD CHRONOGRAPH (JACKSON).—Two members of the Coast Artillery Board recently saw a partial demonstration of the chronograph which is now at the Aberdeen Proving Ground awaiting test there before its is sent out for a service test. A moving-picture camera photographs the projectile in its flight, and a tuning fork makes time lines on the photographic film. The flight of the projectile across these time spaces is measured, and from this measurement the velocity of the projectile is computed.

PROJECT No. 947 — TEST OF OIL CLOTHING FOR USE BY ARMY MINE-PLANTER PERSONNEL.—As previously stated, the actual test of this clothing is being made elsewhere, and when a report is made as to the suitability of the clothing the board should be able to make its recommendations as to standardization for issue.

PROJECT No. 953 — RADIO-CONTROLLED-HIGH-SPEED TARGET.—The Coast Artillery Board believes that such a target is highly desirable for use in advanced target practices. A commercial firm has submitted plans and specifications for a boat, and the board feels that a radio control can be installed locally at comparatively little expense. Report to this effect has been made to the Chief of Coast Artillery, and it is understood that he has referred the project to the Chief of Ordnance.

PROJECT No. 964 — TEST OF RUBBER-JACKETED SUBMARINE MINE CABLE.—The test of this cable is still in progress. Considerable actual mine work has been carried out in which this cable was used in connection with Coast Artillery Board Project No. 971. Final report cannot be made until certain endurance tests have been completed.

PROJECT No. 966 — TEST OF CIRCUIT CLOSER, MODEL 1933.—See Project No. 971, below.

PROJECT No. 968 — PREPARATION OF COAST ARTILLERY MEMORANDUM NUMBER FOURTEEN.—As previously stated, this is the memorandum issued each year giving the results of target practices throughout the Coast Artillery. Due to the suspension of regular target practices during the fiscal year 1933, the necessity for this information has not been pressing. However, recent information from the War Department indicates that normal target practice will be taken up after July 1, 1934. Such decision will make necessary the issue of this memorandum at an early date. The board has the preparation thereof well under way at this time. In this connection it may be stated that under War Department instructions the size of this memorandum will be considerably reduced as compared with former issues.

PROJECT No. 971 — COMPARATIVE TESTS OF SUBMARINE MINE SYSTEMS.—After a considerable number of delays due to weather and late arrival of material and equipment, the actual work of planting and taking up the mines in connection with this test, has been completed. The report is in process of preparation.

PROJECT No. 973 — TEST OF LACQUERS AND VARNISHES FOR USE AS RUST PREVENTIVES.—A description of this test may be found in the September-October issue of the JOURNAL. Due to delay in arrival of materials and to the discovery of new ones, the board has not yet coordinated a test or applied to a

gun or carriage any of the lacquers that have been recommended, but work on this will be begun at an early date.

PROJECT No. 975—TEXT ON TRACER CONTROL.—A brief description of this project may be found in the November-December issue of the JOURNAL. The Chief of Coast Artillery has directed the Coast Artillery Board to write a text on this subject. The board is attempting, through correspondence with individual officers, to accumulate all pertinent information available. The difficulty that is being experienced in finding anyone that knows anything about it, indicates the great necessity for such a publication. If you have not received such a letter, no reflection is indicated, and your suggestions as to what should appear in this text will be most welcome.

PROJECT No. 980—MODIFIED RETICULE SPLASH SCALES, MODEL 1910 AZIMUTH INSTRUMENT.—Nearly all azimuth instruments in the Coast Artillery service that bear a reticule splash scale graduated in degrees and fractions thereof have this scale so placed as to obscure a large part of the field of view, and such scales are rather difficult to read. It has been suggested that a splash scale be etched on a piece of plain glass and placed in the optical system of the telescope in the position of the ordinary reticule to replace the more or less opaque scale now in use. Such a scale has been tried out by the board and appears to be satisfactory. However, improvements have been suggested in the system of numbering this scale, and completion of this test is awaiting the receipt from Frankford Arsenal of a scale numbered according to the new method.

New Projects

The following new projects have been initiated since the publication of the last issue of the JOURNAL:

PROJECT No. 981—ANTI-AIRCRAFT DIRECTOR T8E3.—This director is briefly described in the November-December issue of the JOURNAL under Section III of the Coast Artillery Board Notes. The test of this instrument was taken up as Project No. 981. As stated in the article referred to, the director is very similar to the older model director. The modifications incorporated in the new instrument remedied the defects for which they were designed, and a complete report on the test of this instrument, tested during the month of November, is now being prepared.

PROJECT No. 986—AIR BRAKES ON 3-INCH ANTI-AIRCRAFT GUN MOUNTS M2 AND ON INSTRUMENT TRAILERS M1.—Improvement in mechanization has considerably increased the capabilities of towing vehicles in making speed on good roads. Any kind of a vehicle that is towing a load, on wheels, at a speed of twenty miles per hour or better, or down any appreciable grade, should have some means of checking the velocity of the tow.

Most of our unpowered Artillery vehicles or carriages are provided with hand brakes, but the application of such brakes is uncertain and difficult to coordinate with the actions of the driver of the towing vehicle. Air or hydraulic brakes are provided for all the new prime movers. Coupling these braking systems to a similar system on gun mounts and trailers is being undertaken, and the board has been directed to make tests of such installation.

Fort Monroe is not very well provided with hills, so it will probably be necessary to take such equipment at least as far as Yorktown during the tests.

PROJECT No. 987—LUMINOUS PAINTS FOR GUNS.—There is a nice balance on the one hand between illuminating gun mounts on emplacements sufficiently for the gun crew to work and making such illumination, on the other hand, invisible to aerial observers. This balance has not yet been well established. Illumination for rapid-fire guns, like a 3-inch antiaircraft gun, is one problem; illumination for a 16-inch gun emplacement, with its slow rate of fire and infrequent flashes is another problem.

Luminous substances are being improved constantly, and the painting of the essential or most frequently used parts of a gun and carriage with such substances may make it possible to load and fire a gun with a very small amount of illumination around the emplacement. The Coast Artillery Board is collecting luminous paints with a view to trying them out.

PROJECT No. 988—LINN HALF-TRACK TRUCK.—The Linn Half-Track Truck is described as a powerful, heavy prime mover, similar, in general design, to the prime mover T-9 described above under Project No. 984. It is understood that this vehicle has proven quite satisfactory in tests elsewhere, and it is to be tested by the Coast Artillery Board in connection with 155 mm material, and other heavy tow loads.

SECTION III

Miscellaneous

The following subjects, not taken up as projects but upon which the Coast Artillery Board has acted since the last publication of the JOURNAL, have been selected from the files of the Coast Artillery Board because of their general interest:

EXTREME ANGLES OF ELEVATION, ANTI-AIRCRAFT GUNS.—It has been found that when antiaircraft guns are fired at a high angle of elevation and into the wind, the shrapnel cases sometimes fall perilously near the gun. Fragments of high explosive shell might also fall and do injury to the gun crew or other elements of the battery when such ammunition is fired. The recommendations of the Coast Artillery Board were requested on a proposal to limit firing to angles so small that there would be no danger of parts of a pro-

jectile ever falling near a battery. The board was of the opinion that no mechanical limitation should be put on the elevation of the gun other than that required by the construction of the gun. However, the board recommended that certain changes be made in safety regulations to prevent accidents to personnel during peace-time target practice.

SOUND-POWER TELEPHONE.—It is understood that one of the first telephones ever produced was one

that operated, however inefficiently, without the use of an outside source of electricity. A development of this same principle is now being experimented with, and the Coast Artillery Board was called upon to make recommendations concerning the test.

It is known that these telephones, which are actuated by the currents produced when voice vibrations are transmitted to an armature moving in the field of a permanent magnet, have been used successfully under certain conditions.

COAST ARTILLERY ORDERS

Colonel William A. Covington, from recruiting, Presidio of San Francisco to recruiting, San Francisco.

Colonel Percy M. Kessler, detailed member, court of inquiry, Panama Canal Department.

Lieutenant Colonel William S. Bowen promoted Colonel November 1.

Lieutenant Colonel Avery J. Cooper promoted Colonel November 1.

Lieutenant Colonel Frank Geere promoted Colonel December 1.

Lieutenant Colonel Richard I. McKenny promoted Colonel December 1.

Lieutenant Colonel Hollis LeR. Muller, from 11th, Ft. H. G. Wright, to the Philippines, sailing New York, January 18.

Lieutenant Colonel Clarence B. Ross promoted Colonel November 1.

Lieutenant Colonel James B. Taylor promoted Colonel November 1, retired physical disability, November 30.

Lieutenant Colonel George L. Wertebaker promoted Colonel December 1.

Lieutenant Colonel Philip H. Worcester (deceased) advanced grade of Colonel December 3.

Major Donald M. Ashbridge promoted Lieutenant Colonel November 1.

Major E. E. Bennett promoted Lieutenant Colonel November 1.

Major Frank S. Clark promoted Lieutenant Colonel November 1.

Major Clarence E. Cotter, from 7th, Ft. Hancock, to Coast Artillery Board, Ft. Monroe.

Major William S. Fulton promoted Lieutenant Colonel November 1.

Major Robert E. Guthrie promoted Lieutenant Colonel October 27.

Major Paul H. Herman promoted Lieutenant Colonel November 1.

Major Monte J. Hickok, from Hawaii to 62d, Ft. Totten.

Major Thomas O. Humphreys promoted Lieutenant Colonel November 1.

Major Kelley B. Lemmon promoted Lieutenant Colonel November 1.

Major Joseph D. McCain, from Coast Artillery Board, Ft. Monroe, to the Philippines, sailing New York, January 18.

Major Charles B. Meyer, from instructor, Pa. National Guard, Allentown, to 61st, Ft. Sheridan, December 31.

Major Hollis LeR. Muller promoted Lieutenant Colonel November 1.

Major William R. Nichols promoted Lieutenant Colonel November 1.

Major Robert M. Perkins, from the Philippines to 62d, Ft. Totten.

Major Evan C. Seaman, from 61st, Ft. Sheridan to instructor, Pa. National Guard, Allentown, March 1.

Major Berthold Vogel, from 8th, Ft. Preble, to 11th, Ft. H. G. Wright.

Major Oscar C. Warner promoted Lieutenant Colonel November 1.

Captain Albert A. Allen promoted Major November 1.

Captain Arnold D. Amoroso, from Hawaii, to 6th, Ft. Winfield Scott.

Captain Thomas R. Bartlett, from 63d, Ft. MacArthur to the Philippines, sailing San Francisco, May 25.

Captain Ben B. Blair, from 63d, Ft. MacArthur to 3d, Ft. MacArthur.

Captain Louis J. Bowler, from 2d, Ft. Monroe, to the Philippines, sailing New York, May 4.

Captain Albert C. Chesledon promoted Major November 1.

Captain Walter J. Gilbert, from 52d, Ft. Hancock, to 5th, Ft. Hamilton.

Captain Chauncey A. Gillette, from 3d, Ft. MacArthur, to 63d, Ft. MacArthur.

Captain Joseph B. Hafer is relieved from detail in the Quartermaster Corps, January 31. Remain on present duties.

Captain John H. Harrington, from instructor, Delaware National Guard, Wilmington to Finance Department, Ft. McPherson, November 14.

Captain Charles S. Harris, from 51st, Ft. Monroe to Coast Artillery Board, Ft. Monroe.

Captain George W. Hovey, from 13th, Ft. Barrancas, detailed to Quartermaster Corps, Ft. Bragg, December 18.

Captain Walter L. McCormick, from the Philippines to 6th, Ft. Winfield Scott.

Captain William R. Maris, from 6th, Ft. Winfield Scott, to the Philippines, sailing San Francisco, May 25.

Captain Mahlon M. Read to Hawaii, sailing San Francisco, March 30, previous orders amended.

Captain Kenneth Rowntree, from 14th, Ft. Worden, to Hawaii, sailing San Francisco, May 26.

Captain Henry H. Slicer, from 52d, Ft. Hancock, to the Philippines, sailing New York, May 4.

Captain Arthur W. Waldron, from Hawaii, to 8th, Ft. Preble, revoked.

First Lieutenant Russell E. Bates, from 62d, Ft. Totten, to the Philippines, sailing New York, May 4.

First Lieutenant George J. Bedford, CA-Res., promoted to Captain, CA-Res. December 20.

First Lieutenant Alvin T. Bowers, from the Philippines to 69th, Ft. McClellan.

First Lieutenant Walter H. Carlisle promoted Captain November 1.

First Lieutenant Kenneth E. DeGraw, CA-Res., promoted Captain, CA-Res. December 18.

First Lieutenant Harvey H. Eustrom, CA-Res., promoted Captain, CA-Res. December 14.

First Lieutenant Lee E. Gray, from the Philippines to 6th, Ft. Winfield Scott.

First Lieutenant George F. Heaney, Jr., from the Philippines to 6th, Ft. Winfield Scott.

First Lieutenant Henry L. Hughes, from 14th, Ft. Worden, detailed to Quartermaster Corps, effective April 12. Assigned to Q.M. Depot.

First Lieutenant McLean, from the Philippines to 52d, Ft. Hancock.

First Lieutenant William H. Papenfoth promoted Captain November 1.

First Lieutenant George F. Pierce, from 6th, Ft. Winfield Scott, to the Philippines, sailing San Francisco, February 9.

First Lieutenant Clarence H. Schabacker, from 69th, Ft. McClellan, detailed to Quartermaster Corps, December 1.

First Lieutenant Rupert E. Starr promoted Captain November 1.

First Lieutenant Guy H. Stubbs, from the Philippines to 11th, Ft. H. G. Wright.

First Lieutenant Walter L. Weible promoted Captain November 1.

Second Lieutenant William H. Ball, from Air Corps, Randolph Field, to 61st, Ft. Sheridan.

Second Lieutenant Oscar B. Beasley, from the Philippines to 52d, Ft. Monroe.

Second Lieutenant Fred G. DeBerry, CA-Res., promoted to First Lieutenant, CA-Res. December 21.

Second Lieutenant Philip V. Doyle, from 52d, Ft. Hancock, to the Philippines, sailing New York, May 4.

Second Lieutenant Roy K. Kauffman, from 61st, Ft. Sheridan, to the Philippines, sailing New York, May 4.

Second Lieutenant Lamar C. Ratcliffe, from Air Corps, Randolph Field, to 6th, Ft. Winfield Scott.

Second Lieutenant Irving D. Roth, from 52d, Ft. Hancock, to the Philippines, sailing New York, May 4.

Second Lieutenant Walter A. Rude, from 6th, Ft. Winfield Scott to Hawaii, sailing February 10.

Second Lieutenant Harry W. Schenck, from Air Corps, Randolph Field, to 11th, Ft. H. G. Wright, December 13.

THE FOREIGN MILITARY PRESS

Reviewed by Major Alexander L. P. Johnson, Infantry

AUSTRIA — *Oesterreichische Wehrzeitung* — November 24 and December 1, 1933.

NEW FORTIFICATIONS. By Major General Schäfer, retired.

The ample publicity enjoyed by the frontier fortifications of France, the author writes, is indeed surprising and contrasts markedly with the custom that prevailed in the days before the World War. France permits her press to publish photographic views of sections of these forts, and to give detailed accounts of their armaments and installations as if to allay on the one hand French apprehensions, and on the other, to impress her probable enemy with the formidable character of her defences.

From the published data we learn that principal forts have been erected at intervals of ten kilometers along the German frontier. These are so well constructed that they can withstand the fire of any weapon from machine guns to the most powerful artillery. The interval between these forts is dotted with smaller works and machine-gun nests. Large subterranean barracks farther to the rear are likewise proof against bombs and gas. According to Czechoslovak sources, the author states, these lesser "works" are concrete blocks 10-12 meters square, and one to two stories high. The total excavation for each of these structures amounted to about 10,000 cubic meters. The garrison of the blockhouses consists of twelve men with machine guns. The cupola accommodates the observer and one machine gun with gunner. This gun is sited for fire against targets at close ranges, while the guns emplaced in the lower tiers have the more distant fire missions. These works are so well concealed and camouflaged that they cannot be seen at a distance of 50 meters.

Mobile fortification parks designated by the French as "fortifications à roulette" contain, besides munitions, stores of material and equipment for the construction of trenches, concrete bases and obstacles. They are located near railheads ready for immediate transport.

Italian sources, the author writes, describe the forts of the second line, about $1\frac{1}{2}$ kilometers in rear of the first line, as turret forts armed with light field guns. Each of these forts supports ten of the front-line blockhouses. The walls of these forts are four to five times as strong as those of the famous Fort Vaux at Verdun which, the author recalls, after two months of sustained bombardment during the World War remained practically intact. Only three out of 18 chambers suffered actual damage.

The French fortifications, the author states, are fully manned at a permanent war footing. The garrison comprises a total of 42 especially trained battalions of infantry, thirty regiments of field artillery, and six regiments of heavy artillery, representing more than 100 batteries of

all calibers. In addition to these there are two regiments of engineers (sappers and miners), one regiment each of signal and railway troops and three companies of electricians. The total strength of this garrison is estimated at 50,000 officers and men, whose sole mission even in time of peace is to defend the frontiers of France against a possible German attack.

The Belgian Crown Council, on October 11, 1933, the author writes, set aside 230 million Belgian francs for the construction of fortifications along the German frontier. The projects comprise (1) preparation of defensive works on the Hervé Plateau between Liège and Aix-la-Chapelle; (2) construction of "points d'appui" along the frontier zone in the provinces of Limbourg, Liège and Luxembourg; (3) completion of the fortifications of Liège and Namur; (4) organization of a fortified area in the vicinity of Ghent for the defence of the Scheldt sector.

Turning his attention to the Pacific, the author believes that the prevailing situation in that part of the world is quite serious. Construction of new forts forms an important part of the Japanese program of defence. The Japanese are very secretive in this matter, and the author recalls the strict regulations the Island Empire enforces upon foreign aviators who contemplate flights over any portion of Japan.

The author quotes the Italian naval review, *Rivista Marittima*, to the effect that Japan is now engaged in fortifying the Marianas, Marshall, Caroline, and Pelew Islands. This work, it is said, has been in progress since 1932. He states, that the Japanese have consistently refused permission to American vessels to visit these islands, and that when the League of Nations got interested in the matter and proposed an investigation the Japanese withdrew from the League and declared that these islands are Japan's spoils of war, and that Japan does not recognize "mandates."

The Italian source named states that the principal fortifications are located on the Pelew Islands, about 1,000 kilometers east of the Japanese archipelago. Bases for submarines and seaplanes have been established on the island group of Kossol Reef and on Mataka Island. The fortifications of Korov Island are said to be armed with 203-millimeter guns. The principal base, the author states, is Seipan Island (Truk?) in the Carolines. The harbor of this island can accommodate ships aggregating 4,000 tons. The Japanese spent about \$6,000,000 to complete these fortifications. Sugar refineries are so constructed, the author states, that they can serve as bases for 305-355-mm. coast defense guns. At present the Japanese are concentrating their efforts to fortify the

islands of Wolsai, Uyelong, Kuayalong, Walvelab and Rongelab, the latter only about 1,000 miles west of Honolulu.

The author concludes his survey with the observation that the United States have improved their fortifications in California, Hawaii, Panama and in the Philippine Islands, and that even far-away Australia is pushing her defensive plans by completing Port Darwin as a naval base which, the author believes, will be used by the joint British and American navies in the event of a war with Japan.

CHILE—*Memorial del Ejercito de Chile*—
March-April, 1933.

THE KEY TO EUROPEAN PEACE. By Professor Guillermo Ferrero.

The well-known Italian historian, Professor Guillermo Ferrero, contributes a few interesting observations in support of the French proposal to abolish all professional armies in Europe, such as was imposed upon Germany by the Treaty of Versailles, and their replacement by a militia system of the Swiss type.

The author differentiates three types of military systems in contemporaneous Europe: (1) the professional army of German and British model; (2) the permanent armies based upon the principle of universal compulsory service like those of France and Italy; and (3) the militia of Swiss type. Professor Ferrero voices the opinion that the professional army is best adapted to wage political wars which, he observes, are always wars of aggression. He states that in the past, professional armies have always been used in wars of aggression. The great permanent armies of today owe their origin to the genius of Napoleon. Like the professional armies, these huge military machines led by professional officers are trained for aggressive warfare. Their military preparation is predicated upon the principles of wars of aggression, hence they differ from the truly professional army type only in the method of recruitment. The militia is the only truly defensive type of army. Professor Ferrero, therefore, concludes, that Europe's peace and salvation depend upon her speedy return to the pristine concept of the conscript army.

The learned professor, like so many pacifists, overlooks the simple fact that aggression, lust for conquest, and expansion do not result from any particular type of army, but rather from the state of mind of a people. Even a casual study of American history is sufficient to demonstrate that the innate urge of expansion may impel a people to aggression even though it may be lacking in the necessary military means and preparation. The small, ham-strung, poorly trained and equipped "professional" army maintained by the United States before the Civil War certainly did not inspire aggression, neither did its condition of woeful inadequacy deter the American people from seeking the "natural limits" of their commonwealth. Verily, great reputation as an historian is not yet an assurance against illogical thinking.

CZECHOSLOVAKIA—*Vojenske Rozhledy*—February, April, 1933.

ANTI-TANK WEAPONS. By Colonel Joseph Srstka.

The author presents some very interesting ideas about the qualities which, in his opinion, modern anti-tank weapons should possess. He assumes that the modern tank attack will, as a rule, be launched from a concealed line of departure not more than 800 meters from the hostile front line. By the same token he believes that the defence will seek to destroy the attacking tanks before they come within 200 meters of the main line of resistance. These tendencies will limit the action of the anti-tank weapon to a zone 600 meters deep, or to a period of 90 seconds. Inasmuch as anti-tank weapons are generally emplaced about 500 meters in rear of the main line of resistance, it follows that these weapons must possess a minimum range of 1,300 meters. They should have a flat trajectory and must be capable of piercing armor plate of 30-millimeter thickness. These requirements, in the author's opinion, indicate a weapon having a caliber of 20 to 30 millimeters and an initial velocity of about 1,000 meters per second. Such characteristics, he states, will permit effective use of these weapons against low-flying aircraft as well as against tanks.

The effectiveness of an anti-tank weapon, the author states, depends to a large extent upon the ease and rapidity of its manipulation. In view of the desire to render such an anti-tank weapon effective against aircraft, it should have an all-around radius of action, and a vertical field of fire of at least 60 degrees. A weapon that fulfills all these requirements, the author observes, is likely to be quite heavy, and will necessarily have to depend upon tractors for its mobility.

The author thinks that such a weapon must be provided with armor-piercing shells for use against tanks and with shrapnel for use against aircraft. He estimates that two anti-tank weapons of the type conceived by him on a front of one kilometer should be able to take care of twenty tanks in an attack, but suggests a third gun farther to the rear to combat any tank that may have eluded the two closer to the front.

FRANCE—*La Revue d'Infanterie*—September, 1933.

PROFICIENCY TESTS IN THE ROUMANIAN ARMY. By Lieutenant Colonel St. Nic. Petrescu, Roumanian Army.

The author outlines the system of proficiency tests employed by regimental commanders in the Roumanian Army to determine the professional fitness and aptitude of battalion and subordinate commanders and the combat efficiency of the units under their command. The tests, which consume two days for each battalion, consist of a tactical exercise, march discipline, ability of officers to issue proper orders, handling of troops and administrative functions of commanders in the field. The tactical exercises, conducted under simulated war conditions, are followed by a forced march of two hours (5 kilometers per

hour), terminating with a mission to quell a local disturbance. The return march ends at the target range, where the troops engage in combat exercises, range estimating, and tests with and without gas masks in locating concealed targets. Parade and review complete the program of the first day.

The second day is devoted to an inspection of the proficiency attained in various branches of theoretical instruction; moral, national and social education of the individual soldier; nomenclature and functioning of weapons. The colonel completes his inspection by an inquiry into the state of morale, the loyalty and patriotism of the troops, the general efficiency of the clerical and sanitary personnel and noncommissioned officers.

GERMANY—*Militar Wochenblatt*—July 4, 1933.

THE POLICY OF MIGHT IN THE FAR EAST. By No. 5.

The Pacific Ocean, the author of this leading article writes, has become the center of world politics. Since major wars comparable to the World War in point of destructiveness are conceivable in the future only in conflicts between continents, the Japanese, realizing this fact, are busily engaged in consolidating their position to meet such a contingency on the most favorable terms. The basis of the Japanese foreign policy was clearly defined by General Araki, Japan's Minister of War and militarist leader, in an article recently published in a Japanese military periodical. According to that article, the author states, General Araki and the Japanese government came to the conclusion that the League of Nations constituted an obstacle in the way of Japan's manifest destiny. That view unquestionably hastened Japan's withdrawal from the League.

General Araki believes in Japan's divine mission in the Far East. He writes: "The continuing chaos in China, the tense suffering of the people of India under the British yoke, the Soviet rule of blood and sword over Central Asia and Siberia prognosticate a general crisis in the near future. Under the circumstances Japan cannot afford to tolerate such a state of affairs. As the leading power of Asia, Japan must assume active leadership. We must act and risk a struggle of despair to the last particle of our national strength and resources. The white race regards the countries of Asia as fields of exploitation and oppression. Imperial Japan cannot allow these abuses to go unpunished. Japan has a divine mission. It must spread its national ideas over the seven seas and the five continents, if necessary by force of arms. The race of Yamoto must carry Japanese culture to the four corners of the World. Our Empire personifies Right and Justice. Every Japanese is expected to be ready spiritually and physically to put over this Empire concept if necessary by force of arms."

In the author's opinion, Japan's first objective is the achievement of political and economic hegemony in Asia. In the initial stages force plays an important part. Later, the author thinks, force will give way to diplo-

macy, and Japan will seek completion of her plan by means of treaties and alliances. Japanese colonization, the author thinks, is unlikely to play an important part in this project, and he cites the failure of Japanese attempts at colonization in Corea, Manchuria, and even in Hokkaido (Northern Japan) on account of the severity of the climate. The author believes that a quasi independent North China under Japanese tutelage is not at all unlikely in the near future. As to Japan's ability to carry to fruition this grandiose imperial plan, the author points to the prodigious efforts and remarkable military prowess manifested by Japanese troops during the Jehol campaign. Japanese infantry, he states, marched 31.5 kilometers daily for 13 consecutive days, and 80 kilometers daily for three days under the severest winter conditions. During this period troops subsisted on cooked rice, canned meat and fish, and vegetables. They were without shelter or hot drinks throughout this period. The author seriously doubts the ability of any other army to duplicate these feats.

Wissen und Wehr—October, 1933.

THE MILITARY-POLITICAL SITUATION OF SOUTHEASTERN EUROPE. *Anonymous*.

The post-war arrangements, the unnamed author writes, failed to solve the political and economic difficulties of the Balkans. The long series of political, military and economic treaties, conferences, alliances, blocks, understandings, and plans clearly demonstrate this one outstanding fact.

The treaty of Lausanne practically eliminated TURKEY as a Balkan state. Her recent understandings with Bulgaria and Greece do not alter the basic fact that Turkey, for the time being at least, does not pursue any serious international policy. Nevertheless the author thinks that sooner or later Turkey will demand elimination of the restrictive clauses of the treaty of peace which enforced demilitarization of her European frontier districts.

Geographical position determines the foreign policy of GREECE. Internal dissensions, revolutions, and too much politics in the army have seriously weakened the military establishment. Apprehensive of the strength of her northern neighbor, the Greek government granted important concessions to Jugoslavia in the Port of Salonica. Although Greece concluded treaties of friendship with Italy and Turkey, her foreign policy is essentially based upon the desire to preserve her own freedom of action. The Greek army, consisting of eleven infantry divisions and two cavalry brigades, is hardly strong enough to confer upon Greece a position of influence in Balkan politics.

BULGARIA lost substantial parts of her national domain as a result of her defeat in the World War. Bulgarian foreign policy, like that of Greece, aims at the preservation of Bulgaria's freedom of action. She maintains friendly relations with Turkey and Greece. Serious

differences, however, continue to exist between Bulgaria on the one hand, and Yugoslavia and Roumania on the other. Bulgaria can hardly forget the loss of the Dobrudja, which passed to Roumania. Neither will she forget the loss of Macedonia to Yugoslavia. The size of Bulgaria's army is limited by the treaty of peace. This restriction, the author notes, has a serious disturbing effect upon the political equilibrium of the Balkans.

Roumania made the largest territorial gains as a result of the World War in which she went down in defeat only to reap the benefits of the victory won by her allies. This over-extension of her national boundaries without geographic or ethnic necessity, the author notes, is the cause of serious conflict with the neighboring states at whose expense Roumania profited. Possession of Transylvania, the Dobrudja and Bessarabia, therefore, determine Roumanian foreign policy. The natural desire to preserve these territorial gains compels Roumania to align herself with the Little Entente, Poland and the French sphere of interests in the Balkans, notwithstanding the fact that such alignment is detrimental to her own economic interests. It is noteworthy that Roumania some years ago concluded a treaty of friendship with Italy also. This desire to cover herself in every conceivable direction, the author holds, is a tacit confession of weakness. The renewal of the pact with Italy encountered serious difficulties since Roumania could not meet the Italian demand to agree to maintain neutrality in the event of an armed conflict between Italy and Yugoslavia. On the other hand, the recent pact of the states of the Little Entente will, in the author's opinion, definitely terminate the friendly relations which heretofore existed between Roumania and Italy. The author believes that the Roumanian Army, consisting of 23 infantry divisions and two cavalry divisions, reflects the instability and inherent weakness of the kingdom.

Jugoslavia, the author writes, is the realization of that dream which prompted pre-war Serbia to risk the holocaust of the World War. This "Greater Serbia", which confers hegemony upon the Serbs over the Southern (Jugo) Slavs, the author notes, entails serious difficulties. The desire for the possession of the Adriatic Coast engenders the embers of conflict with Italy. Expansion to the south is responsible for the disturbances in Bulgarian Macedonia, while the territorial gains to the north brought the enmity of Hungary. The greatest problem of Yugoslavia is, however, engendered by the discontent of the Croat and Slovene elements of its population. The dictatorship of the King did not solve this problem, it merely postponed the day of reckoning. The author thinks that in the course of events Yugoslavia will either gravitate towards an even more stringent form of dictatorship or towards the formation of a federal state.

The foreign policy of Yugoslavia is determined by the desire to preserve all territorial gains, to maintain Yugoslav prestige in the Adriatic, and to secure an outlet to the sea at Salonica. These objectives naturally compel

Jugoslav adherence to the Little Entente, and dependence upon France. It accounts for her cordial deference to Greece. The army consists of seventeen infantry divisions and two cavalry divisions. The high morale and fighting quality of this army is materially offset by shortage of material.

Albania with its Italian-trained army of 10,000 men, the author thinks, would be of little importance except for its complete dependence upon Italy. Albania, he writes, is destined to play a very subordinate part in future events.

The Little Entente, the author believes, is the most important factor in Balkan politics. Originally a series of bilateral treaties directed against Hungary, the Entente became a triple alliance in 1929. The supplementary pacts of February 16, 1933, created a permanent Secretariat for the conduct of foreign affairs. It provides that all international agreements must have the unanimous approval of all member states of the Little Entente. It expands the economic agreements as well as the military arrangements.

The political aim of the Little Entente is to present a united front and thereby acquire the advantages of being a quasi-Great Power. The objectives of the Little Entente are: neutralization of Austria; suppression of Hungary's activities in favor of treaty revision; perpetuation of French influence in the Danube valley, and the political isolation of Italy. In summarizing the situation, the author states that the Balkans continue to be the battle ground of two great powers—France and Italy. To outward appearances France and her allies seem to have the advantage of strength at least for the present. He adds, however, that this apparent strength is materially diminished by the internal and inherent weaknesses of the allies of France. This condition, he adds, will in the end benefit those countries which demand a revision of the treaties of peace which terminated the World War.

GREAT BRITAIN—*The Army Quarterly*—July, 1933.

MILITARY PRIZE ESSAY, 1933. By Captain Douglas Wimberley, M.C.

The prize competition called for a discussion of the following interesting and timely thesis:

"British forces may be required to engage in warlike operations under a variety of conditions, both as regards the nature and armament of potential enemies, and the climate and terrain in which the operations may take place.

"Discuss these different conditions and consider how the lessons of recent campaigns can best be applied to present-day training methods."

The author appropriately chose as his line of departure the ultimate objective of all military training: to achieve success in operations undertaken against enemies anywhere throughout the world. As to the probable nature of the campaigns in which the British Empire might be

come involved, the author considers: (1) imperial policing; (2) minor expeditions; (3) major campaigns, and (4) a national war.

In discussing past experience with minor expeditions, the author quotes some very valuable lessons from the *Official Military History*: (1) "A force, although it may be equipped with the most modern weapons, cannot command success unless its men are physically fit, well trained and well led. More powerful modern weapons demand a higher standard of intelligence in their employment in all ranks". (2) "The main requirements for efficient infantrymen were found to be physical and mental fitness, keen eyesight and supreme confidence in their weapons". (3) "The information obtained from air photographs was of great tactical and topographical value".

The author points out that the *Official History* of the Afghan campaign shows: (1) that bold measures in attack often paid well and that exposure, which might have been fatal in France, was frequently worth risking. (2) Skillful use of the ground enabled infantry to advance against hostile machine guns with reduced casualties. (3) Careful reconnaissance and well-trained horses will assure success to cavalry employed with boldness. (4) The leading of fast moving troops, such as cavalry, requires fast thinking and quick decision on the part of leaders. (5) Trained observation and intelligent use of the terrain are essential factors in the employment of infantry in mountain warfare.

The author contradicts the oft repeated statement that "infantry wins battles". He ascribes ultimate success to the "close coöperation of all arms". Applying the lessons of past wars to present training methods, the author states as his basic principle that "training of the mind must take precedence over all other forms of training," for "if a unit is to be really well trained for modern war, every individual man in it must be intelligent." He considers a general grounding in normal physical training, marching and trench digging as the best preparation for war fitness. "The use of the shovel," he observes, "is good exercise for the foot soldier." As to the effect of mechanization, the author believes it will tend to drive infantry more frequently to fight and maneuver in thick woods.

ITALY—*Rivista Militare Italiana*—February, 1933.

FORCES AND MATERIAL EMPLOYED IN THE CHINESE-JAPANESE CONFLICT, 1931-1932. By Major Guglielmo Scalise, GS.

After discussing the chief events of the Chinese-Japanese conflict and the forces and material employed by the belligerents, the author presents an interesting summary of the lessons and conclusions afforded by the Far Eastern campaign. With the exception of chemical warfare material, the author states, the Japanese employed all modern implements of war. At first the coördination of the different arms was not all that could be desired, but it greatly improved as the campaign progressed. Aviation

played a considerable part in the operations, but experience demonstrated that success depends upon the employment of a large number of planes.

Tanks proved a disappointment to the Japanese since they were unable to overcome the numerous obstacles. A number of tanks were put out of action by Chinese mines and hand grenades. Japanese armored cars fared no better. Neither were the Japanese particularly successful in the use of smoke screens. The author observes that the Japanese refrained from employing gas partly because they were confident of success without having to resort to chemical warfare, and partly because of their desire to avoid further complications in their international relations.

The Japanese, the author states, invariably attacked with all available forces. Artillery and aviation prepared the attack. The intensity of the preparation was one of the outstanding features of the campaign. The infantry attacked immediately after the preparation and, as a rule, was preceded by tanks. In the early stages of the campaign the artillery preparation seemed inadequate. This coupled with the failure of tanks was largely responsible for the prolonged resistance offered by the Chinese. Attacks were generally launched in daytime. Nights were employed to consolidate and organize positions. The Japanese evidently desired to gain ground with the minimum of losses.

Although the Japanese had from 90 to 130 modern airplanes against the 20 to 25 obsolete craft of the Chinese, Japanese flyers seemed to concentrate their efforts to eliminate Chinese aviation, and until they accomplished that purpose they did nothing else. Japanese aerial attacks were generally made by six or twelve, and on one occasion by eighteen bombers escorted by a few pursuit planes. After the destruction of the Chinese air force, Japanese aviators concentrated their efforts to coöperate with ground troops, notably the artillery.

By way of conclusion the author observes that the Chinese-Japanese conflict clearly demonstrates that pacts and treaties designed to prevent war are not in fact effective preventives when a nation's vital interests are at stake. In such cases the aggressor will have no difficulty in finding a justification of his course. The great military lesson of the campaign, the author points out, is the fact that great difference in the relative strength of the contending parties has again led to position warfare. This, he observes, is not without significance for the future. He states that the campaign proved the correctness of the well-known principles of position warfare. In his opinion, entrenched positions cannot be taken except by envelopment. Artillery preparation must be intensified to the highest degree. The campaign, the author also notes, established once more the importance of organizing the defense. It likewise demonstrated that a decision without movement (maneuver) is inconceivable. And finally, the campaign proved that the machine gun is the principal weapon of the defense, while the attacker must largely depend upon his artillery.

NATIONAL GUARD NOTES

Making Code Practice Successful

BY LIEUTENANT GEORGE W. FRIED, 205TH INFANTRY, MINNESOTA NATIONAL GUARD

COMMANDING officers of communications units in the National Guard quite commonly have one bugbear in their training schedules under the caption "Code Practice". The results obtained from the time spent in this instruction are frequently so unsatisfactory as to be negligible. The chief difficulty, perhaps, lies in the fact that students are on hand for instruction but once each week, and that they have six days to forget what they learned in one-half hour. There was a day when nearly every little hamlet could produce one or two boys who were "ham" operators. The novelty of the radio and the old home-built set is past, and now cities of several thousand people could produce but few of these amateurs.

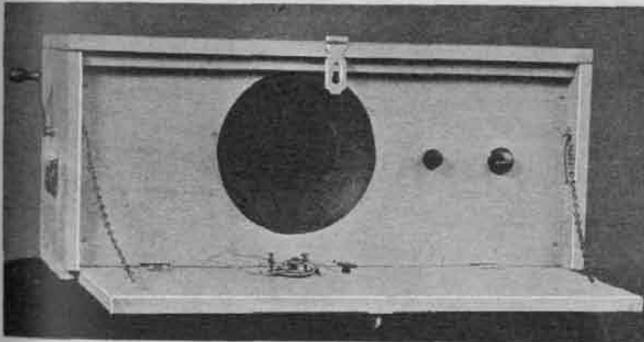
Sooner or later every communications unit will be faced with the necessity of training radio personnel which has absolutely no knowledge of the code. When that time

comes something will have to be done to stimulate the interest of the student to such an extent that he will enjoy code practice.

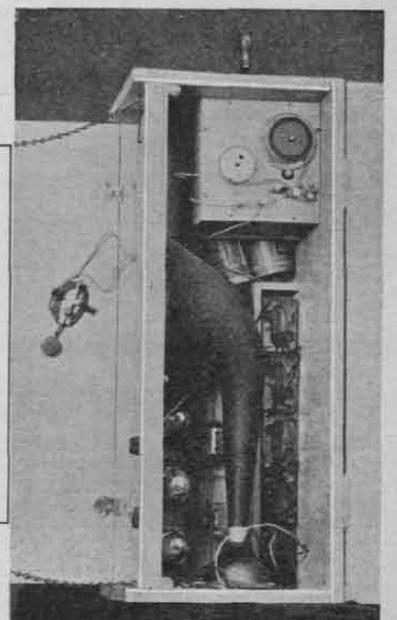
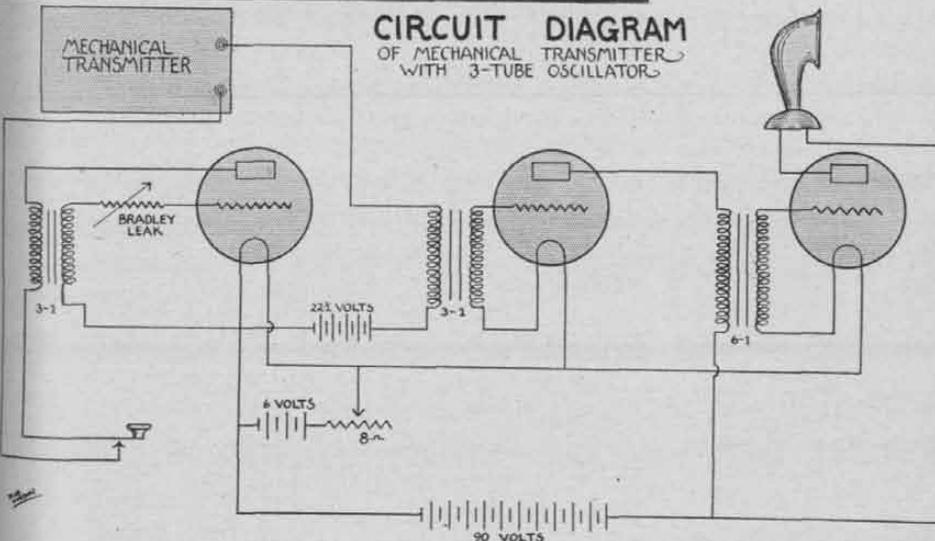
In order to create this interest the writer has evolved a simple piece of apparatus, which has done much to increase interest in code practice. It has put this instruction on a competitive basis, and students now vie with each other for the most perfect paper in tests.

A second-hand, mechanical code transmitter was secured. It happened to be a Teleplex. There are two commonly known makes on the market—the Teleplex and the Omnigraph—both of which are very satisfactory for this purpose. The one we bought was an old hand-operated model and we attached it to a spring phonograph motor to do away with the necessity of manual operation. A three-tube oscillator was connected to the Teleplex and an old-fashioned horn model loudspeaker was connected to the output of the oscillator. By using 90 volts of plate current sufficient volume was produced to make the note, or signal, from the oscillator clearly and distinctly audible in any part of the drill hall. The accompanying circuit diagram shows how to construct the oscillator. The tone of the note is varied to the desired pitch by the adjustment of the Bradley leak.

After having completed the oscillator, three practice tapes were purchased from the manufacturer, one a be-



CIRCUIT DIAGRAM
OF MECHANICAL TRANSMITTER
WITH 3-TUBE OSCILLATOR



The photograph shows the transmitter ready for use. The handle at the left is for winding the tape transmitter. Below at the left is the wiring diagram, while at the right is a top view of the transmitter, showing the interior arrangement.

ginners' tape containing the alphabet and numerals, and one each of five-letter groups in cipher and four-letter groups in code. The tapes were ordered made for speeds of from five to twelve words a minute.

Best results are obtained by having the alphabet placed on the tape out of its regular sequence. The instructor should first take up certain letters and then have the students pick out three letters from the tape transmission. As the students become proficient in receiving the letters the tape can be started at varying points. When the students have practically mastered the alphabet they should be put to work on the code groups. The fastest receivers should then be segregated from the rest of the class. When teaching code the transmission should always be just a little faster than the student can receive until such time as he can pass the test for a certain speed, when it is again increased.

When a student discovers that he is able to receive his first message interest in code study has been established, and the man will improve with very little further attention. The spirit of competition will make its appearance and the instructor's worries will be over.

The practice set described above has certain definite advantages over the commercial key and buzzer type and the service buzzer:

a. It produces perfect copy for the student. At the same time it does not sacrifice hand operation.

b. There is no variation in the speed of the transmission when once timed to a certain number of words per minute.

c. With it one instructor can teach as many as 50 students at one time, and at the same time can pass among the students and observe their progress. Being relieved of the necessity of hand-operation he could conduct classes in code throughout the day without undue fatigue.

d. It has ample volume for the largest classrooms. Students can be placed far enough apart to keep them from copying each other's work.

e. There is no necessity for an elaborate table hook-up of earphones for each student. The set is contained in one small case slightly larger but much lighter than the average table-model radio. It can be transported from room to room by one man, or even taken in the field.

The cost of constructing the set is so slight as to be within the reach of any communications unit. The mechanical transmitter is the most costly single item, but it is often possible to purchase a second-hand machine by consulting a "ham" exchange list. Their cost, new, is not prohibitive, ranging in price from \$25.00 to \$32.00. All other materials required should not cost in excess of \$10.00.

A list of parts necessary to construct the oscillator are:

3—201A tubes.

2—Iron core transformers, ratio 3-1.

1—Iron core transformer, ratio 6-1.

1—Bradley variable grid leak.

1—Telegraph key.

1—8 ohm rheostat.

1—Magnetic type loudspeaker.

3—Commercial 1½ volt dry cells.

3—Tube sockets.

Bus wire and screws.

The 22½ volt Signal Corps issue batteries are satisfactory for "B" and "C" battery use.

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The National Guard Association Annual Convention

REPRESENTATIVES of the National Guard from all parts of the United States met recently in Chicago for the 1933 convention of the National Guard Association to discuss the current problems of the Guard. The delegates were welcomed by the Honorable T. F. Donovan, Lieutenant Governor of Illinois, and the Honorable E. J. Kelly, Mayor of Chicago.

In their addresses of welcome Governor Donovan and Mayor Kelly emphasized their confidence in the National Guard as an agency of the executive power. "Every man and woman who saw the 33d Division pass in review at the Exposition, went home feeling that their lives and property were more secure because of the National Guard," said Governor Donovan.

Apart from the gratifying tributes paid to the progress of the National Guard by the Honorable Ross Collins, the essence of his address may be found in these words:

"We have been making progress at a snail-like pace. . . Must we be abused for demanding the discontinuance of useless weapons and meaningless methods? Is it not the sane and safe policy to insist that we profit by our war experience?"

"The same drill, the same system of marksmanship and musketry based on the rifle, the same divisional organization of the infantry troops, and the same insistence on mere numbers are still with us. . . ."

"We have ignored the fact that we are the greatest scientific and industrial nation in the world. We are not planning for the use of armored fighting vehicles. . . . We have not, and are not now, making use of our scientific and industrial preëminence in equipping our Army."

Major General Parker's address emphasized the basic elements of a sound national defense. These, he said, were three:

1. The "One Army" composed of the Regular Establishment, the National Guard and the Reserves.
2. The patriotic and fraternal organizations.
3. Intelligent community support.

In the "One Army" the Regular component does not and must not exercise political influence. Its function is primarily to instruct the citizen soldiery in peace and to prepare plans for its use in war. The civilian components, active citizens, must interpret a sound national defense policy to their communities. To do this effectively General Parker recommended the formation of local de-

fense councils composed of representatives of the National Guard, Reserve officers, the Naval Militia or Reserve, Marine Corps Reserve, American Legion, Veterans of Foreign Wars, United Spanish War Veterans, the G. A. R., and similar patriotic societies.

General Parker outlined a plan for close and constant collaboration between citizen soldiers and veterans, for keeping exact data on the needs of national defense and for its distribution.

The Chief of the National Guard Bureau gave a full account of the activities of his Bureau during the past year, emphasizing the building program, camp construction program and the motorization of the National Guard Field Artillery. A detailed and up-to-date description of the activities of the National Guard Bureau may be found in the Chief's Annual Report recently published.

Resolutions adopted included the following:

- No. 1. Expressing appreciation of the courtesies of the hosts.
- No. 2. Requesting the Secretary of War to authorize a minimum of 48 armory drills and 15 days' field training for 1935.
- No. 3. Indorsing the measures taken by the National Guard Bureau toward the forming of a bibliography and directory of source materials in each state relating to the history of the National Guard.
- No. 4. Indorsing the project for an armory for the District of Columbia National Guard.
- No. 7. Advocating a change in the method of appointing candidates from the National Guard to the U. S. Military Academy.
- No. 8. Requesting that campaign streamers be awarded for service in the Spanish War to units not reaching the theatre of operations.
- No. 9. To correct inequalities in the awarding of decorations for exploits during the World War.
- No. 10. Indorsing HR-No. 1758 providing for the commissioning of band leaders.
- No. 11. Advocating that when funds are available, Air Corps officers not below the rank of Captain be permitted to attend the Air Corps Tactical School.
- No. 12. To permit the rating of "A. O." being given to Air Corps officers of the National Guard, omitting the existing requirement that they must have served for one year with an observation squadron of the Regular Army.
- No. 14. To allow the rating of "Airplane Mechanic" to enlisted men of the National Guard in lieu of flight pay, in cases not in excess of 10 per cent of the enlisted strength.

Officers for the coming year were named as follows:

President: Major General Mathew A. Tinley, Iowa National Guard.

Vice-Pres.: Major General Roy D. Keehn, Illinois National Guard.

Treasurer: Brigadier General Milton R. McLean, Kansas National Guard.

Secretary: Brigadier General Fred M. Waterbury, New York National Guard.

The Executive Committee:

The President of the Association.

Brigadier General H. T. Johnson, Vermont National Guard.

Brigadier General Dudley J. Hard, Ohio National Guard.

Brigadier General Ellard A. Welsh, Minnesota National Guard.

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Paying Off On Drill Night

By DAVILLE

A NUMBER of National Guard units have some system of paying off the men in the organization each drill night, and a number of these plans have appeared in various periodicals.

A company of the Hawaii National Guard has a system that probably entails the minimum of work on the part of the personnel, yet affords the enlisted men an opportunity to receive some part of their pay each drill. As a matter of fact, about fifteen minutes' time after drill on the part of the company commander and a sergeant is all that is necessary.

About four years ago the present company commander, as a lieutenant, was assigned to command of the organization which was going down hill on greased skids so far as attendance and morale were concerned. Besides not qualifying for drill pay, the company was in debt to the tune of about \$700 with \$4.91 in the company fund; could not secure recruits on account of new men being afraid of having to pay up these old debts of the company, and the old-timers in the company were fast falling away, they also being afraid of having to pay the debts of the company. In addition, the annual ordnance inspection and federal army inspections were due within a short time. The company had no source of income except the voluntary donations of the enlisted men, and these had fallen off considerably.

The company commander borrowed \$350 on a note signed by himself and his lieutenants and mimeographed small receipt blanks, reading as follows:

(Date)

I acknowledge to have received from the Commanding Officer, Co.—, 298th Infantry, the sum of FIFTY (50c) CENTS, as an advance on my Armory Drill Pay, same to be repaid on my next pay day.

(Signed)

Except for the first drill in the quarter, which is normally a pay day, each man is entitled to draw a 50-cent advance on his pay each time he attends drill. Thus at the end of the quarter the private still has to his credit \$6.50 if he attends all drills, and if he drew his 50c at the end of each drill. Not all men in the company take advantage of this privilege, about 75% of those attending drill requesting an advance on their pay. The receipt blanks are left on a table, with pencils handy, and men sign up if they desire to draw the 50c per drill. The men then line up before the company commander, and are paid.

With greatly increased morale the company then proceeded to organize a series of community dances, and made sufficient money to pay off half of their \$1,050 indebtedness before federal inspection. With some new enlistments, the strength of the company on paper was 60, and the company commander succeeded in mustering 34 men for the inspection. By putting in two extra drills a week, this nucleus was quite well trained. By sponsoring sales of company equipment and property, and adjustments, and dances, the company in the next year climbed out of debt, began qualifying regularly for drill, and at the end of the next two years had paid off all its indebtedness, amassed \$400 in its fund, had an attendance of from 60 to 65 men each drill night, and lo and behold, had what all company commanders dream about, a waiting list! The first question usually asked is: "What are the money losses to the company, etc?" There have been few. In order to cover such losses, the company agreed to donate from 10c for privates to 18c for sergeants to this Club Fund to cover losses. Each quarter, about \$250 to \$300 is advanced to the men and during the period covered approximately \$3,500 was loaned to the members of the company with no security or no assurance that the men would appear at the end of the quarter to sign their checks. In the original agreement with the members of the company, the company commander held out a "big stick." He specified that he reserved the right to refuse any member this cash advance for two reasons, first, failure to attend drills regularly, and second, for breaches of discipline. The first reason has been used approximately a dozen times in the three and one-half years this system has been in vogue, and the second has never been used.

The company commander is responsible for the funds, and must be able to produce either cash (or show bank deposits), or show receipts for the total amount of the fund. The small mimeographed receipts are filed alphabetically. At the end of the quarter the men sign their checks, and the company is paid off in cash. The deductions on account of cash advances and for other items, are made at this time. The company is then ready to start out with a clean sheet for the next quarter. Periodically, a "chop suey" dinner is given by the entire company; overnight encampments with a couple of good meals thrown in; outright donations to deserving individuals or

causes, and many other similar things make constant demands on the fund, but a yearly dance around the holidays, replenishes the fund for the coming year.

Improved Armory Training

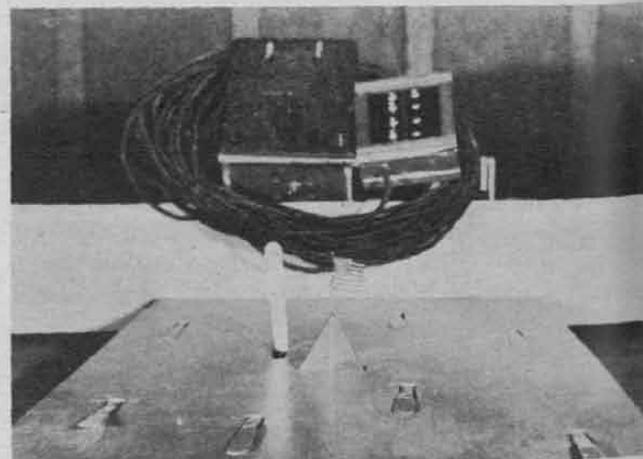
ONE of the drawbacks of armory training for National Guard units has been the difficulty of approximating conditions obtaining during service firing at the annual encampments. It is true that such matters as close order drill and drill for range sections can be carried on very well, but gun crews and spotting sections have gotten their instruction largely by the lecture method with no opportunity to do the actual work.

These difficulties have been overcome quite effectively by Battery C, 249th Coast Artillery (HD), and it is believed that the methods used may be of interest to other units facing the same problem.

Training of the gun section consists of actual drill on a dummy gun, using the regular shot truck, rammer and sponge and a dummy projectile. The drill is supplemented by lectures illustrated by means of a projector and a very complete set of slides, showing all details of the gun, carriage, and service of the piece.

In the training of the spotting section use is made of a rather novel device that, as far as the writer is aware, is original with the battery. It consists of a rectangular platform mounted on runners and drawn across the floor at the proper speed by an electric motor, ropes and pulleys. Mounted on this platform are eight metal tabs representing splashes. They are pivoted, and are actuated by solenoid magnets fastened on the under side of the platform. These tabs lie flat until a simulated shot is fired, when the operator causes one to rise by means of a selective controller operated from the B. C. station.

A small rectangular target is placed at any desired point on the platform, and the distance from it to the various tabs are computed from scale. The battery commander is thus able to pre-determine a set of eight different shorts, overs, rights and lefts, and, from his sta-



The movable platform, showing the target. One splash indicator is up.

tion, cause any of these deviations to appear at will. As the observers and readers at S-1 and S-2 are ignorant of the location of the target with relation to the tabs, and are prevented from visually estimating the deviation by screen boards at front and rear edges of the platform, the battery commander is able to check very accurately the work of the spotting section. Very good results have been obtained and the spotting section has been brought to a high degree of accuracy.

One of the most serious handicaps of National Guard service practice has been the lack of trained spotters and reliable spotting. Battery C has met this problem with a device that comes very near to producing actual conditions, and, in addition, requires a very small cash outlay.

A word of praise is due to Sergeant Paul Clemans, who spent many hours of his own time in the construction of this device. Battery C is to be congratulated on having made a real contribution to progress in training. The battery is located at Marchfield, Oregon, and its officers are: Captain Charles A. Jensen, First Lieutenant Chester R. Clark, and Second Lieutenant Arvid Smith.

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How They Do It In the 197th C. A. (AA)

THE 197th Coast Artillery, New Hampshire National Guard, has solved a difficult problem intelligently. Other similar units in other states may find valuable hints in this solution.

First of all, the Regimental Commander, Colonel Clarence E. Rexford, and Adjutant General Charles W. Howard, recognized that one of the essential features of an antiaircraft regiment is its ability to move immediately to the scene of an emergency. It must be able to get there promptly.

The motor equipment issued to the regiment consists of the Model 1918 trailer mount, 3-inch antiaircraft gun and the series 1917 and 1918 Class B and F. W. D. trucks. There is no guarantee of mobility in this equipment. The second difficulty is that the Regiment is scattered "from Dan to Beersheba" throughout the State of New Hampshire. Nevertheless the 197th is confident that it can move out on as short notice and reach a given point prepared for service of any kind as rapidly as any regiment with more modern equipment. How this is done contains a lesson for the National Guard everywhere.

The first step was to impress strongly on every officer the vital need for mobility. The second was to devise a means for keeping the old equipment in a state of high efficiency. The third step was to develop a personnel capable of getting the maximum performance out of it.

To this end Colonel Rexford and Adjutant General Howard worked hand in hand. The state motor repair shop at Concord operating under the direction of Captain Norman Andrews, commander of Headquarters Battery, 197th Coast Artillery, is equipped with modern machinery for all types of motor repair and employs a staff of specialists. This shop is the pride of the Adjutant General. By operating at the highest point of efficiency it has succeeded in repaying the state for the cost of installation and operation. When appropriations for its maintenance were reduced the shop met the crisis by economizing on time and materials. Not a minute was lost and every piece of metal was utilized.

This shop has been busy converting and reconditioning the rolling stock of the regiment. From time to time the 197th has received a number of pre-war vintage "Liberty" and F.W.D. trucks of 3-ton capacity. First, the motors were rebuilt and tuned up. Next the wheels



Summer Camp of the 197th Coast Artillery, New Hampshire National Guard

were converted from solid tire to the oversize pneumatic tire type. A program of conversion and reconditioning was drawn up calling for the complete overhaul of so many trucks a year, all work being done in the state shops.

In addition to the transportation enumerated above, the Regiment has four solid-tire Packard trucks, eleven pneumatic-tired G.M.C. trucks of $\frac{3}{4}$ -ton capacity, a Marmion and a Hudson limousine, a Ford sedan, a White reconnaissance car, and a number of trailers and motorcycles. The regimental transportation officer makes it his boast that his transportation is always 100% operative.

The next problem is how to keep it that way. With incompetent or inexperienced drivers much grief can be manufactured. To enable the regiment "to get that fustest with the mostest" all drivers are sent every year at state expense to Concord to take a course of study in motor driving and road maintenance. So well are the principles of good driving instilled into the operators that the New Hampshire National Guard has not had a single serious accident on the road in the past ten years, in spite of the heavy tourist traffic throughout the summers.

The 197th Coast Artillery is reaping the fruits of thoughtful and intelligent planning.

* * *

News from the 251st C. A. (AA)

ON November 25-26, the 2nd Battalion, less two machine-gun batteries, with a gun battery and search-light platoon, took part in a Division CPX held by the Reserve Officers of the Los Angeles area.

The 251st installed a machine-gun battery on either flank of the attacking troops to protect the advancing infantry from enemy aircraft. The gun battery was located 2,000 yards behind the line of departure and the searchlights were located on an arc about 4,000 yards behind the gun battery.

Officers from the 1st Battalion journeyed from San Diego, about 125 miles, to attend the CPX and critique.

With Cadets Wade, Dany and Ruhlen already at the U. S. M. A., the Headquarters Detachment and Combat Train is likely to be represented by a fourth, Private Ray Mueller, having successfully passed his examination for appointment to West Point.

The 251st Coast Artillery is given advice that is good everywhere in view of the shortage of pistol ammunition for target practice resulting from the economy forced upon the War Department during the economic crisis:

"Continue snapping them in dry at home and you will be a whiz when ammunition is issued."

* * *

New York National Guard Coast Artillery Brigade

MAJOR General William N. Haskell, commanding the New York National Guard, was tendered a review by the 212th Coast Artillery (AA), NYNG, on December 4, 1933. Among the guests were Brigadier General William E. Cole, Colonel Arthur S. Conklin, Lieutenant Colonel C. T. Marsh, Major Stewart S. Giffin, Captain John G. Murphy, and Lieutenants Carter, Roth, Nelson, Ogden and Madison. General Haskell was greatly pleased with the fine appearance of the 212th, and commended them on their excellent attendance percentage during the past training year. The regiment attained the highest percentage of attendance in New York State and lost the Hines Trophy by less than half a point.

The Armory of the 245th Coast Artillery (HD), NYNG, the old 13th, was the scene of a review to Colonel William H. Wilson, C. A. C. Colonel Wilson is commanding officer of the 11th Coast Artillery at Fort Wright, New York, where the 245th conducts its annual field training. During the ceremonies Ten and Twenty Year Regimental and State Long Service Medals were presented.



Battery "E", 251st C.A., California National Guard

RESERVE NOTES

How It Affects You

EXCERPTS FROM ANNUAL REPORT BY GENERAL DOUGLAS MACARTHUR, CHIEF OF STAFF, U. S. ARMY

THE four-army organization, initiated during the early months of the year just past, seeks to insure the prompt and unified employment in emergency of existing elements of the Army of the United States, as well as the rapid integration and preparation of additional forces.

Under the systems employed in many foreign countries military training is so nearly universal, and prearrangement for mobilization is so perfected that their full military power may be brought to bear at the decisive point within a matter of days or weeks. In our own case geographical isolation has served to lessen the necessity for such a degree of preparedness. The American defense system definitely recognizes that a period of some months must intervene between any declaration of war and the time when fully developed citizen armies could be ready for employment.

If attacked, we would necessarily commit our forces to action by increments; the better prepared elements carrying the full burden of initial operations. Consequently, peace-time preparation must assure readiness for the tactical employment of existing forces as well as for efficient conduct of a mobilization. The amended National Defense Act of 1920 was devised with this end in view.

As that act marked a new departure in military preparation, the War Department at once encountered a number of new and difficult problems. Among them were the initiation of a sound organization for the National Guard, the formation of an adequate Officers' Reserve Corps, the establishment of the Reserve Officers' Training Corps and the Citizens' Military Training Camps, and the development and execution of training and administrative programs for all components. A substantial degree of progress in all these, and the development of basic methods applicable to general mobilization were necessary before there could be undertaken practical preparation in the field of higher tactical organization.

The forces that would be involved in initial mobilization are the existing Regular and National Guard units and the auxiliary services needed to support them, including essential establishments in the zone of the interior. Officers in the National Guard are appointed by State authorities and any vacancies existing in the commissioned ranks of that component upon the outbreak of an emergency would necessarily be filled by National Guard personnel. Officer requirements in other organizations during

initial mobilization would total about 80,000. We have only some 12,000 Regular officers, of whom almost 2,000 are constantly on foreign service. Among this latter group no changes could be made in the early weeks of an emergency. Consequently the 80,000 vacancies would have to be filled by 10,000 officers from the Regular Army and 70,000 from the Reserve Corps. It is important to note that these 70,000 Reserve Officers will be needed during the processes of initial mobilization, and are in addition to all those necessary in Reserve units that might be called during the subsequent stages of a mobilization.

The whole matter of progressive reductions in the sums made available for the Military Establishment has become so serious as to warrant here a statistical review of the successive steps taken in this direction.

The last fiscal year in which appropriations for the support of the military establishment were comparatively free from the destructive influence of the existing economic situation was 1932. For that period military appropriations aggregated \$334,764,748. This total was distributed as follows:

Regular Army and overhead for all components of the Army of the United States . . .	\$ 285,627,022
National Guard	35,109,142
Organized Reserves	6,537,785
Reserve Officers' Training Corps	3,978,900
Citizens' Military Training Camps	2,779,129
National Board for the Promotion of Rifle Practice	732,770

Total \$ 334,764,748

The following fiscal year (1933) Congress decreased the appropriation by a total of \$48,771,771. This decrease was distributed to activities as follows:

Regular Army and overhead for all components of the Army of the United States . . .	\$46,283,116
National Guard	1,645,577
Organized Reserves	183,437
Reserve Officers' Training Corps	¹ 109,484
Citizens' Military Training Camps	175,505
National Board for the Promotion of Rifle Practice	593,620

Total \$48,771,771

¹Increase.

For the fiscal year 1934 Congress further decreased the amount available for military activities to \$269,673,353. This reduction of \$16,319,624 was distributed in the following amounts to the various components and activities:

Regular Army and overhead for all components of the Army of the United States	\$15,444,661
National Guard	178,701
Organized Reserves
Reserve Officers' Training Corps	612,953
Citizens' Military Training Camps	103,624
National Board for the Promotion of Rifle Practice	¹ 20,315

¹Increase.

The sum of the cuts absorbed under appropriation acts during these 2 fiscal years were, in terms of the 1932 appropriations:

	<i>Per cent</i>
Regular Army and overhead for all components of the United States	38
National Guard	10
Organized Reserves	6
Reserve Officers' Training Corps	10
Citizens' Military Training Camps	16
National Board for the Promotion of Rifle Practice.	159

The data accompanying the memorandum of the Director of the Bureau of the Budget indicated that the proposed authorizations were allocated to activities as follows (omitting funds for departmental expenses):

Regular Army and overhead for all components of the Army of the United States	\$ 182,351,959
National Guard	6,400,312
Organized Reserves	1,134,458
Reserve Officers' Training Corps	1,685,005
Citizens' Military Training Camps	45,000
National Board for the Promotion of Rifle Practice	2,700
Total	\$ 191,619,434

In comparison with the appropriation for 1934 the Budget Bureau figures required the following reductions:

	Amount of reduction	Per- centage of reduction
Regular Army and overhead for all components of the Army of the United States	\$41,547,286	19
National Guard	26,884,552	81
Organized Reserves	5,219,890	82
Reserve Officers' Training Corps.	1,790,426	52
Citizens' Military Training Camps	2,455,000	98
National Board for the Promotion of Rifle Practice	156,765	99
Total	\$78,053,919	29

Translated into terms of its effect upon the military establishment this proposal contemplated—

The retirement of some 3,000 to 4,000 Regular officers.

The discharge of about 12,000 to 15,000 enlisted men of the Regular Army.

The elimination of field and armory drill training for the National Guard.

The elimination of all active duty training for the Officers' Reserve Corps.

The elimination of the Citizens' Military Training Camps.

The elimination of field training for the Reserve Officers' Training Corps.

The elimination of field training for the Regular Army.

The almost complete dismantling of the technical services of the Army, including the discharge of civilian technicians engaged in research, design, development, and experiment.

The cessation of procurement of necessary equipment and nearly all supplies except clothing and food.

From these many indirect effects would have been experienced, particularly by reason of losses in Regular officers. Because of lack of instructors, inactive training for civilian components would have almost ceased, and the military school system would have been practically paralyzed. Manifestly such results would have meant the scrapping of the system prescribed in the National Defense Act, and the reduction of the American Military Establishment to the status of a Federal constabulary.

The War Department therefore vigorously contested these figures as being entirely inadequate for each of the components of the Army of the United States. The adjustment of the requirements of the Military Establishment to the Government's retrenchment program was the subject of continuous and intensive study by the War Department, and of written and oral presentations to the Director of the Bureau of the Budget. As a result that official, under date of June 9, 1933, communicated a decision increasing the total authorized expenditures for departmental and military activities to \$224,964,758. In forwarding this decision to the Secretary of War, the Director of the Bureau of the Budget stated:

The allocation of this amount is entirely within your discretion and you are authorized by the President to take such steps as may be necessary in order that your expenditures may be within the \$224,964,758 herein specified.

Just after the close of the fiscal year, the Director of the Bureau of the Budget increased the allotment for the National Guard by approximately \$6,000,000. Half of the sum was provided by the Budget Bureau as an increase in total authorized expenditures. The remainder had to be secured by reducing the amounts for other military activities. Subsequently the President, upon the earnest recommendation of the Executive Committee of the Reserve

Officers Association, approved a \$1,000,000 increase in the total authorizations and directed it be used for training of the Organized Reserves.

The expenditure program for the fiscal year 1934, in accordance with the final instructions received from the Director of the Bureau of the Budget, represents the following percentages of reduction from the corresponding amounts available for the fiscal year 1932:

	<i>Per cent</i>
Regular Army and overhead for all components of the Army of the United States	32
National Guard	31
Organized Reserves	48
Reserve Officers' Training Corps	35
Citizens' Military Training Camps	66
National Board for the Promotion of Rifle Practice	93
	—
Total	33

In no other profession are the penalties for employing untrained personnel so appalling and so irrevocable as in the military.

Suspension of military training or further slashing into the Army's existing organization would produce a tragic situation—a situation even more serious in its eventual results than that discussed in the preceding section. Efficiency would fall off rapidly. Future correction would involve years of intensive work to make good months of current neglect. In the event of an emergency human and material costs and risk of defeat would be multiplied.

Mutual confidence, morale, and teamwork in a military force are the products of unremitting and intelligent effort. Continuity of training along lines determined by incessant study and research is the price of professional skill. That these things are essential to military success is a fundamental truth established by the experience of centuries. Today they are of greater moment than ever before, since modern weapons are so varied in type and some of them so complex in construction that exploitation of their full possibilities in combat requires the utmost in technical and professional ability.

The first essential of an efficient training system is a strong corps of highly qualified Regular officers. Such a body must attain the professional ability to analyze and interpret the lessons of history and evaluate them in the light of present and constantly changing conditions. From these it must develop correct principles, methods, and technique applying to every phase of the military art. Its size should be sufficient to insure efficient performance of all duties devolving upon it under the American system of national defense. Among other things it must provide the officers required in foreign garrisons and in the permanently manned harbor defenses of the country. It must furnish commissioned personnel for all types of technical duty in the procurement and development services and for all portions of the general overhead required by the Army of the United States. A part of its strength must be set aside for the maintenance of professional efficiency

through school operation, and another for carrying on the many activities involved in peace-time preparation for mobilization.

In addition to these varied duties the Regular officer corps must provide military instruction for all elements of the Army of the United States. The first objective of this instructional work is to bring to a satisfactory level of proficiency the technical qualifications of every man in every component who will act as a unit commander in a war.

These leaders bear unmeasurable responsibilities. Lack of skill in the individual soldier inevitably results in exposure of his own life to unnecessary risk. But lack of skill in the officer directly endangers the lives of his followers and comrades, as well as his own. Unless he is a man of practiced judgment and technical ability it is certain that his unit will, in battle, suffer futile and needless losses. Without officers, and I mean trained officers, armies are nothing but mobs, and successive disaster must almost certainly bring final defeat before commanders can absorb the lessons they should have learned in peace. An army without trained leaders is a contradiction in terms.

The fitness of officers therefore is a matter of serious concern to the War Department, a concern that would be intimately shared by the whole American people if there were universal appreciation of these basic truths. But because war is of infrequent occurrence, and because its dramatic rather than its technical side is emphasized in popular histories of military campaigns, the shibboleth persists that a commander's duty comprises nothing more than urging his men forward to the charge. Men who would tremble at the thought of plunging a surgeon's knife into the abdomen of a suffering appendicitis patient seem to have, although equally ignorant of applicable technique, a bland confidence in their ability to maneuver thousands through the dangers of a shell-torn field to the never-changing end of glorious victory. Though they might stand in helpless wonder before the intricacies of a machinist's lathe they apparently assume that the complicated and dangerous weapons of modern war miraculously operate themselves, to the consternation of the enemy and our own benefit.

No man, whatever his calling, can have greater need for the ultimate in professional knowledge and skill than he to whom falls, for example, the responsibility of leading a single infantry battalion in battle. The mere bringing up of his battalion to the front, adequately prepared for battle, represents the fruition of weeks or months of intensive effort based upon years of self-preparation. Every man in the unit must have been diligently and properly practiced in the use of rifle, bayonet, and gas mask. Specialists must be expert in the use of machine guns, automatic rifles, 1-pounder cannon, and 3-inch mortars. The commanding officer must know that his supply and communication units are well trained and that his medical detachment is ready to render efficient service.

He must be assured that each man knows how to conduct himself under shellfire, under air, tank, and gas attacks, and through every vicissitude of modern battle. He must train every element of the command to work smoothly and efficiently with every other. And finally the leader must have developed to the highest degree his own understanding of human nature and his capacity for personal leadership, for in battle men will follow only those whose demonstrated efficiency inspires confidence and respect.

Once the commander has brought his unit into position for attack, he must decide correctly upon the best formations and methods to be employed against the particular opposition he has encountered. He must give appropriate orders to every unit in his battalion and to elements attached to it; he must make sure that his communications will keep him in touch, throughout the progress of the engagement, with each portion of his whole command and with cooperating units. Every factor applying to supply, reserves, wounded personnel, entanglements, entrenchments, transportation, and, above all, to the morale of his men must be studied and provided for. He must be able to follow with a discerning eye the progress of the battle so that at its crisis he may make the most effective use of all his remaining assets. And he himself must be so accustomed by peace-time maneuvers to efficient performance of his control functions that the stress and nervous strain of battle will not paralyze his brain and nullify the efforts of his whole command.

As far as possible every officer of the National Guard and of the Reserves is now assigned to the position he would be expected to fill in an emergency of the immediate future, and to the greatest practicable extent his training is directed toward qualifying him for the particular duties applying thereto. In this way each can be expected to acquire reasonable proficiency in his particular military function, providing only that he is offered and avails himself of training opportunities and that his morale and interest are maintained at high levels.

Our minimum requirements in the fields of personnel and training include theoretical instruction for all components of the Army and for the Reserve Officers' Training Corps and the Citizens' Military Training Camps on the scale of the 1932 program; an Officers' Reserve Corps of about 120,000 with two weeks' active duty training for 30,000 annually; maintenance of the National Guard at least at existing strength with 48 armory drills yearly and two weeks' field training in as large formations as practicable; target practice and field exercises, to include maneuvers by large commands, for all tactical units of the Regular Army, and an enlisted strength of 165,000. This number of enlisted men will provide training cadres of satisfactory strength and an efficient tactifful force of reasonable size constantly available for emergency use.

The missions, requirements, and general conditions of the civilian components have already been generally discussed in those sections of this report that pertain to the Army as a whole. But efficient development and prepara-

tion of these elements for their vitally important place in our system of land defense involve some special measures and some considerations applying to them exclusively.

The civilian components constitute a volunteer reserve for the professional force, and the greater portion of the time they devote to military purposes, particularly in the Officers' Reserve Corps, is gratuitously given. Consequently, among them a high morale is essential, not only to efficiency but to their very existence.

Since, with negligible exceptions, no member of the civilian components gains a livelihood from military activity, the matter of emoluments has not for them the vital importance that it has for professional soldiers. Their principal incentive for pursuing military training as an avocation is a patriotic desire to fit themselves for efficient service in a national emergency. Their greatest reward is definite assurance that the value of their efforts is recognized and appreciated by the Government. They are entitled to, and it is essential that they be accorded, proper opportunity to prepare themselves for emergency duty. It is important also that policies controlling appointments, promotions, and administration clearly evidence the Government's interest in their welfare and efficiency.

Selection and promotion of personnel in the National Guard are accomplished under State authority. For the Officers' Reserve Corps appropriate policies, crystallized some 2 years ago after continuous study throughout the period since the World War, have received practically unanimous support from the members of that organization. Favoritism and special influence have no weight in initial appointments, and promotion is accomplished under methods that recognize efficiency and experience. These policies have been faithfully adhered to by the Department, with splendid effect throughout the Corps.

With organization and administration of the civilian components established on a satisfactory basis, the chief concern of the War Department is to insure their steady development as an efficiently trained portion of the Military Establishment. Their theoretical training usually involves but slight direct expense, and can be largely controlled by administrative regulations and policy. Winter classes under Regular Army instructors, closely supervised and progressive correspondence courses, and individual contacts are all utilized to promote the military efficiency of these elements. During recent years it has been possible also, under congressional authorization, to detail annually a few selected officers for short terms at the Army's general and special service schools.

But opportunity for active-duty training is rigidly limited by the sums provided for the specific purpose. Since existing law very properly provides that during such tours each member of the civilian components will receive the normal pay of his grade. In the National Guard the number of armory drills with pay in any year is also fixed by appropriations. As pointed out in a prior section of this report, there is no substitute for field and other practical work, and a reasonable amount of it is essential to

efficiency. This fact is fully realized by the civilian components, and failure to provide such opportunity would be interpreted by them as a complete lack of governmental appreciation of their personal sacrifice and would result finally in a distinct loss of interest and morale and definite deterioration in their dependability for defense purposes.

In the sense that the training of the average officer of the civilian components is specifically directed toward qualifying him for a particular position in emergency, he must be considered a specialist. The purpose is to insure that he will be entirely competent for his particular war assignment. On the other hand, Regular officers, professionally equipped by lifelong devotion to military careers, must bring to an expanded emergency army that broad background of general experience and varied training that will enable them to coordinate and unify the activities of all arms and services. The professional and civilian contingents have each their specific places to fill in an amalgamated whole.

Under the practically stabilized and consistently followed training programs of recent years the civilian components have made steady and commendable progress in attaining a proficiency essential to their respective missions. They now represent a considerable investment in time, effort, and money, and an asset for emergency use that should be jealously guarded. Future policies should countenance no curtailment of programs that have attained these results, and in the case of Reserve Officers should provide for some expansion of field training. Junior combat officers of that corps should be called to active duty annually for 2 weeks' practical training and others in accordance with their somewhat lesser needs. The total yearly quota should not be less than 30,000.

The Reserve Officers' Training Corps and the Citizens' Military Training Camps should be continued on the basis prevailing for the past several years. The value of these as feeders for the Officers' Reserve Corps and as agencies for imparting a degree of military training to a typical cross-section of young Americans has been clearly established. Their cost to the Government is insignificant compared to the resulting benefits.

1 1 1

First Annual Report of the President, Washington Chapter, U. S. Coast Artillery Association

By Major John Caswell, Jr., C.A. Res.

IN November, 1932, the Washington Chapter of the U. S. Coast Artillery Association was formed at a dinner held at the Army-Navy Country Club, Arlington, Virginia. Some sixty officers of the three branches of the military establishment were present; included among them were many notables of the Coast Artillery, now retired and residing in Washington. I was honored at that time in being named President of the chapter. Major Walter W. Burns, commanding the 260th C. A. (AA) D.C.N.G., was elected Vice-President and Major E. B. Gray, C. A. C., D. O. L., Instructor of C. A. Reserve Regiments, was named Secretary-Treasurer.

At that dinner, Major General John W. Gulick, Chief of Coast Artillery and our National President, welcomed the birth of the chapter in Washington, and many other prominent active and retired officers of the Coast Artillery spoke of the benefits that were expected to be derived by the formation of the chapter.

During the early winter, circulars were sent out to get suggestions for the type of get-together parties that the majority would approve. It is regretted that the response to these circulars was so limited that the opinion obtained did not represent the will of the majority. However, based on such replies as were received, and in consultation with other officers, it was decided to hold a spring get-together in the form of a talk, a stag smoker and the opportunity to test out the newly legalized 3.2 beer. On April 24th, at the Danish Rose, some forty officers assembled and listened to an instructive address by Sir Willmott Lewis, Washington correspondent of the *London Times*. The talk was exceedingly interesting, in that it dealt principally with World economics and the troubles of our own country.

The summer slipped by without a meeting, due in some respect to the multiple activities of regular army officers in connection with the C. C. C. and probably more definitely to the fact that your president was really quite busy throughout the summer and could not find time to organize a meeting.

After due consultation, November 14th was picked as the evening of the second annual dinner of the chapter. This date was chosen as it was the regular meeting night of Reserve officers in this territory, and by picking the regular night it was hoped that the turnout by the junior officers of the Reserve would be adequate. The responses and attendance of the Regular Army officers, National Guard officers, older officers of the Reserve and retired officers were in welcome numbers. Many of those unable to attend took the trouble to send in negative replies with explanations.

This dinner was held jointly with the Coast Artillery Club of Washington, which is the organization that conducts Reserve inactive duty conferences in Washington. This club is the parent forerunner of our organization so far as Reserve is concerned and likewise, parent and forerunner of the Washington (D.C.) Chapter of the Reserve Officers' Association of the United States, which was organized during the past year. As honor guest, we again had with us our Chief, Major General John W. Gulick. As guest of honor, Colonel D. C. Herron, of the Field Artillery, Liaison Officer for Reserve affairs on the General Staff, who was kind enough to join with us. Major Irwin, of the Field Artillery, Acting Unit Instructor for Coast Artillery Reserve Units in Washington, was our other outside guest. General Gulick, General Todd, General Davis and Colonel Herron made interesting talks which were much to the point and in line with the circular announcing that talks would not be of a serious nature.



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It was highly regrettable Lieutenant Colonel James B. Bentley, the President of the Coast Artillery Club of Washington, was at the last moment unable to be present.

After due deliberation by the members present, Major Walter W. Burns was elected President for the ensuing year, Lieutenant Colonel E. E. Bennett, Vice-President, and Lieutenant Colonel Harry P. Newton, Secretary-Treasurer. The policy that was deemed advisable a year ago was carried out this year, and your chapter is headed by a National Guard officer; an officer of the regular service as Vice-President and an officer of the Reserve as Secretary-Treasurer, thereby maintaining a program of rotation. The newly elected officers made a few brief remarks. A vote of thanks was offered your retiring President, which was greatly appreciated.

My year in office has been extremely pleasant, and I appreciate the honor which was conferred upon me and trust that I have carried on with the duties entrusted to me to the satisfaction of the membership.

Doings of the 621st C. A. (AA)

THE regimental troop school has been progressing satisfactorily in the past two months. To date thirty-eight subcourses have been completed for a total of 444 credit hours. Subcourse 20-3, Parts I and II, has been completed December 6th and subcourse 20-5 started December 20th. Other subcourses conducted at the regimental troop school, are 20-1 Part II, 30-4, and 40-5 Part I.

A large number of reserve officers of the 621st Coast Artillery attended meetings of the Reserve Officers' Association of the United States, Department of Delaware. At the meeting of R. O. A. November 14th, Major W. M. Cravens, C. A. C. (DOL) Unit Instructor, 621st C. A., gave a very interesting lecture about the Civilian Conservation Corps and his experiences while on this duty last summer. At the meeting of December 12th, War Department motion picture of the "Battle of Arras" was shown. At both of these meetings a large number of Reserve officers of the 621st C. A. and other branches were present.

Up to present time six Reserve officers, members of this regiment, received orders for active duty with the Civilian Conservation Corps. Captain A. L. Schaeffer, First Lieutenant G. H. Seitz, Jr., Second Lieutenants O. S. Bray, Martin Harwitz, L. H. Lewis, and H. W. Orth. Lieutenant Seitz and Harwitz visited this office while in Wilmington on leave of absence.

A number of officers in this regiment are making progress towards promotion to the next higher grade, First Lieutenant Seitz and Second Lieutenants Ford and Moran appeared before the board of officers this month, and no doubt will be promoted in the near future. Lieuten-

ant Spicer made application for certificate of capacity and will appear before the board of officers as soon as authority is received.

1 1 1

Major General Gulick Addresses Washington C. A. Club

AT its December meeting the Washington Chapter of the Coast Artillery Club was fortunate to have as its principal speaker Major General John W. Gulick, Chief of Coast Artillery. The General gave a very edifying talk on "Leadership."

After this was held a very formal meeting and general discussion. A committee on entertainment was appointed to report at the next meeting on ways and means to increase the attendance.

At the January meeting Major George R. Meyer of the Chief's office gave a very interesting talk on new prospects for harbor defense all over the country, giving specific details of how that was being done at San Francisco. Major E. B. Gray, the unit instructor, also spoke a few words. We understand he is definitely back with us after a long tour with the C. C. C.

1 1 1

627th Coast Artillery Holds Meeting

WORD has been received from the far-off Pacific Coast that the personnel of the 627th, C. A. (A A), held a special meeting on December 18, 1933. This meeting differed from any regimental meeting held in the 9th Coast Artillery District heretofore, in that hot dogs and free beer were served at the conclusion of the business meeting.

The program included a talk by Colonel J. C. Johnson, Reserve Executive for the 9th Coast Artillery District, on the subject of reserve activities of present-day interest. Following this Lieutenant Lester Cole gave the officers the benefit of his observations and the latest news from Fort Monroe, where he had recently completed the special course for reserve and national guard officers. Plans for regimental activities were discussed and steps initiated preparatory to the active duty training of the 627th during the coming summer. This regiment has the distinction of having its personnel scattered in the States of California, Montana, Idaho, Wyoming, Utah, and Nevada. For this reason it is almost impossible to assemble the officers for monthly conferences and all contact must be by means of correspondence. Notwithstanding this fact, the 627th has given a good account of itself and under the able leadership and direction of the regimental commander, Colonel Mund, and the district executive, Colonel J. C. Johnson and his assistants, it is anticipated that it will add new laurels to its crown.

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By Katherine Mayo Price \$3.50
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BOOK REVIEWS

THEORY OF THERMIONIC VACUUM TUBES, By E. Leon Chaffee. McGraw-Hill Book Co., New York. \$6.00.

In 1920 Van Der Bijl brought out his famous treatise on the vacuum tube which has been the only fundamental reference on the subject until Dr. Chaffee published this book. The development of the vacuum tube has been so rapid that any real attempt to write and publish a comprehensive book would have been futile. Future vacuum tube developments will be based on well established fundamentals which are very thoroughly treated in this book. Thus this book can be considered as the starting point for future work just as Van Der Bijl's book provided the groundwork for past development.

The book is divided into two parts—the first part covering the physical laws essential to a vacuum tube while the second part very thoroughly covers the vacuum tube itself and associated circuits.

The first part is properly headed by a brief, up-to-date, discussion of atoms and electrons. This is followed by a chapter on conduction of electricity. Electronic emission is next taken up and it is one of the important chapters in the book. This chapter considers many of the basic principles of the vacuum tube and taken with the next chapter forms the foundation of the vacuum tube theory.

The second part of the book is opened by a complete treatment of the triode. The triode is the basic tube, all others being elaborations on the original triode. Two-thirds of the entire book is taken up with the complete detailed treatment of characteristic curves, equivalent circuits, dynamic measurements, triode amplifiers, triode oscillators, and triode detectors. Each of these are discussed in great detail. A large part of this work is original with Dr. Chaffee. Particularly due to his work are the chapters on Regeneration in Coupled Circuits, and Detection with Large Signals in Nonlinear circuits. Following the complete triode treatment there follows a chapter on multi-element tubes. This chapter is too short to completely cover the subject which should be made the principle subject of another book.

The Theory of Thermionic Vacuum Tubes is intended to be a text as well as a reference and therefore it is a thorough and clearly written treatise on vacuum tube theory written by an authority who understands the art of imparting information. It is indispensable to the serious experimenter and student.

NO MAN HAS EVER LEFT HIS FOOTPRINTS *on the sands of time by resting his anatomy in a comfortable chair.*—
THE COLUMBIAN.