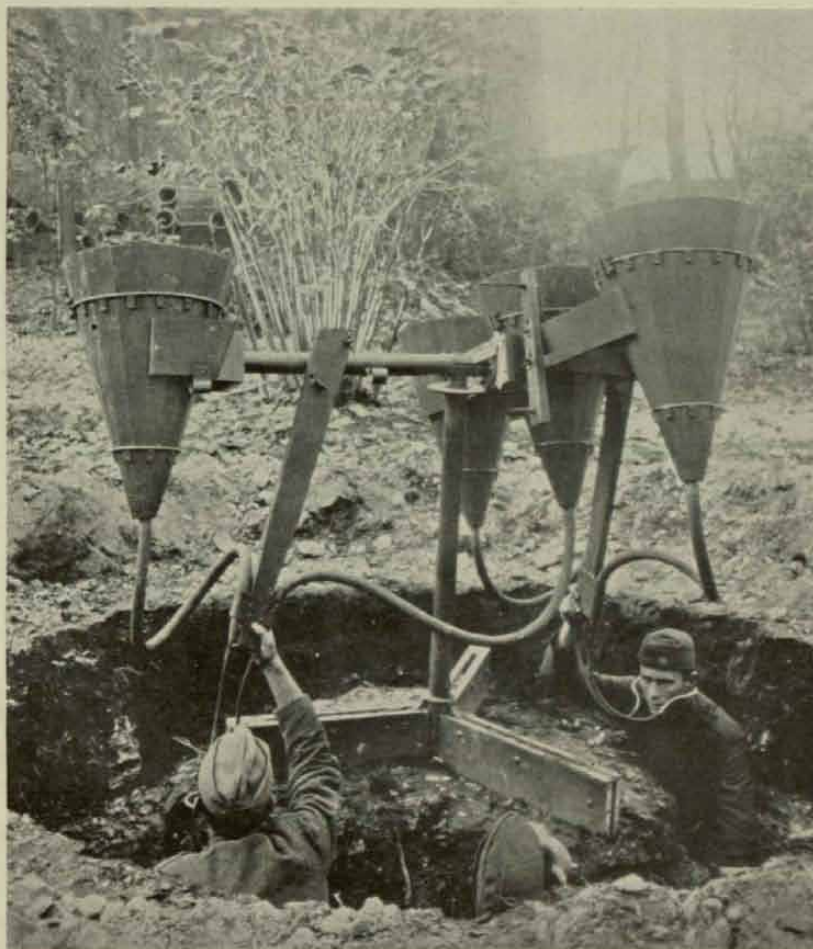


COAST ARTILLERY JOURNAL



March-April, 1932

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THE COAST ARTILLERY JOURNAL

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

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Number 2

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U.S. Coast Artillery Association Meeting

IF YOU receive your copy of the JOURNAL somewhat later than usual it is due to the fact that we wish to announce to all our readers the details of the Grand Convention and Meeting of the Association at Fort Monroe, Virginia, May 27-28, 1932.

The program for these two days has been worked out in the minutest detail by Colonel H. E. Cloke and his staff of assistants. The members of the Association will be guests of the garrison of Fort Monroe and nothing will be left undone which would add to their pleasure during these two days. Only the general features of the program are given below but from the diversity of events listed no one can fail to find some feature which will interest him. Never before has it been possible to offer visitors such a wonderful opportunity to observe the inner workings of our most famous Coast Artillery station. The inspection of the School plant will be an education even to those who have received their field training at the post. The trip through the quarters of the enlisted men may attract a deeper interest from others. If it's guns you wish to see you may find every type of armament manned by the Coast Artillery at Fort Monroe. You may not only look at them but your hosts will be at your elbow to answer every question from the profound to the—well, the kind the ladies will ask. And there will be firing. Battery Montgomery will belch forth its 12 rounds for your entertainment and, at the same time, tell the Coast Artillery Board something which it wishes to know. You may be keen on anti-aircraft. There will be plenty of anti-aircraft firing at the model anti-aircraft firing point—Wilson Park. The anti-aircraft battery is the crack outfit of this kind in the Coast Artillery and will demonstrate that the Air Corps is up against a hard proposition.

Interesting as all this may be, recreation is desirable and every possible means of recreation has been provided. The attractive Officers Beach Club will be the headquarters for swimming parties and the scene of the reception which will be held during the afternoon of the first day and the dance the same evening. All the military part of the program will be concluded by noon Saturday and the afternoon may be devoted to sight seeing for those so inclined. The officers of Fort Monroe have challenged the visiting members to a golf tournament to be played on the Hampton Roads Golf Course. Send in your entry and handicap to Major E. H. Metzger, Fort Monroe (no fee). Not the least attractive feature will be a trip on the Coast Artillery yacht, the U. S. Army Mine Planter, *Gen. John M. Schofield*.

Rates of \$10.00 for the round trip have been obtained from the Old Bay Line (from Baltimore) and the Norfolk-Washington Steamboat Co. (this includes stateroom and two meals each way). Make your reservations individually and direct—and make them early because this particular week end will find the boats crowded. Your membership card is sufficient identification to secure the special rate.

The Hotel Chamberlin has made to the members of the Association a tremendous cut in its regular rates. Accommodations, including room and meals, are offered at \$4.50 per day or \$2.25 for room alone. If these low prices are more than you can stand Colonel Cloke has provided sleeping accommodations in the well-known summer camp buildings. The cost here will be little or nothing. Meals can be obtained at the Post Exchange restaurant or the Chamberlin Coffee Shop. Make your reservations for the Chamberlin or Camp through Major E. H. Metzger.

Many distinguished guests will be present. The Secretary of War and Major General Paul B. Malone, Commanding the Third Corps Area, have been invited. Many other officers of high rank have signified their intention to be present.

Wear your uniform or civilian clothes, just as you please. You will receive a warm welcome in either. The main idea is to get there. Notify your regimental commander, your unit instructor, your chapter president or the Secretary that you will be present.

PROGRAM

Friday, May 27	Morning	Registration. Inspection of School and Post Activities.
	Afternoon	Demonstration firings: a. Battery Montgomery (fixed). b. Anti-aircraft armament.
Saturday, May 28	Evening	Reception, Officers' Beach Club.
	Morning	Dance—Officers' Beach Club.
	Afternoon	Review and Inspection of Troops. Meeting of Association.
	Evening	Visits to place of historical interest—Yorktown, Williamsburg, Jamestown, etc. Golf, Swimming, Tennis, and Equitation, if desired. Trip of Mine Planter around Hampton Roads. Dinner and Dance at Hotel Chamberlin.

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 materiel and methods of training, and by fostering mutual understanding, respect and cooperation 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:

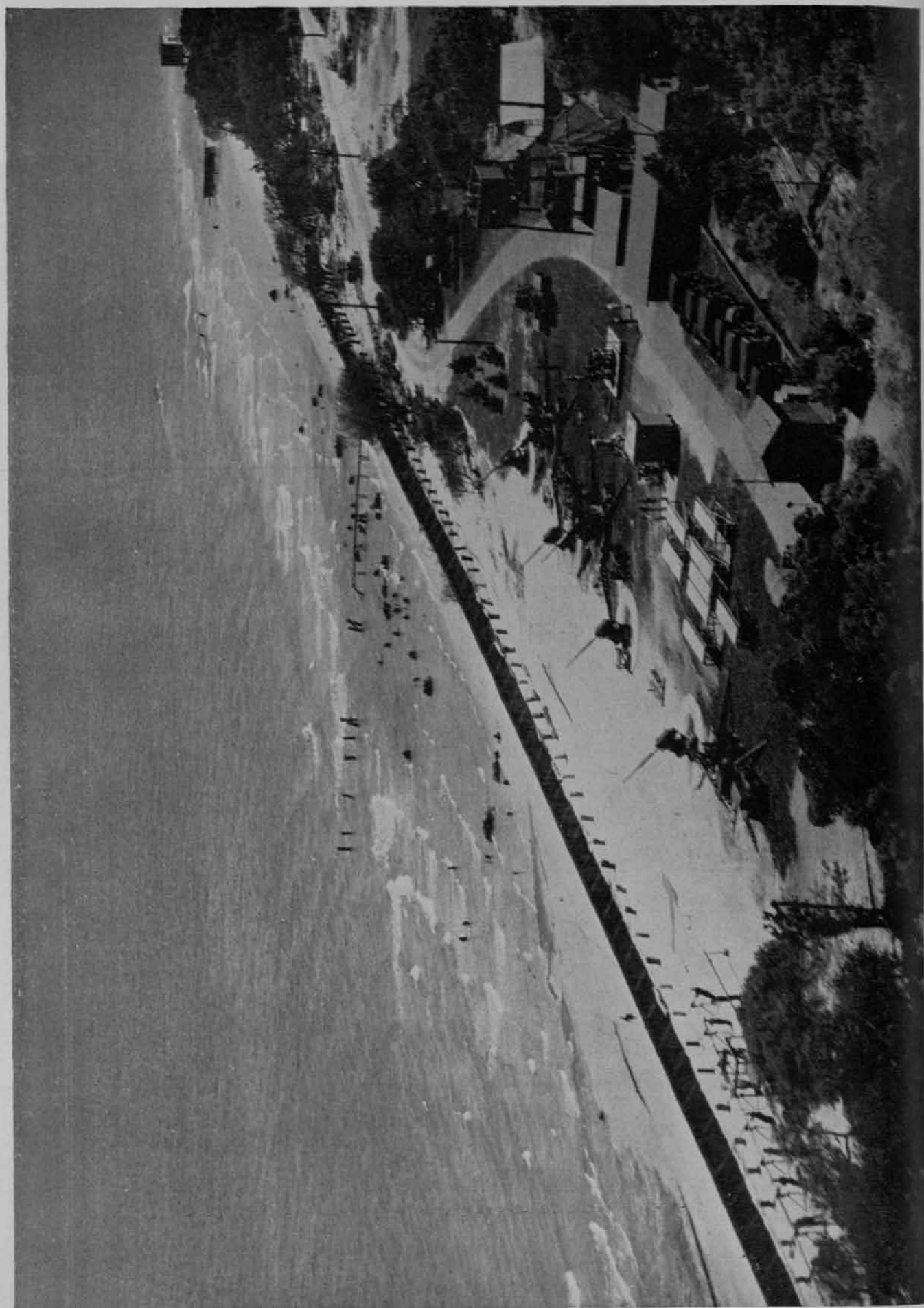
- a. Commissioned officers, active or retired, of the Coast Artillery of the Army of the United States.
- b. Commissioned officers, active or retired, of the Staff Corps and Departments of the Army of the United States who at any time have served in the Coast Artillery.
- c. Commissioned officers, active 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 non-commissioned 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."



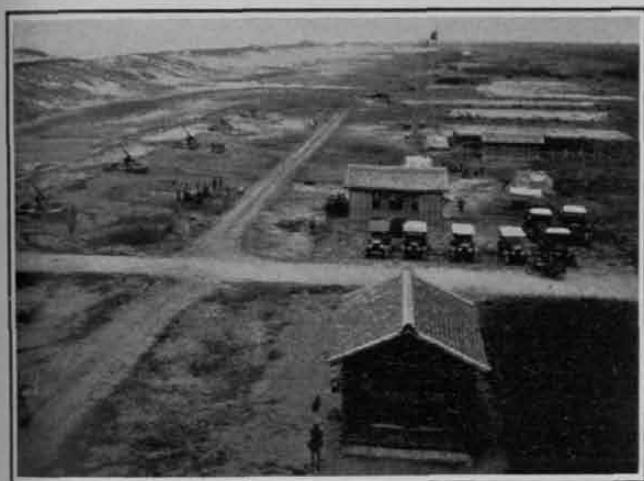
WILSON PARK—THE ANTI-AIRCRAFT FIRING POINT AT FORT MONROE.

Japanese Antiaircraft Artillery

By First Lieutenant E. Carl Engelhart, C. A. C.

THE writer, upon completion of a Japanese language detail, had the unusual experience of six months with a Japanese antiaircraft artillery regiment. This assignment came after three years' study of the Japanese language—study which has resulted not in my gaining easy fluency in the language of the Samurai but in completely and devastatingly confusing my already vague notions of English grammar and composition. The Editor of the JOURNAL has requested an article on my service with the Japanese regiment. I apologize now to any unwary readers of the JOURNAL for this collection of split infinitives, misplaced clauses and phrases, and tangled tenses. Any anonymous donations of texts on English as she should be writ will be gratefully received.

Four years ago when I received my orders to Tokyo the comment of our friends was peculiarly unanimous—



Antiaircraft Target Range

"What a wonderful dead-beat!" No O. D. tours, no property responsibility, and no assignments "in addition to your other duties" may sound like the life of Riley. Add cheerful allusions to dirt cheap servants, brilliant life in diplomatic circles, and the final remark that a language officer has nothing to do but learn Japanese. The picture is inviting but very, very misleading.

Believe it or not, the biggest drawback to the Japanese language detail is the Japanese language. Japanese may not be the world's most difficult language but it is at least a strong contender for the honors. A few month's study is usually sufficient to convince an ambitious officer that he will be able to spare very little time for social activities.

Japanese servants may be cheap (\$20 a month, up, for what is called a cook) but opinion differs on this subject according to each person's own wallet view-

point. General cost of living? Well, not so long ago our State Department announced that Tokyo is one of the five most expensive cities in the world in regard to the high cost of living. Trying to make a dollar do the work of two yen has given me the fixed opinion that no officer, benedict or bachelor, can hope to live decently in Japan on an income of less than that of the third pay period. An officer with children of school age must also, perforce, squeeze tuition fees, a not inconsiderable item, into the family budget—so he is even worse off.

The Japanese language detail requires three years of constant hard study with practically no vacations at all. This represents enough academic endeavor, laid end to end, to graduate from a couple of colleges. All of this work only gives a student the humble realization that he could advantageously devote three more years to the language.

Japanese is odd in that a student must first learn to express his thought in a manner somewhat at variance to our own conceptions of logical order. The result is that it takes an inordinate amount of time to make a fair translation from or into Japanese. One morning, toward the end of my service with the Japanese regiment, a lieutenant told me that the regiment was giving me a farewell all-day party the next day and that it would be nice if I were to make a speech at the concluding banquet. I immediately went home and got to work. It took me six hours to write a three-hundred word extemporaneous speech in Japanese for that party. It took me half the next day to memorize it, hiking up one side of a mountain and skidding down the other side (part of the entertainment program), mumbling surreptitiously all the way. The speech went over. In spite of all the effort it took me to prepare the three hundred words, I think I have acquired an average amount of Japanese for a language officer.

Perhaps it may seem that I am giving a doleful slant on the Japanese language detail. Glowing accounts are numerous, however, and I think it is only fair to drop the word of warning that as far as the Japanese language detail is concerned the word "dead-beat" is spelled W-O-R-K, eye-straining work.

Service with a Japanese regiment, to my mind, fully repays a student for all of the energy and effort he has put into his studies. I was attached to the 1st Antiaircraft Regiment, Imperial Japanese Army. The regiment is stationed in a little country town half-way between Tokyo and Kyoto. This town, called Hamanatsu, is also the station of the 7th Air Regiment, an air service outfit of light and heavy bombers.

Several days ahead of time I moved my impedimenta to Hamamatsu. It was quite a practice march with a wife, a baby, a cook, two dogs, emergency rations

(canned goods), baby rations (more canned goods), a goodly supply of medicines and first aid equipment, Gold Medal cots, and other necessary household paraphernalia. I have often heard it remarked (by dough-boys) that when a Coast Artillery outfit goes into the field it takes everything but the kitchen stove. We knew where we were going so we also took the kitchen stove, a big gas range.

Fortunately, we were able to move into a rambling Japanese house immediately. It was a good house. It had conveniences such as an outhouse inside, a half-inch gaspipe outlet in the kitchen, and running water which ran only when the electric pump at the well on the hill above us was working (for a change).

Our gas range immediately became a source of wonder and worry for the local gas company. It was the first to come to town and it took us two days to convince the company that we really wanted gas piped to it and that we knew full well we'd use a lot of gas and, what was more strange to the gas people, we were ready to pay for the gas.

Once we were settled down, after a fashion, our cook, busy making intricate graft arrangements with the local tradespeople, the baby trying his latest teeth on the thick floor matting, and my wife absorbed in her next-to-favorite pastime, unpacking (her bar-none favorite is packing, thank God!), I button-hooked myself into my uniform and went out to report to the regiment.

The commanding officer of the 1st Antiaircraft Regiment, Colonel Kurasaki, received me very cordially and took me to the office of the 2nd Battery. I was assigned to this battery for my six months with the regiment. I was pleased to discover later that the colonel had attached me to his best battery. Colonel Kurasaki is a zealous student of antiaircraft artillery and reads everything in English that he can find on the subject.

The battery was commanded by a captain who had been in the regiment since it was first organized some seven years before. There were three first lieutenants on duty in the battery and I was given a desk in their office. Transfers were made a few weeks later and the two first lieutenants who were finally settled on the battery became my constant companions and mentors. I hope I did not do them an ill-turn when I taught them to play chess. They became such addicts of the game that they were at it every spare moment. One lieutenant even forgot to take half of his field equipment on a five-day maneuver but remembered to carry our improvised chess set.

The 1st AA Regiment is the only mobile antiaircraft unit in the Japanese Army. (There is a small detachment at the Artillery School, used for instruction purposes.) Fixed batteries are included in the Japanese coast defenses but their organization details are not known.

The 1st Antiaircraft Regiment has neither a headquarters battery, a service battery, combat train units, nor a machine-gun detachment. The Artillery personnel consists of about 34 officers, 10 warrant officers, and 801 enlisted men, distributed as follows:

	Officers	War-rant Off.	En-listed Men
Headquarters and staff ..	10		6
Two gun battalions	20	8	636
One searchlight battery ...	4	2	159

There are only two batteries in each gun battalion, a total of four gun batteries and one searchlight battery for the entire regiment. The personnel of a battery averages 4 officers, 2 warrant officers, and 159 enlisted men, distributed as follows:

Captain, 1—battery commander; Lieutenants, 3; Warrant officers, 2—one "1st Sgt." and one in charge of training; Staff sergeants, 2—assist in training; Sergeants, 5; Corporals, 2; Superior privts., 26—these men perform most of the duties of our corporals; 1st & 2nd Cl. privts., 122; Buglers, 2.

In time of war it is probably that there will be at least four lieutenants in a battery, perhaps more. As it is now, with three lieutenants and two warrant officers, a Japanese battery commander is relieved of many of the annoyances and nontactical worries which beset an American battery commander. The "1st Sgt." warrant officer is saddled with battery property woes, for instance, and there is a regimental enlisted men's mess instead of battery messes.

All of the three grades of privates are conscripts who serve only a year and eleven months. The last day of November about half of the privates in a battery are discharged, their service with the colors ended. The new draft arrives about the 1st of January. This means, of course, that training must be conducted for two groups, one of first-year conscripts and one of second-year men. This sounds like the life of a Japanese officer is one continual round of recruit instruction. Such is not the case. All training is conducted by one of the warrant officers with the help of the NCO's. Battery officers merely supervise training.

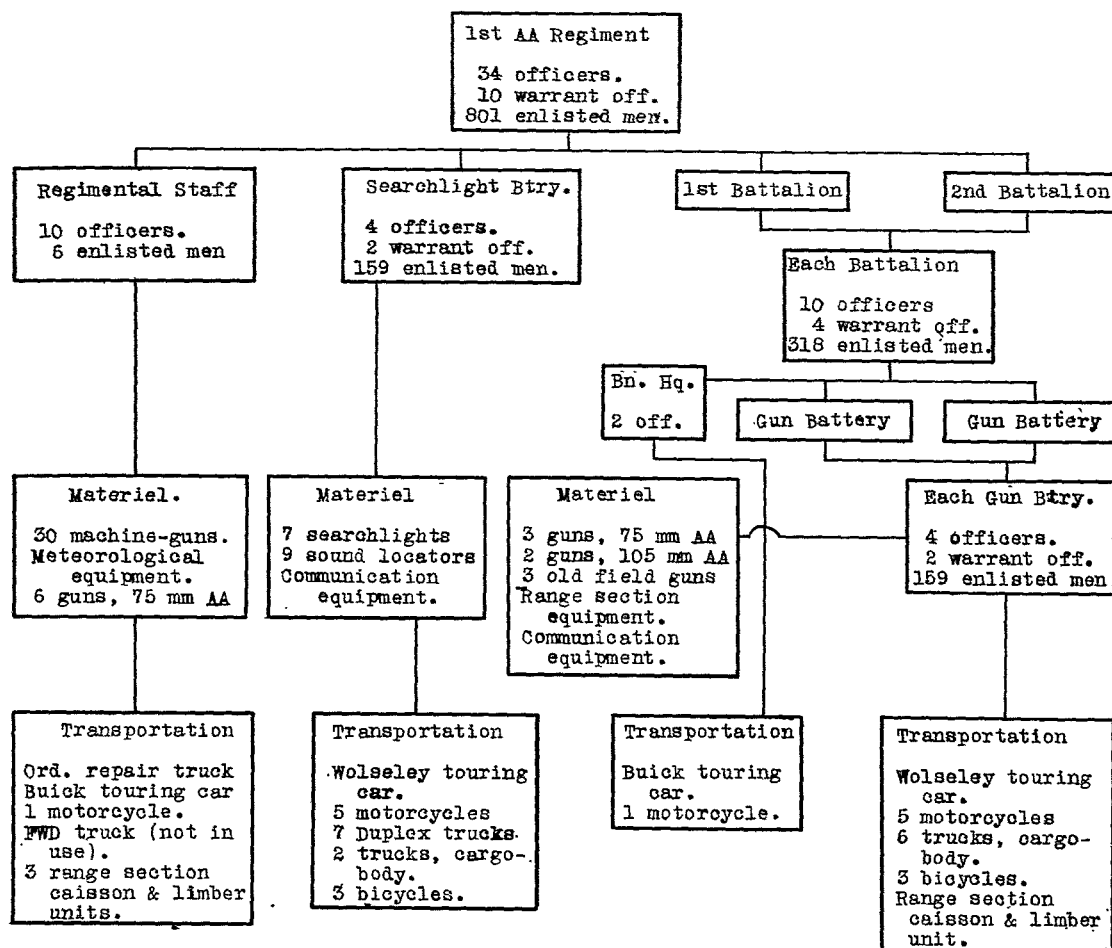
All noncommissioned officers in a battery are professional soldiers who serve three-year enlistments. A battery commander is never faced with the necessity of giving chevrons to the best of a poor lot of privates when one of his noncommissioned officers fails to reenlist. There are usually ten or twelve noncommissioned officer candidates in the regiment ready for chevrons and responsibility.

An NCO candidate is permitted to enlist voluntarily upon signifying his desire to become a professional soldier. He must also have had the equivalent of a high school education. The training of NCO candidates is in charge of one officer in the regiment. This officer has no other duties and at the end of a year his candidates usually pass their examinations and become full-fledged corporals.

The gun materiel assigned to a gun battery includes: 3 guns, 75mm antiaircraft, mobile; 2 guns, 105 mm antiaircraft, mobile; 3 old field guns.

The old field guns mentioned above are Russo-Japanese War vintage (Krupp) and are used solely in training draught truck (prime mover) drivers.

There are no machine guns or automatic rifles in a gun battery. One officer on the regimental staff is the machine gun officer. Some half-dozen privates



Organization Chart, 1st AA Regiment

from each battery report to him daily for machine gun instruction.

The ultimate decision as to the proper assignment of the 30 machine guns which are now listed as regimental materiel is problematical. At the present it is the custom to issue two machine guns to each battery for the duration of any maneuver or exercise.

It will be noted that a battery has antiaircraft guns of two calibers—three 75 mm guns and two 105 mm guns, five in all. Only two guns are manned by a battery at one time, regardless of the caliber, the rest of the guns being left in the battery gun shed.

The 105 mm fire unit is definitely only two guns. The fire unit for the 75's may also be considered two guns, just now, but there is some tentative thought of increasing it to three or four guns. I observed three special target practices indicative of this trend of ideas. One practice was fired with three 75's, the guns on a line parallel to the course of the target. A second practice was held with four guns, the guns again on a line (at about 25 yds. interval) parallel to the course of the target. A third practice was fired with two batteries acting as platoons. They were separated by about five hundred yards. Each "platoon" had two 75 mm guns, its own range section, and a lieutenant in command. The acting battery commander was stationed where he could see neither platoon. He gave his orders by telephone. The platoons fired

when ready with the result that bursts could not be identified.

Regulations call for a regiment of four gun batteries, each battery manning two antiaircraft guns, a total of only eight guns. The 1st Antiaircraft Regiment has at present (including six 75's in a regimental godown) a total of eighteen 75 mm and eight 105 mm guns, 26 antiaircraft guns in all, a latent firepower three times that of a regiment as laid down in the latest regulations. These regulations, however, are re-issued frequently. The copy published in January, 1930, was superseded in August, 1930. One sergeant commented that as soon as he had gotten his copy well annotated in red pencil along would come a new copy for him to go through again.

The Japanese system of antiaircraft position finding is, I believe, an example of the application of the Linear Speed Method. Only the altitude, real speed, and angle of path of the target are supplied to the guns as firing data. (Angle of "path", not "approach".) The altitude is obtained either by a height finder or by the altimetric roof method.

The height finder is a 1.2 meter self-contained base range finder with a sample gadget to convert slant ranges into altitudes. The slant range must be read first. This range is noted by eye on a graduated arm which hangs freely in a vertical position in a glass-windowed case at the end of the instrument. Alti-

tudes (or horizontal ranges) are then read from the grid in rear of the slant-range arm.

The height finder is a coincidence type range finder. The line of optical bisection is along the apparent horizontal axis of the object in view. The part of the target beneath the line of optical bisection in the field of view of the instrument is reflected above the line when the instrument has been adjusted to the proper range. The range finder does not give a complete view of the target.

There are two height finders in each gun battery. One is a Zeiss instrument and the other is nearly identical but of Japanese manufacture.

The Japanese B' and B'' altimeters differ in that their elevation scales are graduated in opposite directions. The B' instrument also has two cylinders attached to it. The B'' elevation is set on one cylinder by moving a pointer to the proper graduation curve. This same movement changes the position of a pointer which indicates the altitude among the curves graduated on the other cylinder. The cylinders can be rotated independently of each other to effect the proper length of base-line setting. Thereafter they move together with the B' sight as the altimeter is elevated.

I must frankly admit that the speed and angle of path instrument gave me the willies. On the reticule of the instrument there is an ellipse with its circumference graduated in mils. The number of seconds required by the target to move from the center of the ellipse to the circumference is measured by a stopwatch. The mil reading for the point of the ellipse where the target crosses it is taken. The angle of elevation of the target at the instant it is at the center of the ellipse (when elevating is stopped) is automatically set off on both an angle of path cylinder and a flat speed platen by means of a long screw which turns in conjunction with the elevating movement of the sight element. The altitude of the target is then obtained from either the B' altimeter detail or the height finder detail and is applied to the cylinder and platen. The angle of path of the target is read to the nearest mils. The real speed of the target is read in terms of the number of seconds per 500 meters of linear flight.

The deviation instrument is used to obtain the difference in altitude between the burst and the target. It requires the altitude of the target, the elevation of the target, and the mils of vertical deviation. The latter two are furnished by the B' altimeter detail. The altitude used is the one supplied the guns by the battery executive. The deviation as computed by the instrument is in meters.

It is interesting to note that each battery has equipment for two complete range sections. When it is remembered how many guns are left idle in a battery, it seems inconsistent to find that personnel for two range sections is trained and maintained. During target practice one range section computed firing data while the other obtained deviations for the information of the battery commander.

Firing data is reported by the NCO chief of range section to the battery executive who transmits it to the guns by voice in the following sequence.

Angle of path—to the nearest 50 mils.

Speed—number of seconds per 500 meters travel.

Altitude—in hundreds of meters.

The application of data to the guns is in the same manner for both the 75 mm and the 105 mm guns. The firing data ordered is first applied at the following places:

Angle of path—Gun movable azimuth circle on the pedestal.

Speed—Vertical and lateral deflection correction cylinder.

Altitude—Fuze-range and superelevation discs.

The angle of path is set as soon as the lateral deflection gun pointer has traversed the gun onto the target for the first time. A member of the gun crew at a word from this gun pointer turns the movable azimuth circle until the mil reading for the angle of path ordered is set on the circle opposite a pointer attached to the gun carriage. This pointer moves with the upper carriage as the gun is traversed thereafter and indicates the corrected angle of path as it changes. (Actually, this "corrected" angle of path is always in error due to the time which elapses between the instant the original angle was obtained at the speed and angle of path instrument and the instant it is first set on the gun.) This corrected angle of path for the moment is called off to the operators of the lateral and vertical deflection cylinders. As the angle changes, a new reading is called off. The angle of path will not change, however, if the target is flying a course which will carry it directly over the gun.

The gun fuze-range disc has two sets of curves. One set, altitude curves, was probably plotted with the polar coordinates of elevation and time of flight. The other set of curves is known as "reference curves." The fuze-range disc pointer is mounted on an arm which is linked to the gun trunnions so that the arm is always set at the same angle as the gun elevation. The pointer is set to the proper altitude curve on the disc by means of a handwheel. This same operation applies the proper time of flight setting on the fuze-setter.

The lateral deflection correction cylinder really consists of two cylinders. One cylinder bears two graduated scales, one for speed (seconds per 500 meters linear travel) and the other graduated to correspond to the marking of the reference curves on the fuze-range disc. The other cylinder has a set of curves marked for angles of path.

The two cylinders are first twisted independently of each other to accomplish the speed setting. Then they are rotated together to make a setting which corresponds to the position of the fuze-range disc altitude pointer with respect to the reference curves. Then, by means of a small handwheel, the angle of path pointer is moved laterally until it is set at the curve for the latest angle of path as announced by a man at the azimuth circle. Moving the angle of path pointer offsets the gun sights (both in lateral deflection). Traversing the gun of course changes the position of the azimuth index which means that a new angle of path is read. The position of the fuze-range disc pointer arm

also changes with the movement of the target in vertical deflection. This requires resetting the altitude pointer and then new reference numbers must be read and the lateral deflection correction cylinders re-set accordingly. Briefly, this method of applying data to the guns is one of successive approximations.

The operation of the gun superelevation disc and the vertical deflection correction cylinder is in the same manner. Setting the pointer on the superelevation disc to the altitude by means of a small handwheel offsets only the vertical deflection sight by the amount of superelevation.

The searchlight battery is not organized in platoons or any such units. The number of lights in an illumination unit has not as yet been decided upon and is still a subject of much experimentation.

The latest regulations, it may be remarked, give a regiment composed of two battalions, each battalion consisting of two gun batteries and one searchlight battery. Each searchlight battery, however, has only two lights and one sound locator. Japanese officers admit that this is entirely insufficient. The interesting part of it is that the new regulations indicate that the idea of only one searchlight battery for a regiment has been discarded. Officers in the 1st Antiaircraft Regiment, however, do not expect that a new searchlight battery will be organized in the regiment until the proper number of lights for a battery has been determined. The number given in the new regulations is two searchlights only because some number had to be stated. I noticed that during maneuvers with the regiment that the number of lights used varied from two to four.

Searchlights are usually controlled by battalion commanders. (Sector commanders, in an air defense command.) One maneuver almost was held in which gun battery commanders were to control their own searchlights. This maneuver was abandoned because at darkness the ceiling dropped to less than a thousand meters and a light fog settled on the air corps landing field.

The monostatic method of sound locating using an estimated altitude of the target is the normal method of pointing searchlights in the 1st Antiaircraft Regiment. An occasional drill is also held with the horizontal intersections method.

All of the sound locators in the regiment are of the exponential horn type. None of them are equipped with sound lag correctors nor are there any comparators in the regiment. Two contangent charts are used for predicting and for correcting for sound lag and wind effects.

There are three large type sound locators. These were the only sound locators in the regiment when I joined it but several months later six new type instruments were received. The new instruments are extremely small and particularly adapted to conditions in Japan. The large instruments were very unwieldy and required too many trucks to carry the horn sections. They will probably be discarded in the near future.

The small sound locators are Model 1930. The distance between axis of the horizontal pair of horns is

about 70 inches and of the vertical pair about 60 inches (estimated). The horns are in two sections, the straight bell and a curved section which fastens to the tube leading to the receivers. The receivers do not have ear plugs, a result of the complaint that the ear plugs in the old instruments were very uncomfortable and annoying. The horn tubes end in a $3/8$ inch hole in the receiver.

The horn bell is carried in a canvas bag similar to our barracks bag when dismantled. The rest of the sound locator is packed into two chests, each chest of the dimensions of about $2 \times 31\frac{1}{2} \times 1\frac{1}{3}$ feet.

The tripod mount of the 1930 model sound locator is a complete departure from the design of the large locator. The foot of each tripod leg rests on a round metal disc to prevent the leg from sinking into the ground and the bottom of the disc has a short spike. The tripod can be leveled by screws which run down each leg to the foot-plate.

Target practices are held semiannually, spring and fall. The Japanese call their spring target practice "preparatory," probably because 40 to 60 percent of the privates in a battery are conscripts newly enlisted each January. The fall target practice is called "battle."

During the spring target practices each battery must fire with the 75's at least one practice at night and at least two at a towed sleeve target. During the fall practices each battery must fire with the 75 mm guns at least three practices at a towed sleeve target and one practice using data computed by sound.

The regimental commander determines the type of practices for the 105 mm gun. He is also permitted to excuse batteries from firing any of the required types of the 75 mm practices. The number of rounds allotted to each battery practice is also at the regimental commander's discretion.

The 1930 fall target practices of the Antiaircraft Regiment extended over a period of two weeks. The range used was on the seacoast, a small government reservation some seven or eight miles from the post. The guns and all regimental equipment were moved down to the range and left there under guard until the conclusion of the target practice period. Except for a guard detail which was relieved daily, regimental personnel returned to barracks every night.

The battery to which I was attached took three 75 mm guns to the target range and the other three batteries in the regiment took two guns each. Later, each battery brought both of its 105 mm guns.

All guns were emplaced on a single line parallel to the shore. The field of fire for each gun was limited to 850 mils each side of a line normal to the line of guns. These limits were indicated by chalk lines on the pedestal and by flag markers erected to show plainly the same area of fire.

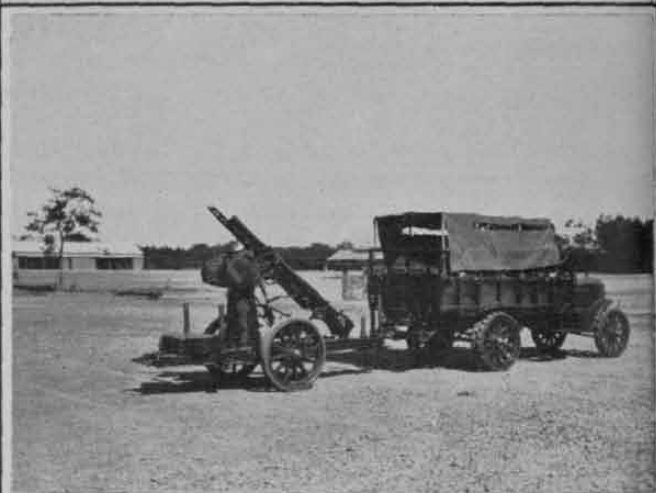
The 75 mm and 105 mm guns are primarily designed for a type of high explosive shell called "fragmentation shell" by the Japanese. This shell is supposed to have nearly the same effect as a high explosive shell coupled with the advantage of bursting into many small fragments each with its own high velocity.

There are three types of 75 mm projectiles being used now for target practice: the target practice shell, the smoke shell, and the parachute shell. The target practice shell is of a cheap grade of cast iron and breaks into several large pieces. The smoke shell is known by a Japanese term which means literally "has holes". The body of this projectile is of a better grade of cast iron than the target practice shell and is perforated by holes about a sixteenth of an inch in diameter, one hole per square inch. The projectile has a thick coat of black paint so that the holes cannot be

There are only two types of shell for the 105 mm gun, the target practice shell and the parachute shell. The parachute for the 105 is probably nine feet in diameter when open.

Ammunition allowances per gun battery are:

		Target	Smoke	Para-
		Practice Shell		chute
Spring	75 mm	60 rounds	30	7
	105 mm	22 rounds		3
Fall	75 mm	25 rounds	50	4
	105 mm	20 rounds		3



Above, left to right: Deviation Instrument and B' Altimeter. Instrument. Below, left to right: 75 mm. A.A. Gun.

Shelter is for B' Phone Operator. Speed and Angle of Path 75 mm. A.A. Gun and "Army Model" Draught Truck.

seen unless the projectile is scraped. The purpose of the holes is to lessen the bursting effect so that the projectile will not fragment but will still give a good smoke burst. The parachute shell has a small bursting charge, enough to blow off the fuze. A thin rubberized silk parachute, about six feet in diameter when open, is carefully folded inside of a two-piece metal tube which is inserted in the projectile. The tube is attached to the parachute shroud lines and acts as a balancing weight for the parachute after it opens. The parachute shell is used when the wind is strong enough to dissipate smoke bursts too rapidly to permit their being used as targets.

A Safety Officer was designated daily for the target practices. He had a detail of four privates and two NCO's equipped with one range finder and three pairs of field glasses. The detail manned two steel fifty-foot towers in rear of the line of guns. Communication was maintained between the two towers by telephone. The safety officer took his post on the tower nearer to the battery firing. He warned the battery commander whenever the field of fire was not safe. No practices were suspended, however, even when fishing boats were passing the front of the battery off-shore.

Two B" (distant) observation stations were established, one on each flank of the gun positions. Each

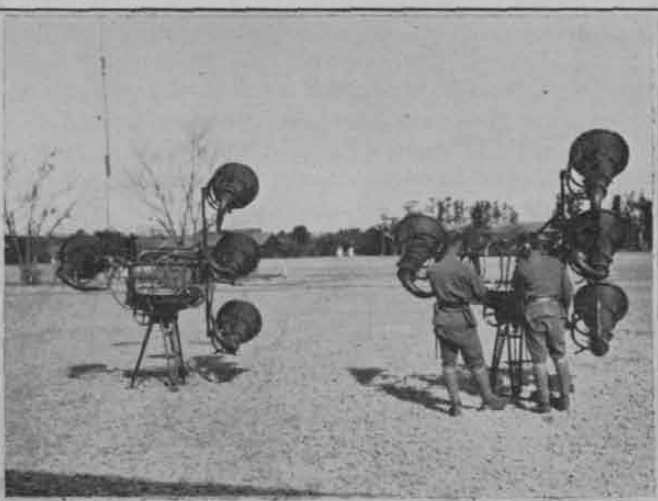
battery manned a right and left baseline at all times, the observers for all batteries at the two B" stations grouping their instruments close together. Each battery located its B' station for both baselines at its own gun position. Baseline lengths thus varied with the batteries. The average was about 2000 meters. Ordinarily, each battery used one baseline system to compute firing data and the other to obtain deviations.

Firing was conducted for six days without a towed target. A single smoke burst was used as a target at first and then later a battery would be directed to fire at a single smoke burst among half a dozen bursts. Parachute shells were also used to provide targets.

Once, when the wind was blowing in from the sea, a parachute shell was fired into the wind. The parachute came back directly over the firing battery. The battery continued firing until an elevation of 82 degrees was reached. Gun pointers then started to traverse their guns 180 degrees to follow the target back

Communication with the plane from the ground was by panel signal in the daytime. Any messages which could not be sent by panel signal were telephoned to the headquarters of the air regiment and were included in the instructions to the next pilot to go out. Communication with the plane by night was by searchlight signal. The plane used only Very pistol signals.

The sleeve target was five meters long, one meter in diameter at the mouth, and .95 meters in diameter at the tail. One day the ceiling shut down during target practice when the plane was towing a sleeve. A thin mist also began to drift in from the sea and the pilot saw that he would have to skim the house-tops in order to get back to his field so he flew down the line of guns and had his observer cut the towline. I was thus afforded an opportunity to examine the sleeve. It had six leads of quarter-inch hemp rope fastened to scallops at the mouth of the sleeve. These leads passed over and were fastened to a spreader ring



Left: Zeiss 1-2 Meter Base Range Finder—Altitude Converter. Right: Small Type, Model 1930, Sound Locator.

over the land but the supervising officer halted the practice. The rate of fire was not perceptibly slowed down by the high elevation but I did notice that the observers on the position finding instruments had to assume some fearful contortions due to the low mounting of their instruments.

Data records were kept for these preliminary practices. The recorders for each battery practice were furnished by some other battery. The recorders wore white bands on their caps to distinguish them from the personnel of the firing battery.

The airplane which towed the sleeve target was furnished by the bombing regiment, a neighbor of the antiaircraft regiment. The plane was of an old reconnaissance type which is being kept only to tow targets for the antiaircraft artillery. An observer was detailed from among the lieutenants in the antiaircraft regiment to ride the towing plane and note deviations of shots. The average speed of the towing plane was about 93 miles an hour. I obtained this figure by frequent check based on the speed expressed in seconds per 500 meters of linear travel as computed by the range sections.

of heavy wire about two feet from the end of the tow line proper. The leads were about twelve feet long and were spliced to the end of the tow line which was also of quarter-inch hemp rope. The towline was about 500 meters long and the sleeve had no frame or other reinforcing.

No practices were fired with a maneuvering target. As a matter of fact, the present method of position finding will not provide data for fire on a maneuvering target. The target practice course was flown parallel to the line of guns at altitudes varying from 700 meters to 2000 meters. The slant range was between 1000 meters and 4000 meters. In one or two cases when the ceiling was low the altitude and slant range were decreased to nearly 600 meters. At night brush fires were kept burning on each end of the line of guns and also at about 5000 meters on each flank for the benefit of the towing plane pilot.

The Japanese method of fire is Case 11½. The present sighting equipment of the 75 mm and the 105 mm guns prohibit fire against any moving target when it cannot be seen by the gun pointers. Barrage or zone

fire can only be conducted by using a hand quadrant to impart elevation to the gun.

Trial fire of about four shots is usually held before opening fire on a towed target. The fire corrections based on trial shots are usually the mean of the deviations. Vertical and lateral deflection corrections are usually applied directly on the gun sights. Altitude corrections are sometimes made algebraically by the battery executive before he announces the altitude to the guns. No attempt is made to apply corrections during fire but for that matter once the first shot is in the air during a target practice shoot no change is made in the basic firing data furnished the guns without first suspending fire. Corrections based on the shots fired on one course of the target are sometimes applied on the next course.

The pilot searchlight for night practices was located at the center of the line of guns. (The Japanese have no particular name for such a light.) Three illuminating lights (pilot light was also used to illuminate the target) were used, one about 2000 meters directly in rear of the guns and one about 3000 meters on each flank. The flank lights were not up on the prolonged line of guns but were about 1000 meters behind it. This was entirely due to the fact that there were no roads leading to the beach near the desired locations for the flank lights. An extra searchlight was hauled to the top of the sand dune on the left front of the line of guns. This light was under the control of the Safety Officer. The searchlight battery C. P. was as the center rear light. The battalion commander or the officer supervising the target practice issued orders to the searchlights.

Practices fired at the towed sleeve target were considered record. The correct record of deviations was determined by the observer in the plane and two officers or noncommissioned officers at the guns. The observer in the plane measured mil deviations by using the string and ruler method. His data form had a series of concentric circles, 25 mils apart, the center of which represented the target. He plotted deviations on this form according to their clock-hour location and mils of distance from the target.

The deviation recorders at the guns used the "so-many-fingers-so-many mils" method of measuring deviations, lateral and vertical.

There were no direct hits made on the sleeve and neither was it torn by fragments. I had had no previous antiaircraft experience and was without means of estimating the accuracy of practices but it seemed to me that some of the practices were excellent.

The antiaircraft machine gun used by the 1st Anti-aircraft Regiment is 6.5 mm in caliber and bears the trademark of the Tokyo Gas and Electric Company. It is air-cooled. It has no shoulder stock or rest. The grip is double with a bar connecting the two triggers. The tripod mount is very low and is made of heavy tubing. There is no adjustment for height. The sight is the "forward area" type but the usual graduated-leaf rear sight and the normal front sight have been left on the gun.

This machine gun is intended to provide protection

for the guns and searchlights against enemy troops on land and low-flying planes. It is principally a defensive weapon for the elements of the antiaircraft artillery and is regarded as such by the Japanese.

There are four types of service ammunition for the 6.5 mm machine gun: armor-jacketed, smoke tracer, fire tracer, and incendiary. "Armor-jacketed" is the literal translation of the Japanese term. The bullet has a lead core covered with a cupronickel or similar case. The regimental machine gun officer did not know the exact composition of this case or jacket. He stated that the burn-out point for the fire tracer is at about 600 meters and that he was of the impression that the burn-out point of the smoke tracer is about the same.

There is an additional round for the machine gun called a "cleaning bullet." This bullet has a soft steel jacket. Thirty rounds (one clip) of "cleaning bullets" are fired from a machine gun after it has been used.

Regimental machine gun target practice is held semi-annually, usually the last day of the artillery target practice period.

Ammunition allowances are allotted according to the number of batteries in the regiment. The allowance per battery is:

Spring practice—200 rounds, armor-jacketed only.

Fall practice—240 rounds, armor-jacketed only.

Four guns were taken to the range for the practice. The gunners from all batteries used the same guns. The guns were mounted at about twenty yards interval. Each tripod was bolted to a heavy wooden base, three feet square and about three inches thick. Sand bags were piled on the base between the legs of the tripod.

A sleeve target, the same dimensions as that used for the artillery practices, was towed on two types of courses for the machine guns. One course was a straight line parallel to the line of guns so that the maximum slant range would be about 500 meters and the minimum about 300 meters. This course was for gunners in their first year of service. The course for second-year gunners was a figure eight. The plane flew from left to right parallel to the line of guns, then turned out to sea on a wide circle to the left, came in perpendicular to the line of guns, crossed over the guns, and then swung around to the right to complete the figure eight. For the figure eight course, machine guns were fired through the safe arc on the left to right leg of the course and were fired at the incoming target as soon as there was a safe vertical angle between the plane and the target. The gunners followed the target to the highest angle of fire they could but the low mounting of the Japanese machine gun makes it very difficult to sight at angles above 60 degrees.

The approved stance for a gunner is with one foot forward, both knees slightly bent. The gunner bends his knees as the firing angle increases until he finds his rear knee on the ground. Then he must shift his position to a squat before he can follow the target farther.

Tracers were not used in the target practices although it is intended under service conditions to use

single gun adjustment with tracers. The method of fire was Case 1. All firing was by short burst of five or six rounds. Bullet tips were touched with colored enamel, a different color for each gun. Sleeve targets were reeled in close to the plane after every two legs of the straight courses and after each figure eight course and the sleeve cut loose over the guns. The sleeve was then examined and bullet holes could be attributed to different guns depending on the color around the edge of the hole. There were very few hits made on the sleeve but this is not surprising because the gunners had no means of telling where their shots were going.

Vital areas in Japan will be protected in wartime from sky attacks by an organization termed the "Air Defense Command." There will probably be a separate command for every important city, harbor, or other locality. Such organizations are not in existence now, principally due to Japan's lack of antiaircraft artillery. A series of air defense maneuvers has been started, however, to acquaint the civilian populations in as many localities as possible with a modern phase of national defense and also to test existing communication facilities for intelligence service purposes.

An air defense commander has under his control all fixed and all mobile antiaircraft artillery stationed in his area. It is not definitely known whether he will command all air force units in his area but it is known that he will have at least some air force units under his command.

The air defense commander is required to establish his own intelligence service and to maintain liaison with neighboring air defense commanders so as to be able to utilize intelligence reports from lookouts stationed beyond his own net.

The intelligence service for an air defense command is organized according to local needs. The present general scheme places each group of a small number

of distant lookout stations in direct telephone communication with its own group headquarters. Intelligence reports are phoned from the group headquarters to the headquarters of the air defense commander who utilizes a map board equipped with colored lights to spot the location and imminence of air raids.

Intelligence service observers for recent maneuvers were obtained by mobilizing students. Every hamlet in Japan has a fire watchman's tower and these towers have been found to fill the requirements of a lookout station.

The Japanese antiaircraft artillery has reached a stage when rather radical changes in materiel can be expected at almost any time. It has been pointed out that the present position finding system and fire control apparatus are not capable of handling maneuvering targets. For this reason alone, it is probable that the Japanese will shift to a director controlled system.

News about developments in army materiel is not apt to be broadcast in Japan until the article is ready for issue. Recently, however, Japanese newspapers gave considerable publicity to a new antiaircraft artillery shell. This shell is to contain some three hundred tiny parachutes, each one weighted with a small piece of lead. The shell is to be fired so as to burst slightly ahead and above the enemy plane. The three hundred parachutes will be released by the burst and it is expected that an enemy plane will be forced to run into at least several of the 'chutes and will damage its propeller to the extent that it will have to make a forced landing. That is what the inventor claims.

Who knows? Perhaps antiaircraft artillerymen in the future will only have to put in a few moments of fast work at dusk, scattering parachute shells in the sky, and then he will be able to go to bed and let the little drifting parachutes and their lead weights bag him a few enemy planes in practically unused condition.



Officers' Quarters on Water Front, Fort Monroe, Virginia.

The Antiaircraft Machine Gun Problem of Today

By Captain E. T. Conway, Coast Artillery Corps

EDITOR'S NOTE—You will find in Captain Conway's article no scheme of his, patented or otherwise, calculated to solve the problem of which he writes. It does provide a careful study of the foundations upon which a satisfactory solution must be based, with discussions of the most recent attempts. No one concerned with such matters can afford to be ignorant of the facts and comments which he presents.

TODAY it is possible to draw some conclusions about antiaircraft machine gun fire which are quite likely to be still true tomorrow. The tremendous development, during the last decade of guns, mounts, ammunition and fire control devices, to say nothing of the changes in the probable target, has made this rash in the past. But now enough tests have been made and enough experience has been gained to state, in order of importance, the three basic requirements which the ideal antiaircraft machine gun must meet.

It is obvious that a hostile plane risking fire from the ground will make every effort to give as little warning of its approach as possible, and to get away as quickly. Flying low—just over tree tops—delays both visual and aural discovery. High speeds cut the time of action to seconds. This means that we must have equipment and a system to permit opening fire in "next to no time" and which can cope with the highest angular speeds likely to be encountered. It may seem obvious that great accuracy will be of no use if it takes so long to open fire that the target will pass out of range. Yet this has been considered too negligently in the past in some cases, and, probably will be again. There *must* be, however, as the first requisite, *high speed of operation*. Everything must be directed toward the target within a very few seconds of its discovery; fire must be opened without the necessity for further delay; and tracking must be smooth and continuous.

Secondly, we must have a certain degree of *accuracy* if we are to get hits. This is a problem of fire control, considered further below.

Effective hits are the goal of our endeavors. The number obtained in a given time may be increased by a greater accuracy of fire or less satisfactorily, by greater *fire power*. This, the third requisite, is the idea behind the multiple mounts.

The four gun multiple mount in its latest form was a great attempt to combine the maximum possible accuracy and fire power. A Vickers director was provided to insure accurate data. Unfortunately, so little firing time was left in many service cases after getting the instruments on the target, and the change in angular leads was then so great, both the *net* fire power and the accuracy were largely destroyed by this neglect of the speed factor. A two-meter stereoscope was supplied to observe the tracers with reference to the target but vibration made it useless. Furthermore, the application of arbitrary corrections at the stereoscope had

the effect of throwing the trackers off the target. Their immediate attempt to get "on" again introduced erroneous rates into the director which completed the vicious circle by throwing the tracers still farther away. Unless existing instruments are radically changed, it seems to have been established that the first basic requisite—speed of operation—will exclude data computers of this type from such use in the future.

The latest type of two gun multiple mount concentrates primarily on a combination of speed of operation and fire power. It is trained and fired by one man who uses a one-meter stereoscope for the observation of his tracers. Vibration reduced the accuracy of this device until the results were equivalent to those of the tripod mounts. It appears that further development of this type of mount may prove to be profitable.

The stereoscopic fire director with Case III electrically controlled sights is perhaps the best approximation to a satisfactory solution yet presented. There are two distinct units, the director and the alignment sight. The latter is attached to the sight bracket which is attached to the yoke or upper half of the tripod, in such a manner that the sight may be moved by two motors 200 mils laterally and 100 mils vertically with the pivot of the line of sight near the gunner's eye. (See Fig. 2). A "speedometer" clock connected with each motor registers the number of mils the sight has been displaced. With this method, the function of the gunner is to keep the sight on the target and fire the gun. The leads set are controlled electrically from the fire director. A one-meter stereoscope on top of this instrument is kept on the target by two trackers. The adjusting officer observes the tracers through the stereoscope and, by moving the control hand wheels, changes the leads of all connected guns to bring the tracers on the target.

Other recently tested equipment, including the 37-mm. guns is distinctly better than the items replaced and, with further refinement, will probably be found throughout the service in a few years. The 37-mm. tracer is larger and easier to see than others. This aids in adjustment but since tracer control is still a mooted question, especially for the longer ranges, remarks herein may be applied to it also. Consideration must be given to the fact that responsibility for hitting at longer ranges is imposed by increased calibers. All equipment can be made to hit at the shorter ranges with "down the barrel" methods.

We have machine gun equipment today which is suf-



Fig. 1. Multiple Machine Gun Truck Mount T-1

This instrument is tracked by two operators. The adjusting officer, using the stereoscopic, adds to the present position indicated by the trackers, the angular leads, vertical on the left and lateral on the right, through the knurled handwheels mounted horizontally below the instrument.

A new design of the instrument combines the action of the adjusting handwheels into one lever—a "joy-stick" arrangement.



Fig. 2. Stereoscopic Fire Director T-7

ficiently speedy in operation; we have equipment which is highly accurate at the shorter ranges; we have units with great fire power. Our fundamental problem in its most modern aspect is how, without sacrificing speedy operation and fire power, we may increase the accuracy and thereby our hits, particularly at longer ranges. If we say that the effective range of our .50 caliber gun is the range at which hits have been obtained, experience shows that there is much to be accomplished in extending the effective range, and increasing the accuracy at all ranges. The present efficient tracer range is 1900 yards; the maximum possible range of the gun well over 5000 yards. The corresponding ranges for the 37-mm. gun are still greater. We know that individual tracer control ("down-the-barrel" method) is indispensable within 600 yards. This is due mainly to three reasons: (1) Each singly mounted gun must be able to engage, instantly and without aid, any target in its basic sector during a multi-plane attack. (2) The experienced gunner can open fire sooner, estimate leads, make his own adjustments, and get both a higher percentage of hits and more hits per gun per minute than by any other method yet devised. (3) The angular changes in the leads are so great and come so rapidly that no other system can follow as smoothly as the individual gunner. However, if we wish to deliver effective fire at the maximum tracer range, we find very different conditions. No longer is it possible for the individual gunner to estimate leads, observe his tracers, and get a satisfactory percentage of hits. We thus face a problem of fire control, the fundamental characteristics of which we may well consider in brief. There are two phases of this problem, namely (1) the calculation of the leads and their application to the gun; and (2) the determination of the deviations and the application of the necessary corrections.

These leads may be determined by estimation, calculation, data computers, and self-contained sights. As intimated above, estimation is not satisfactory either theoretically or practically at the longer ranges. The computers and sights are, of course, essentially ma-

chines to make the necessary calculations, each course being a special case of a general problem. It has seemed to be a proper problem for a data computer. Several have been built and tested. All have come to grief, and would have, even if satisfactory otherwise, because they were too slow in operation. Few realize how little time is available until an actual attempt is made to pick up, and fire at, a hedge-hopping plane. The self-contained sights attempt to fit a given course into a general and previously calculated background. No sight as yet gives satisfactory results under service conditions. The specifications for a sight and the limitations of sights now available are discussed later.

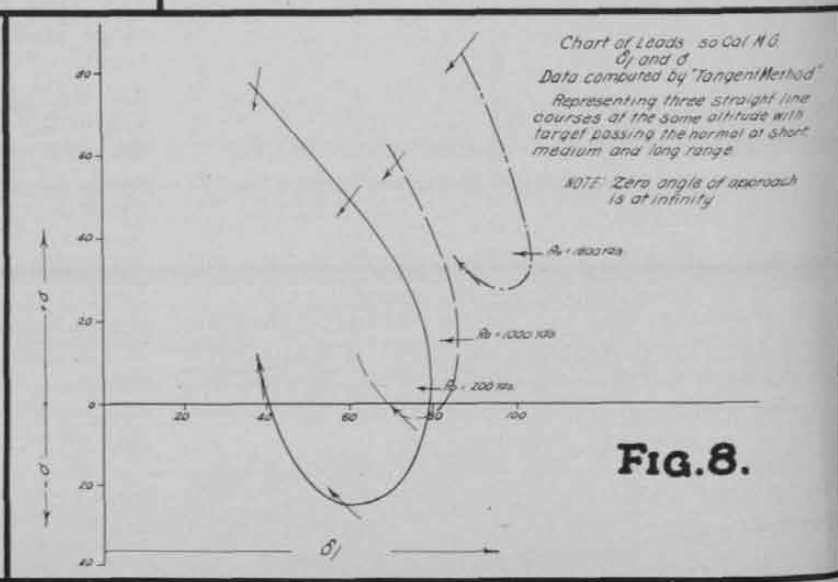
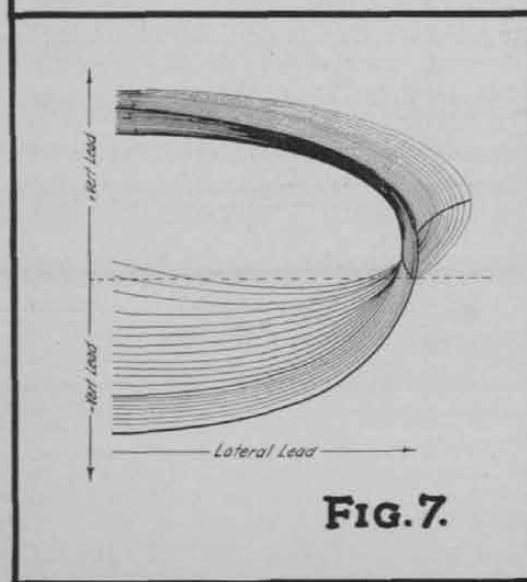
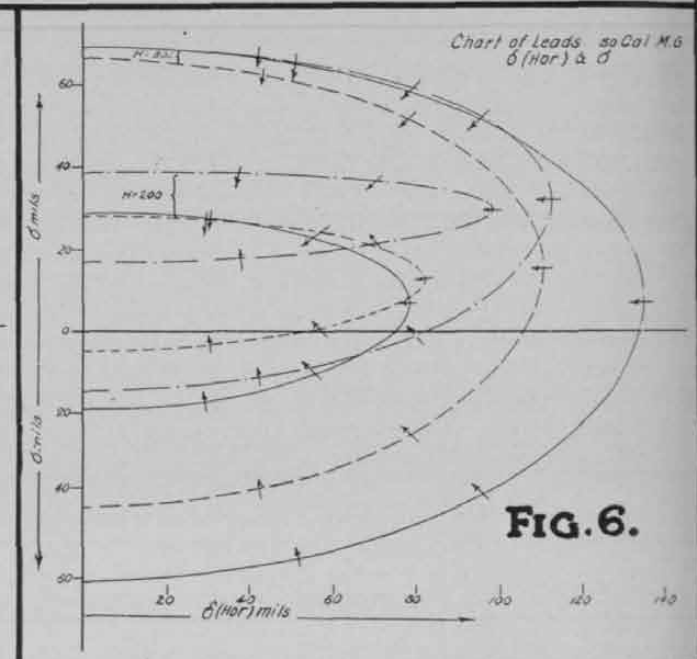
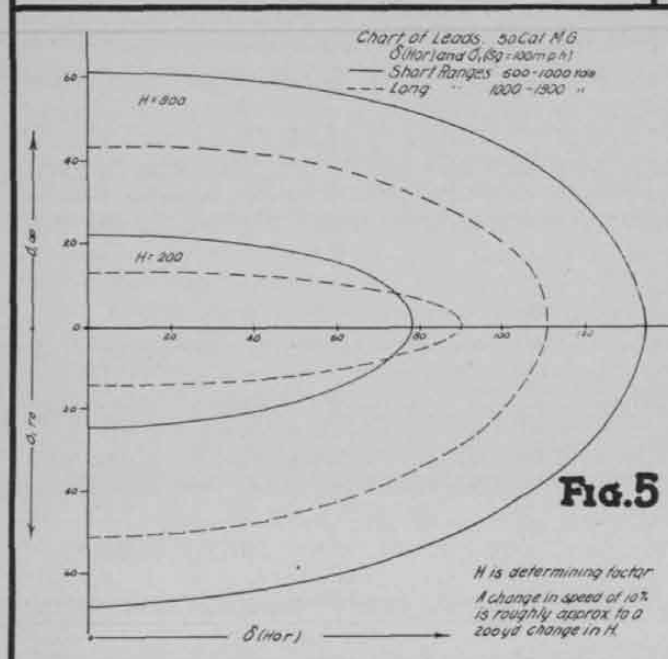
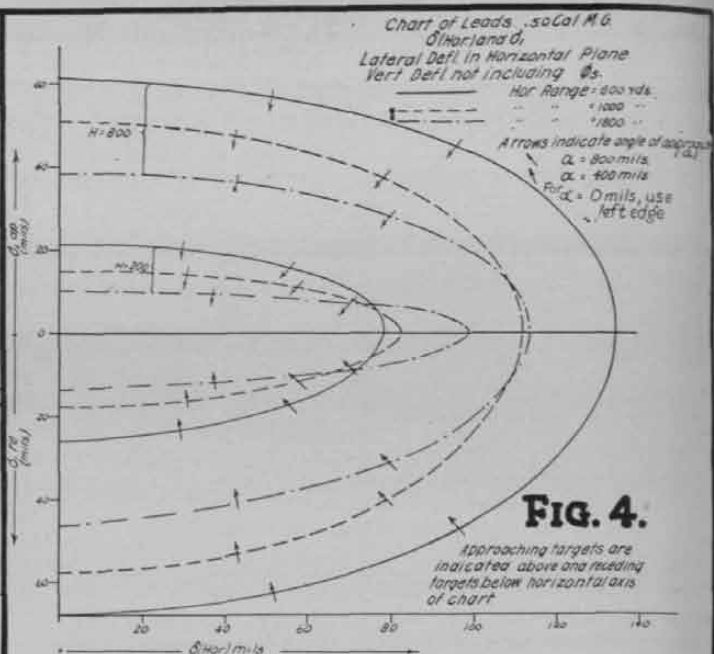
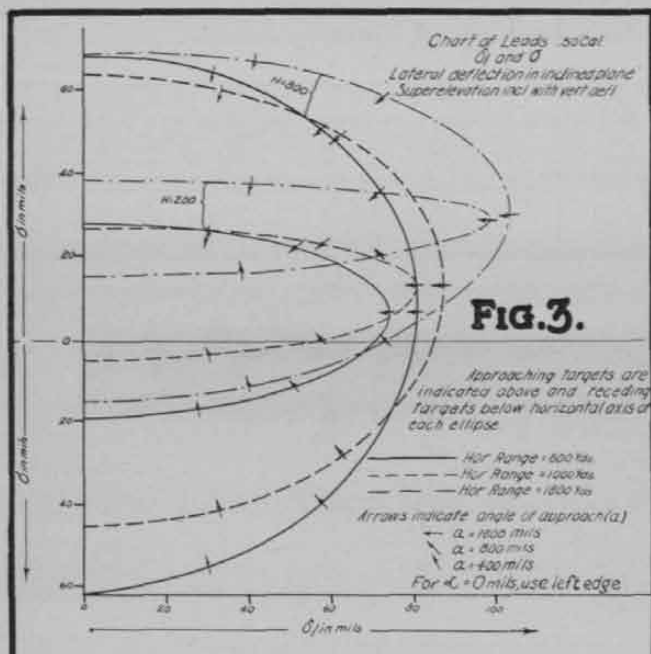
If we make a detailed calculation of what the leads should be under various conditions, we may obtain curves as shown in figures 3 to 12, and from them certain conclusions may be drawn. Before doing so, it may be well to recall that every course is actually a crossing course, the so-called "coming" course being a limiting case in which the horizontal range from the gun to the point of nearest approach is zero. When this range is large we have the conventional "crossing" course. The normal to a course is the line from the gun to the horizontal projection of the point of nearest approach (straight course assumed), at which point the angle of approach is 90 degrees. The terms "coming" and "crossing" will be used to refer to courses which do, or do not, respectively, come close in horizontal projection to the gun.

The more important deductions may now be set down: The lateral deflection is zero when the angle of approach is zero.

The vertical lead for approaching targets on coming courses, over a limited belt of ranges, 600-1800 yards, and for a constant altitude, varies so slightly that it may be considered as constant.

The same condition is present in the vertical lead on crossing courses between 600 and 1500 yards until the angle of approach is greater than 45 degrees.

The vertical lead is superelevation only, when the target is at the normal.



The angle of approach has more effect on the leads than any other factor, when considering a particular target on a particular course. It causes the lateral lead to be zero on the horizon (neglecting drift) and a maximum at the normal. It causes the vertical lead to be a maximum for zero angle of approach and a minimum, superelevation only, at the normal.

The vertical lead during any course is effected by changes in altitude and range. The principal effect for approach angles below 800 mils is due to altitude changes; above 800 mils the effect of range changes increases until, at the normal, it is dominant. The vertical lead of a receding target is very difficult to approximate. Lateral deflections must be figured in the inclined plane of sight for alignment sights which move in elevation with the barrel. They vary uniformly from zero for a zero approach angle to a maximum at the normal. Altitude changes have little effect, range changes being the determining factor.

When an azimuth clock is used as in the case of the 37-mm. gun, the lateral leads are applied and must be figured in the horizontal plane. For such a condition, altitude changes will have the greater effect between 0 and 800 mils angle of approach; thereafter changes in both altitude and range affect it.

Our purpose in studying these figures is to discover the best methods of combining the various curves so that they may be used in practice with a minimum of estimations, yet retain the desired degree of accuracy.

Curves plotted between altitude changes and average lead at various ranges would be erroneous at the normal and worthless for receding targets.

Curves plotted between range and average altitude changes would likewise have serious errors during a large part of the course.

Figure 5 represents an attempt of this sort. This combination is limited to equipment using azimuth clocks and directors with a separate cam furnishing superelevation.

We have given barely more than an outline of the matters involved in obtaining the proper leads but it is necessary to consider now the second phase of the fire control problem,—how the deviations may be obtained and proper corrections made.

The observer of antiaircraft machine gun fire is dependent upon the tracer bullet for information about the relative positions of the target and the stream of fire. It might seem to the uninitiated that it should be a very simple matter to bring the target and tracers together when both may be seen. There are unfortunately several reasons why it may be extremely difficult. The basic fault lies with the eye rather than the modern tracer. Stereoscopic vision for the unaided eye ceases at ranges of about 600 yards. Beyond that we must see one object silhouetted against another or use some similar indirect method to know which is farther away.

Fig. 7

Type of figure made by charting both leads at one altitude and at one speed, using small increments of horizontal range. This shows the difficulty of combining a number of such figures, for various altitudes, so as to make a single self-contained sight capable of being operated by one man. The "pushed-up" effect of this figure at the longer ranges is due to the inclusion of superelevation with the vertical lead. Without superelevation, this figure would be symmetrical with the axis of the chart and the line joining the points at the normal would be horizontal.

Let us suppose that we fire a series of tracers at a target moving at a constant speed and altitude on a circular course 1200 yards from the gun and that we use a constant lead. The steady lateral movement of the gun will cause each tracer to be fired at a slightly different azimuth from the one before. Although the horizontal projection of the trajectory of each bullet will be nearly a straight line, the various tracers in their various positions from gun to burn-out point will outline a visible curve which not one of the bullets is following. If every tracer seems to be behind the target we can be sure that all the bullets are actually behind but when we try to make this apparent curve touch the target we experience the greatest practical difficulties. A certain amount may be learned from experience so that hits with tracer control may be obtained beyond the range of stereoscopic vision but not to the extent which is desirable.

Recently stereoscopic observing instruments have been supplied to extend the short normal range of the eye in this respect. There were stereoscopic instruments on the latest 4 and 2 gun multiple mounts and on the central tracer control fire director. The first two were made practically useless by the vibration, but the last was not affected by this, by smoke, or flash. It was a one-meter instrument which theoretically should give correct stereoscopic vision to points well beyond the maximum range of the equipment. Despite these facts, the adjusting officer was not able to adjust satisfactorily. The failure was probably not due to the stereoscopic feature. The fire director tracked the "present" position. The adjusting officer had to add the principal deflection by estimation as well as the arbitrary correction. In addition, he had to change the principal deflection constantly due to the rate of change of the leads. Briefly, he had too many duties for one man. This device warrants further development. The ob-



Divided Remote Control

Two units are used, one of which is shown here (one for lateral adjustment and the other for vertical adjustment). The lateral adjuster takes station in rear of the battery, the vertical adjuster takes station as far to the flank as possible. Units are connected directly to the appropriate receiver motor on the machine gun sight.

Communication is maintained between both stations and the battery commander. Photograph shows the designer, Lieut. F. T. Ostberg CAC.

vious course is to track the "future" position and limit adjustment to arbitrary correction.

The tracer immediately in front of the gun is very bright but in much less than a second it assumes a definite reddish hue which is maintained to the burn-out point. The observer at or near the gun has the impression that the tracer is moving slowly and that the burn-out point is only a short distance away. Experience and common sense tell him this cannot be so, but capable gunners have attempted to adjust the tracers to the target on what they call the descending branch of the trajectory. Yet a glance at the trajectory chart shows that a tangent to the trajectory at a point 1500 yards from the gun at 800 mils angular height lies along the trajectory from a point near the gun to a range of over 2000 yards with a maximum deviation of about 5 yards at either extreme. This is small leeway.

There is another point not generally understood. One cannot actually see the tracer "at the target" due to the relative speeds. If the projectile velocity is 2000 feet per second and the target velocity 150 feet per second (100 m. p. h.), a 30-foot target will pass the projectile in $1/5$ of a second while the projectile will pass the diameter of the target (5 feet) in $4/100$ of a second.

Observation of tracer fire from the flank suggests itself for vertical adjustment. This has been modified into a divided remote control, with the lateral control behind the gun and the vertical control on the flank. The two units are connected by telephone. This general scheme did not work very well but the tests were not complete and the results not conclusive. However in the daytime the flank observer must get closer to the gun than theoretically advisable, in order to see the tracers. There was too much time lost in getting an adjustment. It has possibilities which deserve more exhaustive tests.

Another method, called "Tangential Adjustment" has recently been studied in detail but awaits test. In this method the observer is located at the point where the tangent to the trajectory at the target meets the horizontal plane of the gun. This provides theoretical advantages which must be evaluated by service tests.

Tracers which change color at a definite range may prove to have value and a field of usefulness.

While it is realized that the foregoing consideration is not exhaustive, the more important aspects of the subject have touched upon. We will discuss, next, various sights which have been developed.

Machine gun sights may be classified broadly as alignment sights and self-contained sights. Alignment sights are those which move primarily with the gun and to which the corrections are applied as secondary movements as from the fire director. There are two types, open and telescopic. The open sight is preferred by the gunners due to the larger field of view. Self-contained sights are those which automatically set the line of the barrel at variance from the line of sight by an amount equal to the proper vertical and lateral leads.

The requirements for an ideal self-contained sight are as follows:

First, it should be applicable, with any necessary modifications, to .30 and .50 caliber machine guns on tripod mounts, to multiple machine gun mounts and to a central control fire director.

Second, it should be rugged enough to withstand shock due to vibration of the mount in use, to transportation, and to rough handling in the making of minor adjustments.

Third, it should be simple to use and adjust.

Fourth, it should be accurate to within a few mils under all conditions.

Fifth, it should require a minimum of estimation so that it may be used quickly upon a target which appears suddenly.

Sixth, it should be ready for instantaneous use. There should be no time interval between prediction and the application of the prediction.

Seventh, it should be operated by a single gunner.

For multiple mounts and central control instruments we have the following exceptions and added requirements:

1. Duties in these cases may be divided into tracking and adjusting. The tracker should track the "future" position, thus putting in the principal deflections, and fire the gun when "on target" if signalled to do so by the responsible officer. Adjustment might be based on erroneous "spots" if any one else fired the guns. Adjustments should be applied to the barrel of the gun instead of displacing the sight as the latter method throws the tracker off the target. This adjustment should include all arbitrary corrections.

2. The superelevation may be added by a separate operator, for the central control fire director.

Needless to say, we have no such sight in use at the present time nor is one being developed, to our knowledge, which combines these requirements.

A discussion of some of the sights which have been developed may lead to still greater improvements in future sights through an understanding of present limitations. We will distinguish between the circular sight and the straight line sight. The former includes all which use a curve or part of a curve for results; the latter includes all which apply leads along straight lines whether they be horizontal, vertical or oblique lines. The Forward Area sight is representative of the circular division; the Schmidt sight being a limited application of the idea. The most familiar straight line sight is probably the obsolete Peyru Sight, while the Boyd-Greené is the present outstanding representative. The Negrotto sight is a limited application of the straight line.

The theoretical sight upon which all circular sights are based, but which has certain practical limitations, has fundamentally the following characteristics. A circle is mounted near the muzzle of the gun in such a manner that it will always remain in a horizontal plane, no matter what the angular height of the gun. The radius of this circle is such that it subtends, at its particular distance from the eye, the angle through which a target of assumed speed would move at mid-range during the time of flight of the bullet to that range. When the target is near the horizon, the circle will present the aspect of a straight line; directly over-

head it will appear as a circle; and, at intermediate elevations it will seem to be an ellipse.

Under the conditions for which it was designed, this circle would then always present the true relation between the lateral and vertical leads to the future position of the target—the absolute lead being the distance from the center to the point on the circumference representing the angle of approach of the target. It is obvious that, for a zero degree approach angle, the absolute lead is the distance from the center to the target position on the lower end of the vertical axis of the sight. Likewise, for a target at the normal, the absolute lead is the distance from the center to the target position at the end of the horizontal axis on the side from which the target is flying. There are intermediate points for all intermediate approach angles. The use of this sight will be without error under the special conditions for which it was designed except for superelevation which can be added to the rear sight. If the target were at a greater range than that chosen for the radius, the circle would have to be moved nearer the eye to give a greater angle due to the increased time of flight, and, of course moved farther away from the eye if the range were less than the chosen normal range. Likewise, variation of the actual speed of the target from the speed chosen for the design of the sight, would necessitate an inward or outward movement similar to that for range changes. It is possible to construct one cam which would take care of an arbitrary combination of range and speed variations.

In operation, under the conditions so far laid down, the crew would consist of a gunner to track the target, a man to raise the sight leaf for range changes and the same or another man to adjust the combination cam. It is hard to conceive of a sight built on these principles which would not be complicated in its construction and mounting. It assumes no variation in trajectory for variations in angular height and for such reasons would fail on at least five counts in the previous list of requirements for an ideal sight.

The Forward Area sight is the nearest approximation to the ideal circular sight and closely approaches the general form of the curves in figure 3. It consists of two ellipses mounted in a plane always perpendicular to the barrel of the gun. It is accurate for the particular range, altitude and target speed for which designed. The outer oval is correct for the .30 caliber machine gun for a target moving at 100 m. p. h. at 1000 feet altitude and 435 yards slant range. The inner oval is correct for a speed of 120 m. p. h. altitude 200 feet and slant range of 258 yards.

A study of the curves in figure 3 gives an idea of the variations in leads due to range and altitude and, with a mental picture of changes needed in the circular sight described above, indicates the limitations due to using any two ovals. There are so many variations that the average gunner can not use the sight satisfactorily.

Due to the fact that it has such definite limitations in speed, range, and altitude, all attempts to make accurate use of the sight depend upon a complete and

separate position finding system which is out of the question for war-time conditions. Such attempts have been made and some have been highly successful under the limited conditions of target practice, particularly when the field of fire was restricted to a small angle and the target was required to fly definite, straight courses.

Based on such conditions, the sight designed by Lieutenant Grayson Schmidt, C. A. C., may be used to get hits. The range, altitude, and speed at the point where the target will enter the restricted firing sector, are measured and the proper leads ascertained from data previously calculated and tabulated. These leads are set by adjusting movable horizontal and vertical wires on a square sight mounted near the muzzle. The value of this sight is limited to a small field and it is necessary that the target maintain the estimated course for

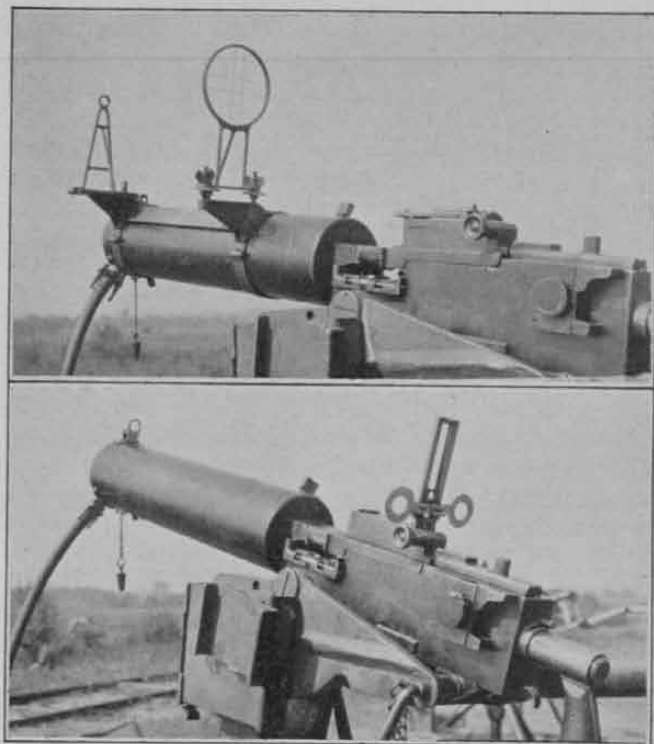


Fig. 9. Above. The Boyd-Greene Antiaircraft M. G. Sight

The horizontal wires should have the crimps noted in the vertical wires. The sight had been damaged and smooth wires were used to repair it.

Fig. 10. Below. The Negrotto Antiaircraft M. G. Sight

Used for obtaining an opening lead. The "spectacles" are adjustable, laterally and may be swung upward.

its successful employment. The estimations, measurements and tabulated data required for its use are considerable and preclude its use under service conditions.

The straight sight differs markedly from the circular sight in that it takes no account of the angle of approach. The two sights previously mentioned under this classification—the Boyd-Greene and the Negrotto—were developed at the Infantry School for the use of the Infantry when firing against low-flying planes. Altitude is not considered, and fire power and dispersion due to a single point suspension are assumed to take the place of accuracy. But since accuracy is the

second important characteristic of an automatic anti-aircraft weapon for the artillery, that phase of the sights must be studied.

The Boyd-Greene sight has been adopted by the Infantry and deserves careful consideration. The typical Infantry aircraft target is one which approaches the gunner at very low elevations and such short ranges that the instantaneous application of fire is the first requisite. Other features were included in the sight to assure some hits on crossing targets and targets above 100 feet altitude. The requirements of a sight for anti-aircraft artillery are more complex due to greater ranges and altitudes and all-around fire. The Boyd-Greene sight was tested by Coast Artillery troops at Aberdeen and not recommended for anti-aircraft artillery. The main objections were its lack of ruggedness and simplicity, its inferiority to tracer control at ranges for which designed, the number of estimates required for its advanced use, and the serious limitation on the number of hits which can be expected.

It is designed for the .30 caliber machine gun. The front sight is a circle with an outer diameter of 0.75 inch. The rear sight is also circular but 3.75 inches in diameter and with two pairs of wires, one vertical and one horizontal. (See Fig. 9). The inside distance between wires is 0.6 inch and the distance between front and rear sights 12.8 inches. There are two methods of using the sight; basic and advanced.

In the basic method, the front sight with the target centered therein, is moved from the center of the rear sight to the end of the path formed by the guide wires and then back to the center. This movement varies the lead from 0 to about 125 mils. This distributes the fire over a length varying from 37 feet at 100 yards range to 220 feet at 600 yards. As a result, even with perfect elevation, 17 per cent of the fire will be wasted at the 100 yard range and 86 per cent at 600 yards. The factor compensating for this certain wastage of ammunition is that the gunner is required to make only one simple estimate before opening fire, namely, whether the target is within the maximum range of 600 yards.

The great wastage of fire in basic use is remedied in part by the advanced method. In this the length of the traverse is controlled by brackets on the rear sight guide wires. There are three brackets on each pair of wires. The inner bracket is for speeds of 70 to 120 m. p. h. and at inclined angles of approach; the middle one for the same speeds but where the full length of the target is visible; and the outer one for targets presenting their full length at speeds over 120 m. p. h. Each bracket represents 47 mils.

The gunner must estimate the range as less than 600 yards, between 600 and 1000 yards, or over 1000 yards; the speed as below 70 m. p. h., between 70 and 120 m. p. h. or over 120 m. p. h. and the angle of approach as judged by the apparent length of the target as compared to one passing the line of sight at right angles. The altitude is not considered in this sight and no superelevation is applied. The gunner deter-

mines from these estimates which of the three brackets he will use and whether he will use the horizontal wires, the vertical wires, or estimated brackets at some other angle. After this determination, he centers the target in the front sight and keeps it there while moving the front sight circle between these limits.

Aside from the difficulties of making rapid and accurate estimations of range, speed and angle of approach, the influence of their changes, of failure to consider altitude and superelevation for the longer ranges, and the difficulties of keeping the target centered, there are errors in the design which greatly limit possible hits. When the target is centered in the front sight, the muzzle must move with the angular velocity of the target. Traversing the front sight between the limits of the rear sight brackets is an added movement independent of target speed. Each bracket is 47 mils; each traverse theoretically accomplished in $2\frac{1}{2}$ seconds or at a speed of 18.8 mils per second. The 30-foot sleeve target is 20 mils long at 500 yards and so the cone of fire would be on the target for only slightly more than one second out of each $2\frac{1}{2}$ of fire. The 50 per cent zone at 500 yards is 6.7 feet. For a sleeve 5 feet wide and a rate of fire of 10 shots per second there will be 3.7 possible hits during each traverse. For 20 seconds of fire of 200 rounds per gun, the maximum possible percentage of hits is 15. The influence of operating factors may be evaluated from the results of six practices at Aberdeen. The best percentage of hits obtained in any one practice was $2\frac{1}{2}$ at an average slant range of 244 yards with 1067 rounds fired. The percentage of hits for all six practices was $1\frac{1}{2}$; average slant range 497 yards; rounds fired, 8182.

The Negrotto sight is a limited application of the straight line sight. It is, in fact, very limited, as it makes no attempt to carry the target through a course. Its purpose is merely to give an opening lead, tracers being depended upon thereafter. It may also be used on the infantry rifle.

The sight (Fig. 10) is very simple. It consists of a flat bar with a peep hole in one end and a slot in the other. Its distance from the rear sight leaf can be varied and the bar may also be swung vertical for a coming target or set at any intermediate angle.

This sight may be of assistance in training gunners to estimate proper opening leads. The delay caused by setting the sight to the proper length and angle is too costly for an opening lead only where tracer control is to be used in service. It is less suited to the .50 caliber machine gun than to the .30 caliber.

In conclusion it may be said that sights now in use in the Coast Artillery are too limited in their application to be considered as sights in the sense of the requirements mentioned above. It is hoped that this article may furnish a firm foundation for anyone who contemplates the construction of an anti-aircraft machine gun sight or be a measuring device to evaluate ideas already developed but not yet tested.

Antiaircraft and the 200-m.p.h. Bomber

By Major G. B. Robison, Coast Artillery Corps

EDITOR'S NOTE: *The author of the following article wishes it understood that it deals only with the night defense of a small rear area. Furthermore he does not offer an approved solution. He hopes that it will create discussion particularly with reference to our present antiaircraft tables of organization. A few people who have read this article seem to think that Major Robison prefers four batteries of three guns to four batteries of four guns. He wishes it to appear clear that he favors four batteries of three guns in preference to the present arrangement of three batteries of four guns.*

A NEW magazine, *The Air Legion Weekly*, in its first issue carries this paragraph: "The Belgian government has contracted for a number of Fairey 'Firefly' pursuit airplanes and Fairey 'Fox' observation and bombardment airplanes. They are equipped with 500-650 h.p. Rolls-Royce engines and, of their type, are among the fastest in the world. The Firefly has a high speed of 223 m.p.h. at 13,000 feet and climbs to 19,700 feet in 11½ minutes. The Fox has a high speed of 190 m.p.h." Other items appearing in the public prints recently, indicate that the 180-200 m.p.h. bombardment airplane is an actuality which should be studied carefully by antiaircraft officers. Many things which have been possible and good practice in the past when the target was traveling from 90 to 120 m.p.h. have become impossible or of questionably sound practice under the conditions we face now. This study is not presented as a detailed and complete analysis of the problem from every angle but with the hope that other officers will ponder the best solution.

We will first consider the high speed target as it affects the 3-inch gun battery. There will be an attempt to show that we should change our present regimental organization from three batteries of four guns each to four batteries of three guns each. We assume the armament under discussion is the latest type issued to the service and that the ammunition is high explosive with mechanical fuses. This will permit us to use a maximum slant range of 8000 yards in our calculations.

The most severe condition which we will assume is an attack at 15,000 feet altitude by a bomber traveling 6000 yards per minute, which is just slightly more than 200 miles per hour. We take a circular defended area with a 2000-yard diameter. We neglect the influence of air in our bomb-dropping calculations as this makes the calculation very simple and the answers worse than the actuality, which is desirable. (We also neglect the entire question of what sort of bombing accuracy might be expected at such a speed from such an altitude as we wish to make the problem sufficiently severe to be in advance of expected present performance.) Under the assumed conditions, it will take 30 seconds for the bomb to fall from 15,000 feet and during this time, with an initial horizontal velocity of 100 yards per second, it will strike about 3000 yards from the projection of the release point. All of which means that we have a danger zone 3000 yards wide. This locates a second circle, radius 4000 yards. See Figure 1.

Our permissible maximum horizontal range for a target at 15,000 feet altitude is approximately 6000 yards. We will investigate the situation when three batteries are located symmetrically on the danger zone boundary. There are three general types of courses which may result, as shown in Fig. 1. Course No. 1 is a straight incoming course, in range of one battery only, for a period of one minute. (It is assumed throughout that fire will have been opened at such time as to have the first shell exploding as the bomber passes the maximum range boundary.) Course No. 2 has an azimuth component of motion, is within range of the primary battery less than one minute, and might be fired upon by a second battery for a few seconds at extreme range. Course No. 3 comes directly in between the primary action zones of two batteries, may be fired upon equally well by either, the time of possible fire being very short.

It would be a simple matter to measure or calculate the length of time on each course required to pass from the outer limit of fire to the danger zone and calculate from that the number of exploded shots possible. However, our fundamental concern is with hits which are not a direct function of range. To justify sound conclusions, we must calculate probable hits on these courses. Later we may then compare the hits obtainable under similar conditions but with four groups of three guns each.

We need a percentage of hits—slant range curve. We will use the curve from all firings with Sperry and Vickers directors, all 3-inch gun courses at Aberdeen Proving Ground in 1930, extended as may be necessary. This curve was not obtained under the conditions described above and is not suitable in a strict sense. It is, however, the best available and, used solely as a basis of comparing two dispositions of materiel, should not give misleading comparative results.

Our hit expectancy is calculated from an assumed rate of 30 shots per gun per minute, and from the summation of hits every ten seconds of fire, at the average slant range for that ten seconds.

Such calculations will give us for Course type 1, for the 4-gun battery, 124 shots and about 1.8 hits; for Course type 2, 104 shots and about 1.1 hits; and for Course type 3, 62 shots and about 0.28 hits from each of the two batteries or 124 shots and 0.56 hits if both batteries fired.

If now, we dispose four 3-gun batteries symmetrically around the danger zone boundary we obtain the

result shown in Fig 2. Similar calculations will give us for Course type 1, 93 shots and about 1.35 hits; for Course type 2, 87 shots and about 1.1 hits; and for Course type 3, 63 shots and 0.55 hits from each of the two batteries or 126 shots and 1.1 hits from both batteries.

This comparison shows a reduction of hit expectancy

form hit-expectancy coverage with a lower average expenditure of ammunition, there is another great advantage in the four battery arrangement. Four batteries may simultaneously and effectively engage a maximum of four targets in a converging attack as against a maximum of three for the present arrangement.

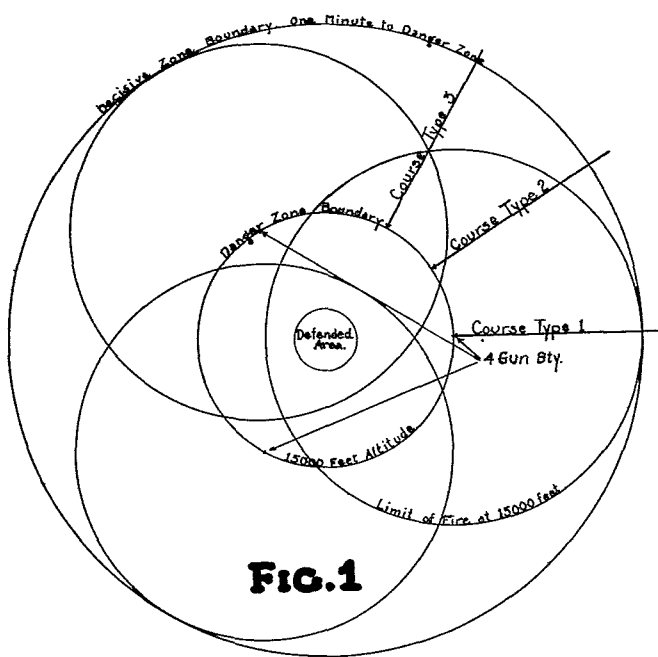


FIG. 1

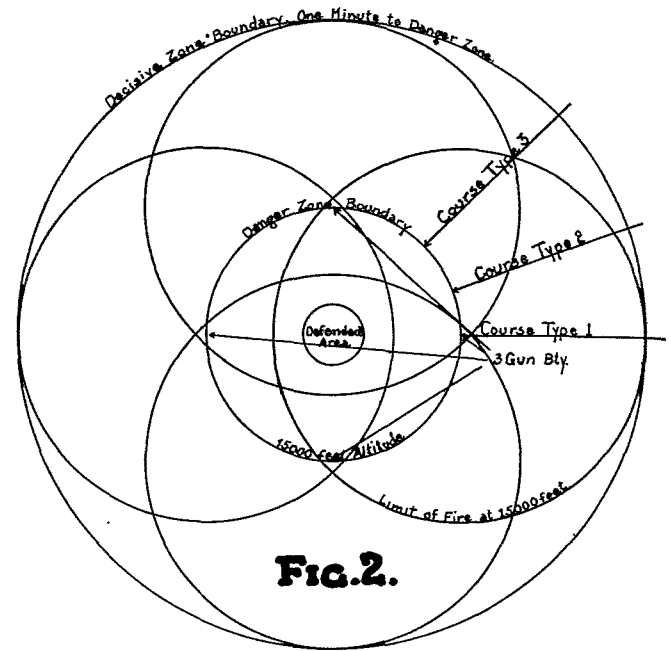


FIG. 2.

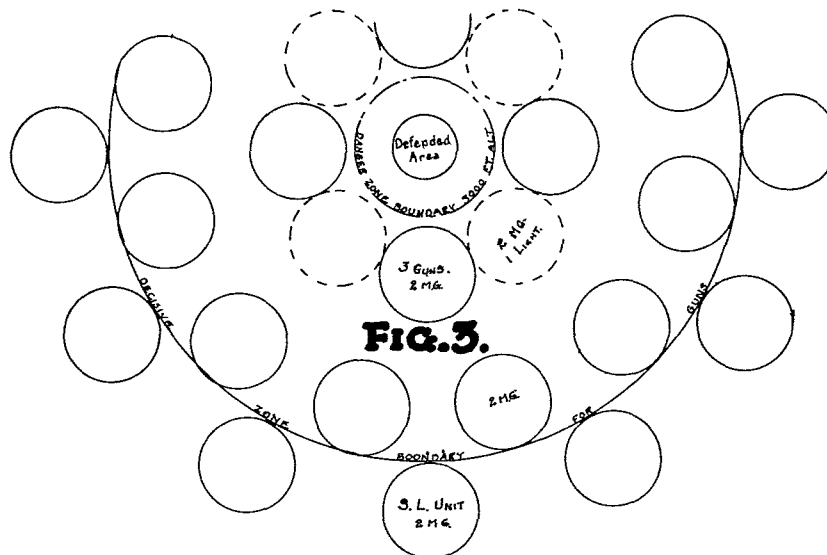


FIG. 3.

Fig. 1. Three 4-Gun Batteries. 200 MPH Bomber at 15,000 ft.
Fig. 2. Four 3-Gun Batteries. 200 MPH Bomber at 15,000 ft.
Fig. 3. Machine Gun Disposition. 200 MPH Bomber

on the type 1 course which is not excessive and can well be spared in view of the maintenance of hit expectancy on the type 2 course with a smaller number of shots and the doubling of the hit expectancy on No. 3 courses with the same approximate number of shots. In the last two cases the decrease in fire power is more than offset by the advantages from firing at shorter ranges.

In addition to providing a more adequate and uni-

Let us consider the relative effectiveness of these two arrangements if, after locating our batteries as above, the bomber actually came across the area at 10,000 feet altitude. This decreases the width of the danger zone to about 2500 feet and increases the maximum horizontal range of batteries to a little over 7200 yards. For Course type 1, four guns, the hit expectancy rises to about 5 and one other battery could fire for 9 seconds at extreme range. For the 3-gun bat-

tery on this type of course the ammunition expenditure and the hits will be $\frac{3}{4}$ of that for the 4-gun battery. But, with this arrangement two neighboring batteries could fire at accompanying targets for 25 seconds. For Course type 2, the 4-gun battery can fire 136 shots and expect 3.2 hits while the 3 guns with only 111 shots can expect 3.4 hits. Furthermore, a second 4 guns can fire 27 seconds as against a second 3 guns which can fire 41 seconds, the larger time and correspondingly shorter ranges being a great advantage. A third 3-gun battery could fire 12 seconds. For the type 3 course, the 4 guns with 88 shots could expect 1.2 hits but the 3 guns could get in 90 shots for 1.6 hits. In each case the performance is possible for either one of the two symmetrically placed batteries. Thus we see that while there are a few restricted approach areas which require the fire of two batteries on one target to total a unit hit expectancy (impossible for the 4-gun batteries) at 15,000 feet, one battery of 3 or 4 guns is the maximum needed per target at 10,000 feet.

At 5000 feet altitude we find the advantage of the 4 three-gun batteries still further emphasized. Table I gives the figures for this altitude together with a compilation of those above.

If a fourth gun battery is formed from the present three batteries by a transfer of one gun and its personnel from each, there will be necessary one more height finder, director and truck. Officer personnel must be provided for the new battery plus not to exceed a number of men considered further below. Most of the trucks necessary can be contributed from the parent batteries. More exact figures will be considered after discussion of the machine gun elements of the gun batteries.

Four guns were placed in one battery at a time when the rate of fire from such a group was about 60 shots per minute and when the accuracy of these shots was conspicuous mostly for its absence. Since then, the rate has increased until it is possible to maintain in excess of 120 shots per minute and the accuracy has also increased by large amounts. It would, in fact, be entirely proper from the standpoint of performance and firepower to propose two-gun batteries or—what amounts to the same thing in performance—the division of present batteries into two two-gun firing platoons, each complete in itself. The trend not only is, but *must* be, in this direction. The problem is no longer how we may bring down a target but how to oppose the considerable number which may appear simultaneously, perhaps all from the same general direction. It certainly will not be solved by attempting to bring a large concentration of fire upon one, to destroy it quickly, and then to shift the fire to another and so on. The fundamental fallacy of any such solution is that the minute or so necessary to shift fire is all the time required for the other high speed bombers to cross the decisive zone. Fire must be brought to bear simultaneously on the maximum possible number of attacking ships. The ultimate is clearly one target for each gun. If the time has not yet arrived to try this, the time to change from four

to three-gun batteries passed with the appearance of the first 180-mile-per-hour bomber.

The searchlight battery will have to rise to new heights of achievement if it is to continue to provide maximum service to the gun batteries. This maximum service we may consider to be adequate illumination of the target in the decisive zone plus illumination before the decisive zone is reached for a period sufficiently long for the target to be picked up in all instruments, for the rates to steady, and for the shells to reach the target. This amounts to a maximum of one minute in the decisive zone and from about one minute to 80 seconds before the bomber reaches the decisive zone. In distance, this means initial illumination 18,000 yards from the center of the defended area, for the most extreme case. Let us see how possible it may be to supply this service.

It is not desirable to place adjacent searchlights more than 6000 yards apart. There are several strong reasons for this. One is that greater separation tremendously increases the chance of successful (unheard) penetrations of the line by planes below 1000 feet altitude. It is frequently impossible to hear such planes more than 2000 yards away. Another reason is that, while the effective range of the searchlight is a variable depending upon a number of factors, it may be taken at 8000 yards under the conditions likely during a bombardment attack. This, in turn, means that if the air target happened to fly in at 15,000 feet directly over a light it would be in range of that light only. Obviously this is a limit to desirable separation. Still another reason is that neighboring lights must be close enough to illuminate other members of the formation. If now, we put twelve of our lights in the outer ring with this spacing, the radius will be approximately 11,500 yards. The maximum pickup required would be 6500 yards in front of the light.

Let us first regard this figure as optimistically as possible. In previous years, scoring emphasis has been laid on quick pickups and carry-time in target practice rather than on long range pickups. Average horizontal pickup ranges obtained under such conditions are not a fair measure of what may be done. The Humphreys tests showed that it is possible to pick up bombers at altitudes from 10,000-16,000 feet at slant ranges of 7000 to 8000 yards. Our new instruments are very promising for such work. At lower altitudes the pickup ranges fall off but so too does the necessity; the danger zone is some 1300 yards narrower at 5000 feet altitude and the percentage of hits much greater.

On the other hand it must be admitted that the 200-m. p. h. bomber appears to stretch the searchlight battery to the limit of its capacity. Furthermore, it does not seem that this stress may best be reduced by even a considerable addition to the number of lights employed in the outer ring. This would be objectionable not only because of the involvement of more men and materiel but for a limiting technical reason. The range from the director to the bomber at the instant

at which it should first be illuminated (for 200 m. p. h.) may reach as much as 14,000 yards. This is practically the extreme range at which an illuminated bomber may be seen in the best night glasses and is several thousand yards in excess of the extreme range of the present director telescopes. This indicates the present desirability of developing night telescopes for directors. But it is unlikely that even the best night glasses would disclose an illuminated target at greater ranges and thus it would be futile to attempt to provide it by using more searchlights.

For such reasons it is believed that higher speed targets will be opposed with a different arrangement of materiel. The searchlights will be disposed in the manner indicated above, but the batteries will be placed on a circle around the defended area with a radius approximately the same as the outer ring of lights and spaced about the same distance apart. This, even with two-gun batteries, would unavoidably require 24 guns. On the other hand, every target illuminated would be well within observing range, and batteries would be close enough to close the avenue of approach so long as two adjacent batteries were not out of action at the same time. The slight additional firing time would probably make a two-gun battery sufficiently effective with this disposition of materiel.

The present organization of the antiaircraft regiment associates one searchlight platoon with each of the three-gun batteries. If there were to be four batteries, it appears desirable to add one light to the battery and have four four-light platoons instead of three five-light platoons. This would permit the use of twelve lights in the outer ring with four desirable carrying lights inside. Further discussion of searchlights must be postponed until after consideration of the machine guns and what should be done with them.

The danger zone width for 200-m. p. h. bombers at machine gun target altitudes is a maximum of 1200 yards. This means that 2200 yards is the nearest that we should have our machine guns to the center of the defended area. If our 48 guns were divided into 12 four-gun groups they would be approximately 1260 yards apart. This is quite good from the standpoint of firepower and average ranges, but there are other powerful reasons against this disposition. These guns will be over 8000 yards from the nearest outer-ring searchlight. This means that low-flying bombers will not be illuminated for machine gun fire except as may be possible by the inner carrying light. There is no question that unilluminated planes may be seen on moonlit nights at considerable ranges but whether they may be fired upon with any degree of success, due to the glare of tracers and the flash of the propellant, is very questionable. It is beyond question however, that the percentage of hits obtainable would be far below that for fire on an illuminated target. Other things being equal the percentage of hits varies with the contrast of the target and tracers against the background. This contrast is greater for night and an illuminated target. Thus, to obtain maximum effectiveness we would have to provide more of an

inner ring of searchlights for the illumination of machine gun targets or move our machine guns to the vicinity of the outer ring.

It is possible to provide four more lights. These lights, as 1st Lieut. John L. Goff has suggested, may be no more than powerful incandescents with 24-inch mirrors, mounted for rapid hand control only, and without sound locators. Sound locators and distant electric control are unnecessary for low-flying targets. However, while this arrangement would probably provide sufficient effective illumination and a strong machine gun protection for the defended area it deprives the twelve outer ring lights of any considerable amount of usefulness in a low altitude attack and leaves them without any local protection. While it has properly been deemed necessary to provide machine gun protection for the gun batteries, none has been furnished for the searchlights. Yet the lights are easier to locate, and to put two adjacent ones out of commission would open an undefended avenue for hostile approach.

It is believed that the increase in mechanical effectiveness plus the greatly increased percentage of hits now obtainable, warrants the formation and use of two-gun groups for machine guns instead of the customary four. In addition there is some reason to believe that nearly as high a total of hits in a given time may be obtained from two guns as from four. This seeming paradox is due to the fact that gunners may observe their own tracers so much better when only two guns are firing instead of four. If now, we place two machine guns near each forward searchlight we will have reasonably adequate protection of the lights from attack planes, smoke and gas layers, and low-flying bombardment, as well as target illumination by the lights. This will dispose of 24 guns. Of course, assuming an effective maximum range of 1500 yards, there will be 3000-yard gaps between lights which must be covered by a second ring of machine guns. This second ring should not be much more than 3000 yards behind the first as the effective carry-range of searchlights on very low flying targets is apt to be short due to interfering terrain features. Nor should the guns of the second ring be placed in the gaps of the first ring. By placing them in the rear of the gaps they are likely to have in their field of fire those targets which attempt to escape from outer-ring fire. This would not be the case if all guns were on the same line.

We have now disposed of the 48 guns of the machine gun batteries but have yet 12 now allotted for the protection of the gun batteries or, since we are assuming 4 batteries, we may assume also that we have 16. Two of these may be placed near each battery and two in each interval between batteries. This provides a third and closed ring served by the carrying lights and protecting guns, lights and defended areas.

The four machine guns now assigned to each gun battery for local defense should be removed from the control and responsibility of the gun battery commanders and given as an extra platoon to each of the

four machine gun batteries. The main reasons for such a shift are that gun battery commanders will use their best men, thoughts, and efforts toward the accomplishment of their basic mission. In addition, few gun battery commanders will be in a position to give proper machine gun training and if more were, it would be an unnecessary and wasteful multiplication of effort. It is furthermore our belief that this transfer of machine guns to the machine gun batteries would necessitate little, if any, increase in the personnel of the machine gun battery other than another 2nd lieutenant. Modern tracer control has simplified operation and it seems, without making an exhaustive analysis irrelevant to this article, that 180 men should be able to handle 16 machine guns for 24 hours a day without strain. Certain readjustments of the Table of Organization would be necessary. This would provide, at the same time, an opportunity to eliminate such antiquated oddities as instrument corporals. There would have to be a probable minimum increase of four trucks. But whether there is a net increase or decrease, the shift must be made for efficiency.

Nearly all the enlisted personnel for the fourth gun battery can be obtained from the present three without impairment. From the 167 now listed may be subtracted 20 for one gun section which leaves 147 and from this the 18 now allotted to the machine gun detail. The balance is 129. With 38 men contributed from three batteries for a total of 114, there is a net shortage of only 15 men, and four officers.

The searchlight battery organization also needs reconsideration. No provision has been made for advanced listeners. These men are essential and not less than two should be at each of twelve posts in wartime. To these 24 men should be added the 16th light crew of 5 men and another platoon headquarters of 9 for a total of 38 men. To offset this it is believed that the four inner lights need not be provided with sound locators which saves 18 men now allotted. The net increase, badly needed, is 20 men.

There has been no intent to pretend here that the foregoing has been an exact or detailed study of anti-

aircraft battery reorganization. We have intended to examine from the antiaircraft viewpoint, the more important aspects of the modern high speed bombers. This examination leads to the conclusion that organization and tactics should be revised to meet the new conditions. But when such studies are made they will include also the effect of changes in our materiel and methods which have occurred since the last revision of these tables and tests.

In conclusion, we may summarize the more important recommendations. We deduced from our study that:

1. The 3-inch gun power of the antiaircraft regiment should be changed from three four-gun batteries to four three-gun batteries.
2. The gun directors should be provided with telescopes designed for night use. This is immediately imperative and should be done irrespective of the action taken on other recommendations.
3. Still higher target speeds may result in normal firing at targets receding from the gun battery to the defended area.
4. Searchlight batteries should be reorganized into four platoons of 4 searchlights and 3 sound locators to each platoon.
5. Machine guns should be placed near searchlights to be able to fire on an illuminated target and to protect the lights.
6. A new tactical distribution of machine guns is desirable.
7. Machine guns assigned to gun batteries should be assigned as additional platoons of machine gun batteries.
8. Detailed studies should be made to revise the tables of organization of the antiaircraft regiment in the light of advances in materiel, methods and aerial target speeds.



Lighthouse at Fort Monroe, Virginia.

The 30th Infantry in the Hawaiian Maneuvers

By Captain Walter M. Mann, 30th Infantry

FOREWORD

THIS is the story of the practical experiences of the 30th Infantry during its participation in the recent joint Army and Navy Maneuvers in Hawaii.

No attempt will be made to discuss strategical or major tactical questions. Such considerations can be more appropriately left to those who, from their seats on Mount Olympus, looked down with a general staffs-eye view on the scene with vision unimpaired by the trivial details as to how Private John B. Doe was to be specially trained, equipped, embarked, administered, debarked, maneuvered and, last but not least, brought safely home again.

The announced purpose of the maneuvers was to test the defenses of Oahu. However, we believe that the brunt of the testing was borne by the expeditionary forces, for upon them fell the necessity of working out the practical details of an overseas movement culminating with a landing on the beaches of a hostile shore.

For the former phase we had recorded precedents; for the latter we found none.

Upon receipt of the directive for participation in the maneuvers, the first logical step was to begin an exhaustive historical research in an effort to find something on record for guidance, and it was surprising—and disconcerting,—how little of actual value could be found in the dusty archives. There were volumes of printed matter on the theoretical phases of overseas expeditions, but no one seemed to have been much concerned about delving into the work-a-day details. Consequently it is felt that the experiences of the 30th Infantry will be of value for reference in future operations of this kind.

Finding the records so barren we had to fall back on those best of teachers, experiment and experience, and develop our own ways and means. It is the purpose of this article to present them in narrative form to those interested, omitting, of course, some details of confidential nature.



30th Infantry Practicing

NARRATIVE

Organizations: The actual army troops taking part in the maneuvers consisted of the 30th Infantry (less one battalion), with Battery "D", 76th Field Artillery attached.

The regiment was organized with a reduced command group, communication platoon, transportation platoon and two battalions. Rifle companies averaged two officers and sixty-three enlisted men in strength, and machine gun companies two and forty-six.

The rolling equipment taken consisted of four two-line team wagons; two four-line team rolling kitchens; eight machine gun carts with trailers and two communications carts. Twenty-six animals were taken.

The strength of the battery was four officers and eighty enlisted men. Its rolling equipment consisted of four guns with limbers, four caissons and four wagons, and it was allotted seventy-five animals.

The total strength of the regiment and battery was thirty officers and six hundred and ten enlisted men.

For purposes of record, and possible interest to some readers, the following roster of officers, showing duty assignments, is given:

THIRTIETH INFANTRY

Commanding Officer Colonel C. B. Stone, Jr.
Executive Officer and S-1 Captain W. M. Mann
S-2 and S-3 Captain P. J. Lloyd
S-4 Captain W. V. Rattan
Communications Officer 1st Lt. J. W. Newberry
Shore Party Commander Captain N. M. Walker

First Battalion

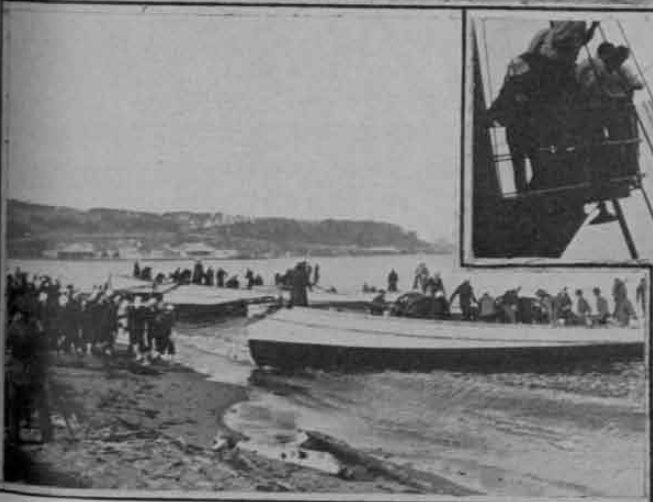
Battalion Commander Lt. Colonel E. E. Lewis
S-1, S-2, S-3 and S-4 1st Lt. D. P. Frissell
Company A

Company Commander Captain M. W. Marsh
Company Officer 1st Lt. H. G. Sydenham
Company B

Company Commander Captain P. B. Robinson
Company Officer 1st Lt. W. E. Smith, Jr.
Company C

Company Commander Captain E. J. Curren, Jr.
Company Officer 2nd Lt. H. J. Van der Heide
Company D

Company Commander Captain C. Collins,
Company Officer 2nd Lt. P. J. Black.



Upper left—Unloading Field Guns from Naval Motor Sailors. Upper right—"Look out, Oahu! Here we come." Lower left—Debarcation Practice on the Beach at Presidio. Lower right—Slinging an Animal from Transport to Mine Sweeper.

Second Battalion

Battalion Commander Major W. J. Morrissey
S-1, S-2, S-3 and S-4 Captain A. R. Mackechnie
Company E

Company Commander ..Captain P. B. Waterbury
Company Officer (and in charge of flags representing constructive Divisional Units)
Captain D. P. Yeuell

Company F

Company Commander Captain A. W. Penrose
Company Officer . First Lieutenant J. H. Stokes, Jr.

Company G

Company Commander Captain H. F. Love
Company Officer ...First Lieutenant E. H. Wilson

Company H

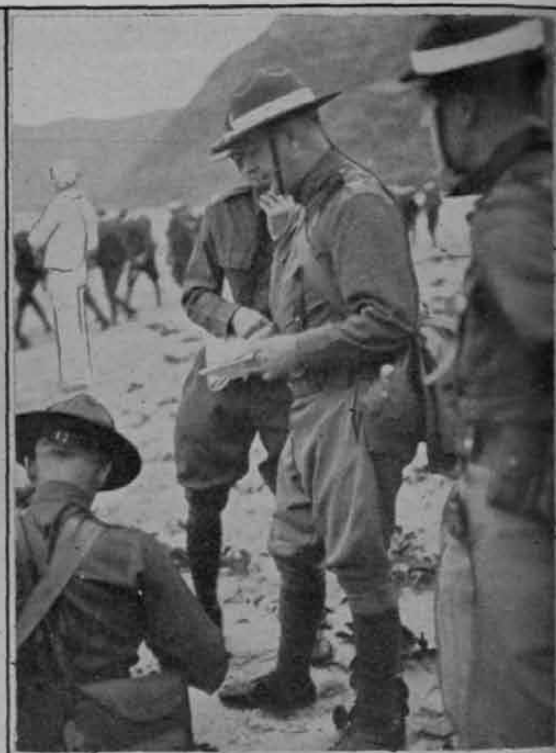
Company Commander Captain G. K. Crockett
Company Officer (and Personnel Adjutant)
First Lieutenant J. C. Odell

Battery D, 76th Field Artillery was attached to the 30th Infantry for the maneuvers. The personnel of this battery consisted of four officers, assigned as follows:

Battery Commander Captain J. C. Hughes
Battery Officers: ..First Lieutenant W. R. Schaefer
Second Lieutenant C. R. McBride
Second Lieutenant C. C. Smith;

and eighty enlisted men.

Training: In addition to the normal training of in-

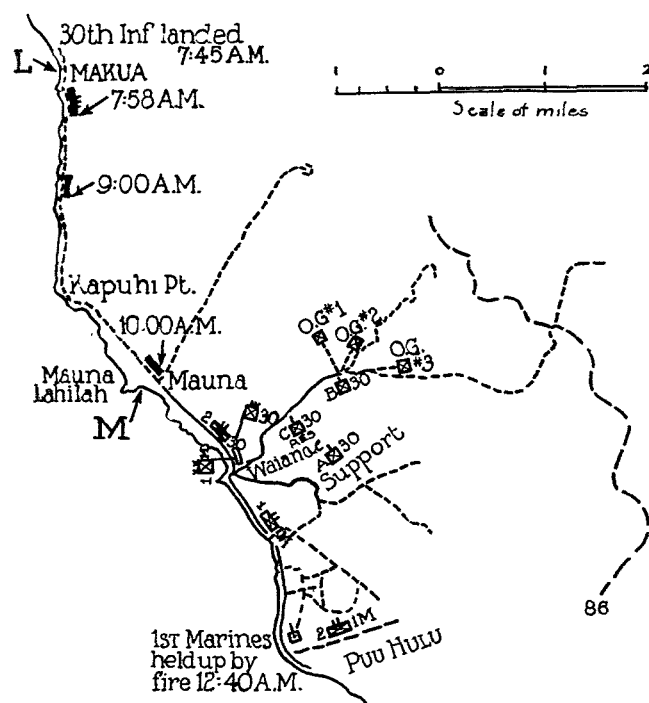


Upper left—The Beach at Makua. Upper right—Col. C. B. Stone, Jr., 30th Inf. at Makua Beach. Lower left—Naval Radio Station at C. P. of 30th Inf., Waianae. Lower right—Regimental Commander and Staff. C. P. at Waianae.

dividuals and units considerable thought and time had to be given to special training for the particular operation in prospect. This training was begun about four months prior to the period of the maneuvers.

As a preliminary step all individuals and animals of doubtful physical endurance were eliminated from the units scheduled to go. The survivors were put through a series of intensive hardening exercises consisting of marches, setting up exercises and rope climbing. This latter exercise was intended to develop muscles that might be needed in clinging to swaying rope ladders dangling over the transports' sides in case feet slipped from ladder rounds or a failure to connect with the launch occurred.

From the beginning the safety factor was always uppermost in the minds of the organization commanders and, in appreciation of the hazards of debarking troops



into small boats in the open sea and landing them through the surf on open beaches, all men were given carefully supervised swimming instruction. At the beginning only sixty per cent of the men were found to be qualified; at the time of embarkation all men of regiment, except nine, could swim at least fifty yards.

The animals were also given swimming exercises. This interesting phase of the training has been covered by another writer in articles previously published.

The debarkation plans called for the troops to go over the sides of the transport into the small boats by means of "Jacob's" (rope) ladders. Accordingly ladders of this type were procured, swung from second story windows and troops required to practice descending until a feeling of confidence in their use was attained.

Working with the navy representatives the following schematic diagram of landing was drawn up which shows in detail the units to be loaded in each small

boat, the order in which they would be loaded, and the schedule of their procedure to the beaches:

BEACH X
SCHEMATIC DIAGRAM OF LANDING

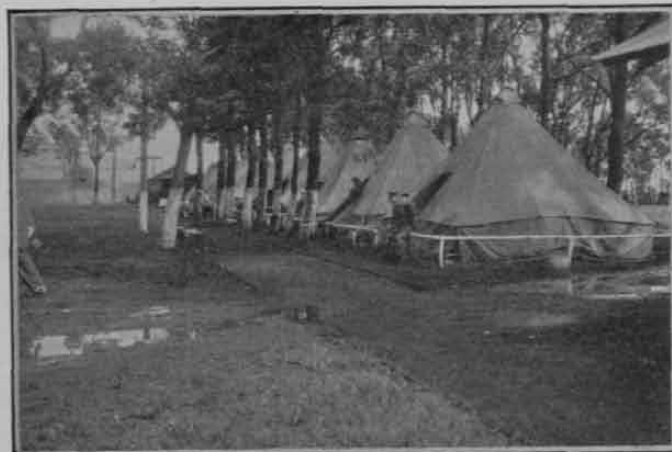
	Beach Sector "A"		Beach Sector "B"	
	B-2	B-1	A-1	A-2
3 minutes or 500 to 600 yards		No. 2 (40') Navy 11 Co. F less one Plat 34 Hq. 2nd Plat 4 Co. H 7 3rd Squad 7 8 boxes 56	No. 1 (40') Navy 11 Co. E less one Plat 34 1st Squad 7 Co. H 4 Hq. 1st Plat 4 8 boxes 56	
3 minutes or 500 to 600 yards	No. 4 (40') 2nd Plat 28 Co. F 7 4th Squad 7 Co. H 17 Shore party Comdr and 16 men 17 8 boxes 52		No. 3 (40') Asst shore party comdr & 5 men 6 2nd Squad 7 Co. H 14 Hq. 2nd Bn 14 2nd plat 28 Co. E 28 8 boxes 55	
3 minutes or 500 to 600 yards		No. 6 (40') 2nd Plat 28 Co. G 7 3rd Squad 7 Hq. 2nd Plat 4 Co. D 12 Navy Comm Group 51 8 boxes 51		No. 5 (40') Hq. Co. H 6 1 Off 2 men 3 (Arty) 3 Co. G less one Plat 34 Co. D (1st Sq) 7 Hq. 1st Plat 4 Co. D 4 8 boxes 54
3 minutes or 500 to 600 yards	No. 8 (50') Co. B 61 4th Squad 7 Co. D 7 Hq. Co. D 5 Regtl Hq. 7 8 boxes 80		No. 7 (50') Co. A 61 2nd Squad 7 Co. D 14 Hq. 1st Bn 14 8 boxes 82	
3 minutes or 500 to 600 yards				No. 9 (50') Co. C 61 Regtl Hq. 19 8 boxes 80

The type of boat to be used was the navy motor-sailer, having its own motor. Six of the boats were forty feet long and three fifty feet,—a total of nine required to land the combat personnel of the regiment in one trip to the shore.

It will be noted that in each boat was a complete combat team of either a platoon or company of riflemen and a machine gun squad. The idea was that when the boat reached the beach its load of troops could hit the sand and immediately take up fire and movement on its own until other units arrived and team work was coordinated by successively arriving intermediate commanders.

Early in the training these boat groups were organized and trained to work together. Diagrams of the boats were taped out on the ground at the foot of the rope ladders referred to above, and troops shown how to dispose themselves and their equipment in the boats.

In the tactical training special emphasis was placed on the establishment of temporary beach heads. For this training the exercises habitually started at the water's edge on the Presidio beaches with units initially disposed in boat groups relatively located on the beach as they were scheduled to land, and from such



Part of 30th Infantry Camp at Schofield Barracks, T. H.



30th Infantry Camp—Kohe Kohe Pass in Background

points the exercise developed to the establishment of the temporary beach head. Riflemen were taught to start moving on the run toward their assigned objectives the moment they hit the sand. Machine gunners were trained to go quickly into firing positions on or near the beaches in support of the advancing infantrymen.

The general scheme was for the leading battalion to quickly clear the beach of hostile troops, push them back and contain them until the rear battalion had landed. The rear battalion then passed through the lines of the former and took up the fight—and so on until resistance was dispersed and the march column could be taken up.

Later we had a short practice with the Navy; a so-called "dry run," which proved literally not so dry. For this practice the troops were taken aboard the army transport "Grant" which was moored at the Fort Mason docks. The navy motor-sailer came alongside and the troops went over the ship's side into the small boats by means of the rope ladders. The launches then put out into the bay and landed on the Presidio beach and the exercises proceeded as outlined above.

This rehearsal was invaluable in bringing out errors and unsatisfactory conditions which might have proven disastrous if not corrected before the landing on Oahu.

It was found that the navy boat crews were too cautious in driving their boats up on the sand;—this left quite a stretch of water, sometimes waist deep, to be negotiated by the troops in reaching the beach line, and everyone got thoroughly soaked. The fallacy of troops jumping out of the boats wearing their packs was also proven. It was found that the weight of the pack overbalanced its wearer and frequently deposited him in a ludicrous and uncomfortable position with the water line up around his neck. In subsequent landings the pack and rifle were carried in the hands and served to pull the jumper forward instead of backward.

The debarking of the troops was simple compared with getting the heavy rolling equipment ashore. For this purpose the navy equipped its fifty-foot motor-sailers with steel channel irons, or "I" beams, whose gauge corresponded to that of our vehicles. The latter were swung off the transport and into the launches by

means of winches. With luck and a reasonable sea their wheels sometimes connected with the track on the boat. Upon beaching the boats an extension to the track was run out over the bow to the sand and the guns, rolling kitchens, wagons, etc., were manhandled to the shore.

The first experiments with this method were not so satisfactory. It was found that when the boat lifted on the surge of the surf the shore ends of the track would dig into the sand and as the boat settled down again pry it back into the water. This difficulty was met by fixing rollers on the shore ends of the tracks which would then roll back and forth with the motion of the boat.

Under the Plan of Landing the navy was responsible for moving the troops and equipment from the ships to the water line on the beach. From the arrival on the sand the responsibility for further movement passed to the army.

To facilitate and coordinate such landings the navy sent ashore in the first boats a group called the "Beach Party" under command of a naval officer. Its function was to meet the boats upon their arrival on the beach and by means of lines passed to the shore pull them further upon the sand, steady them and unload the equipment. In this group was also a signal unit to communicate between shore and ships.

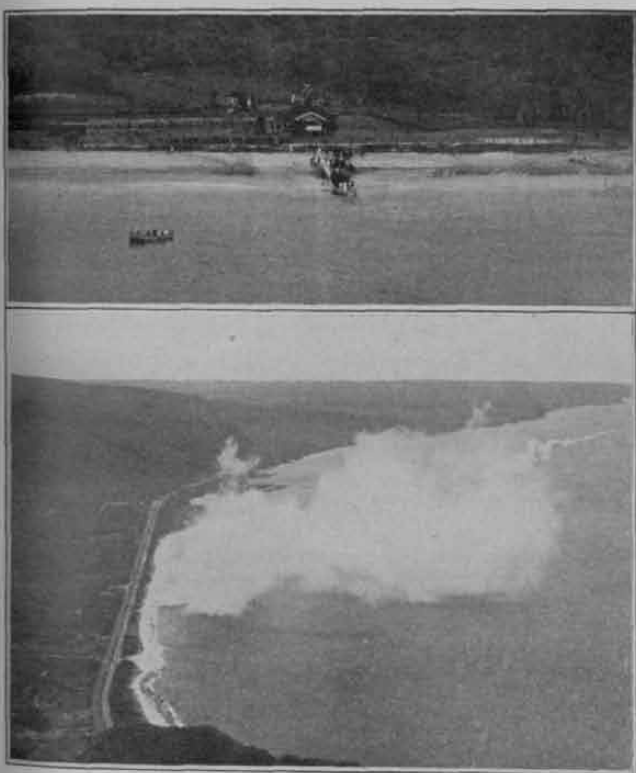
Movement Overseas: Profiting by the disastrous experience of one of our allies in a historic landing on a hostile shore during the World War, the "Unit" loading plan was prescribed for the expedition. This method provides that a complete, self-containing combat team of combined arms with all unit transportation and supplies be loaded on one ship.

The advantage is obvious. It is supposed to ensure that the balanced team can be placed ashore together on the same beach. However, without disparaging this principle, it was found that its advantage was neutralized materially by the comparative time factors involved in landing infantry and artillery. In our experience on Oahu the infantry combat troops had landed and marched seven miles before the first gun was reported in a firing position near the landing beach, and the final objective had been reached be-

fore the battery became mobile. This delay was not the fault of the artillery but was due to the fact that the infantry had priority in debarking, and to the much greater difficulty in getting the animals and heavy equipment ashore. It is possible that better results might have been obtained if the artillery had been on a separate transport and could have begun its debarkation simultaneously with the infantry. Also for sanitary reasons, the advisability of combined loading of troops and animals for voyages of any length in warm weather is questionable.

Our expedition embarked on the USAT "St. Mihiel" and sailed from San Francisco in the late afternoon of January 31, 1932. At noon the next day the transport arrived at the rendezvous of the battle fleet off the southern California coast and thereafter proceeded in convoy. In spite of rough seas, restricted quarters and abnormal living conditions, the men were in fine fettle and eager to play the game according to the rules.

The convoy sailed on a course which took it far to



Above: Thirtieth Infantry Landing at Makua, Oahu.
Below: Smoke Screen Laid By Navy Plane During Landing of Thirtieth Infantry.

the south of the island of Hawaii, the southernmost island of the Hawaiian archipelago and, making a long sweeping curve to the west approached the shores of Oahu from that direction.

Dawn of February eleventh found the transports with their protecting warships off Waimea Bay on the north coast of the island; and considerable excitement stirred up ashore. Search lights blazed out and a hornets' nest of Black bombing planes made spectacular dives at the ships, dropping flares representing bombs; our eight machine guns, mounted on the transports' decks, returned their fire.

When the purpose of the feint had been accomplished and the garrison of Oahu alerted, the ships put out to sea again and spent the day browsing around up north just out of sight of the Island of Kauai. After dark they turned southward, and rounding Kaena Point, made for the west coast of Oahu.

Orientation: Battles may be fought and wars perhaps won without the active presence of generals, but in a maneuver there is always one that is absolutely indispensable. We refer to that old, hardboiled "General Situation," and so:

(In brief) x x x The Blacks had captured Oahu from its defending Blue garrison about three months previously x x x x It was reliably reported that with minor changes they were using the old Blue plan of defense. x x x x x

The Black strength was x x x x thousands and thousands x x x x. The strength of the Blue Expeditionary Forces was "constructively" ditto x x x x.

Think of the possibilities for the staffs! None was neglected. Orders were written for the Army, the Corps, the Division, the Brigade; combatical, logistical and annexical; and all nicely mimeographed.

Disregarding, with this brief reference, these thousands of constructive combattants we revert again to the narrative of the actual troops.

With the main strength and major dispositions of the Black forces our regiment was not much concerned, but we were vitally interested in the locations of their centers of resistance, with their supporting artillery, in our immediate front.

As we numbered among us many officers who had served in Hawaii in the past, and some who had in recent years helped revise the Primary Tactical Plan, the locations of these defensive areas were supposed to be fairly well known. However, there was a question about this, for as brought out at the general critique those former members of Oahu's garrison were probably more practically familiar with the road from Schofield Barracks to Honolulu than with the defense plans of the Island. Be that as it may.

The Landing and Operations Ashore: At 3:45 A. M. February 12th, the troops were awakened and messed. Boat groups were assembled, unit equipment placed at the loading points on deck and all stood by waiting for the small boats. The transport cautiously felt her way in toward the shore with all lights out, and at 5:00 A. M. hove to about two and one half miles off Makua Beach, eight miles north of Waianae.

We had arranged two debarking points on the transport. Six of the small boats (forty footers) were to load from the afterwell deck, in numerical order, and three (fifty footers) similarly from the forwardwell deck. Each boat carried a crew of from fifteen to twenty-five sailors and mounted a navy machine gun in the bow for antiaircraft fire. The first boat was hailed at 5:15 A. M. but proved to be boat Number 6, and it was fifteen minutes later that Number 1 came alongside. The navy furnished the life jackets and they had to be hoisted aboard the transport from the small boats, thereby causing additional delay.

The boat groups filed past the box slings depositing

packs and arms, and while this equipment was being lowered into the launches the men put on life jackets. At the command of the Army Debarkation Officer the troops went over the side by means of two rope ladders at each loading point. The average time for loading a boat with equipment and personnel was about eight minutes. As each boat completed loading it shoved off and moved to a rendezvous point about three hundred yards from the transport. From this point, the boats were started for the beach by the Navy Control Officer in successive waves of two boats each at three minute intervals. The first two boats were scheduled to reach the beach at zero hour (6:30 A. M.).

Sea and weather conditions were ideal; there was very little swell and the sky was slightly overcast. At the start of debarkation the darkness made movement somewhat cautious and slow. The beach selected for the landing was an indentation in the coast line, partially sheltered from the open sea, with a shelving sandy stretch about one-half mile in length, and opening on a little valley of about the same distance in width. This was bordered on all sides, except for a narrow beach road running north and south, by the sheer, unscalable cliffs of the Waianae mountain range.

During the movement of the boats to the shore friendly planes from the warships dropped smoke screens to blind the enemy OP's on the heights. Viewed from the sea the white smoke banks, contrasting with the dark mountain sides, were a sight to be remembered.

Hostile planes were a bit tardy in arriving, and several boat groups were ashore before they swooped down, raining bombs, machine gun bullets and general destruction on the landing Blues. Considering the fact that the AA batteries of the warships were in action against them, and that the machine gunners and riflemen of the landing forces were peppering away at them one could not but be amazed at their daredeviltry in flying so low. They dove again and again to within a few hundred feet of the ships, and these repeated attacks also made one wonder what miraculous system of replenishment of bombs and ammunition they used.

But to continue with the story of the infantry.

Boats were beached. Riflemen and machine gunners went over the bows, slung equipment, clawed their way up the sandy banks looking for trouble,—and were disappointed that none could be found. The landing was unopposed. The only visible evidence of the garrison was a medical officer, who with his family, occupied a lonely beach cottage nearby and who had a ringside seat to see the show.

An umpire coming up during the landing remarked: "Well, you certainly 'G-two-ed' them this time. They were looking for you over on the northeast coast"; and, true to the form of all umpires, assessed a loss against us of seventy-five men from plane fire. Our quick thinking "K.O." immediately allotted this loss to our "constructive" third battalion, and the command was "Forward."

Disregarding the lack of hostile opposition, the leading battalion established the temporary beach head as per schedule. The rear battalion, completing its landing, passed through the beach-head lines, and in se-

curity-march formation moved on Waianae, eight miles away.

Our mission was to capture this west coast metropolis in order to afford the Marines, whom, without malice aforethought, we have so far forgotten to mention, a place to land. The march southward was over an unimproved, stony road, thickly overgrown with algeroba brush.

The Waianae mountain range on the west coast flings itself down toward the sea in a succession of bold headlands. Rounding the nose of each of these ridges we expected trouble, but to our growing surprise none was encountered until our advance guard began passing through the streets of Waianae. Here, the umpires



30th Infantry Going Ashore in Small Boats.

told us, some 155 HE's were falling from a battery firing from the vicinity of Kole Kole Pass about five miles away.

In passing through Waianae our advance guard captured the only Black troops seen during the maneuvers, a platoon of the 35th Infantry which had been pushed out as a sort of a forlorn hope observation group from its main body ten miles away near Nanikuli. Due perhaps to the fact that we were hungry and that it brought to mind a one-time famous New York restaurant, we remember that the platoon leader's name was Lieutenant Delmonico.

At about 11:00 A. M., as the Regimental Commander and the writer, marching a little ahead of the main body, arrived at the Waianae railroad station, there came sounds of boats scraping on the sandy beaches near by, and bursts of strong language.

We knew the marines were landing!

Contact was made with their battalion CP which "constructively" represented their regimental, brigade and division headquarters, and we made the most of our opportunity to report that "The army has landed and has the situation well in hand." With the landing of the marines our first mission was accomplished and it only remained for us to pull back our advance guard and establish a covering force on Mauna Kuwale which commands the approaches from Kole Kole Pass; and to await further orders from the high command.

So much for the activities of the combat units. Now let us go back to our rear echelon left on the transport to put ashore the animals, rolling equipment and supplies—a man-size job, plus.

The animals were sent ashore by three methods. One, by loading them into the fifty-foot motor boats by

means of a "flying" stall, (see previous articles) carrying them fairly close inshore and dumping (or dunking) them into the water for the swim ashore; another, similarly loading them on mine sweepers for a part-way trip to the shore. This method, which if properly handled by requiring the mine sweeper to come as close inshore as the depth of water would admit would have been the most expeditious way in getting the animals ashore, proved unsatisfactory due to the vessel standing entirely too far off shore. A few selected animals were slung overboard direct from the transport and swam all the way to the beach. The rolling equipment was handled as described during the practice runs at the Presidio.

At 2:30 P. M., a message was received from the rear echelon commander to the effect that all animals, rolling equipment and supplies were ashore; this was very gratifying to the front line troops as they hadn't expected hot food or the blankets until next day.

The maneuvers terminated at 4:30 P. M.

The regiment moved by train from Waianae to Schofield Barracks, remaining there under canvas until it reembarked at Honolulu on February 19, 1932. Sailing the next day, it arrived back at its home station on February 26, 1932.

Retrospect

The Regiment feels a justifiable pride in the fact that it moved its personnel of six hundred and forty,

its one hundred and one animals, and its necessary accessories three thousand miles across the sea, landed them on a beach under simulated war conditions, and brought them all home again without a serious casualty or the loss of important piece of equipment. In the process we feel that we have learned many things that will prove of much help in future expeditions of this kind.

In due course of events a considerable portion of the personnel who went with the expedition, particularly the officers, will scatter throughout the service carrying with them the experience and ideas that may be utilized by other organizations in case of need.

In closing, it would be only appropriate to express our appreciation of, and our admiration for, the officers of the navy,—those hard working, capable gentlemen who manipulated the imposing fifty million dollar "battlewagons" with such assurance and ease, and who took us across the sea, deposited us upon the appointed beach at the appointed hour, and in the appointed manner.

And the same sentiment goes also for our own army transport personnel, those good old practical buddies who saw us and our "junk" over the side and back again without a single mishap.

All in all it was hard work, fine experience and good fun. We hope to go again some day.



The Job Done. Thirtieth Infantry Returning to its Barracks at the Presidio

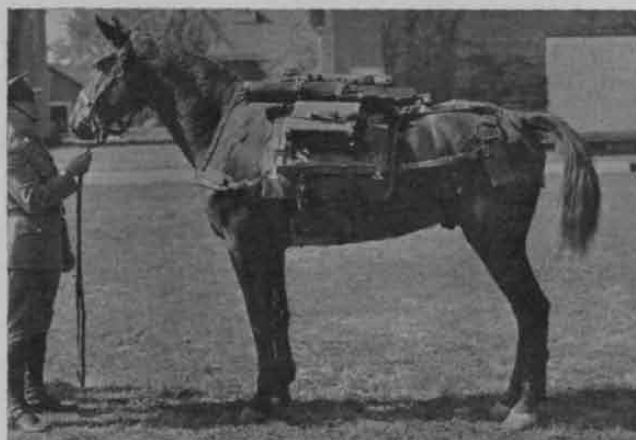
The Trend of Organization and Equipment of Cavalry in the Principal World Powers and Its Probable Rôle in Wars of the Near Future

By Major General Guy V. Henry, Chief of Cavalry

IF I were discussing the organization, tactics and powers and limitations of infantry or artillery my readers, either at home or abroad, cavalymen or noncavalymen, would have nearly the same mental picture of my subject; but when I write on cavalry my readers have no such uniform mental picture. The reason for this is that infantry and artillery are fairly uniform in the armies of the world. Such, however, is not the case with cavalry. The cavalries of various armies are armed in a radically different manner, ranging from those whose horse elements are merely reconnaissance groups, carrying saber or lance and an ineffective carbine, to the heavily-armed United States Army Cavalry. This carries on its horses alone a greater small arms fire per man when engaged in dismounted combat than does most infantry.

American Cavalry, (because of its ability and tendency to fight dismounted), was classed by pre-war European standards as "mounted infantry." A similar classification pertains today in a less degree where purely mounted elements of our own and foreign cavalries are concerned.

Due to these differences, military men of different countries have no common conception of what basically constitutes cavalry; therefore in studying their writ-



(Photo by Signal Corps, U. S. Army)

Cavalry Heavy Machine Gun, U. S. Army. Average Time Into Action From a Gallop, 20 Seconds

ings one should try to obtain the author's basic conception of cavalry—knowing this one can more justly evaluate his writings.

Broadly speaking, in European armies the term "Cavalry" means mounted troops possessing great mobility, little dismounted firepower carried on its horses alone and past traditions for use of the *arme blanche*; while in the United States Army it means mounted troops possessing great mobility, heavy dis-

mounted firepower carried on its horses alone and little tradition for the use of the *arme blanche*.

This different basic viewpoint added to the fact that in no two armies is cavalry armed or organized alike, is largely responsible for the differences of opinion expressed and the exaggerated statements of some, that cavalry is a thing of the past.

If cavalry is less important today than it has been in the past, of what are we speaking? No one knows, for there is no standardized conception of cavalry.

All military men agree that with present means of rapid transportation, communication, air service and long-range fire, an army needs now more than ever before some force capable under modern conditions of efficiently performing the textbook rôle, now and in past wars, allotted to horse cavalry. That horse cavalry as heretofore armed, equipped and trained cannot always perform with maximum efficiency this rôle under modern conditions, is equally agreed; therefore all nations are more or less seriously engaged in providing some force that will. To provide such a force will be a process of evolution, but I prophesy that within ten years military thought will be as crystallized on this line as it is on the infantry of today. When it crystallizes we will and must have a highly mobile force, capable of independent action and able to close with the enemy. These are the characteristics essential for the security, information, detached independent duties and the mobile reserve forces of a modern army,—in other words these are the characteristics of modern cavalry whose armament, organization and means of transportation must be adapted thereto.

Let us now see what the various armies of the world think on cavalry, what they are doing to reorganize it, and then deduce what will be its rôle and armament in the wars of the near future.

I will take Great Britain and France first, as these two countries have progressed farthest in mechanization and reorganization.

Great Britain.

The British Cavalry consists of 22 regiments; of these, two have been converted into armored car regiments. The horse regiments are armed and equipped much as is American Cavalry, except that there are attached thereto a number of Austin scout cars and their machine gun squadron (troop) is mechanized.

The conversion of these two horse regiments into armored car regiments seems to be as far as Great Britain has gone in the mechanization of horse cavalry.

The Secretary of State for War recently made the following statement in Parliament:

"Mechanization is being carried on with due caution. When a type can be fixed and its efficiency thoroughly proved, then it will be time to build up a stock. Until the War Office is convinced that horses can be dispensed with absolutely, the cavalry will remain as at present."

However, the above does not mean that Great Britain has not experimented extensively with mechanization; for, on the contrary, she has experimented more extensively than any other nation.

The British divide their troops into:

a. Mobile Troops.

- (1). Cavalry brigades and cavalry divisions.
- (2). Light armed brigades.

b. Combat Troops.

- (1). Infantry divisions.
- (2). Medium armored brigades.

Thus she links the rôle of light armored brigades with cavalry (organized as at present).

A light armored brigade consists of:

- Headquarters and Signal Section.
- Two or three battalions of light tanks.
- One close support tank battery.
- One armored antiaircraft battery.
- One armored car regiment if necessary.

This linking together of light armored brigades and horse cavalry is also expressed by Sir David Campbell, G. O. C. M. C., Aldershot Command, in the 1930 winter maneuvers: "Cavalry and armored fighting vehicles are complementary to one another. Cavalry is immeasurably superior for reconnaissance; armored fighting vehicles have offensive power. It follows, that both types of mobile troops should be used together. There may be exceptions to this rule, but a commander would be justified in using his armored fighting vehicles alone only when time is of vital importance, the distance involved too great for cavalry, and the importance of the object to be achieved compensating for the heavy losses to be expected in the armored fighting vehicles to which their inability to reconnoiter adequately must render them liable."

The above expresses the trend of British opinion from which we can deduce that for wars of the near future British cavalry will consist of armored car and horse regiments, the horse regiments with heavy firepower and both, used in combination with light armored brigades. Light armored brigades will not be called cavalry, but with cavalry are classed as mobile troops and considered complementary one to the other.

France.

We recently had a very distinguished French soldier as guest of our nation at the Yorktown Sesquicentennial Celebration—Marshal Pétain.

Marshal Pétain has said: "During the course of battle, thanks to the modern increase in the firepower of cavalry, it may perform work of the most varied nature. Cavalry remains the favored arm for reconnaissance and screening before battle and for the exploitation of success after battle."

Another distinguished French soldier, General Weygand, says: "The rôle of cavalry far from being

diminished will appear on the morrow, if there is another war, as great as we deemed it to be in the past. It will hold its importance as long as speed and surprise hold their value on the field of battle."

As General Weygand is now vice president of the Superior War Council, we may well assume he will use his great influence to prepare the cavalry of the French Army to carry out his prophecy. It is therefore most interesting to study what France is doing in organization and armament of her cavalry.

France divides her cavalry into two classes: Cavalry Divisions and Divisional Cavalry. Divisional Cavalry are squadrons of horse cavalry permanently attached to the infantry divisions, primarily for close security purposes. The French cavalry division is now organized as follows:

Strength: 350 officers; 10,000 men.

Headquarters.

Two horse brigades.

One Portée Dragoon Regiment (Squadron in Peace) (Riflemen transported in Kegresse-Citroen cross-country cars.)

One Regiment Field Artillery 75s. (horse).

One Group 105mm. Portée.



Above—Cavalry Combat Car, T-5, U. S. Army. Below—Cavalry Light Machine Gun, U. S. Army. (Average Time into Action from Gallop, 20 Seconds.)

One Regiment Armored Cars (36).

One Observation Squadron (air).

Sappers, Bridge, Supply and Medical Troops.

France has been greatly increasing the amount of mechanization and motorization within the cavalry division and places great reliance on the mechanical groups (*Portée Dragons*) to increase the firepower of the horse elements. Recent maneuvers indicate that due to different rates of march, different cross-country ability of the two, and various other reasons, the combination of the two within the cavalry division is not satisfactory. Considering this and also the wonderful road net and the terrain in general in France's probable theater of operations, we may expect that she will probably in time completely mechanize some of her cavalry divisions. However, her cavalry for the near future will be a combination of mechanization and horse, and all information indicates that it will have a rôle similar to that of horse cavalry of the past. What final form its purely mechanized cavalry will take is not yet known, but we may be sure it will be equipped with the best cross-country vehicles available.

Germany.

The German Army is limited by the Versailles Treaty, as is its progress in mechanization. However, about 16% of such active army as Germany has is Cavalry. The percentage of cavalry in France and Great Britain is about 7%. Germany's 18 regiments

are armed with the saber, carbine and light machine gun carried by the trooper and heavy machine guns in pack. In no European army have the heavy machine guns in pack the mobility of similar guns in pack in the United States Army, nor do the individual troopers of any of these armies have the proficiency in the use of rifle and pistol that has the American soldier.

Due to the treaty restrictions on mechanization referred to above, we can only surmise what Germany would do towards re-equipping its cavalry if these restrictions were removed.

Lieutenant General Von Kaiser, (Recently Inspector General of Cavalry) has said: "Every new means of transportation appearing seems to be followed by a cry for doing away with the cavalry. Thus in a book which appeared in 1871 I found many persons considered cavalry superfluous, as they claimed the progress made in railway transportation was replacing it. Now it is the same with the motor. The truth is that the progress of technique in all branches of the service—including the cavalry—does not render existing arms superfluous, but improves them. In the case of cavalry the assignment to it of motorized troops is augmenting its possibilities."

General Von Seeckt (Recently Commander in Chief, German Army) writes: "The aviator has come to aid, not to replace cavalry. Close reconnaissance is left to the cavalry whose vision is not dimmed by clouded skies. In combination with airplanes, squadrons of cavalry find new employment."

"The motorization of armies is one of the most important questions of military development. It may be briefly pointed out that for the time being, roads, bridges, forests and mountains will oppose mass employment of motor vehicles."

The following extracts are taken from a recent publication: "Moderne Cavalerie" in which the author, General G. Brandt, Inspector General of Cavalry 1926-1931, gives his opinion of what Germany should do to modernize her cavalry:

"Modern warfare requires the presence of large bodies of cavalry."

"Today we require a cavalry with strong firepower, including light and heavy machine guns, and regimental antitank weapons. About their importance and necessity no words are spared. Whatever the desire is in this respect the factor that too many of these weapons might decrease mobility must be thought of. Countries having no limitations on equipment will transport them in first-class mechanized vehicles. These vehicles must be able to go across country."

"Cavalry needs for its support reconnaissance detachments of armored cars and light, rapid combat vehicles so armed that they can attack with ease hostile armored vehicles."

We can thus conclude that Germany believes in a heavy firepower horse cavalry to which she would attach armored fighting vehicles if not prevented by the Treaty of Versailles.

The probable rôle of such a cavalry seems laid down



Cavalry Trooper, U. S. Army. Arms—Rifle, Pistol and Saber



Cavalry Combat Car, T-1 (Christie), Entering a Bomb Crater



French Portée Dragoon Vehicle

in her various manuals and regulations. The latest of these show in general no change from the tasks allotted to cavalry in past wars.

The cavalries of Italy, Russia, Poland and Japan apparently have done little in the way of reorganization or rearmament since the termination of the World War; all have introduced, however, machine gun and armored car units into their cavalry organizations.

United States.

As previously stated, the term "Cavalry" in the United States has in the past implied primarily small arms firepower rapidly transported on horses. The horse has been used to bring this close to the enemy. When American cavalry dismounts it has the small arms firepower and combat efficiency, man for man, equal to that of infantry. Such is not true with the cavalries of other powers, but even with its above efficiency our horse cavalry is for conditions of today inadequately supplied with antiarmored vehicle and antiaircraft weapons, and armored cars. Its trains (transport) also lack the desired mobility. It is hoped that the necessary funds will soon be received to remedy these deficiencies.

The American Cavalry Division has a war strength of:

465 officers and 8,840 men, with an organization of—Headquarters and Headquarters Troop.

Two horse brigades of two regiments each.

One regiment of Field Artillery 75-mm. guns (horse).

One Armored Car squadron—36 cars.

One tank company (Infantry).

Proper proportions of Engineer, Ordnance, Signal, Medical and Quartermaster Corps troops.

Its offensive or defensive dismounted fire power, is that given by—

5,000 rifles.

8,500 pistols.

400 machine guns.

10 37-mm. guns.

24 75-mm. guns.

The Cavalry Division is a powerful, efficient force,

combining excellent mobility, firepower, independence of action and ability to close with the enemy. It should be noted that this division contains a limited amount of mechanization in its armored car squadron and tank company; but with a view of securing still greater mobility for cavalry by the application of modern machines to cavalry missions, the War Department has decided to completely mechanize one horse regiment, not to be a part of the above described division. The directive for this follows:

"a. The mechanization of one regiment is the first step in determining the application of modern machines to Cavalry missions in war and in developing the technique and basic tactical principles applicable to Cavalry in which the horse is replaced by machines.

"b. On favorable terrain, mechanized cavalry should extend the sphere of action of Cavalry to much greater distances and increase the speed of performance of its missions without, however, altering the accepted fundamental missions of that arm.

"c. When the development of one mechanized cavalry regiment reaches a satisfactory stage, other elements may be organized and supporting troops developed and attached for operations therewith."

The regiment in question will be stationed at Fort Knox, Kentucky, with a peace strength of 50 officers and 610 enlisted men.

To perform the missions of cavalry the regiment must have mobility, both road and cross-country; offensive and defensive power; possess the necessary requisites for independence of action and ability to close with the enemy. With these in view its organization will be as follows:

Headquarters and Headquarters Troop, containing the necessary administrative, supply, repair and communications personnel.

One Covering Squadron, consisting of one Armored Car Troop of 17 cars and one Scout Troop with 7 combat cars (light fast tanks) and 6 cross-country Personnel Carriers, transporting

8 .30-caliber machine guns with crews and 10 riflemen.

One Combat Car Squadron, consisting of two troops of 13 Combat Cars (light fast tanks) each.

One Machine Gun Troop, with 18 cross-country Personnel Carriers, transporting 24 .30-caliber machine guns with crews and 50 riflemen.

With this organization we have in the Covering Squadron an Armored Car Troop whose primary mission is reconnaissance, and in the Scout Troop an organization with sufficient offensive power in its combat cars and defensive or offensive power in its machine gun and rifleman platoon to cope with small parties of the enemy or for limited foot reconnaissance or security.

In the Combat Car Squadron we have an element of great offensive power, while in the Machine Gun Troop we have an element of considerable defensive or limited offensive power. The entire regiment will have extensive road and considerable cross-country mobility.

When this regiment is properly equipped it is the present intention to mechanize one more horse regiment and then form a mechanized brigade of a headquarters troop and the two regiments. This brigade will then be given a thorough test. How much more horse cavalry may be mechanized in the future only the result of this test, appropriations available, and time can tell.

In this development it must be remembered that troops transported in ordinary commercial road motor vehicles (portée troops) utterly lack the necessary mobility on poor roads or cross-country to perform the numerous duties required of cavalry—they are a poor substitute for either mechanization or horse.

The rôle of our combination cavalry (mechanized-horse) in wars of the near future will be the same as that laid down for our cavalry of today. *Each must be used in conjunction with but not tied to the other to obtain its maximum efficiency.* Both horse and mechanized cavalry will have their powers and limitations. The high command must know these and assign missions accordingly.

A few of the points to bear in mind in the employment of this mixed cavalry follow:

The rate of road march of horse and mechanized cavalry is very different; their cross-country rate will in general be about the same.

Mechanized cavalry will be far more road and ground sensitive than will be horse cavalry. The tactical use of terrain by and for both will be vastly more important than ever before.

Armored cars are reconnaissance elements, are excellent for distant reconnaissance and can be dispersed in small groups for this purpose. Horse cavalry is greatly superior to mechanized cavalry for close in reconnaissance and security purposes.

Combat cars (light fast tanks) are fighting elements and must concentrate for this purpose. Herein lies an essential difference between mechanized and horse

cavalry. While mechanized cavalry due to its road mobility may operate over great distances, it must concentrate at the moment of combat in order to make use of the shock power of its fast combat cars; while horse cavalry normally attacks and defends on a broad front.

Mechanized cavalry will be very dependent on a base of supply: while horse cavalry can and has lived, even in our recent campaigns, off the country for protracted periods.

Remembering these characteristics we may expect to see at the opening of a campaign, armored car units rushed to the front for distant reconnaissance with other mechanized cavalry units seizing and holding advanced positions—horse cavalry following by the most rapid means of transportation available.

As the opposing infantries approach each other, horse cavalry will be used to maintain continuous contact with the enemy and for screening and close in reconnaissance; while mechanized cavalry guards the flanks or is held awaiting a favorable opportunity justifying its employment.

During battle both classes of cavalry will guard the flanks of their own army, operate against the enemy's flanks or rear or be used as a mobile reserve. When used as a reserve mechanized cavalry will most likely operate in offensive combat alone or augment infantry tank units; while horse cavalry will act defensively or offensively to augment or replace infantry.

In breakthroughs both cavalries will be pushed forward as conditions warrant. In pursuit mechanized cavalry will be most useful for distant parallel pursuit and horse cavalry for the less distant parallel pursuit.

In retreat horse cavalry will be most useful in covering the direct retreat, while mechanized cavalry protects the flanks.

In zones of action horse cavalry should be assigned to terrain least suitable for mechanized cavalry.

I have only briefly indicated how these two types of cavalry both fulfill the missions of cavalry within their respective powers and limitations and how they should be used complementary one to the other. I am convinced that the War Department is right in incorporating completely mechanized units within our cavalry and also that we have today by tradition, armament and training, a most efficient horse cavalry.

Our cavalry officers are sincerely interested in mechanization.

With proper financial and official support they may be relied upon to develop efficient mechanized and horse cavalries suitable to our needs, and also to arrive at a correct balance between "mechanization" and "horse"—both manned by men of the same tactical training, quickness of thought, courage, élan, and determination to close with the enemy that for centuries has been the spirit of cavalry.

This accomplished it then remains for the high command to use that composite cavalry in such a manner that it may be able to acquit itself with maximum efficiency in any wars of the future.

The Guest of a Chinese War Lord

A Side-Light on War in China

By Captain David D. Barrett, Infantry¹

IN the spring of 1928, the North and South of China were engaged in war much as they are today, but at the time the forces of the Nationalist government, which is now at least partially in control of that troubled country, had not yet captured Peking. They were then driving northward in two columns, one in general following the Peking-Hankow, and the other the Tientsin-Pukow Railroad. Both columns had as their objective Peking, which was at that time the capital of China and held by Generalissimo Chang Tso-lin, the old war lord who, in his adventurous career, had risen from bandit chief to commander in chief of the Army and Navy and Dictator of the Chinese Republic, at least so much of it as was under his sway.

The drive against the North had been attended with great success, and all of China south of the Yangtze River, as well as a great deal of country on the northern side of that mighty stream had fallen to the Nationalists, but whether or not Chang Tso-lin and his lieutenants could be driven further back was still a mooted question. In Shantung, the advance of the Southerners had been temporarily halted along a line running generally east and west through Lincheng, the little town which leaped to world-wide fame in 1922 as the place where bandits raided the Tientsin-Pukow crack Blue Express, and carried off into captivity a number of foreigners, including an American Army major and his son.

Things being comparatively quiet for the moment in Shantung, our legation in Peking, interested in securing first-hand information as to conditions in that section, decided to send an observer there, and I was selected for the duty.

On arrival in Tsinanfu, the capital city of Shantung, I visited the American Consul, who arranged for me to make a call upon Chang Tsung-chang, Tupan (military governor) of the province, and vice commander under Chang Tso-lin of all military forces in the area. Chang's armies had recently been roughly handled in the fighting to the south, and he had withdrawn a great number of his troops to Tsinanfu for rest, reorganization, and further training.

I was very glad of the opportunity to meet Chang Tsung-chang, for at the time he was one of the most talked about of the Chinese military leaders of the day. It was not so much because of his reputation as a troop leader, either good or bad, but more because of his personal characteristics that he was so much in the public eye. He was, and I suppose still is, for I have never seen his death reported, a huge figure of a man, standing about six feet six inches tall, and with

a frame entirely in proportion to such a height. The most fantastic tales were told of his huge capacity for food and drink. Furthermore, he was reputed on good authority to be supporting a stable of forty concubines, seventeen of whom were said to be White Russians. Whether his seraglio really included that number of white women, I am unable to say, but does not seem unlikely in view of the fact that at the time Tsinanfu was full of White Russians, most of whom were without visible means of support other than working for the Tupan as soldiers, or as in the case of concubines, in some other capacity.

While undoubtedly possessed of great personal courage, as might be expected of a man of such unusual physical powers, Chang Tsung-chang was no great shakes as a troop leader, even in a country where military genius has been generally conspicuous by its absence. As a civil administrator, however, he was even more of a failure, and under his regime the people of Shantung suffered acutely. This was due not so much to the personal cruelty of the Tupan as to his total inability to select subordinates, civil or military, possessed of either capacity or integrity. During Chang's administration the province was literally squeezed dry, but I doubt if a fraction of the funds so extorted ever reached the Tupan's hands.

The Tupan received me very cordially in his *yamen*, and I was rather surprised to find him considerably different from the terrible person I had expected to meet. In appearance he was fully as impressive as he had been reported, but in manner he was jolly and easy going, and he gave the impression of being more of a big, overgrown boy than the fire-eating militarist which common repute had made him out. Even now, when I think of Chang Tsung-chang, it is with the recollection of a pleasing personality, in spite of the fact that I know he was a great scourge on a long-suffering people.

During my rather brief visit with the Tupan, our conversation was at first carried on through a secretary, who spoke excellent English. After exchanging some very dull commonplaces in this fashion, I decided that I was giving very poor return for four years of language study if I couldn't do without an interpreter, so I launched boldly forth on my own. The moment I spoke a word of his native tongue, Chang's whole manner became more friendly, and from then on we chatted along on a much less formal basis. When I judged that it was time for me to go and asked to be excused, he invited me to his *yamen* for dinner the following evening, an invitation which I accepted with alacrity.

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I shall always remember that dinner as one of the most interesting events of my life. It was served in the great reception hall of the Tupan's yamen, a vast room all done in foreign style, and I might say, in the most execrably bad taste. The walls were hung with large gilded mirrors, interspersed with life-size portraits of Chang Tsung-chang and other military figures in resplendent uniforms. Around the sides of the hall were alcoves furnished with chairs, tables, and carpets of the most rococo Western designs, and through these alcoves the guests of the evening milled about while waiting for the appearance of their host. The large company had been bidden for eight o'clock, but of course the Tupan did not arrive until much later. In China it is not considered rude for a host of high rank to keep his guests waiting, nor is a person of importance expected to arrive at a dinner at the hour specified in the invitation.

While waiting for the Tupan we put in the time as best we could in drinking tea, smoking, and conversation. There were of course no ladies present, but our genial host had thoughtfully provided for those who might desire a sprightly feminine conversation by posting a large number of concubines in various places throughout the hall. These girls, who I was informed had been chosen to appear that evening because of their charming manners and brilliant conversational powers, were all young, apparently around fifteen years of age, though it is likely that they were older, as many Chinese are deceptively youthful in appearance. Far from being the hardened jades one might expect from their station in life, they were modest in dress, and very proper in speech and demeanor.

Around ten o'clock, the Tupan finally appeared. In keeping with the foreign style of his room, he was fully arrayed in faultless Occidental evening dress, in which he cut a most impressive figure. He may have had Gargantuan tastes in food and drink, but at the time I saw him he showed no evidence of having been softened by high living. Any prize fighter might have envied him his breadth of shoulder and flatness of stomach. As a matter of fact, he reminded me not a little of Jack Dempsey.

The dinner was served in western fashion, and the appointments of the long tables in linen, silver, china, and glassware were surprisingly good. The food was of course delicious, as the Chinese are famous cooks, and outside of a few minor slips, no Occidental host need have been ashamed of the manner in which the courses were placed before us.

I hope in this account of the Tupan's dinner that I have not given the impression that I was the guest of honor, for such was not the case. There were many there of more rank and importance than an assistant military attaché, even though he might represent the great and respected Republic of the United States of America, hence my seat at table was not near the Tupan's side. But while my rank did not entitle me to a place on his right or left, by a lucky chance I found myself seated directly across from him, where I had opportunity both to observe his actions and pass an

occasional word with him when he was not occupied with his more important guests.

The Tupan may possibly have been on a diet, or probably he had dined elsewhere before his arrival, for in spite of his reputation as a hard feeder, he did little else than toy with the viands as they were placed before him. It is also possible that the foreign food



Chang Tsung Chang, Former Military Governor of Shantung.
Inset—The Author and His Three Chinese Hosts.

was not particularly to his taste. He did full justice, however, to the wines which accompanied the various courses, draining his glass, irrespective of its contents, at a single draft. He seemed to find considerable enjoyment in drinking toasts to his guests. Raising his glass to a guest he would say, "I drink a glass in your honor." Then, as they put the glasses to their lips, he would add "Kan pei!" meaning literally "dry glass," or the equivalent of our "bottoms up!" This made it obligatory on the guest to drain the cup to the dregs, after which both he and the host would invert their glasses over the table to show that not a drop remained. I watched the Tupan quaff a good many healths that evening, but if the liquor went to his head at all, he showed no signs of it.

As the guests of honor were some Japanese military officials of high rank, we were regaled during the dinner by the singing and dancing of inmates of some of the considerable number of Nipponese pleasure houses in Tsinanfu. A further feminine touch was given by the Chinese concubines who assisted in the serving of liqueurs and cigars, but did not themselves touch a drop or smoke even a single cigarette.

After dinner, while I was waiting to pay my respects to the host, an officer came up and informed me that the Tupan was leaving the next day for an inspection of the front lines in the vicinity of Lincheng, and that if I cared to go along, he (the Tupan) would be glad to have me accompany him as his guest on his special train. Needless to say, I accepted the invitation eagerly, for while I had asked the Tupan's permission to visit this area, I had had no hopes of falling into a piece of luck such as this.

I was told to be ready with my baggage the following evening, at which time the staff officer called me and said that the Tupan's train, or rather trains, as it required three to transport the great man, his staff, and bodyguard troops, would probably leave late that night or early the next morning, he could not say definitely just when. Meanwhile I was to go to the station, where an officer would show me my berth.

After a considerable search I succeeded in locating my compartment and went to bed, expecting to waken enroute for Lincheng. Daylight, however, found us still in the Tsinanfu station. On inquiry as to the cause of our delay, I was informed that the Tupan had spent the previous night at a great farewell dinner, which even then was still in progress, and it was uncertain just when he would cease making whoopee and take off for the front.

Actually, it was not until about four o'clock in the morning of the third day after the one set for our departure that I was awakened by a commotion outside the car window. Looking out I found the station brilliantly lighted and a scene of great confusion, especially in the neighborhood of the Tupan's private car. Automobiles were arriving in numbers, troops were being marched hither and yon, and throngs of officers were boarding the train, followed by soldier servants with mountains of luggage. In the midst of the hubbub I heard a soldier shout, "The concubines have arrived," and I knew the Tupan was finally about to "shove off." A few minutes later a great shouting of commands, a burst of military music, and a fanfare of bugles announced that he had boarded the train.

One armored train, manned by White Russians, and another filled with a brigade of Chinese infantry, had pulled out an hour or so before to precede us and insure our safety on the journey south.

Our train was a tremendously long affair. In the very middle was the Tupan's private car, a luxurious piece of equipment once used by some high official of the Tientsin-Pukow line, while the members of his staff occupied the big steel coaches which in more peaceful times made up the "Blue Express," the crack train of all North China. This rolling stock, for which, incidentally, at that time not one thin dime had ever been paid by the railway company, was originally some of the finest I have ever seen, but years of usage in troop transportation had put it into a terrible state. Most of the windows were broken, the electric light fixtures gone, the once beautiful mahogany woodwork was marred by boots and burned by cigarette stubs, and the fine leather upholstery of the seats was sadly cut and torn. Viewing the wreck of the coaches, I dreaded

to think what must have been the condition of the big Baldwin locomotive, a steel monster of the latest design, also unpaid for, which with much wheezing and clanging, dragged us over the rails.

The run from Tsinanfu to Lincheng is normally a short one, but our journey was interrupted at every station of any importance while civil and military officials crowded around the Tupan's car to pay their respects. During these halts the local garrison would be paraded on the platform. The troops all turned out in their best uniforms and wearing newly issued steel helmets of a most peculiar and cumbersome looking design, with the legend, "Dare to die and save the country," blazoned across the visor in Chinese characters.

I shared a compartment on the train with three officers of the Tupan's staff, all very sociable young chaps, courteous in the extreme, well educated, and keenly interested in learning all they could about the United States, so that time on our journey passed quickly and pleasantly. My companions informed me that their duties were more of a secretarial than of a military nature. They possessed military rank, however, in no small degree, one being a brigadier general, another a colonel, and the junior a major. It seemed quite a surprise to them when I admitted that I had been in our Army for almost eleven years and was still a captain.

In the Chinese army, however, a distinction in titles is made between officers commanding troops and staff officers or persons with military rank but performing nonmilitary duties. For example, the commanding officer of a regiment is called a "tuan chang," meaning the leader of a "tuan" (regiment). A quartermaster, however, might be a colonel, but he would be addressed as "Quartermaster," and only a look at his shoulder straps or visiting card would show his rank. More emphasis is placed upon the duties of an officer than upon his purely military rank. To illustrate, I was not addressed as "Barrett, Captain" (the surname comes first in China), but as "Barrett, Military Attache," which was rating me higher than I should have been, at that.

While on the Tupan's train I took my meals in the diner, where such foreign fare as scrambled eggs, steak, bread, and jam could be obtained. The food was palatable enough, but my appetite was at times dulled by the sight of officers reclining in their places at table and sucking on opium pipes. Opium while being smoked has a peculiarly sweetish, almost sickening odor, once smelled never again to be forgotten.

On the morning of the second day after leaving Tsinanfu, we reached the little village a dozen miles or so south of Lincheng, near which was located the so-called front. Here we detrained for the inspection of the front line. Knowing the habits of Chinese generals fairly well, I had at no time entertained the idea that we should visit any area where there was fighting going on; but if I had ever had any hopes that we might possibly see some troops in action, they would have been blighted by the manner in which we set out for the lines.

If there had been any enemy within miles, we should have run the risk of being blown off the map, for we presented a shining mark if ever I saw one. As soon as we had detrained, mounts were brought up for the entire party. I was given a shaggy little brute, tricked out with a crude rope bridle and a high wooden saddle which appeared to have been in use since the days of Ghengis Khan. The wild-eyed little beast must have been unused to being ridden by foreigners, for he gave me a nasty look as I swung onto his back, and I was no sooner astride of him than he proceeded to dance a jig all over the station platform, much to the amusement of the bystanders. He was so small, however, that I quickly regained my dignity and at least a part of my lost face by getting him in hand and riding off in good style.

We made a fine cavalcade as we set out from the station. First came the Tupan's personal bodyguard, a squadron of White Russian cavalry, armed with lances, carbines, and curved sabres of a type half Russian, half Chinese. These men were poorly clad and mounted upon scraggly little Manchurian ponies, but nevertheless their lithe bodies, keen, weather-bronzed faces and perfect horsemanship made them as fit a looking body of mounted troops as one would wish to see. Following the Russians, came the Tupan and all his staff, numbering several hundred officers, and as a rear guard was a battalion of Chinese infantry. A short distance to our left as we rode, a Russian armored train steamed slowly along the railroad track, its crew in readiness for instant action.

A ride of a mile or so brought us to the part of the front which the Tupan was to visit. The "front" proved to be a straight line of firing trench, without traverses, in which, posted at regular intervals, were sentries standing at rigid attention. I saw no support or communicating trenches. In two respects, however, the position was a good one from a defensive standpoint; there was a small river, with high, steeply sloping banks immediately in front of the trench, and on the other side of the river, a level plain extended at least 1,000 yards to the front and offered an almost perfect field of fire.

The Tupan, puffing contentedly upon a huge black cigar, entered the trench and walked along it for a few hundred yards, talking and laughing the while with members of his staff, and apparently in the best of humors. At one point he stopped, leaned down on the parapet and called me to him. Handing me a pair of field glasses he indicated a point on the horizon where some small buildings could be faintly seen.

"Right there," he said, "are Chiang Kai-shek's troops." Chiang Kai-shek was the commander in chief of the Nationalist forces.

I strained my eyes at the spot pointed out and thought that I could just discern some men moving about, but whether or not they were the enemy I do not know to this day. The thought occurred to me that if the Nationalists were really as close as the Tupan evidently wished me to think, and they had been

possessed of some reasonably effective artillery, the Chinese Northern Army would soon have been short one Tupan, several hundred staff officers, a squadron of cavalry, a battalion of infantry, and a complete armored train. Nothing happened, however, to disturb the peace of the perfect spring morning.

Once the Tupan left the trench to enter a small mud hut occupied by a squad of soldiers. While the men stood at rigid attention he asked the corporal in charge a few questions. He must have been pleased with the answers, for he called to his chief of staff.

"Li," he said, with a grandiloquent gesture, "these men have done good work. Give them ten dollars."

"*Hsieh hsieh Tupan! Hsieh hsieh Tupan!* (Thank you Tupan, thank you Tupan)," exclaimed the soldiers in unison, bowing almost to the ground to show their appreciation.

I am still wondering whether they ever got the ten dollars, for I saw no move on Li's part to give it to them.

After visiting, in aimless fashion, a few hundred yards of the trench, we all mounted up and returned to the train. Just before leaving the "front," the Tupan again called me to him and asked me what I thought of the position. I gave him my honest opinion, which was that his trenches offered little protection, but that he had an excellent field of fire and a good natural obstacle in his front, and that if he was equally strong on the flanks, I saw no reason why he should not be able to hold at that point.

As a matter of fact, at almost the very moment we were visiting the trenches, the Tupan's forces were being heavily attacked some 40 or 50 miles to the east. The Nationalists were victorious and a few days later Chang was forced to begin a retreat which, with a few brief stands along the way, did not end until he had been driven from Chinese soil.

But I was not to learn of this until later. I remained with the train a day longer, after which, having decided that I had seen about as much of interest as I could in view of the apparently peaceful state of affairs around Lincheng, I thought it best to return to Tsinanfu.

Arriving in Tsinanfu, I was not long in hearing of the defeat of Chang's troops east of Lincheng, and I was soon on my way south again, but this time on my own. My days of travel in luxury on the Tupan's special train were over.

My experience as a guest of Chang Tsung-chang, while, a most interesting one, cannot be said to have been of much value in a military way. The visit to the front at Lincheng, however, served to impress upon my mind two principles of war. One is the military commander who does not keep up active reconnaissance for information of the enemy may easily be lulled into a false sense of security, like an ostrich with his head in the sand; and the other is that he who waits passively to be attacked surrenders the advantage of the initiative and will generally be forced to make his defense on unfavorable ground.

The Verdun Forts

By H. A. DeWeerd, Professor of History, Denison University

"Verdun provides the most valuable lesson of the war in the history of permanent fortifications. The army unquestionably won the battle, but concrete and steel contributed its share."

GENERAL NORMAND.

THE heroic resistance of the French Army has rather obscured the part played by the forts in the epic defense of Verdun. Marshal Petain's recent book contains some very interesting information regarding the resistance value of formal fortifications in the day of modern heavy artillery.¹

The speed and precision with which the great German siege guns reduced the Belgian fortifications upon the outbreak of war in 1914 came as a distinct surprise to many military leaders. Liège fell after twelve days attack, Namur after six days, while Maubeuge and Antwerp held out for thirteen days. The Russian fortresses fared no better. Kovno surrendered after twelve days, Przemyśl after four days attack. These facts caused military leaders to lose faith in formal fortifications and encouraged them to look upon machine-guns, trenches, barbed wire and infantry as the principal factors in defensive operations.

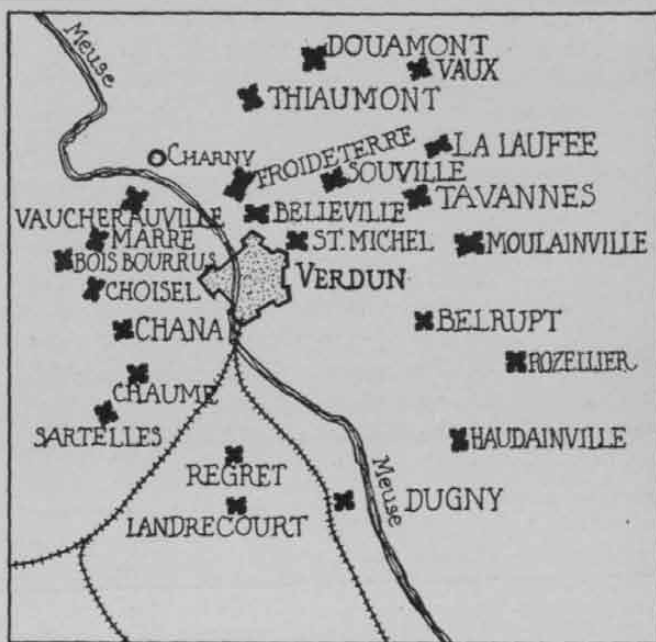
In drawing these conclusions, the military leaders failed to take into consideration the fact, that in the cases referred to, the forts did not have active liaison with a formidable field army. Neither did they stop to determine whether or not the forts had been designed to resist the weapons brought against them. Liège and Namur were constructed to resist shells up to 21 centimeters, but were forced to surrender when attacked by weapons of much larger caliber. The Russian fortress Novo-Georgievsk, which surrendered in 1915, could have resisted the heaviest of Austro-German weapons.

II

Vauban's old circle of forts around Verdun, had been augmented by a series of modern works dating from 1874. The modern forts include: Belleville, Saint-Michel, Tavannes built from 1874-1880; Douaumont, Vaux, Moulainville, Bois-Burrus, and Souville built from 1880-1897; Thiaumont, La Laufée, Froideterre, Charny, and Vacherauville constructed or improved from 1889-1914. These fortified areas were constructed at the cost of 78,000,000 francs, and represented the best work of French engineering and construction. The walls of the modern works were of concrete eight and a half feet thick, using 850 pounds of cement to the cubic yard. In standard European fortifications the proportion of cement to the cubic yard was 550 pounds, while the walls were from five to six and a half feet thick. The main armament of the modern forts consisted of disappearing guns of 155 caliber mounted in turrets, disappearing guns of 75 caliber mounted in turrets for flanking fire, and machine-gun turrets for twelve guns.

¹ Marshal Henri Philippe Petain, *Verdun* (Eng. Trans.) Dial Press, N. Y. 1930.

All these careful provisions for the defense of Verdun were pushed aside, when on August 5, 1915, the French High Command issued an order stripping the fortifications. The artillery of the forts was dismantled and dispersed for use in the field, and preparations were made to blow up the forts in case of an enemy attack. The French prepared to defend Verdun, if this became necessary, with infantry and field artillery. They relied on the natural strength of the area and felt that the Germans would not attack where they felt themselves to be so strong. It was with these facts in mind



that General Joffre steadfastly refused to become alarmed over the warnings of an attack on Verdun. As a consequence, no adequate steps were taken to prepare the area for defense. Petain passes over this negligence on the part of General Joffre in dignified silence. When the evidences of a serious attack became overwhelming, the French made frantic efforts to get Verdun ready for defense, but these preparations consisted in laying out tentative lines of trenches.

The unprecedented severity of the German attack, especially of the artillery preparation caused the French to recoil. Looking on Fort Douaumont as a mere shell trap, the French forces withdrew around it, and made it possible for the German infantry to capture the fortress by the simple expedient of walking into it. They found it virtually abandoned; a company of engineers was futilely trying to dismantle some of the remaining artillery. Fort Douaumont was one of the

most important works at Verdun; it dominated the ground around it, provided shelter for the German infantry and armoured observation posts for the officers. Once in possession of the enemy, the value of Fort Douaumont became apparent to the French. For in spite of constant shelling by the heaviest French batteries, Douaumont protected the German forces and provided an admirable sally point for attacks. The French army commander on March 12 ordered that the forts should be defended in every case. He wrote:

Our experience in recent warfare has given us an opportunity to realize the resistance-value of the forts. They are indeed better organized than hastily constructed strong points on the field of battle, for their sites and plans have been laid out at leisure, the flanking angles carefully calculated, the shelters deeply dug and re-enforced with concrete. The forts can and should be used in every case in the defense of the various sectors.

The guns will therefore be replaced in the casemates, the turrets repaired, the gun chambers cleared of all explosives that have been carried into them in order to destroy them - - .

Under the existing circumstances it was found to be exceedingly difficult to replace the guns and materials long missing from the fortresses. The German attack afforded no respite, and the French had all they could do to bring men and munitions enough along the "sacred way" to support the defense. But where the guns were replaced, they showed great value in action. Froideterre offers a good example. The Germans attacked this work on June 23, 1916, after an intense bombardment. The upper works of the fort seemed heavily knocked about and on fire; the German infantry prepared to enter, when suddenly a 75 turret, thought to be out of action, opened on them with shrapnel and a machine-gun turret caught them in its zone of fire. Thus confused the Germans were driven back by a counter attack which developed behind the security of the fort. Froideterre was deluged with some thirty to forty thousand shells, some as heavy as 210 caliber, but the concrete shelters were not harmed and the Germans never captured the fort.

The experience of the French at Froideterre was repeated on July 11 when the Germans attacked Fort Souville after a terrific bombardment. Once again the German infantry seemed on the point of entering the fort, when the fort's defenders sallied in a counter attack and drove them back in confusion. The three fortified hill tops, Froideterre, Souville, and La Laufée, although involved in desperate attacks never once fell into the hands of the enemy. After the French were committed to the defense of the forts, the works took on new meaning to the troops who battled savagely in their defense. The gallant defense of Fort Vaux under Major Raynal in which the whole force succumbed is a good illustration. The forts became symbols to the troops.

In addition to providing sally points and shelters for the troops, the Verdun forts were also of great

value as organizing factors in the defense. Munitions and materiel were stored in their vaults, headquarters for combat groups were formed, telephone and signaling equipment was installed. Petain emphasises the "organization value" of the forts.

III

When analyzed in retrospect, the resistance quality of the Verdun forts seem a little astonishing. Fort Douaumont for example was struck by 120,000 shells of which 2,000 were of 270 caliber or heavier. (2) But when it was recaptured the tunnels and vaults were found to be undamaged, while one of the 155 caliber turrets although struck twice by shells of 400 caliber "was so little damaged that nothing was needed to put it back into condition except cleaning and greasing." The same turret was later struck while in action by a shell of 280 caliber but was not silenced. Fort Vacherauville was struck by over 8,000 shells, (2) Figures based on French estimates, some as heavy as 420 caliber; Fort Moulainville by more than 8,000 shells of heavy caliber; Froideterre, Souville, and Tavannes, each were struck by at least 30,000 shells but all the tunnels and shelters remained intact. Gun mountings and turrets showed equal strength. General Descourtis, Chief Engineer, 11th Army writes:

The war demonstrated that the portions of our forts adapted to active combat—defied the most powerful artillery. Concrete which may have proved unsatisfactory abroad, and which has been too hastily condemned as useless, has given good service in our cases. The Germans tried in vain to blow it to fragments with projectiles whose weight and explosive force was far beyond anything our artillerymen and our engineers could have imagined, but they achieved only the destruction of local and limited areas. The construction of shell-proof chambers was so well conceived, worked out with so much care, and left so much margin for unexpected developments, that as a whole these parts withstood triumphantly the most formidable attacks.

As to the armoured turrets, the heaviest enemy projectiles were unable to destroy any but a small number of machinegun turrets, which made no claim to resist any but light artillery. All our 155 turrets are in good condition, and the only 75 turret which was destroyed fell victim to the explosion of a charge that we ourselves had carried inside.

Marshal Petain believes that if Fort Douaumont had been garrisoned and defended as it should have been the Germans would never have taken it, and that their advance toward Verdun would have come to an abrupt and early halt. The French paid a very high price for their lack of faith in the Verdun forts, but once aware of their value, they took full advantage of the remaining works. The experience of Verdun makes clear that although a "fortification alone is not enough to check the enemy, it greatly increases the resisting strength of troops who know how to use it.

Historical Pensacola Bay

By Lieutenant Colonel Hartman L. Butler, Coast Artillery Corps

Early History—Spanish

THE Coast Artillery Reserve Officers Training Corps Students, the Citizens Military Training Camp Trainees, and other civilian components from the Fourth Corps Area train every summer at Fort Barrancas, Pensacola, Florida, a place rich in historical tradition. Here Coast Artillery Men of Imperial Spain manned the crude ramparts four centuries ago, a few years after Ponce de Leon landed in eastern Florida. Pensacola has been governed under five different flags: the Lions of the Spanish Hapsburgs, the Fleur-de-lis of the French Bourbons, the Banner of His Britannic Majesty, the Stars and Bars of the Confederacy, and our own Stars and Stripes.

Pensacola Bay was first visited in 1528 by a Spanish conquistadore, Panfilo de Narvaez. About thirty years later—shortly before Saint Augustine was founded—Don Tristan de Luna with two thousand followers made a settlement near the present site of Fort Barrancas.

This venture was unsuccessful, and it was not until the close of the seventeenth century (1698) that Andres de Arriola with a Spanish expedition of three hundred founded the original Pensacola at Fort Barrancas and built the first Fort San Carlos—a wooden structure.

French and British Occupation

In 1719, France being at war with Spain, a French



Above Left. Fort Barrancas, Florida, R. O. T. C. and C. M. T. Camps in the Foreground. Right. Old Fort San Carlos, the Semi-circular Structure Built by the Spaniards in 1781. Old Fort Barrancas, to its left was Constructed in 1839. Below Left. Fort Redoubt, Constructed in 1840, for Land Protection against Indians and Invaders. Right. Sketch of Fort Pickens, Florida. Military Features as of October 9, 1861. (Replotted September 1, 1931, from distances and locations given in Colonel Harvey Brown's and Captain Hildt's 1861 Official Reports, R.R.). (1) Confederate Landing Point and later Debarking Point, when pursued. (2) Camp 6th Regiment N. Y. Volunteer Infantry, Captured and Burned. (3) First contact with Battalion Regulars and Major I. Vogdes captured. (4) Regulars in Defense and when reinforced took up pursuit.

(Photo by Air Corps, U. S. A.)

expedition under Bienville sailed from Mobile and captured Pensacola and Fort San Carlos. During the next few months the harbor changed hands several times, and in the last action the fort and town were burned. The Spanish inhabitants moved to Santa Rosa Island and founded a second Pensacola near the present Coast Guard station. This town was destroyed by a hurricane in 1754, and the survivors moved to the present site of Pensacola.

By the Treaty of Paris (1763) Florida became English territory, and the British proceeded to erect Fort George, a masonry structure, near the present Lee Square, Pensacola, and Fort Red Cliff near the present Fort Redoubt, Fort Barrancas.

In 1781, during the Revolutionary War, a Spanish fleet under the governor of Louisiana, Don Hernando de Galvez, attacked the forts, and Pensacola harbor again became Spanish territory. The Spanish immediately constructed the present semicircular stone and masonry Fort San Carlos, located just south of the present American brick Fort Barrancas.

United States Seizure

During the war of 1812 the British seized and again occupied Pensacola, but in 1814 a force of Americans led by General Andrew Jackson appeared and captured the forts and city. At the end of the war the territory was returned to Spain. However, four years later General Jackson, in his campaign against the Seminole Indians, again temporarily occupied the city. In 1821 Florida, including Pensacola, was ceded to the United States.

Old Fort Pickens was built in 1833, Fort McRee, now almost completely demolished was constructed in 1839, and about this time the large seacoast brick fort and the inland redoubt fort at Fort Barrancas was also built.

Seminole Indian War

During the seven years Seminole Indian War which began in 1835 with the last stand and massacre of Major Dade's Battalion—detachments of the Fourth Infantry, Second and Third Artillery—north of Tampa, the garrisons of the local forts from time to time furnished their quotas. In this war about five thousand regular soldiers were engaged, suffering 30 per cent loss—1466 killed or died of wounds.

Civil War

Early in 1861 were written the most interesting pages of Pensacola's history. The Confederates, numbering nine hundred, concentrated in the city of Pensacola about eight miles up the bay, and then moved down the west side of the harbor and captured the U. S. Navy Yard and Forts Barrancas and McRee. The latter two places had previously been abandoned for strategic reasons. The Coast Artillery battery, being too small to hold three forts, was on January 10, 1861, moved from Fort Barrancas to Santa Rosa Island and occupied Fort Pickens which commanded the harbor entrance. The land force commanded by First Lieutenant Adam J. Slemmer, Coast Artillery, included Second Lieutenant J. H. Gilman and 49 soldiers of Battery G, First Artillery and staff, to-

gether with 30 sailors from the U. S. Navy—total 81. They were supported by one war vessel and one supply ship of the U. S. Navy.

The Confederates very promptly demanded the surrender of Fort Pickens and Lieutenant Slemmer's reply was to grease the mechanism of his cannon and to "weigh up" more powder. The enemy with their greatly superior numbers probably could have overpowered the small Union force but they chose to conduct a campaign of persuasion and intrigue. There was however no weakening on the part of the Slemmer's command. The only deserter was a homesick army mule that swam the bay, returned to the Fort Barrancas stables and became Confederate property.

In the course of a few months, reinforcements consisting of three batteries of Regular Artillery, two companies of Infantry, one company of Engineers and a New York Militia Infantry regiment arrived. Shortly afterwards, now, Captain Slemmer and his nearly exhausted battery were transferred to a northern field.

The Confederates having failed to attack Fort Pickens when it was lightly held, now decided upon a night land assault with a view to capturing the Union force, spiking the guns and destroying the fort. So during the early morning hours of darkness on October 9, 1861, a force of about 1200, including demolition men and hospital corps men, under General Richard H. Anderson, conveyed by two steamers effected a secret landing on Santa Rosa Island about four miles east of Fort Pickens, at the Position (1). (See sketch of Ft. Pickens, Florida.)

This force was divided into three columns: the first under Colonel James R. Chalmers, Ninth Mississippi, via right or north beach; the second, Colonel J. P. Anderson, First Florida, left or south beach; and the third column, Colonel John K. Jackson, Fifth Georgia, the center or reserve. The advance was begun a little after 2:00 a. m.

After a march of about three miles and at about 3:30 a. m. the camp of the Sixth Regiment, New York Volunteers (Position 2) was reached, contact made, the volunteers routed, and their camp captured and burned. The New York troops retreated to the nearby batteries on the west. The Confederates here apparently halted their attack.

When the firing at 3:30 a. m. was heard, the Union Commander, Colonel Harvey Brown of the Fifth Artillery, dispatched to the scene of action a battalion of two companies of regulars, Battery A, First Artillery and Company E, Third Infantry, under Major Israel Vogdes, First Artillery. This force proceeded east along the North Bay shore via Batteries Cameron and Lincoln. At the latter place it was joined by one of the companies of the Sixth New York, which was directed to cover the right flank in the advance, but it became detached and was not seen later. Major Vogdes' force continued its march up the beach some distance beyond the camp of the volunteers, and suddenly a large force appeared on the right flank and rear.

In the darkness they marched by and to the rear of the Confederates. The small force of regulars

about one hundred in number, was wheeled to the right or south. Major Vogdes rode off to the right of the line, apparently into the ranks of the Confederates, and disappeared at position (3) on the sketch, and the fighting was begun. The Union force under Captain James L. Hildt, Third Infantry, who succeeded in command, held its ground for a short period. The enemy's fire then became very severe and the Union force being greatly outnumbered fell back diagonally to the opposite (south) beach to about position (4) on the sketch, halted behind numerous sandhills, and delivered a very effective fire on the enemy. The Confederates retreated along the north beach.

At 5:00 a. m. (about daybreak) Colonel Brown dispatched Battery H, Second Artillery, and Company C, Third Infantry, under command of Major L. G. Arnold, First Artillery, to support Major Vogdes' battalion.

Major Arnold's command, reinforced by one company of New York Volunteers, advanced rapidly to the position where the advance detachment under Captain Hildt was engaged in a hot fight with the enemy. About this time the Confederates disengaged themselves and retreated eastward rapidly. Major Arnold's combined forces pursued and, overtaking the Confederates, attacked them as they were completing their embarkation near position (1). Major Z. B. Tower, U. S. Engineers, with two companies of New York Volunteers, and Colonel William Wilson, Sixth New York Volunteers, with a portion of his regiment, subsequently came up and joined the attack.

The Confederate commander reported that due to the early approach of daybreak with the probable exposure to attack of his unprotected transports by the U. S. warships he gave the order for the withdrawal before meeting effective resistance. The U. S. Navy forces were unable to reach the scene of action before the re-embarking of the Confederates.

The total strength of the Union garrison on Santa Rosa Island at that time is not known, but based on

its strength prior to the Fort Pickens attack, they numbered at least 600, but less than that number were actually engaged.

The total losses of this engagement, as admitted by the respective commanders, were: Union—67 and Confederate—87. Major Vogdes was among the captured and General Anderson was severely wounded.

The Confederates did not again attack Fort Pickens.

On November 22-23, 1861, the Union artillery at Fort Pickens and U. S. Navy warships bombarded the Confederate batteries at Forts McRee and Barrancas and the navy yard with ineffective return fire, silenced Fort McRee, one and one-half miles west of Fort Pickens and set fire to the towns of Warrington and Woolsey.

On May 8, 1862, the Confederates evacuated Pensacola and vicinity in order to reinforce their armies in other areas.

It is claimed that Fort Pickens is the only place within the mainlands of the Confederate states where the United States flag flew during the entire Civil War. The real hero of its defense during the most critical period—Captain Adam J. Slemmer—was cited and a fixed 6-inch battery at Fort McRee was named in his honor. During the World War this battery was dismantled and abandoned. It does seem as if a more fitting way might be found to perpetuate the heroism of Slemmer.

Present Day

Pensacola Harbor with its background of more than four hundred years of history is rapidly developing into a commercial and strategic center of great importance. It not only has the best anchorage facilities on the Gulf but also claims the nearest deep-water seaports to the Birmingham industrial area and is on the main line of communications to the Panama Canal. Besides its strong harbor defenses it is occupied by the U. S. Naval Air Station, claimed to be the largest of its kind in the world.

Will Pensacola's next four hundred years of history be as romantic as the past?



The Foreign Military Press

Reviewed by Major Alexander L. P. Johnson, Infantry

BOLIVIA—*Revista Militar*—November-December, 1931.

"The Military qualities of General Juan Vicente Gomez, Commander in Chief of Venezuela," by General Eleazar Lopez Contreras.

General Juan Vicente Gomez, President of the United States of Venezuela, is one of the outstanding figures of Latin America today. Successful as a soldier and leader of men on the field of battle in numerous campaigns, he is equally successful in preserving peace within the borders of the republic over which he has presided for more than a score of years. General Contreras presents an interesting character sketch of his commander in chief, who evidently possesses to a marked degree the rare gift of commanding not only implicit obedience, but also the loyalty and the devoted affection of his subordinates.

COLOMBIA—*Revista Militar del Ejército*—November-December, 1931.

Reorganization of the Colombian Army.

On November 1, 1931, a presidential decree went into effect for the reorganization of the Colombian Army. The military establishment under this decree consists of 477 officers, and 6,170 enlisted men, organized in five brigades and "Guard of Honor" battalion (Presidential Guards). The brigades, which replace the former divisional commands, consist of brigade headquarters and three infantry battalions of three rifle companies and one machine gun company of four heavy machine guns each. In addition each brigade contains a variable component of other arms. Thus, the 1st brigade has 1 group of cavalry, 1 group of artillery and 1 battalion of railway engineers. The 2d Brigade has, in addition to its infantry, 1 battalion of railway engineers, but neither artillery nor cavalry. The 3d Brigade includes 1 group of cavalry, 1 battery of field artillery and 1 company of railway engineers; the 4th Brigade contains 1 battalion of engineers, and the 5th Brigade, 1 troop of cavalry.

The cavalry group consists of headquarters and 2 troops. Similarly the field artillery group is composed of headquarters and 2 four-gun batteries. The Engineer and Railway Engineer battalion consists of headquarters and 2 companies, while the "Guard of Honor" battalion has a headquarters and 3 rifle companies.

The military establishment includes two river flotillas of two gunboats each.

The reorganization also affects the Ministry of War which, under the new plan, consists of five departments and four separate sections. The General Staff, designated as Department No. 2, consists of five sections: I. Operations and Communications; II. Territorial Service and Mobilization; III. Intelligence; IV. Trans-

portation and S. O. S.; V. Military History and Personnel.

The military school system comprises the School of Cadets, the School of Military Aviation and the War College (*Escuela Superior de Guerra*).

"The Definite Boundaries of Our Country," and "The Surface of Colombia," by Colonel Pedro Julio Doussobes.

Two very carefully prepared, authoritative articles by the same writer. The first is a precise tracing of the geographical boundaries of the Republic of Colombia, whose total area covers 1,194,270 square kilometers. This study includes a succinct statement of the treaty agreements which definitely fixed the various portions of the frontier of the republic.

The second article is a description of the surface character, river and mountain systems of Colombia based upon the author's personal knowledge of the country, as well as upon the works of leading geographers.

AUSTRIA—*Oesterreichische Wehrzeitung*—May 1, 1931.

"The Student Army of Soviet Russia."

Under the heading of "15 million student reservists for communism," the Soviet Commissar for Public Instruction sent to all schools a circular which contemplates the militarization of the entire soviet system of public instruction. Copies of this document came into possession of several members of the League of Nations shortly after Moscow has accepted Briand's invitation to a conference called for the discussion of his United States of Europe project, and soon after the Soviet Government had also announced its intention to participate in the deliberations of the Disarmament Conference. This circular issued by the Commissar places the entire school system into the military service, and virtually transforms the entire population into a nation in arms. An ukase issued shortly afterwards by the Commissariat for Defense regulates the methods of training for the different parts of the country. In the northern districts these instructions are of a purely defensive character, while in the south even boys are to be trained for offensive warfare. Although the Soviet authorities speak officially only of national defense, it is known that they have complete plans for offensive action against Roumania and Poland, for the conquest of the Danube delta, and the reconquest of Vilna, Brest-Litovsk and Warsaw. It is thought that Czecho-Slovakia will be totally helpless the moment the Red Armies occupy Poland and Roumania. The Soviet Government expects Germany to remain neutral, hence the Reich will form an effective barrier against western

aggression. The circular of the Commissariat of War counts upon popular support wherever the Red Armies might operate. Propaganda with that end in view has already been initiated.

Militärwissenschaftliche Mitteilungen—January-February, 1932.

The current number of this Austrian periodical is devoted entirely to the question of disarmament. In a series of very interesting and scholarly articles the various aspects of this important problem of the day are discussed and analyzed.

"The Calvary of Disarmament," by Colonel Maurice Wictorin.

It was the objective of every nation in every age to reduce its enemies to impotence. In ancient times defeated nations were either put to the sword or sold into slavery. As civilization progressed wars terminated with treaties of peace which imposed more or less stringent conditions upon the vanquished. The peace treaties which terminated the World War, although initiated upon the broad, humanitarian basis of Wilson's Fourteen Points, do not, in the author's opinion, differ materially from those of an earlier, more barbarous age. Even so, their enormity lies not so much in the conditions they impose, but rather in the hypocrisy that disarmed the vanquished nations under the pretext that it would initiate a general limitation of armaments among all nations.

The author then traces the history of disarmament during the post-war years, and he scrutinizes the activities of the preparatory commission and the League of Nations in this important field. These do not augur well, in the author's opinion, for a successful consummation of the program before the disarmament conference now in session.

"Potentiel de Guerre," by Colonel Emil Paschek.

This article analyzes Interrogatory V of the League of Nations questionnaire, dated December 12, 1925, which was intended to determine the potential war power of each nation. In the author's opinion, this factor is undeterminable. It is, therefore, an added reason which precludes the possibility of a universally applicable basis for world disarmament. The author believes that the war potential of any nation encompasses the entire state. He holds that mental preparedness and economic weapons may suffice for the conduct of a cruel war of annihilation, especially where there is in reserve a powerful military machine. He cites as an interesting example in point France's gold war of 1931 which featured financial campaigns not only against the defeated Central Powers but also against the British World Empire and the gigantic power of the United States.

BELGIUM—Bulletin Belge des Sciences Militaires—April, 1931.

Russia—In 1927, a "League for the Development of the Aerial and Chemical Arms" (Ossoaviachim) was

founded in Russia under the chairmanship of Rykov, president of the Council of Peoples' Commissars. This organization has, in time of peace, complete charge of all work connected with the antiaircraft and anti-gas defense of the civilian population. The activities of this organization extend to every section of the country which is, for this purpose, divided into "rayons," each containing a number of organized "cells." These provide courses of instruction for the development of leaders for the antiaircraft and antigas defense activities. Several rayons are united under the supervision of provincial directorates, and the latter are directly under the control of the Central Directorate which in turn is in constant touch with the party organization.

The great antiaircraft defensive test and maneuver held at Kiev, in September, 1928, indicated the extent to which this important phase of preparedness had been developed in Russia. In addition to this active defense, there is in Russia also a remarkably well organized passive defense developed by the police, the fire departments, the Red Cross and Ossoaviachim. Since 1928 exercises of a general character have also been held in other Russian cities.

CZECHO-SLOVAKIA—Vojenské Rozhledy—May, 1931.

"Education of a Democratic Aristocracy in the United States."

The "West Point Guide Book" supplies the material for which the author saw fit to select such a fantastic title. He acquaints his readers with the organization and administration of the United States Military Academy. He discusses in detail the prescribed curriculum, the system of training, and discipline. The author apparently believes that the objective of cadet training at West Point is best characterized by the title he selected for his discussion.

GERMANY—De Re Bellica—No. 11, 1931.

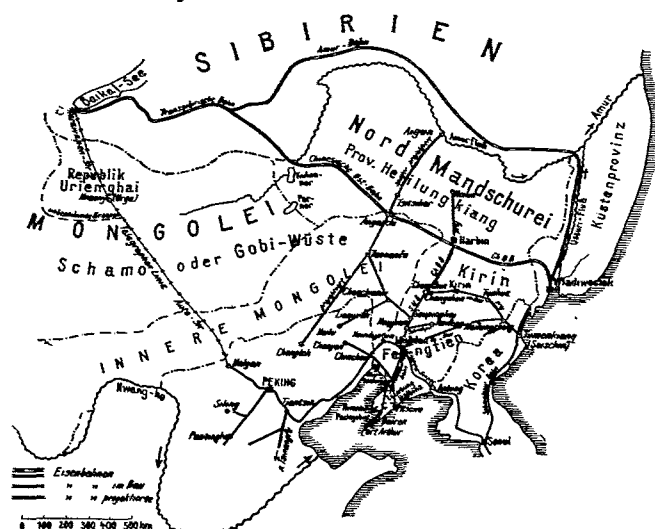
The unfavorable economic situation of the world is having its adverse effect upon this excellent periodical published in the Spanish language by Gerhard Stallings, Berlin. The publishers announce, that unless subscription lists double, publication of this monthly magazine will have to be suspended. "De Re Bellica" is unique among military periodicals. Its contents are of the highest order and provide the reader with excellent material for self-instruction. Suspension of its publication will be a distinct loss to the military profession notably in Spanish speaking countries.

Militär-Wochenblatt—December 4, 1931.

"The Struggle for Manchuria."

Manchuria, with an area of about 924,000 square kilometers and a population of approximately 30 millions, has for a long time been the objective of Japanese foreign policy, which has consistently sought to establish Japan as the paramount power of the Far East. This policy may be defined somewhat along the principles of an Eastern Asiatic Monroe Doctrine. Japanese attempts to colonize in that vast territory have failed. After 25 years of occupation the Japanese population of Manchuria has not yet reached the million

mark. Climate and living conditions are unfavorable to the Japanese. Economically, however, Japan has been eminently successful in her Manchurian enter-



prise. The wealth in natural resources, the products of Manchuria's fertile soil have become an indispensable necessity of life for the Island Empire.

The position of Japan as a world power depends in a large measure upon the raw materials which she derives from Manchuria. It is, therefore, reasonable to conclude that Japan will never voluntarily withdraw from that Chinese province. Japan selected the most auspicious moment for the execution of her designs. Neither the League of Nations, nor any one of the interested powers are in a position to prevent Japan in that.

As to the actual military operations, it is interesting to note that the Japanese forces employed are relatively small but well disciplined. Morale is high. Provided with the most up-to-date equipment, and led with a remarkable singleness of purpose, this army is opposed by improvised, poorly equipped, incoherent masses. Military operations generally followed the railroad lines. The absence of suitable highways practically imposed such limitation upon the action. Occupation of important railway centers and establishment of railway guards were the principal features of this campaign. The Japanese employed their bombing squadrons extensively and effectively. Armored trains and light tanks also played an important part.

GREAT BRITAIN—*Journal of the Royal United Service Institution*, August, 1931.

"The Higher Study of War in the Army," by Major General Sir Charles W. Gwynn, K.C.B., C.M.G., D.S.O.

The author stresses the importance of proper training of staff officers. Their course of study should cover the widest field from the earliest stage of their career. On the other hand, theoretical training without subsequent practical experience is of little value. Hence, the number of officers receiving staff training must bear a definite relation to the number of peace-time staff appointments in which experience can be gained. While under such system some first-rate officers would miss

the chance of higher training, the author believes that to train more than can be assured of staff employment might well produce unsatisfactory consequences, and increase rather than decrease the number of the disappointed. In the author's opinion, senior officers do not form the best material for theoretical instruction. They will miss the assistance of subordinates in matters of detail, yet the solution of problems often turns upon the minutiae of detail. Again, the senior officer might become so involved in details which require expert subordinates that they will lose their sense of proportion and waste time. On the other hand, discussions and lectures without the study of concrete problems tend to a neglect of essential details and the formation of superficial conclusions. Since only a limited number of officers can receive the special training afforded by the Staff College, they must be treated as a leaven to work on the army. It imposes the duty upon commanders and staffs to spread the common doctrine throughout the army, not merely an optional doctrine, but one that affects every aspect of its employment.

The Journal of the Royal Artillery—October, 1931.

"The Mechanized Unit in the Field," by Lieut. Col. C. A. H. Montanaro, O.B.E., R.A.O.C.

During the past three years mechanization of the army has increased considerably. The corps artillery has been completely mechanized, brigades of cavalry partially so, and experimental infantry brigades are provided with mechanized first-line transport. Armored cars of the Royal Tank Corps and the cavalry have likewise made immense strides. For the maintenance of these vehicles a series of experimental mobile (or field) workshops have been tried out in practical exercises. The author undertakes to set out without technicalities some of the problems and the layout of the organization of the maintenance service for the first-line motor transport vehicles on active service. The author believes with respect to future developments that mechanization of an expeditionary force as to first-line and "A" echelon vehicles is limited 1, by the terrain over which the approach march is to be made, and 2, by the daily automatic supply services being able to keep pace with its movements, and its proper protection. From these assumptions the author concludes that only a definite percentage of any expeditionary force is likely to be entirely mechanized. Such mechanized force will be prepared as a mobile reserve in the hands of the C. in C. This percentage, in the author's opinion, will largely be determined by the maximum size of a self-contained mechanized force which can for a very limited time exist unsupported by a line of communications for the purpose of a special operation.

For purposes of his discussion the author makes certain assumptions as to the stage of mechanization reached by the army at the opening of a campaign. Accordingly the force presents the following picture:

1 Cav. div. (2 brigades with each regiment composed of 2 saber squadrons, but with mechanized M. G. squadrons, first line transport and scout cars. Each brig. with one mechanized art. btry. and 1 R. E. field sqn.)

5 (infantry) divisions (in 2 corps), each having one inf. brig. capable of being embussed and incorporated with the mechanized "support," i.e., mortar companies, mechanized and M. G. Cos. and first-line transport.

Corps artillery, engineers, armored cars of the R. T. C. or cavalry for the use of either cav. or inf. divisions; all entirely mechanized.

Auxiliary and H. Q. services with transport all mechanized, and a reserve mobile force consisting of an armored car regiment; 2 cav. brigs. as above; mixed tank brig. consisting of H. Q. and signal section, 3 tank bns. comprising light, medium and close support tanks; 2 army field brigs. R. A.; a mechanized field co., R. E.; and protective and supply formations. The entire force capable of self-sustained action involving separation from the L. of C. for a mission up to a week's duration.

The author further assumes, that this expeditionary force will march 3-6 days and rest 1 day until it establishes contact with the enemy. Shortly after making contact the situation temporarily stabilizes. During this stabilization, which may last 3 weeks, mobile troops screen the force till the railhead can be moved up.

The author then pictures the resulting maintenance situation based upon authorized organization as laid down in F. S. R.

Unit mechanics with hand-tools and spares carried by the organization take care of all first-line supply and repair needs. They attempt none but running repairs; the extent of these depend largely upon the extent of supervision of experienced officers and N. C. O's. It emphasizes the necessity of training competent unit artificers to provide the reliefs for the wastage of war.

Second-line repairs consist of jobs requiring not more than 24 hours. They are carried out by divisional and corps workshops. These include two light aid detachments each, one of which is available for use of the mechanized infantry brigades. Divisional and corps workshops are set up in two echelons to provide continuous repair facilities. These echelons may be advanced by the "caterpillar" or "leap frog" system. The first seems to have the advantage of simplicity, of organization, the second appears better suited to assist rapidly advancing or retreating troops.

The third link in the repair chain is a stationary advanced ordnance workshop which takes care of repairs and overhauls too great to be handled by the mobile shops in the army areas.

The author summarizes the details which, in his opinion, should be put into administrative orders; guiding principles for locating workshops, and considerations of communications. The article concludes with three appendices: A. definitions; B. organization, time and space factors; and C. Diagram showing maintenance and repair installations in the field.

HUNGARY—*Magyar Katonai Szemle*,—August, 1931.
"Organization of the A. A. Defense of the Capital,"
by Capt. Joseph Bálint.

The constantly growing radius of action of airplanes

dictates the necessity of peace-time preparation and organization of an effective antiaircraft defense of the capital and other equally vital strategic centers of the country. The author makes an interesting comparison of the relative values for this purpose of the A. A. artillery and aviation.

The advantages of the A. A. artillery are:

1. *Instant readiness for action.* In contrast airplanes require 13-15 min. in daylight, and 26-28 min. at night, in addition to the time interval between alarm and take-off, to climb to a suitable attack altitude.

2. *Constant readiness for action.* Darkness and fog seriously interfere with pursuit aviation but do not affect the effectiveness of the A. A. artillery.

3. *Sustained power of action.* The number of daily flights of pursuit aviation is limited. This limit cannot be exceeded without rapid deterioration of personnel and materiel. It takes several thousands of rounds to wear out an A. A. gun. Besides, modern artillery equipment permits ready replacement of the worn-out liner.

4. *Constant observation.* Well organized A. A. artillery is prepared to transmit accurate data for effective fire against approaching hostile aircraft from established observation and listening posts 30-40 km. in advance of the gun positions. The air force depends upon the same source for its information.

5. *General view of the air situation.* Ground observation provides better means for estimating the air situation, hence A. A. artillery can render valuable assistance to pursuit aviation by indicating the location of hostile planes.

Aviation possesses the following advantages:

1. *Ability to obtain a decision.* A. A. artillery alone can seldom, if ever, compel an enemy to abandon his mission.

2. *Great mobility.* A. A. artillery is tied to the ground. Airplanes can pursue and strike hostile aviation beyond the range of the A. A. guns. Hence, while A. A. artillery is capable only of passive defense, aviation is capable of active defense.

The author advocates a barrage or belt of fire 20 km. wide and 6000 m. high to compel hostile aviation to run the gauntlet of the concentrated fire of 3-4 guns for every 12 km. of front. He emplaces his guns in batteries of threes forming an equilateral triangle, distance between guns about 4 km. The distance of the barrage from the city limits naturally depends upon the available materiel. Within this belt of fire the defensive mission passes to the air force. Ample maneuvering space must, therefore, be provided within the belt of fire. The center of gravity of the defensive plan depends upon the direction of the expected attack. Listening posts along an observation belt about 30 km. from the center of the defended zone, the author believes, will allow ample time for the alarm and preparation for action.

Smoke-screens are effective defensive agents. Airplanes as well as industrial smokestacks can be used for their release.

SOVIET RUSSIA.—*Voyna y Revolutcia*,—No. 7,— 1931.

"On Sovietization," by Pietrov.

An interesting discussion of the intriguing problem of sovietization of territories "liberated" by the Red Armies in a war of the future, and the proper methods of establishing the dictatorship of the proletariat. It is the bolshevik version of the law of military occupation of hostile territory. The author differentiates with subtle perspicacity between highly and moderately capitalistic states, dependencies, colonial, semicolonial and backward countries. In the case of capitalistic states the author proposes complete sequestration of all large property holdings, organization of all productive activities along communistic lines, distribution of a limited amount of farm land among the peasantry with collectivization of agriculture. In colonies, the author advocates war on feudalism, liberation of subject nationalities. In all cases, he urges close cooperation between the Red Army and the masses of workers and peasants of the "liberated" territory.

SPAIN.—*La Guerra y Su Preparación*,—September-October, 1931.

"The German Cavalry in the Roumanian Campaign, 1916," by Lieut. Col. Beigbeder, Military Attaché of Spain in Berlin.

Recent writings of General Brandt, former Inspector General of Cavalry of the German Army, have renewed general interest in the problems pertaining to cavalry and its modernization. General Brandt incidentally believes that the cavalry has lost much of its former

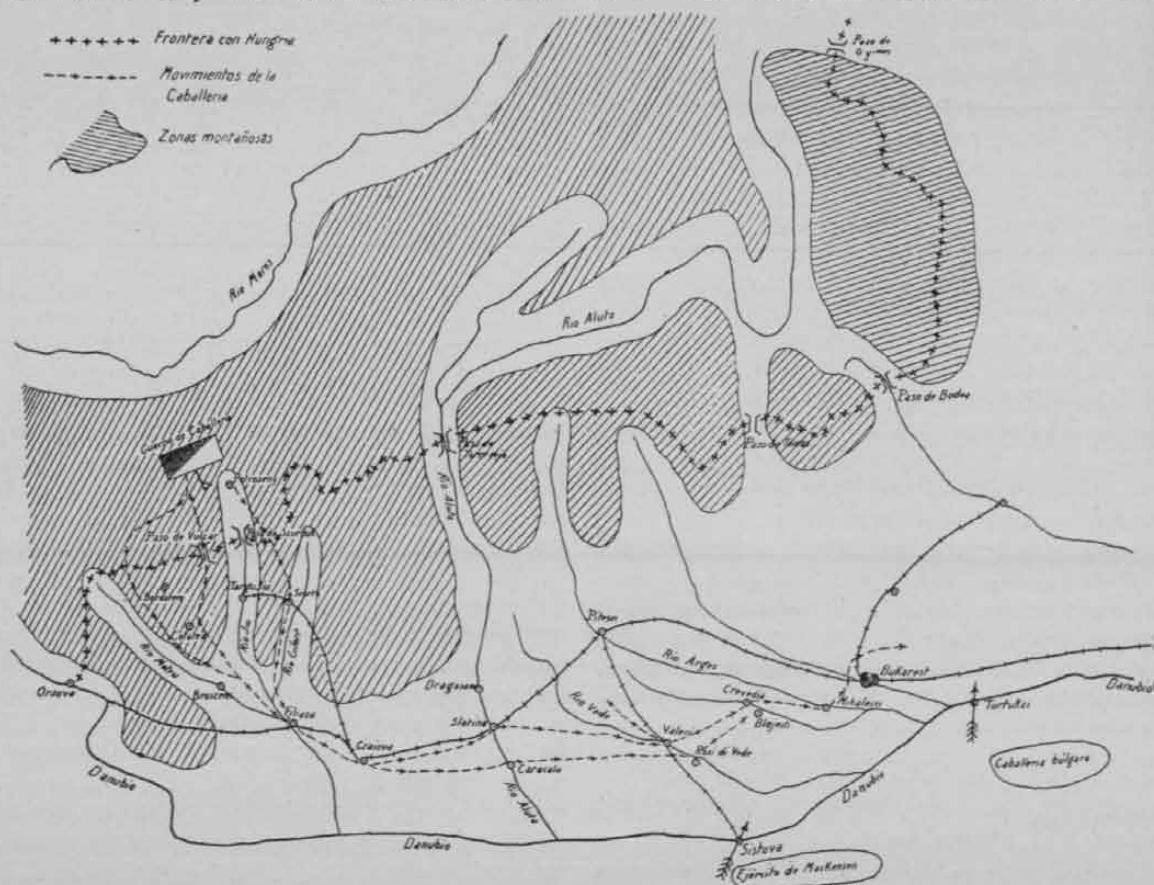
importance as an agent of reconnaissance, and that the essential mission of cavalry will henceforth consist of close cooperation with infantry. For this purpose cavalry will have to be employed in large masses.

The world war furnishes a most interesting, one might say classic example of the employment of cavalry which, to a certain extent, seems to confirm the views of General Brandt. The event occurred during the Roumanian campaign, in 1916.

The German efforts to invade the Roumanian lowlands by forcing the Carpathian passes of Gyimes, Bodza, Tömös and Vöröstorony (Torre Roja) failed. General Falkenhayn, in agreement with the Austro-Hungarian High Command, decided to launch his attack on his right flank in the vicinity of Vulcan Pass with the intention of executing a turning movement towards the southeast in the direction of Bucharest. The first attempt, executed in October, 1916, failed before the 6th and 7th Cavalry Divisions had an opportunity to act. Subsequently these divisions were organized as a cavalry corps under General von Schmettow.

The German offensive was launched on November 11th. During the first four days of the attack the Germans advanced slowly but steadily, occupying the heights south of Szurdok Pass on the 14th. The bulk of the cavalry corps remained in reserve north of the Carpathian crest with one regiment, the 4th Uhlans, detached in position near the pass named with reconnaissance and demolition missions.

On November 14th, the German High Command received information of a general retreat of the Rou-



manians beyond Targu-Jiu towards the south and southeast. The 4th Uhlans, observing the Roumanian retreat, anticipated a general pursuit, proceeded to Scorta in order to cut the railroad to Graiova. General Kuhne's corps, reinforced by one division which had just detrained at Petrozsény, was directed to advance on Dragosani. The cavalry corps was ordered to support this movement, covering Kuhne's right flank, and to envelop elements of the Roumanian army which may offer resistance to Kuhne's advance. The orders designated Filiasu as the cavalry objective. Subsequent events proved that the German orders for the pursuit were premature. They were actually based upon erroneous reports.

The cavalry corps crossed the Transylvanian Alps through Szurduk Pass and upon reaching Targu-Jiu encountered the Roumanians in a strong position along the heights between the rivers Jiu and Gilorta. The 6th Cavalry Division engaged in a stiff battle southeast of Targu-Jiu, but the Roumanians offered stubborn resistance. On the following day, while the battle still continued along the divide, the German cavalry, believing that it had enveloped the hostile left flank, advanced resolutely until it ran headlong into the Roumanian main line of resistance, north of Cetatea. Late in the afternoon, the entire cavalry corps found itself engaged in one of the hardest fought battles of the campaign. A severe snowstorm and the extremely difficult character of the terrain added to the hardships of the battle. On the left of the cavalry corps, the Bavarian 11th Division and the 4th Uhlans endeavored to contain a numerically superior hostile force.

The 6th Cavalry Division, upon being replaced by infantry, retired to Targu-Jiu.

On the following day, November 17th, the Austro-German forces renewed the battle with unabated vigor. The cavalry extended its enveloping movement farther to the west, while Kuhne's corps directed its attack against the Roumanian right. The 7th Cavalry Division attacked the Roumanian positions along the heights north of Cetatea but failed to gain ground. The 6th Cavalry Division, on the right of the 7th, advanced along the valley of the Motru, and closed with the enemy west of Cetatea. After a brief dismounted action it dislodged the Roumanians and promptly launched the pursuit. At the same time, the 41st Division made appreciable gains on the Roumanian right flank. Under this double strain the Roumanians decided to evacuate Cetatea. Farther to the east, the Bavarian 2d Division, reinforced by the 4th Uhlans, dislodged the enemy from his strong position along the Gilort ravine. The 6th Cavalry Division reached Broscani at sunset. Bad roads and Roumanian demolitions considerably retarded the advance of the cavalry.

On November 18th, the cavalry began its advance on Filiasu and Craiova. Reconnaissance detachments, well in advance, reached the valley of the Aluta south of Slatina while pioneers destroyed the Craiova-Slatina-Pitesci railroad line. These developments resulted in the complete isolation of Roumanian forces near Orsova. They attacked the German-Austrian forces in the rear on the 19th and 20th in an attempt to cut

their way through. It was necessary to detach a portion of the 7th Cavalry Division to cover the rear of the pursuing army.

A reconnaissance troop of the 2d Dragoons entered Craiova on November 21st, the advance guard arrived there on the 22d, and the main body of the corps on the following day. At the same time the cavalry secured the bridges at Caracul and Slatina. After crossing the Vede river, the cavalry corps continued the pursuit toward the northeast. On November 30th, it encountered a Roumanian force with artillery near Blejesti. Further advance was impossible until infantry reinforcements came up. On December 1st, we find Schmettow's cavalry corps beyond Crevedia. Here the situation changed completely. Mackensen's army had crossed the Danube at Sistova and was advancing northward seeking to effect a junction with the German Ninth Army. The Roumanians reinforced by Russians opposed this movement. There still was a gap of 40 km. between Mackensen's left and the right of the German Ninth Army. The Roumanians planned to attack and dispose of Mackensen separately. By some chance a copy of the Roumanian attack order fell into German hands and Field Marshal Mackensen, who had assumed command over all Austro-German forces operating in Roumania, promptly decided upon a simultaneous attack with all his forces on December 2nd. He assigned to the Cavalry Corps the mission of covering the interval which separated his two armies.

On December 2nd, the 7th Cavalry Division established two bridgeheads across the Arges, west of Bucharest. On the following day, the 6th Cavalry Division and the Bavarian 11th Division fought a victorious battle at Mihalesci. On December 4th, the Cavalry Corps received orders to move to the north, passing around Bucharest and to cut the railroad leading to the northeast. At the same time the cavalry was to effect a junction with the Bulgarian cavalry advancing from Turtukai with the mission to cut communications east of the Roumanian capital.

On December 6th, the 7th Cavalry Division, supported by infantry, took the Roumanian defenses northwest of Bucharest, and shortly afterwards the Austro-German forces entered the capital.

The author makes the following deductions:

1. The operations were initiated with the definite idea of employing cavalry.

2. The premature action of Schmettow's corps as a result of erroneous information indicates the difficulty of determining the precise moment for the exploitation of a victory. Frequently failure is due to the erroneous or premature decision of the commander in chief rather than to the cavalry employed.

3. During the pursuit, from November 18th to December 5th, the cavalry corps covered daily an average of 23 miles. Considering the size of the command this was indeed a remarkable performance. It must also be remembered that all rivers intersected the direction of march, and that on two days of the pursuit a part of the cavalry had to engage in rear guard actions against a Roumanian detachment cut off by these operations in the vicinity of Orsova.

Reading List for Coast Artillery Officers

THE COAST ARTILLERY JOURNAL receives numerous requests for "Officers' Reading Lists," "Books recommended for a military library," etc. In Bulletin No. 44, W. D., August 24, 1928, the War Department published a list of books for general reading recommended for the military student. This reading course extends over a number of years and was divided into periods, each period covering an average number of years roughly corresponding to the grade of the officer. To comply with the requests received the JOURNAL republishes the books listed in this bulletin and, through the assistance and cooperation of Major C. E. Hocker, Librarian, Coast Artillery School, has added thereto certain books which have been published since Bulletin No. 44 was issued or which are believed to be worth reading because of their particular application to the Coast Artillery.

FIRST PERIOD (Average Four Years)

Alexander, E. P. Military Memoirs of a Confederate.
Chambrun, J. A. deP. and Marenches, C. de. The American Army in the European Conflict. *Out of print.*
Churchill, W. L. S., The River War. (An historical account of the reconquest of the Sudan.) 2 v. *Out of Print.*
Creasy, E. S. The Fifteen Decisive Battles of the World, from Marathon to Waterloo.
Dodge, T. A. A Bird's-Eye View of our Civil War.
Dodge, T. A. Napoleon. (A short history of the art of war.) 4 v.
Fiske, J. The American Revolution. 2 v.
Fiske, J. The Beginnings of New England.
Fiske, J. The Discovery of America. 2 v.
Fiske, J. The Dutch and Quaker Colonies in America. 2 v.
Fiske, J. New France and New England.
Fiske, J. Old Virginia and Her Neighbours. 2 v.
Ganoe, W. A. The History of the United States Army.
Hayes, C. J. H. A Brief History of the Great War.
Henderson, G. F. R. Stonewall Jackson and the American Civil War. 2 v.
Marbot, J. B. A. M. de. The Memoirs of Baron de Marbot. 2 v.
Maurice, F. B. Robert E. Lee, the Soldier.
Parkman, F. Count Frontenac and New France under Louis XIV.
Parkman, F. A Half-Century of Conflict. 2 v.
Parkman, F. The Jesuits in North America in the Seventeenth Century.
Parkman, F. LaSalle and the Discovery of the Great West.
Parkman, F. Montcalm and Wolfe. 2 v.
Parkman, F. The Old Regime in Canada.
Parkman, F. Pioneers of France in the New World.
Ropes, J. C., and Livermore, W. R. The Story of the Civil War. 4 v. *Out of Print.*
Steele, M. F. American Campaigns. 2 v. (Text and Atlas.)
Wells, H. G. The Outline of History. 2 v.

SECOND PERIOD (Average Five Years)

Ardant du Picq, C. J. J. J. Battle Studies; Ancient and Modern Battle.
Beard, C. A. American Government and Politics.
Bowers, C. G. The Party Battles of the Jackson Period.
Buchan, J. A History of the Great War. 4 v.
Channing, E. A History of the United States. 6 v.
D'Aguiar, G. C. Napoleon's Maxims of War, with Notes by General Burnod.
Dodge, T. A. Alexander.
Dodge, T. A. Caesar.
Dodge, T. A. Gustavus Adolphus. *Out of Print.*
Dodge, T. A. Hannibal.
Fiske, J. The Critical Period of American History, 1783-1789.

Ford, W. C. A Cycle of Adams Letters, 1861-1865. 2 v.
Fournier, A. Napoleon I. 2 v.
Green, J. R. A Short History of the English People.
Grey, E. Twenty-five Years, 1892-1916. 2 v.
Hamley, E. B. The Operations of War.
Hart, B. H. L. (Liddell Hart.) A Greater than Napoleon.
Humphreys, A. A. The Virginia Campaign of '64 and '65.
Kitchin, G. W. A History of France. 3 v.
Lodge, H. C. George Washington. 2 v.
Parton, J. Life and Times of Benjamin Franklin. 2 v. *Out of Print.*
Parton, J. Life of Andrew Jackson. 3 v. *Out of Print.*
Paxson, F. L. History of the American Frontier, 1763-1893.
Pershing, J. J. Final Report of General J. J. Pershing.
Robertson, W. R. From Private to Field Marshal.
Sherman, W. T. Memoirs of General William T. Sherman. 2 v.
Smith, J. H. The War with Mexico. 2 v.
Upton, E. The Military Policy of the United States.
Worcester, D. C. The Philippines, Past and Present.
Young, N. The Life of Frederick the Great. *Out of Print.*

THIRD PERIOD (Average Four Years)

Agassiz, C. R. Meade's Headquarters, 1863-65. *Out of Print.*
Arthur, G. C. A. Life of Lord Kitchener. 3 v.
Beard, C. A., and M. R. The Rise of American Civilization. 2 v.
Bryce, J. The Holy Roman Empire.
Callwell, C. E. The Dardanelles.
Durant, W. J. The Story of Philosophy.
Foch, F. The Principles of War. *Out of Print.*
Grant, U. S. Personal Memoirs of U. S. Grant. 2 v.
Greene, F. V. The Russian Army and Its Campaigns in Turkey in 1877-1878. 1 v. and atlas. *Out of Print.*
Hamley, E. B. The War in Crimea. *Out of Print.*
Hart, A. B. The Monroe Doctrine. *Out of Print.*
Ironside, E. Tannenberg.
Johnson, W. F. America's Foreign Relations. 2 v.
Kluck, A. von. The March on Paris and the Battle of the Marne.
* Mahan, A. T. The Influence of Sea Power upon History, 1660-1783.
Maurice, F. B. An Aide-de-Camp of Lee.
Maurice, F. B. Statesmen and Soldiers of the Civil War.
Moltke, H. K. B. von. The Franco-German War of 1870-71. *Out of Print.*
Parton, J. Life of Voltaire. 2 v. *Out of Print.*
Priestley, H. I. The Mexican Nation.
Repington, C. A. C. The War in the Far East, 1904-1905, by the Military Correspondent of the Times.
Rhodes, J. F. History of the United States from the Compromise of 1850. 9 v.
* Sherman, W. C. Air Warfare.
Stephenson, N. W. Lincoln; an Account of His Personal Life. *Out of Print.*
Townshend, C. V. F. My Campaign in Mesopotamia. 2 v.
* Tretyakov, N. A. My Experiences at Nan Shan and Port Arthur, 1911.
Voltaire, F. M. A. de. History of Charles XII, King of Sweden.
Wolsley, G. J. The Life of John Churchill, Duke of Marlborough. 2 v.

FOURTH PERIOD (Average Four Years)

Bernhardi, F. A. J. von. The War of the Future in the Light of the Lessons of the World War.
Clausewitz, K. von. On War.
* Frothingham, T. G. The Naval History of the World War. 3 v.
Goltz, C. F. von der. The Conduct of War. *Out of Print.*
Goltz, C. F. von der. The Nation in Arms. *Out of Print.*
Guedalla, P. Wellington.
Hindenburg, P. von. Out of My Life. 2 v. *Out of Print.*
Hockett, H. C. Political and Social History of the United States, 1492-1828.
Jomini, A. H. Life of Napoleon. 5 v. and Atlas. *Out of Print.*
Kawakami, K. K. Japan's Pacific Policy. *Out of Print.*

- Kawakami, K. K. What Japan Thinks. *Out of Print.*
 Le Bon, G. The Crowd, A Study of the Popular Mind.
 * Liman von Sanders, O. V. K. Five Years in Turkey.
 Ludendorff, E. von. The General Staff and Its Problems. 2 v.
 Ludendorff, E. von. Ludendorff's Own Story, August, 1914-November, 1918. 2 v. *Out of Print.*
 * Mahan, A. T. The Influence of Sea Power Upon the French Revolution and Empire, 1793-1812. 2 v.
 * Mahan, A. T. Sea Power in Its Relation to the War of 1812. 2 v.
 Napier, W. F. P. History of the War in the Peninsula and in the South of France from the Year 1807 to the Year 1814. 6 v.
 Pratt, E. A. The Rise of Rail-Power in War and Conquest. *Out of Print.*
 Robertson, W. R. Soldiers and Statesmen, 1914-1918. 2 v.
 Schlesinger, A. M. Political and Social History of the United States, 1829-1925.
 Tirpitz, A. P. F. von. My Memoirs. 2 v. *Out of Print.*
 Yorck von Wartenburg, H. L. D. M. Napoleon as a General. 2 v.

FIFTH PERIOD (Average Seven Years)

- Adams, H. (B.) History of the United States, 1801-1817. 9 v.
 Aston, G. G. (Ed.) The Study of War for Statesmen and Citizens.
 Beveridge, A. J. The Life of John Marshall. 4 v.
 Bryce, J. The American Commonwealth. 2 v.
 Bryce, J. Modern Democracies. 2 v.
 Buckle, H. T. Introduction to the History of Civilization in England.
 Churchill, W. L. S. The World Crisis. 6 v.
 Gibbon, E. The History of the Decline and Fall of the Roman Empire. 6 v.
 Gilbert, B. Y. What's Wrong With China.
 Gooch, G. P. History of Modern Europe.
 Hendrick, B. J. The Age of Big Business. (Vol. 39 of Chronicles of America Series.)
 Hill, H. C. Roosevelt and the Caribbean.
 James, H. G. and Martin, P. A. The Republics of Latin America.
 Latane, J. H. A History of American Foreign Policy.
 Lodge, H. C. (Ed.) The Federalist. (Madison, Jay, Hamilton, et al.) 2 v.
 Macaulay, T. B. The History of England. 5 v.
 McElroy, R. McN. Grover Cleveland, the Man and the Statesman. 2 v. *Out of Print.*
 Madelin, L. The French Revolution.
 Moody, J. The Masters of Capital. (Vol. 41 of Chronicles of America Series.)
 Moody, J. The Railroad Builders. (Vol. 38 of Chronicles of America Series.)
 Moon, P. T. Imperialism and World Politics.
 Morse, H. B. The International Relations of the Chinese Empire (1910-1918). 3 v.
 Motley, J. L. The Rise of the Dutch Republic. 3 v.
 Munre, D. C., and Sontag, R. J. The Middle Ages, 395-1500.
 Orth, S. P. The Armies of Labor. (Vol. 40 of Chronicles of America Series.)
 Orth, S. P. The Boss and the Machine. (Vol. 43 of Chronicles of America Series.)
 Paleologue, G. M. Cavour. (Translated by I. F. D. Morrow and M. M. Morrow.)
 Pares, B. A History of Russia.
 Porter, R. P. Japan, the rise of a Modern Power.
 Rippy, J. F. Latin America in World Politics.
 Rippy, J. F. The United States and Mexico.
 Robertson, C. G. Bismarck. *Out of Print.*
 Shepherd, W. R. The Hispanic Nations of the New World. (Vol. 50 of Chronicles of America Series.)
 Siegfried, A. America Comes of Age.
 Skelton, O. D. The Canadian Dominion. (Vol. 49 of Chronicles of America Series.)
 Stewart, O. (W.) The Strategy and Tactics of Air Fighting.
 Thompson, H. The Age of Invention. (Vol. 37 of Chronicles of America Series.)
 Thompson, W. The Mexican Mind. *Out of Print.*

- Thompson, H. The New South. (Vol. 42 of Chronicles of America Series.)
 Ugarte, M. The Destiny of a Continent.
 * Note—Of special interest to Coast Artillery.

Supplemental General Reading List

- At the risk of publishing a reading list so long that it will lose its value the following have been selected from a recent reading list published near the end of 1931 by the War Department. It includes recommended books published since Bulletin 44, 1928, was issued.
 Dodge—Great Captains.
 Fay—Benjamin Franklin.
 Fries and West—Chemical Warfare.
 Frothingham—A Guide to Military History of the World War.
 Fuller—The Generalship of U. S. Grant.
 Graves—America's Siberian Adventure.
 Hagedorn—Leonard Wood.
 Hagood—Service of Supply.
 Hart—The Real War, 1914-1918.
 Liggett—A. E. F.
 Ludwig—Napoleon.
 Mitchell—Outlines of the World's Military History.
 Pershing—My Experiences in the World War.
 —Officers' Guide.
 Robinson—Fundamentals of Military Strategy.
 Winthrop—Military Law.

Supplementary Reading List for Coast Artillery

- Arthur—History of Fort Monroe.
 Ashmead-Bartlett, E. Port Arthur, The Siege and Capitulation (1906). *Out of Print.*
 Ashmore, E. B. Air Defence (1929).
 Aspinall-Oglander, C. F. Official History of the Great War. Military Operations: Gallipoli. (British Official History.)
 Bacon, R. H. S. The Dover Patrol, 1915-1917 (1919). 2 v.
 Bywater, H. C. Sea-power in the Pacific (1921).
 Carpenter, A. F. B. The Blocking of Zeebrugge (1922).
 Corbett, J. S., and Newbolt, H. J. History of the Great War. Naval Operations (1920-1931). (British Official History.) 5 v. with Atlases.
 Hamilton, I. S. M. Gallipoli Diary (1918-20). 2 v.
 Hase, G. von. Kiel and Jutland (Tr. 1922).
 Jellicoe, J. R. J. The Grand Fleet, 1914-16 (1919).
 Jones, J. The Fall of Tsingtau (1915).
 Lehmann, E. A., and Mingos, H. The Zeppelins (1927).
 Mahan, A. T. Lessons of the War with Spain (1899). *Out of Print.*
 Mahan, A. T. Naval Strategy (1911).
 Martin. The Selection and Defense of Naval Bases (1911). Pub. in Journal of the U. S. Artillery, Jan. and July, 1911. *Out of Print.*
 Parker, F. A. The Battle of Mobile Bay (1878). *Out of Print.*
 Raleigh, W., and Jones, H. A. The War in the Air (1922-1931). (British Official History.) In progress. 3 v.
 Rawlinson, A. The Defense of London (1923).
 Scheer, R. von. Germany's High Sea Fleet in the World War (Tr. 1920). *Out of Print.*
 Speight—Air Power and Cities.
 Wilson, H. W. Battleships in action (1926). 2 v.
 —Tactics and Technique of Coast Artillery.

It is probable that the foregoing lists are incomplete and that many books of merit have been omitted. The JOURNAL would appreciate any comments and suggestions concerning additions or omissions.

The COAST ARTILLERY JOURNAL will purchase any of the above books in print for members of the Coast Artillery Association, deducting member's discount from the retail list price.

NATIONAL GUARD NOTES

Entries on Efficiency Reports

UNDER paragraph 4 of the Officers' Efficiency Report the reporting officer is required to consider the officer reported upon "in comparison with others of his grade." With respect to officers of the National Guard there has been a question as to whether they should be compared with officers of like grade in the Regular Army or whether the comparison should be confined to officers of the National Guard component.

The Chief of the Militia Bureau has had this question put up to him and the following decision has been rendered:

"In the preparation of efficiency reports, commanding officers of National Guard units should not compare their officers with Regular Army officers of the same grade, as age, military education, and experience are generally not comparable. All National Guard officers should be compared with officers of the same grade and length of service in the National Guard, having in mind, as far as the experience of the rating officer permits, a standard of training and general efficiency attained by the best National Guard officers of the same grade, and having also constantly in mind the standard of combat efficiency essential to success in battle."

Bakers and Cooks School Details

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

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

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

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

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

Promotion of National Guardsmen

ONE of the outstanding provisions of the new revision of Army Regulations 140-10 insofar as the National Guard is concerned is that which authorizes the normal promotion of warrant officers and enlisted men of the National Guard who hold appointments in the Officers' Reserve Corps. Heretofore the guardsmen in this category were not considered eligible for promotion to a higher grade in the Reserve Corps, and as a consequence many desirable men were deterred from enlisting in the National Guard.

In these cases the soldier must meet all of the requirements imposed upon them by the provisions of AR 140-5 with respect to professional and personal qualifications and time served in grade. This latter is three years as second lieutenant, four years as first lieutenant and five years as captain. The requirement of 14 days' active duty training as a Reserve Officer has been waived due to the fact that it is considered that service in the National Guard more than meets the requirement.

In order to get his promotion the soldier must, in addition, have a certificate of capacity indicating his professional qualifications. This may be obtained through the completion of specified subcourses of the Army Extension Courses, which have now been coordinated completely with the subjects included in the promotion examinations. There must be a vacancy in the Organized Reserve under the Corps Area peacetime procurement objective, except in the promotion from second to first lieutenant.

The new arrangement makes service in the National Guard much more attractive to members of the Officers' Reserve Corps. It gives them a definite status and insures their opportunities if and when they are eligible for it. The only drawback that can be visualized is that in case of mobilization the National Guardsman would be relieved of his status as such and be called to service under his commission in the Reserve Corps, and if it happened that he is not ear-marked for a war-time vacancy in the National Guard he would be lost to that component and an untrained man would have to replace him in the ranks.

Waivers of Age

PARAGRAPH 23, National Guard Regulations 20, sets forth the limitations as to the age of persons seeking appointment and federal recognition in the National Guard. The limiting ages for original appointments are second lieutenant, 32 years; first lieutenant, 36 years; captain, 40 years; major, 45 years; lieutenant colonel, 50 years; colonel, 55 years; and brigadier general, 62 years.

The Militia Bureau has always realized that a strict

adherence to these age limits might, in individual cases, be disadvantageous to the interests of the National Guard, and has always taken a liberal attitude in the matter in the granting of waivers, where the applicant possesses outstanding qualifications and it can be shown that he will be of exceptional value in the unit or organization in which an appointment is sought.

The factors included in the above are:

1. Special technical or other valuable training which would be of value to the National Guard.
2. Prominent standing in the community which would serve to promote the interests of the unit or organization. This is especially applicable in the organization of a new unit to replace another which has gone by the boards for one reason or another.
3. Extensive service during the World War.
4. Special experience gained in the ranks of the National Guard. This is especially applicable to non-commissioned officers who have attained the higher grades in the National Guard and are above the age limits prescribed. To deny them the opportunity for promotion to the commissioned grades would be to remove the incentive for further service in the National Guard.
5. The lack of available qualified applicants for the position which is open.

In general, it is the policy of the Militia Bureau to extend federal recognition only to vigorous young men in the junior grades of the commissioned officers of the National Guard, and waivers for age can only be granted in those grades when it is clearly shown that a departure would manifestly be for the best interests of the National Guard and conform to the reasons for waivers as set forth above.

Enlisting Men for Camp

NEVER in the entire history of the National Guard was there such a high attendance at the field training camps as that of last summer. Whole regiments showed up at camp with only a corporal's guard missing from their ranks.

While this splendid record may be partially attributed to the general unemployment situation, that is not responsible for all of it. We are getting a better class of men in the National Guard—men who are in the game for the love of it and who are willing to devote their leisure time to doing something useful for themselves and for their country. They are in the National Guard to make a place for themselves in it and realize that attendance at armory drill is one of the necessary steps towards that goal.

The Militia Bureau budget contemplates that about 86 per cent of the allocated strength of the National Guard will attend the field training camps. The attendance last summer was well over 90 per cent and this places a heavy strain on the purse strings which are already stretched to the breaking point.

It is a well-known fact that the old-time idea of enlisting a lot of men just before camp prevails in a number of outfits. It is also a well-known fact that

many of the men so enlisted leave the National Guard as soon as the camp period is over and really render little or no service to the State or to the Nation. These men have had only a limited amount of armory drill training and as a consequence they have to be assembled into a rookie squad while at camp because they are not ready to go ahead with the work included in the regular camp training schedule. Thus a great deal of the time of selected officers and noncommissioned officers must be devoted to them—time that could be more profitably be given over to more important activities.

Many of these recruits are in the service only for the board and lodging they are to get during the camp and have no intention of rendering any further service.

In view of all these facts, the question arises as to whether or not it is worthwhile enlisting such men in a unit. There is a wealth of quality material for the ranks of the National Guard and the unit commander who is up and doing will seek it out and get it into his outfit. He will not fill up his company with a lot of men who are dead wood and who he will have to rid himself of shortly after camp is over.

Administrative Pay for State Detachment

ADMINISTRATIVE function pay is not authorized for the officer in charge of the State detachment. This organization is provided in the National Guard organization as an aid to the State authorities in handling the affairs of the National Guard and for specific purposes:

1. To provide officers and enlisted men for administrative, sanitary, supply, and transportation purposes for the National Guard before and after the organization of the higher tactical units has been completed.
2. To provide administrative, sanitary, supply, and transportation personnel for mobilization and recruiting purposes for the National Guard in Federal service.
3. To provide administrative, sanitary, supply, and transportation personnel for camps of instruction held under section 94, National Defense Act, except when such camps are of a complete higher tactical unit comprising a staff for administration, sanitation, supply, and transportation.
4. For training National Guard officers and enlisted men in time of peace in duties of administration, sanitation, supply, and transportation, or in the technical branches.

The Chief of the Militia Bureau has repeatedly held that the detachment cannot be considered as an "organization" in the sense of being a company or similar unit, and is merely a detachment having only such organization as may be given to it locally by the State authorities to which it belongs. He has further held that there are no administrative functions in connection with the detachment which would make it advisable or which would warrant putting it in a class with the tactical units of the National Guard, which are all

organized in accordance with approved tables of organization and equipped as provided for in standard equipment tables.

Based upon the above principles administrative pay for an officer in charge of a State detachment has been denied and the same application must be made throughout the National Guard.

Unit Target Ranges

A CAPTAIN of a National Guard company down in Virginia wanted a home town target range for his outfit. Regular procedure was too slow for him, so he went ahead with the project and expended several hundred dollars of his own funds on it. This done, he then made a claim for reimbursement from Militia Bureau funds.

This could not be done. The expenditure of funds by any one on a construction project prior to its approval by the Secretary of War is not legal and the only way a reimbursement could be made is through a special act of Congress, authorizing it and making the funds available for payment. Anyone who has had the experience of engineering such a measure through the legislative maze will appreciate at once the pitfalls and rough places to be encountered.

There is a prescribed procedure for effecting government construction and there are no short cuts in it. Those who spend private or organizational funds on such projects have little chance for recovering them. The subject is covered in paragraph 2d, NGR 56 and in paragraphs 24 and 55b, NGR 75. These references leave no doubt as to the intent of the law and regulations based upon it.

Officers who have unit target range projects on hand will do well to take the orthodox route laid down in NGR 78. It may be a little longer, but there is no crack-up at the end of it.

Ammunition Identification

IN the course of their inspections State Ordnance officers find quantities of caliber .30 ammunition which has been removed from the original containers. This is especially the case with respect to machine gun units which return to home stations from the National Guard field training camps with a lot of loose or belt-filled ammunition. Such practice destroys its identity and when the Ordnance Department declares a certain lot number unsafe to fire, all of this loose ammunition must be included in that which is condemned.

As a consequence, the National Guard loses much ammunition that might be available for target practice.

The remedy rests in the hands of unit commanders. Along towards the conclusion of range and combat firing precautions should be taken to prevent removal of ammunition from the original containers in excess of that which is to be fired during the season. This will preserve the identity of that which remains on hand

and serve to prevent the condemnation of many rounds which would otherwise remain available for next year's target practice.

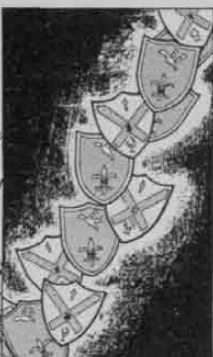
Good Publicity

THIS is an example of effective National Guard publicity put on by the units at Jacksonville, Florida, in connection with the annual armory inspection this year.

There was "open house" at the armory during the afternoon and evening. The mayor of the city issued a proclamation setting aside the day as "National Guard Day" and extended an invitation to the citizens to visit the armory with a view to witnessing the inspection ceremonies, seeing the exhibits, and getting better acquainted with the citizen soldiery of the community.

The newspapers gave liberally of their space, both in the news and editorial columns, to the affair. They published the program of events in full and expanded upon the opportunities of service in the National Guard. They included the history of the National Guard units and organizations and embodied in it a roster of the officers. They ran an article which set forth the Federal contributions to the support of the National Guard in the city and showed that the total amounted to a payroll of more than \$100,000 a year. In doing this, they compared the National Guard to local industries and showed how many of them it would take to equal a payroll of a like amount.

NATIONAL GUARD DAY



Colonel Chester H. Wilson...the 265th Coast Artillery Corps, commanded by Lt. Col. M. R. Woodward...and the crack 124th Motor Transport Company, 31st Division, commanded by Lt. Maxwell C. Snyder. Each resident of Jacksonville has good reason to be proud of the achievements of the Jacksonville Guard troops. And you who turn out for the Armory inspection from 3 to 10 p. m. tomorrow and the parade tomorrow night will have still greater reason for pride. This first annual National Guard Day will be a revelation to those who attend it...a revelation in the thoroughness of Guard training and equipment and in the high standards of manhood maintained by Guard personnel. Incidentally we might mention that, like other wide-awake local organizations, the Jacksonville Guard Post does business with this friendly bank.

FLORIDA



NATIONAL BANK

"A FINANCIAL STRONGHOLD"

OUR DEPARTMENTS: General Banking, Trust, Bond, Savings, Ladies' Collection, Safe-Deposit

COR. LAURA & FORSYTH STS.

COAST ARTILLERY BOARD NOTES

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

Projects Completed During January-February, 1932

No. 566-D. Experimental Gas Proofing Installation, Battery DeRussy.—The gas proofing system for heavy fixed seacoast guns was installed at Battery DeRussy, Fort Monroe, Virginia, and tested by special drill and firings to determine its value. During drill and firings a tear gas concentration was placed on the battery. As a result of these tests it was recommended that this type of installation be adopted as standard but that certain minor changes be made in the system.

No. 827. Temperature Tests of Height Finders.—A series of tests were run to determine what effect the temperature of the air had on the readings of stereoscopic range and height finders. It was found that the effect was negligible and need not be considered by troops equipped with such instruments.

No. 863. Test of Army Hoisting Vessel, H-1.—The Army Hoisting Vessel, H-1, was a boat obtained for the Air Corps as a rescue vessel but found unsuitable for that purpose. It was turned over to the Coast Artillery for test to determine its suitability for use as a distribution box boat in mine planting. It was tested during the planting of a group of nineteen mines and was found unsuited for mine work.

No. 865. Test of Buzzers, Type TG-5-T1.—The buzzers were supplied as a possible replacement for three different types now in use by the service. These buzzers were tested by one of the regiments at Fort Monroe, Virginia, by the Artillery Engineer at Fort Monroe and by the Coast Artillery Board. The buzzers were suitable replacement for the telephone set, Type EE-76, the service buzzer, Type EE-63, and buzzer phone, Type EE-1-A. It was further recommended that a number of these buzzers be turned over to anti-aircraft artillery gun and searchlight batteries to determine whether or not they could be used to replace some of the telephone lines used by these units.

No. 866. Test of Field Service Folding Tables.—Two field service folding tables of special design were tested by the Coast Artillery Board to determine whether or not they were superior to the type at present issued. These tables were given a service test and were found superior to the present issue type, but some minor modifications in these tables were recommended.

No. 870-A. Aerial Position Finder.—Considerable work has been done recently towards solving the prob-

lem of aerial observation for seacoast artillery. Various designs of instruments for use in the observing plane have been submitted for test. The present design was made up by Frankford Arsenal and was tested in conjunction with the Air Corps at Langley Field, Virginia. In order to determine the further usefulness of this instrument it was shipped to the Hawaiian Department to be tested in connection with the long range firings to be held at that place.

No. 875. Automatic Sponging of Seacoast Cannon with Liquid Carbon Dioxide.—Recommended that this subject be referred to the Ordnance Department for test at Aberdeen Proving Ground.

No. 877. Test of Electric Primer Testing Set.—An excessively large number of misfires with electric primers has occurred throughout the service. The Coast Artillery Board in a previous project made a study of the causes of misfires and tested, among other things, a large number of primers. In general, it was found that, whereas, some misfires may have been caused by faulty primers, most of them could be laid to the firing mechanism. To eliminate entirely the primer as a cause of misfire an electric primer testing set was designed by the Ordnance Department and submitted for test. By this set the resistance of the primer may be determined and those accepted which have a resistance between .5 ohms and .3 ohms. A number of primers were tested and all those which passed the acceptance test of the set fired. It was recommended that this set be standardized.

No. 878. Test of Telephone Set, Type EE-82.—For use with tractor drawn artillery. This telephone set was developed primarily for the use of gun batteries of anti-aircraft artillery, but the issue of electrical data transmission systems made such a telephone set unnecessary. These sets were then tested to determine their usefulness with 155-mm. gun units. As a result of the test the Coast Artillery Board recommended that the Type EE-82 telephone sets now on hand be supplied anti-aircraft gun batteries as an emergency system; that they be not issued to 155-mm. gun units, but that the sponge rubber ear piece similar to the type used in these telephones be supplied for incorporation in the field telephone headsets now used by 155-mm. gun units.

No. 879. Fire Control System for 155-mm. Guns.—The Coast Artillery Board has conducted two firings with the 155-mm. guns to determine, among other

things, the type of fire control to be supplied these and other rapid fire guns. As a result of these tests the Coast Artillery Board made the following recommendations:

- a. The 6-meter stereoscopic range finder as laid down in Project No. 609 be constructed for test.
- b. A simple director be developed which will:
 - (1) Give a prediction in range and azimuth.
 - (2) Permit easy application of adjustment corrections.
 - (3) Permit the application of an initial percentage range correction.
 - (4) Be rugged and simple in operation.
 - (5) Be capable of quantity production in emergency.
 - (6) Include no provisions for ballistic corrections.
 - (7) Include provisions for a parallax correction up to 1000 yards.
- c. Fuze data be included in the pilot model.
- d. The Antiaircraft B. C. telescope be tested to determine the advisability of standardizing this instrument for use with all secondary armament.

No. 880. Machine Gun Data Computer (Hohen-thal).—Recommended that no further action be taken on this project.

No. 883. Test of Continuous Fuze Setter T-7.—Considerable trouble has been experienced with the continuous fuze setter M-1 for antiaircraft artillery because when the round is held during the setting operation an incorrect setting is made and a consequent erratic burst results. The T-7 fuze setter was designed so that an incorrect setting would not result should the round be seized by the relayer before the fuze is completely set. This fuze setter was given a service test, which resulted in certain minor modifications being recommended. It did, however, function satisfactorily and as a result the Coast Artillery Board recommended its standardization and that this type replace the old type now supplied antiaircraft units.

No. 888. Test of Height Finders Bausch & Lomb T-9, and O. P. L. T-15.—These height finders are stereoscopic height finders for use by antiaircraft artillery, one of which is made by Bausch & Lomb on the Zeiss model, and the other is a sectionalized height finder made by the Lavallois Company of France. Both are 4-meter base stereoscopic instruments. They were given extended tests at Aberdeen Proving Ground. Not much difference in accuracy was found between the two instruments. The Coast Artillery Board recommended that both instruments be considered suitable for issue to troops and that certain desirable small features be incorporated in each. The Board further recommended that the development of a single-station and two-station height finding system for antiaircraft artillery be continued.

No. 889. Test of Data Transmission and Check Back Systems for Height Finders.—Data transmission and check back systems consist of an installation for transmission of data between antiaircraft directors and height finders. They provide for the automatic transmission of altitude from the height finder to the

director. The check back system proper permits present azimuth and present angular height to be sent from the director to the height finder so that the height finder may be placed on the target by means of the director. Both the Bausch and Lomb T-9 and O. P. L. T-15 height finders were equipped with such systems. These were tested by the Coast Artillery Board. It was found that certain minor modifications to dials would have to be made. The principal trouble encountered was that the transmitting motor of the director was geared for 1800 revolutions for angular height, whereas the receiver for angular height in the height finder was geared for 1600 revolutions. It will be necessary, therefore, to change either the gear of the angular height transmitting motor of the director or the receiving motor of the height finder. It is contemplated, however, that altitude transmission and check back systems will be installed on all height finders to be issued.

No. 890. Test of Twenty-One Second Dummy Fuze T1 for Three-Inch Antiaircraft Gun.—The principal trouble with dummy projectiles supplied antiaircraft gun batteries has been the great number of breakages or deformations that have resulted, with the consequent large amount of work thrown on local Ordnance machine shops. The T1 dummy fuze contains no setting lugs. Also, the groove near the nose has been omitted. This dummy permits the operation of the fuze setter but does not lock the dummy in the setter nor permit of a test of the accuracy of fuze setting. Where it is desired to test the accuracy of fuze setting, a live round should be used. The T1 dummy fuze will permit drill on the fuze setter and will not be damaged and, hence, its standardization was recommended.

No. 894. Angular Travel Device for Use with Cloke Plotting Board (Campbell).—Recommended that no further action be taken on this project.

No. 897. Range Determination Using Depression Position Finders with Vertical Offset Aiming Points.—A system for the use of depression position finders to determine the approximate range of targets by reading on the masts when the hull of ships is obscured by smoke, or for any other reason, cannot be seen, was submitted by the Coast Artillery Board. Formulae were drawn up to determine the corrections to be applied to the ranges read on the position finder. The data was submitted, and it was recommended that a test to determine the usefulness of this system be made by the 59th Coast Artillery in the Philippine Islands.

No. 899. Program for the Development of Rapid Fire Seacoast Armament.—This project resulted from the various firings of rapid fire guns conducted by the Coast Artillery Board. It was determined that any development program must consider improvements to existing types of armament and development of more modern types. Furthermore, the development of secondary seacoast guns is closely associated with antiaircraft artillery gun materiel. As a result of studies and tests, the Coast Artillery Board made the following recommendations:

- a. Concrete emplacements for 155-mm. G. P. F.

guns be installed at once in Panama and Hawaii for all such guns to be used there.

b. Concrete emplacements to provide traversing be installed in such places in the United States as tactical needs warrant, including at least two such emplacements at Fort Monroe for experimental purposes.

c. Efforts be made to improve the traveling ability of the 155-mm. G. P. F. gun.

d. Plans and detailed drawings be made at once for the installation of Case III receiver dials on 155-mm. G. P. F. and other rapid fire guns.

e. A complete pilot installation be placed on one 155-mm. G. P. F. gun for test by the Coast Artillery Board, and that this installation be undertaken at once without waiting the design of a director.

f. A mobile 105-mm. antiaircraft gun be designed and built for test to determine its use as an antiaircraft gun and to determine the suitability of this caliber for seacoast work.

g. A mobile 155-mm. carriage be developed to give all-around fire but if a question of priority is involved, this development be held in abeyance until tests of the 105-mm. mobile antiaircraft mount are completed.

Projects Under Consideration

No. 608-A. "Duco" Surfacing for Guns.—One gun of Battery Montgomery has been completed.

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

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

No. 814. Illuminating Device for 12-inch Barbette Carriage.—Preliminary report submitted. Project held open for retest in connection with the modified shot truck guides.

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

No. 817. Time Interval Apparatus for Mobile Artillery (Wallace & Tiernon).—Awaiting receipt of redesigned instrument.

No. 829-B. Instruments for Training of Stereoscopic Observers.—Project held open for test of Stereoscopic Trainer. Awaiting receipt of instrument.

No. 867. Test of Charging Slides for Browning Machine Gun, Cal. .50.—Under test.

No. 871. Azimuth Pointer for 12-INch B. C. M1917.—Report of test received. Preliminary report in preparation.

No. 872. Service Test of Seacoast Data Transmission System T-7.—Report of test received and under study.

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

No. 874. Service Test of Seacoast Data Computer T-3.—Awaiting receipt of material.

No. 861. Time Interval Apparatus (Rothenberg).—Under study.

No. 882. Service Test of Anti-Submarine Device.—Undergoing test.

No. 884. Development Program for Antiaircraft Fire Control.—Report in preparation.

No. 885. Test of Two-Color Cal. .50 Tracer Ammunition.—Under test.

No. 886. Comparative Test of Antiaircraft Directors T-8, M-2, and M1A1 Uncoupled.—Awaiting tests at Aberdeen.

No. 887. Test of Height Finder T-12.—Awaiting test at Aberdeen.

No. 891. Test of Cotton Substitute for Jute Burlap.—Under test.

No. 892. Test of Diaphragm-Optical Gas Masks.—Test completed. Report in preparation.

No. 893. Labor and Time Saving Equipment for Cleaning Seacoast Armament.—Awaiting receipt of material.

No. 895. Test of Water-Proofed Fire Control Communication Cord.—Equipment received and under test.

No. 896. Service Test of Sectional Wire Pike.—Under test.

No. 898. Test of 220-Ampere Carbon in 60-inch Searchlight with Metal Mirror.—Tested March 14.

No. 900. Test of 3-inch Antiaircraft Truck Mount T-1.—Test completed.

No. 901. Modified Shot Truck and Guide for 12-inch Barbette Carriages, M1917.—Awaiting modification of shot truck guides.

No. 902. Graduations on Fire Control Instruments.—Report in preparation.

No. 903. Method of Graduating Panoramic Sights for 155-mm. Use.—Report in preparation.

Coast Artillery Song Wanted

IT has been proposed that the Association adopt an official song. The Council is favorable towards this proposition and has asked the Secretary to call for assistance through an announcement in the JOURNAL. Send in your contributions (words and music) so that they may be tried out at the meeting at Fort Monroe. There will be no objection if the song is as good as *The Field Artillery Song*. Many national guard regiments have good songs. Let us look them over.

PROFESSIONAL NOTES

Notes on the Hawaiian Maneuvers

By Capt. E. T. Conway, C. A. C.

THE February Maneuvers, called Grand Joint Exercise No. 4, which had been in preparation for many months and for which a minor joint exercise was held last October, was handled by the forces on Oahu in a most commendable manner. Teamwork, coöperation and coordination between Navy, Air, Division and Coast Artillery Brigade was realized.

Seacoast batteries were assigned to several additional types of armament, due partly to peacetime handicaps, and partly to the fact that we were BLACK. Such additional assignments must not be considered normal, and have several serious disadvantages. When an "alert" was ordered, it was accompanied by the appropriate instructions, "fixed," "mobile," or "antiaircraft." This doubled the number of alert periods for an organization and naturally kept them jumping. To say that we were BLACK means that we really didn't belong here and BLUE's mission was to recapture the island.

The BLUE forces came over prepared to land troops, and they did. The necessity of bringing the maneuver to a close at a definite time forced them into positions and formations not to be dreamed of in wartime. They were also forced to consider the safety of ships and planes within the concentration, during darkness and heavy weather, and to avoid running down BLACK submarines.

Until the day preceding actual landing there was practically no seacoast artillery activity. Searchlights, O. P.'s and command posts were constantly on the alert. Antiaircraft units broke up three enemy air attacks. On the evening of February 10th we engaged the BLUE forces making a "reconnaissance in force" off the west coast. Information of this movement was obtained via radio intercept from BLACK patrol terrestrial observers. All west coast lights were busy illuminating targets for the Harbor Defenses of Pearl Harbor and at one time firing was conducted by tracking flashes of enemy guns, (simulated by searchlights). On the morning of February 12th, landing operations started and lasted most of the day. All landings were made at or above Waianae on the west coast. Constructive forces were limited to BLUE transports and landing parties. When a transport unloading troops was being fired upon, it could not be declared sunk until all its mythical lives were snuffed out. As each such phantom boat sank, it took the remaining personnel with it, and if they were units of the Nth division, orders were issued, changing the designation of the units then debarking.

The use of constructive forces gave the newspapers

an opportunity to dig up some old stories which added a little color to subsequent releases. Details of the landing operations will prove interesting reading. An opportunity was given to test various equipment, breaking up of artillery loads, shore to ship communication and so forth. An interesting sidelight on water manners of soldiers was given in the way the latter tried to avoid getting wet at the beach, while the marines jumped overboard. The landing troops had been thoroughly trained for their job and there were no accidents to mar the exercise.

The Air Corps on both sides were highly commended, both popularly and in orders, for daring raids at enormous distances over water, rendezvousing in darkness and flying weather so thick that commercial airlines had suspended operations.

The Naval units assigned to Pearl Harbor, combined with Army tugs and motored sampans, the latter manned by naval reserve officers, formed a perfect screen around the island, and deserve much credit for plugging away for over a week, during which the weather was very bad and the sea rough. The submariners were particularly uncomfortable, running submerged a good part of the time.

Outstanding points of interest to Coast Artillerymen were many, of which the following bear repeating:

a. Carrier-based aircraft will seldom be used against well defended land targets, their main mission being in support of the naval action, which in this case was the neutralization of our long-range air and naval intelligence.

b. When used for siege operations, they should be land-based, from which point, repeated attacks to draw out the defender's aircraft and to bombard enemy installations could be made over a long period. The carrier makes a good target for a bombing attack and slight damage may immobilize all of her planes.

c. Naval vessels, essential to balanced fleet action, should not, and probably never will, come within range of adequate seacoast armament. At this point the remarks of Admiral Frank H. Schofield, United States Navy, are significant: "If the defenses are strong enough, they will never be attacked. I always remember, when considering questions, of peace strategy, that pregnant remark of Admiral Mahan, 'some of the greatest battles are those that are never fought.' The seacoast defenses that stand untouched and unafraid before the greatest of our ports and naval bases at home and abroad, earn fully, in the battles they may never fight, the cost of their construction and their maintenance."

A Fire Adjustment Device for Seacoast Artillery

By 1st Lieut. A. P. Sullivan, C. A. C.

THE following is a description of a device for fire adjustment which was used successfully by Battery C, 2nd Coast Artillery (12-inch mortars) in its target practice at Fort Sherman, C. Z.:

The device consisted of a movable slide (A) (See Fig. 1) set between two guide rails (B) and (C). This slide had affixed to its center a pointer, (D). Along one of the guide rails (C) was placed a scale of deviations in yards with "zero" at the center. The scale was graduated from zero to about 800 yards each side of the center, one side for "overs" and the other for "shorts". The mathematical basis of the device is that if the magnitude of the deviations and also the corrections in yards with which each shot was fired are known and if the fall of each shot is plotted with reference to the fixed deviation scale with the slide set so that the pointer indicates the correction with which that shot was fired, then to obtain the proper correction which theoretically would have caused the C. I. of all the shots to fall on the target it is necessary only that the operator move his slide so that the C. I. of the plotted shots thereon as seen with his eye be opposite "zero" deviation. The pointer then indicates the "net" correction based on these shots considered. In Fig. 1 no scale of "corrections" appears. However, if "flat" corrections only are desired then the deviation scale can be used as a correction scale by simply considering the "short" side as "down" corrections and the "over" side as "up" corrections. The correction indicated by the pointer is obviously a "net" correction at all times. The accuracy of the correction depends upon the accuracy with which the operator can place the apparent C. I. of the shots, as seen with his eye, opposite the "zero" graduation. Should the operator not desire to take all shots into consideration but only, say, the last four shots, then the shots may be plotted by dividing the slide into sections, longitudinally, as indicated at the end of the slide in Fig. 1, using a separate section for each four shots. Each group will then stand out from the rest so that its C. I. may be seen. Should the operator desire to make only a one-half correction then his procedure is to move the apparent C. I. only one-half the distance to the "zero" graduation instead of all the way as for a full correction.

If it is desired to add further refinement to the board an additional slide (E) may be inserted to work in a slot cut in the main slide (A) upon which may be drawn a dispersion ladder based upon the assumed probable error for the practice. As shots are plotted on slide (A) the dispersion ladder may be moved so that its center is opposite the apparent C. I. of the plotted shots. This gives the operator a clearer picture of the fall of his shots along the dispersion ladder and enables him to see more clearly when a shot is obviously "wild" so that he can discard it in considering corrections required.

The advantage of a device of this kind for fire adjustment is that the operator requires no pencil or paper and has no computations to make during the stress of firing the battery. He has only to plot the shots and call off corrections indicated by the pointer. The likelihood of ordering the wrong correction or ordering a correction in the wrong direction is almost nil, in fact is only likely to occur through errors in plotting the shots. The device has some disadvantages. One is that in order to use it one must have the *magnitude* of the deviations. Another is that it is sometimes difficult to keep track of the correction actually applied on each shot in order to set the slide at that correction when plotting the shot. This disadvantage applies, however, to any method of fire adjustment, since if one does not take this into consideration in ordering corrections under any method he will obviously get into trouble.

Before going further with the description of the device it should be stated that as so far described, this idea was introduced to the writer by the late Lt. Col. J. B. Murphy, C. A. C., who used it when he commanded the 52nd C. A. (Railway) at Fort Eustis in 1921. He instructed all his officers in the theory and use of it and most of them constructed these so-called "slip-sticks" and used them in the solution of many class room adjustment problems. I believe one of them was used in one of the target practices

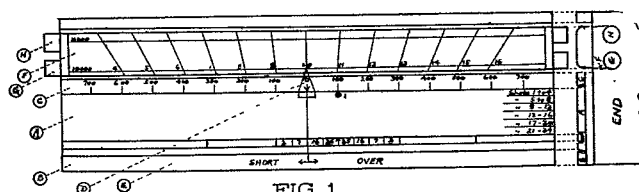


FIG. 1

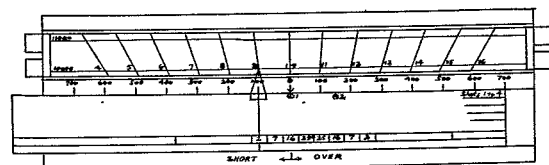


FIG. 2

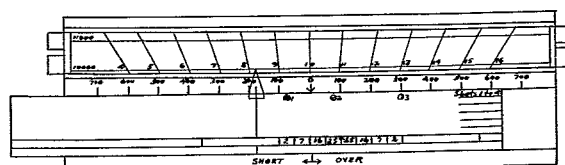


FIG. 3

at that time. I have therefore used his old idea and adapted it to the use of the mortar fire control system. This was done as follows:

First of all it was desired to use percentage instead of flat corrections. It was desired also to do away with "up" and "down" corrections and substitute reference numbers in such a way that the operator of the range percentage corrector who applied the corrections ordered would hardly be likely to apply them incorrectly. Accordingly the Pratt Range Board scale was altered so that "normal" or "zero" correction would be "10". Corrections of "up" 1%, 2%,

3%, etc., became 11, 12, 13, etc., and "down" 1%, 2%, 3%, etc., became 9, 8, 7, etc. The graduations on the range percentage corrector were also changed to conform to this. It then became necessary to add something to the "slip-stick" so that corrections could be read and ordered in percent accordingly. This was easily accomplished by making a roller chart. Using the same "yard" scale as that on the slip stick a series of percentage curves was drawn from ranges of about 4000 to 20,000 yards. This chart (F) was mounted on rollers (G) and (H) set in the ends of a box so that by turning the rollers the chart was passed through slots in the top of the box and across its top alongside the adjustment ruler. An end view of the box, showing its construction, appears as a part of Fig. 1. The chart was so placed on the rollers that the "zero" or "10 percent" correction on the chart came opposite the "zero" of the deviation scale of the adjustment ruler. The device was then ready for use. Let us suppose that the range for the firing was about 10,000 yards. We turn the roller chart until "10,000" is opposite the tip of the pointer (D) on the movable slide. Suppose that the first shot is fired with "zero" (10) correction. Fig. 1 then shows the position of slide for plotting the first shot. The fall of shot No. 1 is reported "over 100". The shot is plotted by inserting a pin or making a mark with a pencil on the slide opposite "over 100" on the deviation scale. (The plotting of shots is rendered easier and more accurate if slide "A" is covered with cross section paper.) To make a full correction for this shot the slide is moved to the position shown in Fig. 2 so that the shot on the slide appears opposite "zero" on the deviation scale. The pointer then indicates "9.0" on the percentage correction scale chart. As previously stated "9.0" is a reference number corresponding to a correction of "down 1%" which at 10,000 yards is "down 100 yards." Assume that the correction is applied before shot No. 2 is fired and that shot No. 2 is reported "over 150". With the slide in the position shown in Fig. 2 the second shot is plotted "over 150". The correction for shot No. 3 is determined by moving the slide until the C. I. of shots 1 and 2 is opposite "zero" on the deviation scale, or to the position indicated in Fig. 3. As seen in Fig. 3 the pointer now indicates a percentage correction of about "8.2" which is a flat correction at 10,000 yards of "down" 1.8% or 180 yards. With this correction applied assume that shot No. 3 is reported "over 300". It is plotted with slide in position shown in Fig. 3.

With ordinary adjustment of fire we might be led at this juncture to believe that something was wrong—either that we were getting one or more "wild" shots or that personnel errors were occurring inasmuch as despite large "down" corrections each shot has fallen farther "over" than the one preceeding it. In Figs. 1, 2 and 3 is shown the use of the dispersion ladder. The assumed P. E. used in the drawing was 50 yards. As each shot is plotted the center of the dispersion ladder is moved as shown to the apparent C. I. of the shots plotted. After plotting shot No. 3 the dispersion ladder indicates that there is still no justification for

assuming any of the shots to be wild although their fall is unusual in that if the C. I. of these three shots is to prove to be about the true C. I. after more shots are fired, then two of the first three shots have fallen in the 2% zones which is entirely possible. If this is the case then after a new correction based on the first three shots is applied no further correction of any consequence should be required.

The difficulty of knowing exactly the correction applied on each shot in order that the slide may be correctly set for plotting purposes is more marked in the mortar battery than in any other type of armament owing to the long interval elapsing between the sending out of data carrying the corrections and the receipt of the data as to the deviation. In order to make no mistake of this nature a record was kept of data sent out including corrections applied and data fired on was marked with the number of the shot so that as deviations were received the officer adjusting the fire was able by glancing at this record to see what correction was applied on each shot.

This adjustment device was used in an effort to simplify a somewhat complicated adjustment problem in the target practice referred to in the beginning of this article. It was necessary to conduct firing with the mortars in two zones starting in one zone and changing over to the other after a specified number of rounds had been fired in the first zone. On changing zones it was necessary to apply a "zone to zone" correction. It was desired to apply this correction quickly and correctly. Accordingly the correction for the difference in the two zones was determined before the practice and was to be applied to the last available adjustment correction in the first zone at the time the change of zone was ordered. This was done by inserting a pin in slide (A), offset from pointer (D) by an amount equal to this difference. When change of zone was ordered the officer adjusting fire had only to glance at the percentage correction opposite the pin instead of the pointer and call that out as the correction for the new zone. He then removed the pin, it having served its purpose.

The same idea of adjustment by means of this adjustment ruler was used for deflection corrections except that the ruler for that purpose was much simpler, not requiring any percentage chart and therefore no box or rollers. The upper guide corresponding to (C) in Fig. 1 was graduated in degrees with "3.00" as normal, the same as the graduations in the azimuth instrument used for spotting lateral deviations. The lower guide corresponding to (B) in Fig. 1 was graduated also in degrees and in such a way that it could be used as a correction scale. Lateral deviations were plotted as read by the spotter and the correction indicated was the reading to be set on the mortar deflection board scale.

In stating that the foregoing devices were used successfully in this target practice I mean that all corrections for both range and deflection, of which there were several, were correctly and instantly determined and applied, which under the conditions of the practice was very satisfactory. Had the same corrections

been figured out with pencil and paper and ordered as "up" or "down" from the last correction I am convinced that we could never have attained anything like the same speed and accuracy we secured by utilizing this mechanical method.

Test of Antiaircraft Equipment

UNDER supervision of the Ordnance Technical Committee a test of antiaircraft material began at Aberdeen Proving Ground, Md., on March 15th and will continue as long as necessary, possibly for six weeks. The following equipment will be tested:

Antiaircraft Director T-8

Antiaircraft Director M-2

Antiaircraft Director M-1, No. 22

Height Finder T-12

Height Finder T-9, No. 2

Trailer T-6

Spotting Set PH-32

Memoscope (Anticipating the inevitable question it should be stated that a memoscope is nothing more than a specially designed kodak used for determining with exactness the setting of the pointers and dials.)

The Director T-8 and Height Finder are experimental types developed by the Ordnance Department. This director is much simpler and cheaper than the present standard M-2 type. The experimental height finder is expected to show increased accuracy.

To handle the tests a detachment of the 62d C. A. (AA) consisting of two officers and thirty-seven enlisted men under command of Captain Morris C. Handwerk traveled overland by motor transportation from Fort Totten to Aberdeen. In addition a detachment consisting of nine enlisted men from the 12th Coast Artillery, Fort Monroe, is also present. Captain J. T. Lewis is representing the Coast Artillery Board during the tests. Major O. L. Spiller, the permanent representative of the Chief of Coast Artillery at the Proving Ground, will also observe the tests.

Don't Miss It This Year

A DIRECTOR of artillery training in one of the R.O.T.C. Camps held last summer comments on the fact that due to the types (seacoast) upon which training was restricted by War Department ammunition allowances, a large number of students could not be actively employed, and he recommends an increase in ammunition allowances to correct for this condition. At this particular camp one 6-inch gun practice and one 12-inch gun practice were held. It is of interest to note that in paragraph 15 b (5), AR 775-10, substitution, based on equal money value, may be made in the allowances listed in that subparagraph. Paragraph 7, AR 775-10 states that wherever substitution, based on equal money value, is made, the prices used will be the reimbursement cost for the fiscal year in which the ammunition is used. In the case in question, had advantage been taken of substitution, approximately 96 rounds of 10-inch or 66 rounds of 12-inch mortar ammunition could have been used in lieu of the 12 rounds of 6-inch and 12 rounds of 12-inch ammunition listed in paragraph 15 b (5).

Battery L, 245th Coast Artillery (HD) N.Y.N.G., Added to List of "Excellent" Batteries

DUE to a delay in reviewing its target practice records Battery L, 245th Coast Artillery (HD) (N.Y.N.G.), was omitted from the list of national guard batteries rated "excellent" as published in the last number of the COAST ARTILLERY JOURNAL.

The addition of Battery L to the list raises the standing of the 245th, commanded by Colonel B. H. Pendry, since Batteries E. and G previously had been placed in the "excellent" class. Major O. C. Warner, C.A.C. (DOL), is the regular officer on duty as instructor.



240th C. A. (Me. N.G.) Firing.

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery
MAJOR GENERAL JOHN W. GULICK

Executive
COLONEL W. F. HASE

Personnel Section

MAJOR G. F. MOORE
MAJOR S. S. GIFFIN

Materiel and Finance Section

MAJOR R. E. HAINES
MAJOR J. H. COCHRAN
CAPTAIN F. J. MCSHERRY

Organization and Training Section

MAJOR J. B. CRAWFORD
CAPTAIN J. H. WILSON

Plans and Projects Section

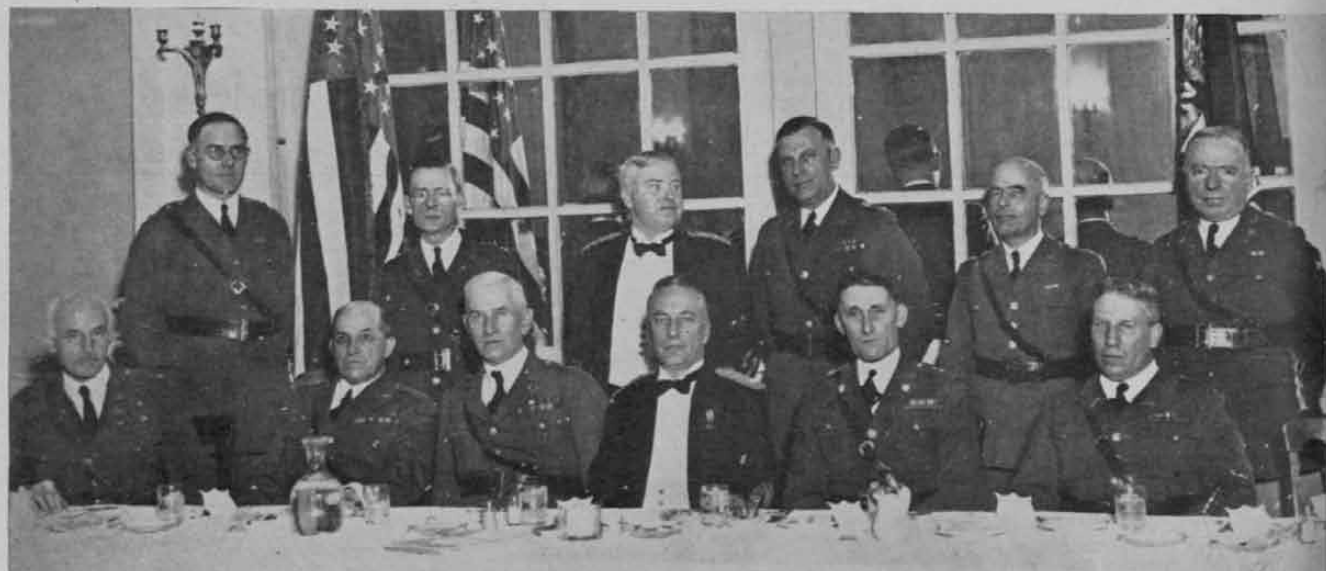
MAJOR G. R. MEYER
MAJOR R. V. CRAMER

Chief of Coast Artillery Attends Meeting of the Maine Chapter, U.S.C.A. Association

ON March 12th a meeting of the Maine Chapter U. S. Coast Artillery Association was held in the Falmouth Hotel, Portland, Maine, in conjunction with the Third Annual Reunion of the 240th Coast Artillery. Colonel George E. Fogg, the efficient regimental commander of the 240th is also the President, Maine Chapter, U. S. Coast Artillery Association. These two organizations work hand in glove. Colonel

Fogg, since the Maine Chapter of the Association was formed at the last annual dinner of the 240th, has cooperated with the chapter and placed all the facilities of the regiment at its disposal.

At the annual dinner of the 240th of this year not only the members of the Association were invited to attend but also all former members of the regiment and organizations associated with it. Some of these organizations were the Portland Light Infantry, the Mechanic Blues, the Montgomery Guards, the Portland Cadets, the 5th Company, the 54th, 72d, and 73d artillery and the U. S. War Veterans. The 240th



SPEAKERS' TABLE AT THE SECOND ANNUAL MEETING, MAINE CHAPTER, UNITED STATES COAST ARTILLERY ASSOCIATION, FALMOUTH HOTEL, PORTLAND, MAINE, MARCH 12, 1932.

First row (l to r): Colonel Samuel G. Shurtle, C. A. C., Unit Instr., C. A. Res., Brig. Gen. Alston Hamilton, Comd'g 1st Coast Artillery District, Maj. Gen. John W. Gulick, Chief of Coast Artillery, Colonel George E. Fogg, Comd'g 240th C. A., President, Maine Chapter, U. S. C. A. A., Brig. Gen. James W. Hanson, the Adjutant General of Maine, Colonel Herbert L. Bowen, 152d F. A., Bangor, Me., Second row (l to r): Colonel Charles W. Savage, Ord. Off., State of Maine, Augusta Chaplain Ezra F. Ferris, Jr., 240th C. A., Lt. Col. Walter Singles, 8th C. A., Fort Preble, Colonel Spaulding Bisbee, 103d Inf., Portland, Maine, Lt. Col. Henry W. Owen, Jr., 240th C. A., Bath, Me., Lt. Col. James S. Dusenbury, Senior Instructor 240th C. A.

was formerly the Old First Maine and has an enviable history dating back to the colonial army.

The Chief of Coast Artillery, Major General John W. Gulick, was one of the honored guests. Brigadier General James W. Hanson, Adjutant General of Maine, and Brigadier General Alston Hamilton, Commanding the First Coast Artillery District were also among the notables attending.

Classification of Officers

THE COAST ARTILLERY JOURNAL reviews annually the classification of officers based on efficiency records. Tables for the years 1929, 1930 and 1931 appear below. It is noticeable that the general standing of all officers has been raised during these three years and that the superior second lieutenant is still holding his own. Who can say that the Coast Artillery Corps is not progressing? Only three years ago there was not a single superior first or second lieutenant. Now there are seven with this rating. The most noticeable increase has been made in the number of "excellent" ratings. There are today 131 more officers with this rating than there were three years ago.

	<i>Superior</i>	<i>Excellent</i>	<i>Satisfactory</i>	<i>Unsatisfactory</i>	<i>Inferior</i>	<i>Not rated</i>	<i>Totals</i>
1929							
Colonels	8	28	16	--	--	--	52
Lt. Cols.	7	32	20	--	--	--	59
Majors	12	127	87	--	--	--	226
Captains	2	138	140	1	--	--	281
1st Lieuts.	--	81	133	--	--	1	220
2d Lieuts.	--	25	117	1	--	34	177
Totals	29	431	518	2	--	35	1015
1930							
Colonels	8	29	17	--	--	--	54
Lt. Cols.	8	35	12	--	--	--	55
Majors	22	138	58	--	--	--	218
Captains	8	155	91	1	--	1	256
1st Lieuts.	3	130	119	--	--	2	254
2d Lieuts.	1	36	89	1	--	30	157
Totals	50	523	386	2	--	33	994
1931							
Colonels	8	25	13	--	--	--	46
Lt. Cols.	12	32	10	--	--	--	54
Majors	24	143	46	--	--	--	213
Captains	6	165	83	--	--	--	254
1st Lieuts.	6	150	99	--	--	--	255
2d Lieuts.	1	47	83	--	--	49	180
Totals	59	562	334	--	--	49	1004

The Coast Artillery School

THE classes at the Coast Artillery School are now on the home stretch, and the students are beginning to show the usual anticipation for the final day when textbooks, midnight oil, and pay problems will no longer monopolize the daily routine. But with this anticipation there always comes the usual reflection—school duty isn't so bad after all. For return to the normal life inevitably brings with it those old millstones of guard duty, property responsibility, surveys, and their annoying relations.

The return of more pleasant weather will mark the beginning of outdoor activities and exercises. Both sections of the Battery Officers' Class will start anti-aircraft firings on April 25th. These will extend over a period of approximately two weeks. Then all hands repair to Fort Story where 155-mm. and 8-inch railway firings will be held. It is probable that director-controlled fire will be employed in one of the 155-mm. practices. It is also planned to employ stereoscopic range finding and spotting. Terrain exercises and other practical problems in the field will also be conducted at Fort Story. Battle practice will take place before the troops and officers return to Fort Monroe. No joint Army and Navy exercises will be held this year. Practical work with submarine mines will be given the Battery Officers' Class during the last two weeks of school. The Advanced Class will return to classroom work during this period.

The usual Wednesday afternoon conferences have been held regularly during the School year. At each of these conferences, a member of the Advanced Class presents a prepared epitome on an assigned subject of professional or general interest. All students and instructors are required to attend. The conferences usually extend from 1:00 to 2:00 P. M. The speaker must not read his paper (although reference notes may be used), and he is allowed not to exceed thirty minutes in which to present it. The balance of the hour is devoted to discussion of the subject. During this period various officers, selected at random, are asked to discuss some phase of the subject. Most of these questions are propounded to members of the Battery Officers' Class, in order to compensate (?) them for their omission from the list of scheduled talks. This also serves as a convenient method of maintaining interest and eliminating Morphean static.

Captain Alf Nyman of the Royal Swedish Coast Artillery, has joined the first section of the Battery Officers' Class, to receive the remaining instruction in Seacoast and Antiaircraft Artillery. This brings the list of foreign officers to four, Lieutenants Hung Chao Chou (Chinese Army), Atif Tevfik (Turkish Navy), and Ismail Jevat (Turkish Army), having joined the Battery Officers' Class at the beginning of the School year.

Work on the Fort Monroe Golf Course continues to show steady progress, although the storm on March 7th delayed the work considerably. In the meantime, due principally to the efforts of Major Hoeker, a very satisfactory arrangement has been made with the Hampton Roads Golf and Country Club.

Trophies to be Awarded by U. S. Coast Artillery Association

AS announced in the last number of the JOURNAL the Executive Council of the Association has approved a system of awards to be made annually to the most outstanding unit in each of the three components of the Coast Artillery. In addition the Council also authorize the presentation of an appropriate medal

to any enlisted man performing an important service for the Coast Artillery. The organization trophies will be in the form of plaques suitable for display on the walls of the headquarters of the unit. They will be presented annually and once presented will remain in the possession of the organization winning them. The period of competition by organizations will be coincident with the fiscal year (the target practice year). The award of the individual medal will not be limited to any particular period but will be made when merited.

The three plaques to be awarded will be identical in design and will carry an additional plate naming the regiment and giving other appropriate information in connection with the award.

The plaque awarded the outstanding Regular Army Coast Artillery unit will be given to the regiment having the largest number of batteries rated "excellent" during the year as determined by the Chief of Coast Artillery. Regiments having less than two firing batteries are ineligible to compete for this trophy.

A plaque will be awarded to the Coast Artillery National Guard Regiment designated as the most efficient regiment by the Chief of the Militia Bureau.

The third plaque will be awarded to the Coast Artillery Reserve regiment showing the largest average number of extension subcourses completed per member. The strength of the regiment will be considered invariable during the year and will be as shown on the strength return of June 30th. Regiments with less than 10 members will not be eligible to compete.

Considerable difficulty was experienced by the Council in determining a satisfactory basis of comparison of reserve regiments. Performance in correspondence course work was finally selected as the most uniform and fairest basis although it was realized that the amount of work done as correspondence students is not a proper measure of the efficiency of a unit. Those who are dissatisfied with this basis of comparison, and there are many who will be dissatisfied, are urged to send in their ideas as to the manner in which a better comparison may be made. It should be kept in mind that it is impracticable to conduct special inspections and tests merely for the purpose of determining the winner of this trophy. The Executive Council is desirous and anxious to obtain a better basis for this award and will approve any change in the conditions which will enable it to compare the efficiency of reserve regiments rather than their proficiency in Army extension course work.

Railway Artillery Movement to Cape May

FOR a period of more than a year a tactical exercise for the 52d Coast Artillery (Ry) including a movement by rail and the firing of the guns from positions at some point along the Atlantic Coast has been under consideration. Recently the approval of higher authority has been received and the exercise will be conducted during the month of May.

As nearly everyone knows, the 52d Coast Artillery is a railway regiment formerly stationed at Fort Eustis. Upon the abandonment of this post the regiment was split—the 2d Battalion moving to Fort Hancock, N. J. for station, the 3d Battalion moving to Fort Monroe (The 1st Battalion is inactive). It is the 2d Battalion, commanded by Lieut. Col. Lewis Turtle, which has been designated to participate in the exercise.

It is obvious that the training of a railway artillery regiment would be incomplete unless it included a movement by rail and the emplacement and firing of the guns under conditions similar in every respect to those which would exist in time of war. The principal handicap in conducting efficient training for the 52d has been the cost of the rail movement and the difficulty in obtaining the necessary funds. Believing that this difficulty could be overcome the Chief of Coast Artillery in January, 1931, recommended that the movement of the 2d Battalion, 52d Coast Artillery, to the vicinity of the Delaware Capes be considered in connection with the firing of its annual target practice. His recommendation was favorably considered by the Second Corps Area Commander and a study was initiated with a view to preparing plans for the exercise.

The topography of the area near the mouth of the Delaware River is ideal for railway artillery operations. There is a good railway network on both sides of the river as well as along the coast of New Jersey and Delaware near its mouth. Numerous spurs and side lines exist. This means that a minimum of track construction by troops would be required to emplace the guns in positions from which they could cover the vital water areas.

The Harbor Defenses of Delaware were originally designed to protect the important Wilmington-Chester-Philadelphia industrial center from naval bombardment. With the increase in the range of artillery this conception has undergone a radical change resulting in a considerable reduction of the armament of the first fortifications at Forts Dupont and Mott and the introduction of additional armament to deny the entire river, and especially Delaware Bay, to hostile vessels by the emplacement of guns in the vicinity of the Delaware Capes. This additional armament may be either fixed or mobile guns.

It is a real tactical problem which the 52d C. A. (Ry.) will face at Fort Hancock when it receives its orders. The general situation which will be known to the commanding officer includes, naturally, existence of a state of war between us and an overseas coalition. Our main fleet is being contained in the Pacific by a hostile fleet and, secure in at least temporary control of the sea, the hostile coalition is believed to be preparing an expeditionary force at a Western European port for an invasion of the United States by land forces. It is believed that the destination of this expeditionary force is Delaware Bay. The Harbor Defenses of the Delaware are being organized (frantically, probably) and the 931st Coast Artillery (Ry) is training (just as frantically) at Fort Eustis.

In this situation it devolves upon the good old 52d to rush into position at the mouth of the Delaware River and keep those rascals out. The whole movement has been worked up in problem form, special situations developing from time to time requiring the making of tactical decision by the regimental commander and his subordinates.

In peacetime a tactical exercise of this kind is greatly handicapped due to lack of funds and also the difficulties connected with the use of private property. The corps area study preliminary to approving the exercise took into consideration the positions which could be occupied by the railway regiment. At first an area in the vicinity of Lewes, Delaware, (Cape Henlopen) was considered. This area is suitable but due to the additional cost of transportation of the railway materiel and to other details connected with the location of a camp-site attention was transferred to the New Jersey side. A satisfactory location was found near Sewell's Point not far from Cape May. The movement will take place some time during the early part of May and the exercise will continue for several weeks. The annual target practice of the regiment will be fired during this period. Following the exercise, the JOURNAL hopes to publish an instructive article dealing with the tactical movement of railway artillery and its proper use in defending harbors not sufficiently covered by fixed defenses.

Moving Officers' Quarters by Barge



Many Coast Artillery officers have lived at Fort Mott, N. J., directly across the river from Fort Dupont. Some have been born there. If

these officers are thinking of holding an old home week there in the future it is well to give them this warning, otherwise they may return and fail to find the quarters which they once occupied. All of which is one way of bringing to attention a rather interesting engineering feat performed by the 1st Engineers now stationed at Fort Dupont.

The Harbor Defenses of the Delaware used to be one of the choice stations of the Coast Artillery. They included Fort Dupont, Fort Mott and old Fort Delaware, located on an island in the Delaware River midway between the two. More modern fortifications were built during the World War near the mouth of the river, but the garrison was quartered at Fort Dupont and Fort Mott. Many of the older guns were removed from Fort Mott and Dupont when the new fortifications were built. As a result these posts were turned over to the Engineers and the Coast Artillery, with the exception of a maintenance detachment, was withdrawn. Fort Dupont became the permanent sta-

tion of the 1st Engineers. Fort Mott remained ungarrisoned.

It occurred to some engineer that excellent quarters and barracks at Fort Mott were going to waste and should be utilized to relieve the shortage of quarters at Dupont. It was inconvenient to split the garrison and have part of it quartered at Mott. What to do? The only possible thing was to move the Mott quarters to Dupont. This might seem an impossible undertaking to the outsider, but the 1st Engineers immediately began a study of the problem and decided that it was practicable. The War Department approved a project of moving seven officers' quarters and four noncommissioned officers' quarters and allotted funds for moving one set of quarters as a test. The field officers' quarters were selected.

The movement of these quarters from their foundation at Fort Mott by barge across the Delaware River, into the Chesapeake-Delaware Canal, to a new foundation at Fort Dupont was a simple matter, according to Lieut. T. F. Kern, 1st Engineers, who relates the story in the *Military Engineer*. After the chimney and porches were removed the quarters weighed about 120 tons. Three barges were secured, lashed together solidly, and the quarters were rolled right aboard. Then this Noah's Ark effect was towed across the river into the Canal, unloaded and a ready-built set rolled unto the new foundation. Some special staying was necessary to prevent injury to the frame of the house, but this caused no difficulty. The quarters were badly in need of decorating and painting prior to moving so no extra expense was incurred through this item.

The figures as to the expense of the movement are interesting. In 1906, when these quarters were built, they cost \$11,000. (Monticello, the home of Jefferson, cost only about \$6,000, in cash.) The expense of the movement of this one set was about \$4100. Additional sets may be moved at a cost of about \$3000. The economy is obvious. We submit it for the attention of Messrs. Sears, Roebuck & Co.

Student Officers for Command and General Staff School

WAR Department Orders issued today designate the following officers as students at the Command and General Staff School, Fort Leavenworth, Kansas, for the 1932-1934 course starting in September, 1932:

Major Willis McD. Chapin, Quarry Heights, C.Z.
Major Delmar S. Lenzner, Fort Monroe, Va.
Major Charles D. Y. Ostrom, Fort Monroe, Va.
Major Adam E. Potts, Fort Monroe, Va.
Major Gerald D. Robison, Fort McClellan, Ala.
Capt. William C. Braly, Fort Monroe, Va.
Capt. Herbert F. E. Bultman, Fort Monroe, Va.
Capt. Benjamin F. Harmon, Off. Chf. of C. A.
Capt. Harold R. Jackson, Fort Worden, Wash.
Capt. Robert N. Mackin, Jr., Fort Amador, C. Z.
Capt. Frank J. McSherry, Off. Chf. of C. A.
Capt. George W. Ricker, Fort Monroe, Va.

Coast Artillery Enlisted Men Make Good

THE JOURNAL is always glad to bring to attention the accomplishments of the enlisted men of the Coast Artillery Corps. In its noncommissioned staff it possesses a body of men without equal either in our service or in the army of any country. Such men as Master Sergeants Paul R. Nelson and Thomas J. Stephens, to mention only two, have contributed through their inventive genius to the efficiency of the Coast Artillery and have been instrumental in saving hundreds of thousands of dollars for the government. Others have also contributed—perhaps not in a spectacular way but by a loyal, efficient and intelligent performance of the duties assigned them. Many a second lieutenant has leaned on them for support with the comforting feeling that Sergeant Schmidt or Sergeant Cooper knew his business and could be depended upon.

Recently a graduate of the Enlisted Specialists' Department, Coast Artillery School, came into prominence in an important and delicate position. During the recent reorganization of the Police Department of Honolulu it was very necessary that some one be selected as Chief of Police whose efficiency and integrity were of the highest order. After considering numerous candidates, former Coast Artilleryman Charles F. Weeber was chosen. Many will remember him as a graduate of the Coast Artillery School in 1916. He assisted in the organization of the First Heavy Artillery Brigade (Coast Artillery) and afterwards became chief clerk in the headquarters of the North Atlantic Coast Artillery District. In 1920, having become a warrant officer, he was assigned to duty in the headquarters, Hawaiian Department, as chief clerk. Shortly thereafter he resigned from the Army and entered commercial life in Honolulu where he has been active in the administration and direction of a number of important corporations. His appointment as Chief of Police was due to recognized merit and nothing else.

It is not only former members of the Coast Artillery who are bringing credit to themselves and their arm of the service. Too often deeds performed by them which call for quick thinking and good judgment are not brought to general attention. This was not the case with an incident which occurred during the target practice of Battery B, 65th Coast Artillery (AA), Fort Amador, and which resulted in the commendation of Private J. J. Zaltski of that battery. Some time ago a serious accident occurred in the Navy during practice with an antiaircraft gun. In some manner the antiaircraft shell exploded prematurely before the breech was closed and several men were killed. It is possible that in the hurry of setting the fuze and loading the piece, the point of the shell may have received a jar which caused it to arm and explode. Perhaps this accident was in the mind of Private Zaltski when one of the loaded shells at Battery B was accidentally dropped on the concrete gun plat-

form. Private Zaltski didn't wait to learn if the jar had started the time fuse burning. He grabbed the shell, loaded it in the gun and fired it. It is quick thinking like this which wins ball games, hits the target, and saves lives. Colonel Mitchell commended Zaltski highly, as he deserved.

A somewhat different exploit earned the Soldiers Medal for Private Jesse R. Compo, Battery B, 64th Coast Artillery (AA), Fort Shafter. During a violent cloud burst an automobile containing three occupants was swept over Moanalua bridge into the stream which had become a raging torrent carrying all kinds of debris. The occupants succeeded in gaining temporary safety in the branches of a tree, although their lives were imperiled by the rising water. (Although not mentioned in the award it is understood that one of the three was a colonel of Cavalry. The vaunted "mobility" of the Cavalry causes them to appear in the most unexpected places.) Private Compo volunteered to go to their assistance and had almost reached them when he was swept down stream by the current and narrowly escaped being drowned. (The mariners were finally rescued by a detachment of the 64th provided with ropes.) Private Compo is now Corporal Compo. He received his award from the hands of Brigadier General William E. Cole at a regimental review of the entire regiment.

Staff Sergeants George E. Topper, James F. Schnur and Richard Merritt, all of the Headquarters Battery, 4th Coast Artillery, Fort Amador, were taking their ease on the edge of what was once the Balboa Dump and is now a beautiful golf course and a part of Fort Amador. The tide had just turned flood and in a short time the Panamanians who investigate the mud flats each time the tide is low would have to get back to shore or take to their boats. The attention of these soldiers was called to a Panamanian boy who seemed to be in difficulties. Suddenly it was realized that he was mired down in the silt and was sinking rapidly. There was no time to be lost since in a short time the water would rise and the boy was sinking deeper into the mud every instant. Procuring planks and ropes they proceeded to the boy's assistance and at risk of their own lives succeeded in bringing him safely to shore.

One morning last April, at Fort Monroe, John N. Lee, a civilian employee of the Public Health Service and pilot of the launch "Heron" was turning over his motor preparing to make his usual trip. Suddenly, without knowing why, the entire boat was enveloped in flames and Lee was overcome with burns and smoke. A number of government boats were anchored in this vicinity. On one of them were Corporal Frank R. Romps, Private James W. Palmer, Private Edward J. Woodfire, Battery A, 12th Coast Artillery. In spite of the danger of further gasoline explosions on the "Heron" Private Woodfire steered their yawl towards the flaming boat, took a line from it and towed it away from other vessels and property. Then running along side the "Heron" these men removed Mr. Lee from his boat and carried him to a place of safety. Unfortunately Mr. Lee's burns were so serious

that he failed to recover and died later in the post hospital.

Above are a few of the outstanding deeds which have come to the notice of the JOURNAL. They are worth mentioning not only because they indicate the type of men which are found every where throughout the Coast Artillery but because their example is an incentive to imitation and a source of pride to the entire Corps. They warm us up to think about them.

Coast Artillery Reserve, 2d Corps Area

Colonel F. W. Stopford, C. A. C. (DOL); Executive.

THE Annual Coast Artillery Dinner Committee of the Reserve officers of the Metropolitan Area held their first committee meeting on Thursday, February 23, 1932, at Coast Artillery Reserve Headquarters, 39 Whitehall Street, New York, N. Y., under the chairmanship of Major Will I. Levy, 530th C.A. (AA). The different committees of publicity, finance, etc., were appointed and it was decided that the annual dinner would take place on or about May 25, the date depending on securing the presence of the Chief of Coast Artillery as well as Major General Nolan, the Corps Area Commander, and the Second Coast Artillery District Commander, Colonel F. K. Fergusson. Every regiment in the Metropolitan Area has a representative on this committee.

The classes and conferences being held monthly at the Engineering Societies Building, 29 West 39th Street, New York City, with the object of fitting officers for their promotion, are proving a great success and attendance has been large at every meeting.

The following promotions have recently taken place: Capt. Herbert V. Ryan, 521st C.A., promoted from 1st Lt.

1st Lt. Gordon R. Williams, 908th C.A., promoted from 2d Lt.

1st Lt. James L. Williams, 607th C.A., promoted from 2d Lt.

Colonel Stopford at a recent meeting of the Federal Business Association, made an address on the subject of Citizens Military Training Camp training and the importance of continuing the appropriation for this purpose.

Lieutenant Colonel W. S. Bowen, Plans and Training Officer of this headquarters, has just finished a trip to northern New York where he addressed groups of Reserve officers at the following named places, on the subject of Antiaircraft Artillery: Albany, Utica, Syracuse, Rochester, and Buffalo. He reports a very great interest was manifested in these lectures and many questions were asked regarding the effectiveness of antiaircraft fire.

The 607th Coast Artillery (TD), Colonel Robert S. Allyn, commanding, held a meeting on March 9 in the assembly room at 39 Whitehall Street, where training films on the 155 G. P. F. guns were exhibited. These films were run through slowly and stopped at various places in order that the full benefit for training purposes might be obtained.

The training schedule for the 1932 Coast Artillery

C.M.T.C. at Fort Hancock, has been approved by Colonel Johnson, the Commanding Officer, and has been furnished to the organizations concerned.

According to present schedule, the following regiments will be ordered to camp:

539th C.A. (AA) (Col. H. D. Cushing), July 31-Aug. 13—20 officers.

533rd C.A. (AA) (Col. F. R. Stoddard), Aug. 9-Aug. 22—20 officers.

602nd C.A. (Ry) (Col. Azel Ames), Aug. 19-Sept. 1—20 officers.

The officers listed above will be allocated as follows: 2 field officers, including regimental commander, 5 captains—battery commanders, and 13 lieutenants, and in addition 1 medical officer and 1 chaplain.

The first essential for this duty is ability to perform the duty efficiently. The instruction of officers at the camp in the details of drill is not practicable. They go there to give instructions only as an incident to this tour of duty.

The policy in selecting officers therefore is to give priority to those now assigned to the above listed regiments, and if a sufficient number cannot arrange to take the special course of instruction outlined below, officers from other regiments will be attached for this camp.

It is planned to hold two training periods a month for the reserve officers who request to be detailed as instructors during the above period at 244th Coast Artillery Armory, 125 West 14th Street, New York, on the second and fourth Tuesdays, during the months of April, May, June, and July, 1932 from 8:00 to 10:00 P. M.

The students at the camp will be organized in four composite batteries. Officers will be assigned to duty in general as follows:

Regimental Commander and one other field officer available for Regimental Executive and Plans and Training officer.

1 Senior Infantry Instructor and Battery Commander.

1 Senior Coast Artillery Instructor and Battery Commander,

a total of sixteen, about four officers per battery, two to specialize in basic instruction (Infantry), and two in Red, White and Blue instruction (Coast Artillery). Officers desiring to go to camp will be expected to attend the preliminary instruction outlined above. Complete sets of Training Regulations will be issued to each officer and lesson assignments will be issued and covered each night.

According to present schedule the following Seacoast Artillery regiments will be ordered to Fort Hancock, during the period July 3-16 for active duty. The 607th C.A. (TD), Colonel R. S. Allyn, commanding and the 620th C.A. (HD), Lieut. Col. Hyland R. Johns, commanding. The 607th has been allocated 14 officers and the 620th 10 officers to take this training. A large number of officers of both the regiments have applied for this duty.

The record of the Extension School as of February 1, 1932, is as follows:

Organization	Enrollments	Completions	Hours	Credit
502	36	5	110	
513	43	15	140	
514	202	132	1614	
521	63	12	223	
522	90	35	476	
530	37	10	202	
533	45	13	238	
539	36	7	172	
602	56	16	203	
607	100	36	460	
619	45	14	210	
620	40	14	285	
621	62	10	162	
908	36	7	125	
909	58	19	299	
910	23	5	110	
Civ.	65	22	260	
CMTC	96	40	359	
OR	39	14	274	

Upstate New York Coast Artillery Reserves

513th, 514th, and 522d Regiments Coast Artillery
(AA). Major Joseph C. Haw, C.A.C. (DOL),
Unit Instructor.

MAJOR OGDEN has been selected to take the special course at Fort Leavenworth this spring and the 513th is justly proud of his selection and confident of his prowess.

Colonel John P. Young, commanding the 513th, is the leading spirit in Reserve meetings that are being held in Ithica this year for the first time in history. The small Coast Artillery group there are, under his leadership, faithful attendants at the meetings.

The 522d, Lt. Col. F. W. Gilchrist, commanding, held its annual dinner at Lockport on January 16. This function has grown to be a very popular tradition and this year's event was, of course, better attended than any previous one. There were thirty present of whom twenty-eight travelled distances ranging from thirty to nearly four hundred miles to reach Lockport. Colonel Stopford, the District Executive for reserve affairs, came all the way from New York and was warmly welcomed. Lieutenant Colonel Gilchrist, the Regimental Commander, surpassed his excellent reputation as a toastmaster.

On February 26, in Schenectady, the 514th, Major N. E. Devereux commanding, joined with the Infantry in a dinner attended by Colonel Stopford and by the Chief of Staff of the 98th Division, Colonel Ingram, Infantry. Colonel Stopford aroused great enthusiasm by his address on "George Washington and his Reserve Officers." More than sixty were present at the dinner and many more flocked in for the meeting that followed. The Coast Artillery was represented on the dinner committee by Captain Henry V. Rector of the

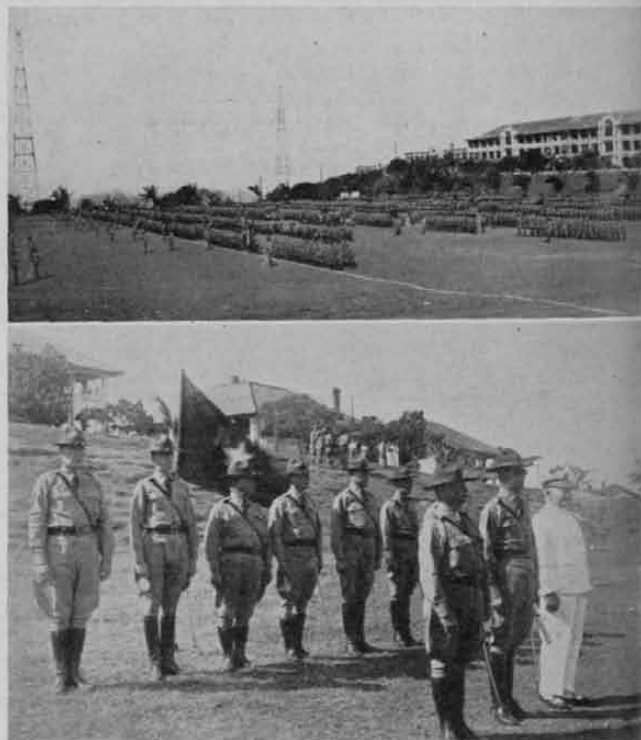
514th. Badges for marksmanship were presented to those who had earned them in camp last summer.

Many Coast Artillery men of Schenectady and vicinity joined the Albany contingent to hear the splendid talk on antiaircraft artillery given in Albany by Lieutenant Colonel William S. Bowen, on February 15th.

All previous records for attendance at meetings and for completion of subcourses are being broken in all regiments, but especially in Schenectady, where there are so many Reserve activities that it is becoming a difficult problem to avoid conflicts in dates for meetings.

Captain Schoon Retires at Corregidor

OFFICERS who have served at Corregidor will recall Captain Peter J. C. Schoon, the master of the harbor boat "San Pedro." On February 24 at the regular quarterly review of the entire command Captain Schoon was the honored guest of Brigadier General C. E. Kilbourne and the troops of Corregidor. Captain Schoon has been a popular figure in Corregidor life for many years and was asked to stand with the commanding general during the review to bid a



Above. Troops at Corregidor Formed for Review Honoring Capt. Schoon.

Below. Capt. Peter J. C. Schoon (in white) receiving the Review with Brig. Gen. C. E. Kilbourne (on his right).

farewell to his friends before his departure for the States and a well-earned retirement.

As a token of the esteem in which Captain Schoon is held at Corregidor the following memorandum was read at the review:

HEADQUARTERS

HARBOR DEFENSES OF MANILA AND SUBIC BAYS,
Fort Mills, P. I., February 24, 1932.

MEMORANDUM:

Captain Peter J. C. Schoon of the Harbor Boat "San Pedro" departs on the U. S. A. T. "Grant" March 4, 1932 enroute home for retirement.

Captain Schoon first entered the U. S. Government Service in January, 1900, and, except for a few years with the Philippine Government Coast Guard has continued in service to date.

His record is one showing devotion to duty, skill in seamanship and high courage. It contains letters of commendation not only for faithful performance of duty but for acts of daring; these letters are from officers of the Army and of the Philippine Government including one from the Governor General.

His value to this command in the service of the garrison, in general control of all shipping in emergency, and during artillery practice has been great. His action in delaying his retirement in order to remain until close of the practice season this year is indicative of the unselfish interest he has taken in the garrison and its training.

Captain Schoon has won the confidence and the affection of all with whom he has come in contact. He leaves the service with our best wishes for his future success and happiness.

By command of Brigadier General Kilbourne:

C. A. Mitchell,
Lieutenant Colonel, A. G. D.,
Adjutant General.

West Point Chapter of the United States Coast Artillery Association

A MEETING of the West Point Chapter of the Coast Artillery Association was held at West Point on February 9, 1932.

Major T. S. Peyton addressed the meeting on "The Caucasus." Major Peyton was on duty with the Near East Relief Expedition following the armistice. He outlined the work of the expedition, the difficulties encountered and recounted many interesting and amusing incidents that occurred during this tour of duty.

Capt. W. W. Jenna, who spent several years as assistant military attache in Athens and Belgrade, also spoke, choosing as his subject, "Greece and Serbia." He outlined in an interesting manner the early history of these countries and their difficulties in the World War.

1st Lt. G. M. Badger, 1st Lt. C. F. Tischbein and 2nd Lt. H. A. Brusher were appointed a committee to handle the next regular meeting on April 12, 1932.

Capt. James L. Hayden, 1st Lt. J. S. Hincke, and 1st Lt. Robert W. Berry were appointed a nominating committee to prepare a slate of officers for presentation at the next meeting.

The Chapter held a special meeting on March 10 when it was addressed by the Chief of Coast Artillery, Major General John W. Gulick. In his talk, General Gulick outlined the current activities and progress

being made in the Coast Artillery, the growth of the Coast Artillery Association and discussed general service events of interest to the officers.

After the meeting all adjourned to the Officers' Club where the Coast Artillery officers and their wives gave a tea in honor of General Gulick. The members of the Academic Board and their wives were also present.

During his visit at West Point, General Gulick visited all the local points of interest, inspected the cadets at Coast Artillery drill, the shops, barracks and the new antiaircraft equipment.

On March 11 the Chief of Coast Artillery addressed the cadets of the first class, outlining the activities to be expected in this arm of the service. His talk was enthusiastically received.

Troop Schools, 62d Coast Artillery (AA)

DURING the past four months, ending March 31, 1932, the Troop School Advanced Course for Officers conducted in the 62d C.A. (AA) has covered a wide variety of subjects and proved to be unusually instructive and interesting. Conferences, lectures and map problems were conducted on Tuesday and Thursday afternoons of each week of from one to two hours covering discussion of the following subjects:

Domestic Disturbances—Five conferences and one map problem, covering the study of legal principles involved in Federal troops rendering aid to both Federal and State Civil Officials, protection of Federal property and sudden emergencies; tactical principles of riot duty, and the application of both legal and tactical principles in a map problem involving the Alert Plan for the regiment and assumed subsequent tactical situations.

Mobilization Plans—Two conferences on General, Special, and Unit Mobilization Plans.

Air Corps—Three conferences and one map problem. The first conference covered the organization of the Air Corps, and the tactics of Pursuit and Observation Aviation while at the second, the tactics of Attack and Bombardment was discussed. The third conference was devoted to the Air Force; Naval Aviation and Foreign Aviation, followed later by an illustrative map problem which involved the tactical principles of an Air Force, composed of all classes of aviation.

Coast Artillery Field Manual, Volume II, AA Artillery—Five conferences on the tactics and technique of Antiaircraft Artillery and the Antiaircraft Artillery Intelligence Service, including the AA Maneuvers held at Aberdeen Proving Ground, Md., in 1930.

Training Regulations 435-55, Coast Artillery Target Practice, with amendments, and other War Department instructions on AA Artillery Target Practice—Five conferences, covering preparation for and conduct of searchlight, gun, and machine gun target practice and the analysis of the record service practices.

Searchlights—One lecture. Explanation of the test of searchlights and sound locators at Fort Humphreys, Va., in 1931, with results obtained, and contemplated improvements in this equipment.

Antiaircraft Defense Plans—Four map problems in-

volving preparation of Antiaircraft Defense of Greater New York City with distant AA Artillery Intelligence Service for the defense plans. These were prepared by a committee of three officers. There was one problem each for the gun, machine gun, and searchlight defense, and intelligence system. The solutions were presented by the committee to the class.

Command and Leadership—One lecture by the Commanding Officer, Colonel Kimmel, 62d C.A. (AA), illustrating the presence or absence of either or both of these qualities in Grant, Lee, Jackson, J. E. Johnston, Sherman and McClelland as determined from a critical analytical study of their conduct and actions during the Civil War, and concluding with proof of the necessity for the critical study of the campaigns of great American commanders to be properly prepared for our duties as American army officers.

Miscellaneous—Five conferences, four of which were on articles in the COAST ARTILLERY JOURNAL as follows: "The Role of Aircraft in Coast Defense", "Comments" C.A.J. August, 1930 and December, 1930. "A Machine Gun Service Target Practice", C.A.J. September, 1930. "Maintenance and Operation of Regimental Motor Transportation", C. A. J. November, 1930. "Tracers versus Sights", and "Comments" on Tracers vs. Sights, C.A.J. January and February, 1931. "Precision Methods versus Improvisation of AA Fire" C. A.J. September and October, 1931. "AA Tactics for Moving Columns" C.A.J. November and December, 1931. "The Lewis Universal Impact and Trial Shot Chart for AA Artillery" C.A.J. November and December, 1931. The fifth conference covered in detail the care, preservation, lubrication and operation of motor vehicles of an AA Artillery regiment.

The lectures and conferences were conducted by officers who, either from experience, or training in our service schools, were best prepared to properly present their subjects.

The 243d Coast Artillery (HD), R. I. N. G.



The regimental coat of arms of the 243d contains the figure of a rooster, rampant (and rouge, out of deference to the well-known breed originating in that state). Its motto is "Game to the Last." There is nothing inconsistent with this motto and the previous history of the regiment. Nor is there anything inconsistent with the cock which appears on the regimental coat of arms and a letter recently received from the regimental commander, Colonel C. L. D. Wells. Both are of the crowing variety.

Colonel Wells is perfectly justified in indulging in a little crowing. The ratings of the National Guard regiments recently published show the 243d firmly established in second place with Batteries B, C, D, and F rated "Excellent" and entitled to wear the "E."

Battery F, under that redoubtable Frenchman Captain James A. Murphy, exceeded the score of 137 which he made last year with a still higher one—144.

"Four out of five" of the harbor defense batteries were rated excellent with an average score of 91. (This regiment also has an antiaircraft Battalion.) In a period of two years the improvement in the score has been 160 per cent.

Pleasing as this record is it is more pleasing when considered as the justification of a system of training which was inaugurated in the regiment by Colonel Wells with the assistance of the instructor, Major A. E. Rowland, C. A. C. This system is too long to be described in detail here but the instructor has been asked to write an article on it for publication in the JOURNAL. The methods used are in no respect a violation of the Training Regulations.

The record of the 243d is, indeed, worthy of special comment and Colonel Wells, Major Rowland, and the entire personnel are to be congratulated on such a high standard of efficiency. It stands at the top of all harbor defense regiments and is second only to the 206th Coast Artillery (AA) (Ark. N. G.).

Philadelphia Chapter, United States Coast Artillery Association

ALL during the winter the Philadelphia Chapter of the Association has been conducting an interesting and instructive series of meetings with the assistance of the Unit Instructor, Major F. A. Hause, C.A.C. (DOL). At one of the meetings Captain Crandall Z. Rosecrans, 603d C.A. (Ry) gave an interesting talk on the battle of Germantown. This battle (more properly, a rear guard action) was fought within the present city limits of Philadelphia along th Germantown Pike now called Germantown Avenue. The talk was extremely interesting to members of the Philadelphia Chapter. Captain Aaron Bradshaw assigned to the 62d C.A. (AA) was discovered in Philadelphia not long ago and was drafted to deliver a talk on antiaircraft materiel. Captain H. F. Crawford, 510th; Captain W. L. Treu, 603d; and Captain S. M. Shindel were the actors in a thrilling playlet entitled "Estimate of the Situation" in which Captain Crawford played the part of the well known Major A and Captains Treu and Shindel performed as S-2 and S-3. The title of this play never changes but the script is altered each time, just to make it hard for Major A. However with the help of his able assistants the correct decision was reached.

Captain Victor Gondos, Jr., the President of the Chapter has been ill in a Philadelphia hospital but at present is on the road to recovery. His friends will be glad to see him again on the job.

Major General John W. Gulick, Chief of Coast Artillery, will visit Philadelphia on April 22 as the guest of the Philadelphia Chapter at a dinner given in his honor. This is the first official visit of the Chief of Coast Artillery to Philadelphia and the Chapter is preparing to make the meeting a gala occasion.

COAST ARTILLERY ORDERS

Brig. Gen. William E. Cole from Hawaii to 2d C. A. District, New York.
Brig. Gen. Stanley D. Embick, from Commandant, Coast Artillery School, Ft. Monroe to Philippines sailing New York, April 29.

Brig. Gen. Charles E. Kilbourne from Philippines to Office, Chief of Staff, (War Plans Division,) Washington.

Brig. Gen. James H. Reeves from 9th, C. A. District, Presidio of San Francisco, to 4th C. A. District, Ft. McPherson, Ga. sailing San Francisco, July 29.

Brig. Gen. Joseph P. Tracy from detail General Staff, Washington, D. C. to Commandant, Coast Artillery School, Ft. Monroe, August 31.

Col. Robert S. Abernethy from 1st C. A. District, Boston, to 1st C. A. Brig., Hawaii sailing New York, August 26.

Col. Percy P. Bishop previous orders to General Staff in Panama revoked.

Col. Edward Carpenter, from military attache, Berlin, to instructor, Org. Res., Boston, April 28.

Col. Robert W. Collins, from Militia Bureau, Washington, to Ft. Monroe, for 3 months refresher course, February 11. Upon completion to Philippines sailing New York, August 20.

Col. Arthur S. Conklin from detail in G. S. C. and headquarters 3d Corps Area, Baltimore, to 62d, Ft. Totten, April 19.

Col. Frederick L. Dengler, from detail in G. S. C. and Headquarters 9th Corps Area, Presidio of San Francisco, to Philippines sailing San Francisco, Sept. 21.

Col. Edward Kimmel, 62d, Ft. Totten to ROTC, University of Washington, Seattle, sailing New York, April 29.

Col. Albert L. Loustalot from Org. Res., Headquarters 9th C. A., Presidio of San Francisco, to Philippines sailing San Francisco, May 25.

Col. George T. Perkins, from Philippines to G. S. C., and duty with Headquarters, Third Corps Area, Baltimore.

Col. Russell P. Reeder, Inst., C. & G. S. S., Ft. Leavenworth, to Panama sailing New York, Oct. 7.

Col. Granville Sevier retired February 29.

Col. Archibald H. Sunderland from detail in General Staff and Hawaii to C. A. B., Ft. Monroe.

Lt. Col. Clair W. Baird, Ft. Monroe, to student Army Industrial College, Washington, Aug. 17.

Lt. Col. William S. Bowen, Org. Res., New York, to 1st C. A. Dist., Boston, April 1.

Lt. Col. Paul D. Bunker, from Historical Section, Army War College, Washington, to 9th, Ft. Banks, March 19.

Lt. Col. George W. Cocheu from detail in G. S. C. and headquarters First Corps Area, Boston, to 12th, Ft. Monroe, July 15.

Lt. Col. Clifford Jones, G. S. C., from Philippines to 13th, Ft. Barrancas.

Lt. Col. Franc Lecocq, 12th, Ft. Monroe, to Org. Res., Ft. Monroe, Aug. 1.

Lt. Col. Horace F. Spurgin orders to report to retiring board revoked.

Lt. Col. George A. Wildrick, from Headquarters, 6th Corps Area and detail with G. S. C., to student, Army War College, Washington, August 15.

Major Roy S. Atwood, student, A. W. C., Washington, to Honolulu sailing New York, July 27.

Major Clair W. Baird, promoted Lt. Col. January 1.

Major Karl F. Baldwin from instructor, C. & G. S. S., Ft. Leavenworth, to Historical Section, Army War College, Washington.

Major Gordon deL. Carrington, student, C. & G. S. S., Ft. Leavenworth, to Headquarters, 1st Corps Area, Boston.

Major Willis McD. Chapin from Panama to student C. & G. S. S., Ft. Leavenworth, Aug. 29.

Major James B. Crawford, from office Chief of Coast Artillery to student, Army War College, Washington, Aug. 15.

Major Octave DeCarre from Hawaii to 13th, Ft. Moultrie.

Major Richard S. Dodson transferred from F. A. and from R. O. T. C., V. M. I., Lexington, to 52d, Ft. Hancock, Aug. 2.

Major Richard Donovan promoted Lt. Col., January 1.

Major Frank Drake, from student, C. & G. S. S., Ft. Leavenworth, to Headquarters, 7th Corps Area, Omaha.

Major Bird S. DuBois, 61st, Ft. Sheridan, to student, Army War College, Washington.

Major Felix E. Gross, student, Army War College to Naval War College, Newport, R. I., July 1.

Major George D. Holland from Hawaii to Org. Res., Cleveland, Ohio.

Major Henry B. Holmes, Jr., student, G. S. C., Ft. Leavenworth, to Headquarters, 8th Corps Area, Ft. Sam Houston, Tex.

Major John H. Hood, student, C. & G. S. S., Ft. Leavenworth, to instructor, C. & G. S. S.

Major Frank L. Hoskins from Hawaii to instructor, C. & G. S. S., Ft. Leavenworth, Aug. 1.

Major Sanderford Jarman promoted Lt. Col. January 1.

Major Delmar S. Lenzner 51st, Ft. Monroe to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Major Albert L. Loustalot promoted Lt. Col., January 1.

Major Clarence T. Marsh, 62d, Ft. Totten, to instructor, C. & G. S. S., Ft. Leavenworth, Aug. 1.

Major Gilbert Marshall promoted Lt. Col. January 13.

Major Charles B. Meyer, instructor, Pa. N. G., Allentown, to instructor, C. A. S., Ft. Monroe, Aug. 1.

Major Harold F. Nichols, instructor, C. G. S., Ft. Leavenworth to student, Army War College, August 15.

Major Chas. D. Y. Ostrom, 12th, Ft. Monroe to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Major Louis L. Pendleton, Army War College, to 6th, Ft. Winfield Scott sailing New York, June 18, promoted Lt. Col., Feb. 1.

Major Randolph T. Pendleton, 59th, Ft. Mills, to student, Army War College, Aug. 20.

Major Adam E. Potts, 52d, Ft. Monroe, to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Major Frederic A. Price from Hawaii to 62d, Ft. Totten, thence to student Army Industrial College, Washington, August 17.

Major Edward W. Putney promoted Lt. Col. January 1.

Major Gerald B. Robison, 69th, Ft. McClellan, to student C. & G. S. S., Ft. Leavenworth, Aug. 20.

Major Alden G. Strong, instructor, C. & G. S. S., Ft. Leavenworth to student, Army War College, Aug. 15.

Major LaRhett L. Stuart, Org. Res., Ft. Monroe, to Philippines sailing New York, Aug. 26.

Major Clesen H. Tenney, student, Army War College to Naval War College, Newport, R. I., July 1.

Major Thomas A. Terry promoted Lt. Col., Feb. 1.

Major Edgar H. Thompson, from detail in I. G. D. and Headquarters, Second Corps Area, Governors Island to Org. Res., New York, June 1.

Major Robert H. VanVolkenburgh, instructor, Ft. Monroe, to student, Army War College.

Major Robert B. Welshmer, student, A. C. Tactical School, Maxwell Field, Ala., to instructor, A. C. Tactical School.

Capt. Reamer W. Argo, student, C. A. S., Ft. Monroe to instructor, C. A. S.

Capt. Clare H. Armstrong, from Philippines to 6th, Ft. Winfield Scott. Capt. W. C. Braly, 12th, Ft. Monroe to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. Harold B. Bliss, from Panama to 6th, Ft. Winfield Scott.

Capt. James D. Brown, from Hawaii to 12th, Ft. Monroe.

Capt. Herbert F. E. Bultman, instructor, C. A. S., Ft. Monroe to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. Geoffrey C. Bunting from Hawaii to 62d, Ft. Totten.

Capt. Francis L. Christian, student, C. A. S., Ft. Monroe to instructor, C. A. S.

Capt. John R. Clark, instructor, Org. Res., Cleveland, Ohio, to Philippines sailing New York, April 29.

Capt. Willis L. Claxton, from Panama to 69th, Ft. McClellan.

Capt. Morris E. Conable from Philippines to instructor, Washington, N. G., Ft. Lewis.

Capt. John T. deCamp, student, C. A. S., Ft. Monroe, to 51st, Ft. Monroe, Aug. 1.

Capt. Joseph H. Gilbreth, R. O. T. C., Miss. A. & M. College, to Philippines sailing New York Aug. 26.

Capt. Henry F. Grimm, Jr., student, C. & G. S. S., Ft. Leavenworth to instructor, C. A. S., Ft. Monroe.

Capt. Alexander L. Haggart from Panama to 62d, Ft. Totten.

Capt. Vernon W. Hall, student, C. & G. S. S., Ft. Leavenworth, to Panama sailing New York, Sept. 2.

Capt. Benjamin F. Harmon, Ft. Totten to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. John E. Harrison, from Philippines to 69th, Ft. McClellan.

Capt. Harold P. Hennessy from Philippines to R. O. T. C., Univ. of Cincinnati.

Capt. Daniel W. Hickey, Jr., from student, C. A. S., Ft. Monroe, to 51st, Ft. Monroe, Aug. 1.

Capt. W. W. Irvine, 51st, Ft. Monroe to instructor, C. A. S., Ft. Monroe.

Capt. Harold R. Jackson, 14th, Ft. Worden, to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. Frederick H. Koerbel, student, C. A. S., Ft. Monroe, to Hawaii, sailing New York, July 27.

Capt. Richard C. Lowry, from Philippines to 52d, Ft. Hancock, N. J.

Captain Samuel McCullough, from Philippines to 61st, Ft. Sheridan.

Capt. Frank J. McSherry, office Chief of Coast Artillery, Washington, to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. Robert N. Mackin, Jr., from Panama to student, C. & G. S. S., Ft. Leavenworth, Aug. 29.

Captain Elmer W. Miller, from Philippines to 63d, Ft. MacArthur.

Capt. Lawrence C. Mitchell, student, C. A. S., Ft. Monroe, to Hawaii sailing New York, July 27.

Capt. Douglas E. Morrison, from Philippines to 12th, Ft. Monroe, Va.

Capt. Geoffrey M. O'Connell, instructor, C. A. S., Ft. Monroe, to Panama, sailing New York Sept 2.

Capt. Ernest R. Percy, from Walter Reed Hospital to recruiting, New York.

Capt. Wade W. Rhein promoted Major Feb. 1.

Capt. George W. Ricker, C. A. S., Ft. Monroe, to student, C. & G. S. S., Ft. Leavenworth, Aug. 20.

Capt. Dorsey J. Rutherford, 62d, Ft. MacArthur, to Panama, sailing San Francisco, May 14.

Capt. Cyrus Q. Shelton from Council Bluffs High School, Iowa, to War Mothers Pilgrimage, New York, May 2.

Capt. Robert J. Van Buskirk, student, C. A. S., Ft. Monroe, to 12th, Ft. Monroe, March 1.

Capt. Leon A. White, R. O. T. C., University of Cincinnati, to Philippines sailing New York, Aug. 26.

1st Lt. Wayne L. Barker, student, C. A. S., Ft. Monroe to Hawaii sailing New York, July 27.

1st Lt. Laurence W. Bartlett, from Hawaii to 51st, Ft. Monroe.

1st Lt. Orley D. Bowman, 10th, Ft. Adams, to Hawaii, sailing New York April 29.

1st Lt. John R. Burnett, 12th, Ft. Monroe, orders to Philippines revoked.

1st Lt. Robert W. Crichlow, Jr., student, C. A. S., Ft. Monroe, to 12th, Ft. Monroe.

1st Lt. John W. Davis, 2 months 15 days leave, June 20.

1st Lt. Escalus E. Elliott from Hawaii to student, C. A. S., Ft. Monroe.

1st Lt. Wilbur R. Ellis to sail New York Oct. 7 for Hawaii instead of July 27.

1st Lt. John M. England, student, C.

A. S., Ft. Monroe, to Panama, sailing New York Sept. 2.

1st Lt. Edward C. Franklin, student, C. A. S., Ft. Monroe, transferred to Ordnance Dept., Springfield Armory, Mass.

1st Lt. Gerald G. Gibbs, student, C. A. S., Ft. Monroe to Philippines sailing New York, Aug. 26.

1st Lt. Sanford J. Goodman from Hawaii to C. A. S., Ft. Monroe.

1st Lt. Lee E. Gray, instructor, Wash. Natl. Guard, Ft. Lewis to Philippines sailing San Francisco Sept. 21.

1st Lt. Richard H. Grinder from Hawaii to student, C. A. S., Ft. Monroe.

1st Lt. Clem O. Gunn, from Philippines to 69th, Ft. McClellan.

1st Lt. John L. Hanley, student, C. A. S., Ft. Monroe to Panama sailing New York Sept. 2.

1st Lt. Melton A. Hatch, student, C. A. S., Ft. Monroe to 12th, Ft. Monroe.

1st Lt. John W. Huyssoon from Hawaii to 12th, Ft. Monroe.

1st Lt. John J. Johnson from Hawaii to 52nd, Ft. Monroe.

1st Lt. Wm. L. Johnson from Hawaii to student, C. A. S., Ft. Monroe.

1st Lt. William H. Kendall from Philippines to 12th, Ft. Monroe.

1st Lt. Lewis S. Kirkpatrick, student, C. A. S., Ft. Monroe, to Hawaii sailing New York, July 27.

1st Lt. William S. Lawton, 61st, Ft. Sheridan, orders to Philippines revoked.

1st Lt. Oscar J. Levin, 14th, Ft. Worden to Hawaii sailing San Francisco June 7.

1st Lt. Dean Luce, R. O. T. C., University of Washington, Seattle, to Hawaii, sailing San Francisco Sept. 23.

1st Lt. John A. McComsey, 2 months leave June 20.

1st Lt. Lew M. Morton, student, Q. M. C. Motor Transport School, Holabird, Md., to instructor, C. A. S., Ft. Monroe.

1st Lt. Wm. L. Richardson to 12th, Ft. Monroe, instead of 13th, Ft. Barrancas, as previously ordered.

1st Lt. Leland S. Smith from Philippines to 12th, Ft. Monroe.

1st Lt. Fiorre J. Stagliano from detail in Ord. Dept., Watervliet Arsenal to Philippines sailing New York April 29.

1st Lt. William F. Steer, from Philippines to 51st, Ft. Monroe.

1st Lt. Will K. Stennis, 1 month and 8 days leave, June 17.

1st Lt. W. K. Stennis from Hawaii to student, C. A. S., Ft. Monroe.

1st Lt. Howard J. Vandersluis, student, C. A. S., Ft. Monroe, to Hawaii sailing New York July 27.

1st Lt. Carl B. Wahle, from Hawaii to 52d, Ft. Hancock.

1st Lt. Walter L. Weible from Hawaii to 63d, Ft. MacArthur.

1st Lt. Albert J. Wick from Philippines to 7th, Ft. DuPont.

1st Lt. Michael H. Zwicker, 13th, Key West Barracks, to student, Q. M. C. Sub-sistence School, Chicago, Aug. 1.

2nd Lt. Robert L. Anderson from Philippines to 12th, Ft. Monroe.

2nd Lt. Neal E. Ausman transferred to Air Corps, December 22.

2nd Lt. James T. Barber, from Hawaii, to 6th, Ft. Winfield Scott.

2nd Lt. C. Robert Bard, from detail in Air Corps, Randolph Field, to Hawaii, sailing San Francisco May 25.

2nd Lt. Marshall S. Carter, 12th, Ft.

Monroe, to Hawaii, sailing New York April 29.

2nd Lt. Albert F. Cassevant, 11th, Ft. H. G. Wright, to Hawaii, sailing New York April 29.

2nd Lt. Clair M. Conzelman promoted 1st Lt. December 25.

2nd Lt. Matthew K. Deichelmann from Philippines to 52d, Ft. Monroe.

2nd Lt. Chester J. Diestel from detail in Air Corps, Ft. Sam Houston, to Philippines, sailing San Francisco, May 25.

2nd Lt. Paul Elias from Philippines to 62d, Ft. Totten.

2nd Lt. William H. Francis, from Hawaii to 52d, Ft. Monroe.

2nd Lt. Richard H. Grinder promoted 1st Lt. January 5.

2nd Lt. Lawrence M. Guyer from Panama to 62d, Ft. Totten.

2nd Lt. Marvin L. Harding transferred to Air Corps, Dec. 22.

2nd Lt. Malcolm H. Harwell promoted 1st Lt. January 1.

2nd Lt. Clarence J. Hawk, Jr., Ft. Monroe, to Hawaii sailing New York April 29.

2nd Lt. Ernest F. Heidland, from Philippines to 61st, Ft. Sheridan.

2nd Lt. Joseph Horridge, 52d, Ft. Hancock, detailed in Ordnance Department and to Ordnance School, Watertown Arsenal, Mass. July 1.

2nd Lt. Olaf H. Kyser, Jr., from aide to Brig. Gen. Cruikshank, Ft. Sill, Oklahoma, to Philippines, sailing San Francisco, May 25.

2nd Lt. Oscar J. Levin promoted 1st Lt. January 1.

2nd Lt. Charles W. McGeehan promoted 1st Lt. January 1.

2nd Lt. Cyril Harvey McGuire resigned.

2nd Lt. Henry R. McKenzie from Hawaii to 61st, Ft. Sheridan.

2nd Lt. Elmo C. Mitchell, from detail in Air Corps, Ft. Sam Houston, to Philippines sailing San Francisco May 25.

2nd Lt. Frank F. Miter promoted 1st Lt. February 1.

2nd Lt. Harlan C. Parks from Hawaii to 6th, Ft. Winfield Scott.

2nd Lt. Edwin S. Perrin transferred to Air Corps, Dec. 22.

2nd Lt. Clark N. Piper transferred to Air Corps, Dec. 22.

2nd Lt. Andrew Samuels, Jr., from Hawaii to 51st, Ft. Monroe.

2nd Lt. F. F. Scheffler promoted 1st Lt. February 1.

2nd Lt. John R. Seward from Philippines to 11th, Ft. H. G. Wright.

2nd Lt. Wilbur M. Skidmore, 51st, Ft. Monroe, to Hawaii sailing New York April 29.

2nd Lt. Eugene C. Smallwood promoted 1st Lt. February 1.

2nd Lt. Tom V. Stayton, 51st, Ft. Monroe, to Hawaii, sailing New York April 29.

2nd Lt. Philip B. Stiness from detail in Air Corps, Ft. Sam Houston, to Philippines sailing San Francisco May 25.

2nd Lt. James S. Sutton transferred to Air Corps Dec. 22.

2nd Lt. Guy E. Thrams, from Philippines to 12th, Ft. Monroe.

2nd Lt. Kenneth J. Woodbury, from Philippines to 8th, Ft. Preble.

2nd Lt. Joy T. Wrean from Hawaii to 51st, Ft. Monroe.

BOOK REVIEWS

THE WAR IN THE AIR: Being the Story of the Part Played in the Great War by the Royal Air Force. Vol. III. By H. A. Jones. Humphrey Milford, Oxford University Press, New York. Price \$9.00.

It is a careful and detailed account of the activities of the British aircraft, and antiaircraft, at home and overseas, showing the development of these new branches under wartime conditions.

The campaigns in Africa, the Zeppelin attacks on Great Britain, and the operations on the Western Front are presented in a clear and interesting manner. Also of an instructive nature are the problems of supply, administration and training connected with the War in the air.

The volume shows the great advantages of aircraft as an offensive arm, and demonstrates with equal clarity its weakness in defense. As a constant potential threat against the enemy, requiring extensive defense measures, aircraft were of inestimable value. They did much excellent reconnaissance service, and were sometimes used to carry messages, for spotting, etc. According to the British historian, Mr. H. A. Jones, the material damage done by bombing from the air was negligible. The most effective defense against the bombers was darkness. When the terrain below showed no lights the airmen were almost invariably hopelessly lost, mistaking rivers, cities and coast lines, for landmarks often miles away. The bombs that did hit objectives of some importance were dropped under the impression that they were hitting something far removed from the actual target. When the antiaircraft defenses of London were so far developed that searchlights could illuminate the target, the day of the raiding Zeppelin was over.

It was interesting to observe that the most successful bombing on the Continent was done on the air-dromes, which depended for their defense on other planes rather than on ground guns and lights.

Mr. Jones' volume will be of value to any man concerned in the defense of his country, and is especially recommended to those whose detailed knowledge of the actual performance of aircraft in the War is somewhat limited.

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MRS. FISCHER'S WAR, by Henrietta Leslie. Houghton, Mifflin Co. 301 pages. Price \$2.50.

The number of books on the Great War that are continuing to appear shows that it has taken at least a decade to get the proper perspective on the events of those trying and tragic times. Naturally, most of these books deal with the experiences and reactions of the average fighting man; but there was another great army—women who were left at home, and whose war

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sears bear evidence of another kind of battle. Uncertainty, worry, helpless inaction, poverty, grief and persecution will try the strongest spirit to the breaking point.

It is with one of these women that "Mrs. Fischer's War" deals; and the author, Henrietta Leslie, successful English novelist and playwright, has told her story with so much realism and such a wealth of convincing detail that the book has become the most widely read and discussed of the recent war novels. It was a choice of one of the Book-of-the-Month Clubs, and is now appearing on the London stage.

There is nothing light or amusing about "Mrs. Fischer's War,"—there couldn't be. "It is a study of the conflict between national sympathies and loyalties" manifesting itself in a woman's struggles to love and to understand both German Carl, her husband, and English John, her son.

Janet Rivers, English gentlewoman, "young, lovely, friendly and human," marries Carl Fischer, German-born expatriate, who had found the "organized restrictions of his home and Fatherland" so unbearable that he had escaped to England before he was old enough for his compulsory military service. In time he had identified himself so completely with the business and social life of his adopted land that he was more English than many an Englishman and his youth in Germany was little more than a memory. The marriage of Carl and Janet is ideally happy, and when their son John is eighteen they decide to take a vacation trip to Germany. They have barely arrived there when the war breaks out and they start home at once on a train filled with refugees like themselves. But as they approach the frontier Carl's patriotism for his native land asserts itself and he leaves the train while Janet is asleep and gives himself up to the German military authorities.

Janet, half-crazed with anxiety over Carl's disappearance, reaches home to find herself listed as an "enemy alien" and Carl suspected of having been German spy. John, English to the core, disowns his father, refuses to forgive or understand his mother's loyalty to Carl, changes his name to "Fisher" and enlists in the English army. Janet, bereft of both husband and son, tries to do war work but is hounded out of one organization after another and deserted by her friends until she is forced to live in total isolation, her only companions a faithful servant and a stray dog.

Finally John writes to his mother that he has seen his father in a hospital, frightfully wounded. Not long afterward John himself is badly wounded, and at the close of the war, shattered in health, he marries his nurse and goes with her to her Canadian home, "with his young wings clipped and with rancour in his heart where love had been."

Carl, blind and crippled, is permitted to return to his devoted wife and to the England he has never ceased to love and takes up life again in a land that has no friendship to spare for the German Fischers.

The book closes with Janet guiding Carl on his daily walk.

"A step here," Janet warned him.

"Is there, darling? Thank you." . . .

Thus the German Fischers. And the Vicar's wife, coming out of a cottage where she had been on an errand of mercy, saw them and quickly crossed to the other side of the road.

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TASCHENBUCH DER TANKS, by Fritz Heigl. J. F. Lehmann's Verlag, Munich, Germany. Price 15 R. M.

This is the third edition of this handy compendium and has been brought to date as much as anything of this character can be accomplished, especially when it is remembered that War Offices are not prone to publish too much regarding improvements in armored vehicles and tanks.

The first part is devoted to armored cars, beginning in 1900, and states succinctly what has been accomplished since then, including their uses, characteristics, transformation of standard vehicles, armor, tires, multi-wheel drive, dual control, climbing possibilities, large wheel vehicles, such as the "Pavesi" and multiwheel chassis.

This is followed by tanks of the wheel-caterpillar type and caterpillar only. The article on caterpillar chain is very instructive, as is also the wheel suspension. The good and bad points of such chains as the Kegresse, Nyberg, Kornbeck, Chase, steel-band, Renault, Vickers, Carden-Loyd and others are fully stated.

The chapter on visibility, with periscopes, is very good and contains some interesting information.

This is followed by methods for transmitting commands within the tank, gun mounts, and finally the problem of new designs.

Quite some space is also given to armored railroad trains, their history, construction, etc.

The tanks employed by various countries are very well described so far as information is available, but newer types are principally based on surmises.

Then follows tank tactics with examples of operations during the World War, the latter with armored cars used by the Austrian troops in the Balkans.

The book closes with a table covering the armored cars and tanks at present in the service of the various countries, including date of adoption, weight, dimensions, power, speed, armament, armor, gasoline capacity, radius of action and hill-climbing capabilities.

The book should be in the hands of every one interested in motorization and mechanization.

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LEONARD WOOD, by Herman Hagedorn, two volumes; pp. 436, 524. Harper & Brothers, New York, 1931. Price \$10.00.

A notable biography of an outstanding American, a fascinating story of an interesting epoch in our national existence. Based upon a wealth of original source material, filled with a mass of hitherto unpublished official

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records and private letters, these two volumes constitute an important American historical document. The author acquitted himself creditably of a herculean task. The stirring record of an eventful and romantic life encompassed within these volumes is a fitting tribute to the memory of Leonard Wood.

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THE RED MAN IN THE NEW WORLD DRAMA, by Jennings C. Wise. 592 pages exclusive of appendices; 54 illustrations. The W. F. Roberts Co., Washington, D. C. \$5.00.

An interesting and absorbing book.

The prints which form the illustrations of the book are, in themselves, of the greatest interest although the explanatory descriptions of the events pictured are not identified.

On the title page, the author calls his work, "A Politico-Legal Study with a Pageantry of American Indian History." The expression sums up the book very well no matter how unusual the joining of these two aspects may seem.

In the foreword, Colonel Wise outlines his purpose of showing that the development of this nation was greatly influenced by contact with the Indian tribes and of waking the American conscience and love of fair play so that something may be done to save the remnant of the once mighty Red Men.

The author read a great deal in his preparation of this work, and his reference footnotes are of great value. In later editions, they might well be listed in a bibliography at the end of the book.

An exhaustive and fascinating story of the origin and pre-Columbian history of the Red Race is given in Appendix I (which should be read first) and Chapters I and II.

A comprehensive account follows of the centuries of invasion and aggression by the white settlers, and of deception and betrayal by the government. A number of our presidents, notably Washington and Grant are credited with attempts to halt the process of spoliation and extermination, but their influence could naturally be only temporary.

The efforts of outstanding Indian leaders to protect their people by organization, through treaties, and by a despairing resort to open resistance, are treated with sympathetic understanding.

Americans may read this book with profit. The subject matter is truly a part of our history; and a part of which we are amazingly ignorant.

It is to be hoped that the author may be successful in stimulating an interest in the American Indian and a desire to assist him to better conditions of life.

Physically, the book is in a form "easy to read" though a bit large and heavy for convenient handling.

Mistakes in spelling abound; errors in dates are frequent; and there are many sentences of incorrect incomplete construction.