COAST ARTILLERY JOURNAL

HONORABLE GEORGE HENRY DERN
Secretary of War

March-April, 1933

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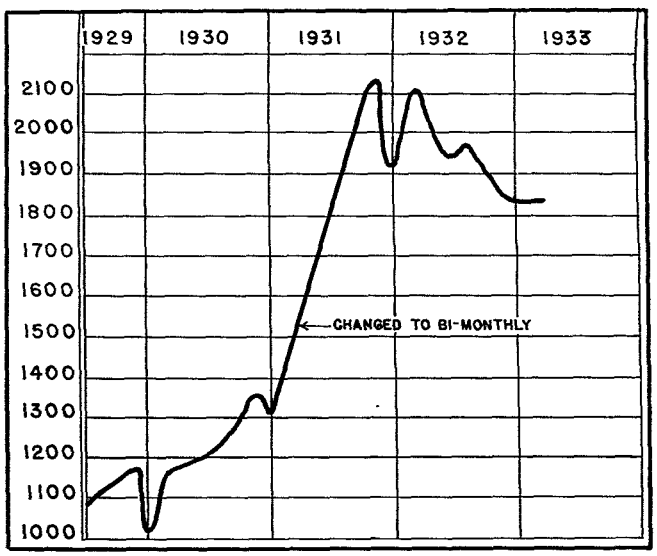
Notes of the Coast Artillery Association

NOW that the tour of duty of the present editor of the COAST ARTILLERY JOURNAL is drawing to a close we will be pardoned (perhaps) if we review the JOURNAL's history of the past four years and relate some of the circumstances which have affected it.

In July, 1929, the subscription list of the JOURNAL was approximately 1100, dropping to a low of 1000 in December—always the low month of the subscription year. There was a slow rise during the year 1930, which reached a more rapid up-grade inclination during the year 1931.

The year 1931 was an important year for the JOURNAL. At the beginning of the year the format, which had remained practically unchanged throughout the JOURNAL's existence, was changed to that in use at present. The principal purpose of this change was to entice advertisers with more attractive space



Graph showing paid subscriptions to the Coast Artillery Journal for the period July 1, 1929—April 1, 1933.

and also to enable us to adopt a format indentical with that of the INFANTRY and CAVALRY JOURNALS. Naturally, as soon as we were ready to offer more attractive advertising space Congress legislated advertising out of the picture and the reduced income forced the JOURNAL to a bimonthly schedule of publication.

The JOURNAL would have been much worse off financially had it not been that the United States Coast Artillery Association came into existence with the year 1931 and the increased interest which the Association generated acted favorably on the subscription list. There is no doubt that more subscriptions would have been obtained had the JOURNAL remained on a monthly basis.

The year 1932 was a sad story in the life of any business. It had its effect on the JOURNAL. We received cancellations. There are numerous letters on file from loyal subscribers telling us of cuts in pay, loss of jobs, bank failures and other financial difficulties. These were mostly from our friends of the National Guard and Reserve. The Regular Army, not being affected proportionally, for the most part stood by. Yet with this handicap, during the year 1932 the JOURNAL loss in subscription income would compare favorably with the losses suffered by other businesses.

Some officers believe that there is not room for so many publications in the service field; that it would be preferable to have one journal for all arms. Such a journal could be easily supported by its subscriptions and a better quality of articles would be obtained. The objection to this plan is the disinclination of any arm to give up its own journal. The journal is the organ of the arm association and as such exercises a great influence on esprit and morale. Furthermore each arm has certain technical information which it desires to disseminate among its personnel in which readers of another arm would not be interested. The thought then occurred: "Why not have a part of the JOURNAL common to other journals." This required editorial affiliation, a common format, and the printing accomplished in the same plant. This plan was adopted by the INFANTRY, CAVALRY and COAST ARTILLERY JOURNALS and has resulted not only in a better quality of articles but in a considerable saving in printing and engraving costs. In this way the best articles pertaining to other arms are selected and the Coast Artillery reader kept abreast of developments and methods of the remainder of the Army.

There is one side of the operation of the JOURNAL which is never seen. We refer to its financial operation. In other words, the Houdini act of "balancing the budget." During the past four years the JOURNAL has supported itself without calling on the Association for a dole. Its present financial situation is excellent (regardless of the Depression) due to the loyal support which it has received from its subscribers. We bespeak this same support for the remainder of our period with the JOURNAL and for our successor.

If, by any chance, it may be said that the occupant of the editorial chair has performed his duties in a reasonably satisfactory manner it is desired to express the deepest appreciation to the Chief of Coast Artillery, the officers on duty in his office and the Council of the U. S. Coast Artillery Association for their constant backing and sympathetic understanding of the JOURNAL'S problems; to the instructors with the National Guard and the Reserve who have cooperated as field agents of the JOURNAL without portfolio or compensation; to the underpaid authors who have assisted in disseminating among our readers information of the greatest interest; and to the members of the Association who have never failed with encouraging and constructive comments.

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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a. Civilians who have demonstrated their interest in national military preparedness.

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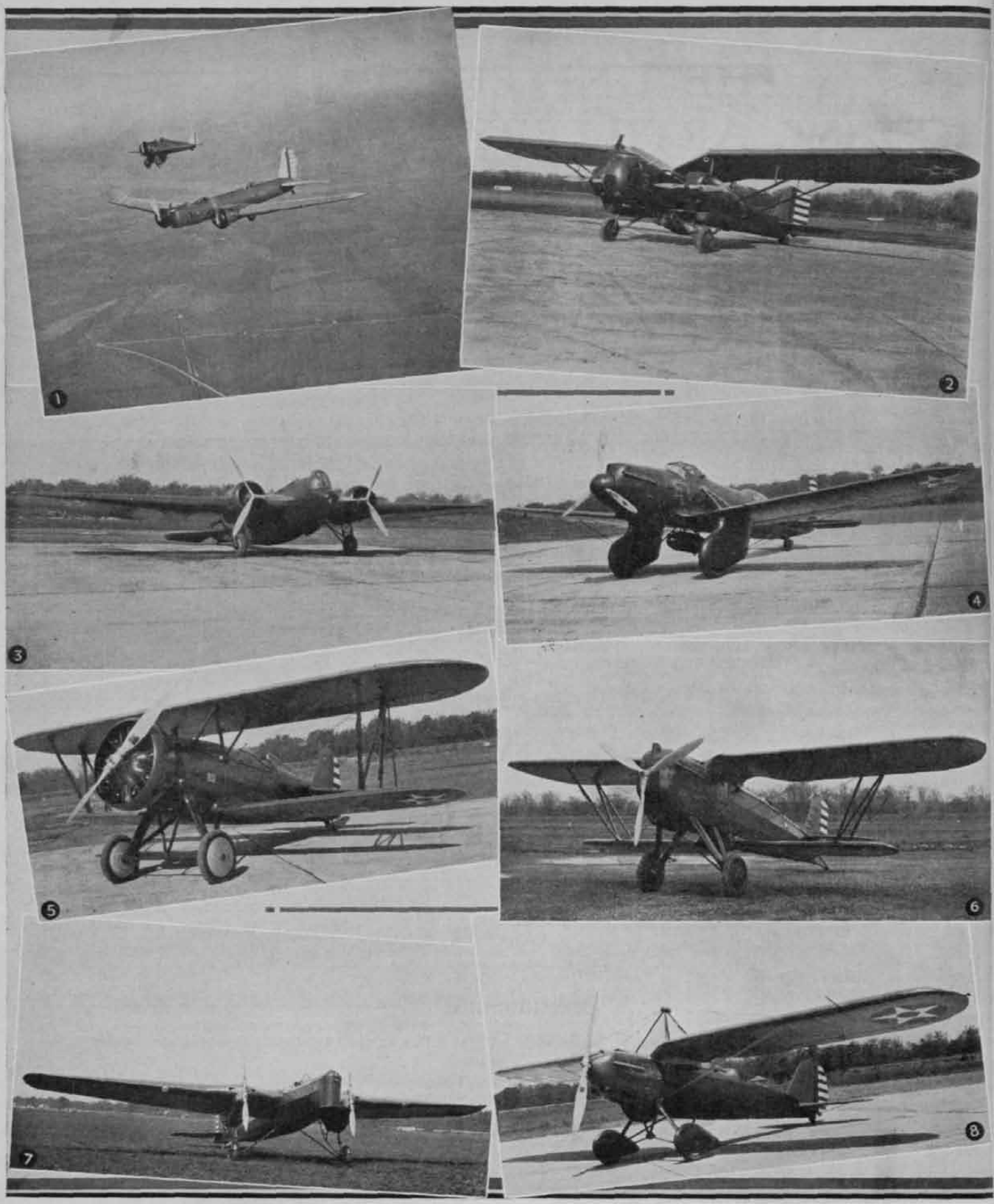


LATEST TYPES OF ARMY AIR CORPS PLANES

1. The B-9, the first of the "super-bombers," threatened the superiority of pursuit types in speed until the P-26 demonstrated the superiority of this type of pursuit plane.

2. The Douglas B-7, Light Bomber. With slight alterations in equipment this ship becomes the O-35, a long range (Army observation) reconnaissance plane. It has retractable landing gear. The gull wing is quite noticeable here.

3. The new Army Martin X B-10 bomber now undergoing test at Wright Field. It is powered with two radial air-cooled engines and has retractable landing gear. The bombs are carried internally in a bomb bay which is closed by a trap.

4. The Curtis A-8 attack plane. This ship carries light bombs and 6 machine guns—4 pointing forward and 2 aft. The attack plane will be used to first attack AA establishments immediately prior to a bombing raid.

5. Boeing P-12-E. Most Army pursuit squadrons are equipped with this single seater. Speed about 190 m.p.h. at 7000 feet altitude.

6. The Berliner-Joyce two seater pursuit P-16. The upper wing is gull type, the center section being cut away for better visibility. The gunner rides in the rear seat with back to the pilot.

7. General Aviation O-27. Long distance reconnaissance plane. Note the motors faired into the wing.

8. Douglas O-31. A fast corps observation plane. The late Douglas models are gull wing designed.

Antiaircraft in the A. E. F.

By First Lieutenant Burgo D. Gill, C.A.C.

EDITOR'S NOTE: *So far as is known the complete story of the beginning of our antiaircraft artillery in France has never been written. There have been so many requests for information on this subject that it is believed worth while for the* JOURNAL *to publish the story in its pages as an historical record and for the convenience of those who are interested.*

Why was the Coast Artillery selected for the important job of developing the antiaircraft artillery? Without disparagement of any other branch of the service it may be said that the Coast Artillery was best qualified to do it. We had long been dealing with moving targets on the water, we were used to the handling of complicated fire control instruments. The use of mechanical devices for the solution of complicated problems of firing data was an old story to us. Every lieutenant had a gadget of some sort in his pocket which would produce instantly the answer which would require hours of computation. With this new enemy, speed was the essential thing and we were able to produce it.

The development of our antiaircraft system from the time of the arrival of our Antiaircraft Mission in France has been a hard uphill battle. Compelled as we were to accept the French and British methods then in use we were not satisfied with them but used them until something better could be developed. It is something of this early period that Lieut. Gill was asked to write. His article is based mainly on the report of Colonel Jay P. Hopkins, who was Chief of the Antiaircraft Service in the A.E.F., and a thesis written by Colonel Hopkins, subsequently, while a student at Leavenworth.

Introduction

THERE was no such an animal as antiaircraft defense in the American Army when the United States declared war in 1917. For that matter, France in 1914 had only ten experimental mounts and no personnel for her air defenses. However, the comparison is hardly just, for this country should have interested itself in what was going on overseas from 1914 to 1917. As we all know, if we learned anything, we did not put much of our knowledge into effect. So it was that, so far as the United States was concerned, antiaircraft defense in April, 1917, did not exist. If one desires to make a startling statement, none existed after the war either. It was disbanded after the Armistice to struggle painfully onward through another period of incubation. All of the Antiaircraft Service, as it was then called, which reached a maximum at the signing of the Armistice, amounted to 12,000 men of seven gun battalions and twenty separate batteries.

The first venture into this new kind of artillery by the United States occurred when a mission, that well beloved device for starting something during the past war, was sent to France to investigate the subject of antiaircraft defense. Brigadier General James A. Shipton, Captain George F. Humbert, CAC, and Captain Glenn P. Anderson, CAC, left for France in July, 1917, to look the situation over.

Perhaps, it would be well to give a little reminder that the Antiaircraft Service in the A.E.F. did not all come from one branch as is the case at present. The Coast Artillery furnished the artillerymen for the guns, although some Field Artillery officers were also assigned. The Engineers manned the searchlights, while the Infantry handled the machine guns. And, even then, the head of the machine gun school was a Gyrene major. What a mixture! But, lest we seem too flippant, the various branches worked surprisingly well together. Because of this admixture of branches, it would be well to discuss the three component parts of the antiaircraft; namely, guns, lights, and machine guns individually.

Artillery

Training, Materiel, and Fire Control

The American Mission investigated the English School in Great Britain, along the Western Front, and the French antiaircraft artillery school at Arnouville-les-Gonese. It was decided that an American school should be organized in France near the French school. English speaking officers were detailed to assist the Americans in the conduct of the school which was established at the chateau at Arnouville-les-Gonese which had been loaned by the French.

Antiaircraft Guns of Battery B, 1st Antiaircraft Battalion in Action at Montreuil, France, June 15, 1918.

While the United States had taken some little time to get the mission underway, the mission itself lost no time in getting things started. The school opened during the latter part of September, 1917, for a class of twenty-five officers. This school was given official recognition by a general order from G.H.Q. dated October 10, 1917. The first antiaircraft batteries, personnel only, began to arrive from the States in December, 1917.

It soon became evident that the school would be a training center as well as a place for educating officers. Final arrangements were made by the French for the use of their materiel at Arnouville and the guns in-

stalled in the Paris defenses that were conveniently near. It might be pertinent to mention at this time that the Americans were forced to use French guns for the duration of the war for mobile batteries. The three-inch, trailer mount, model 1918, never saw action.

All classes at Arnouville were given a finishing touch by a two weeks tour of duty with active French batteries on the Front. This method of training was also amplified to train American batteries as well. This proved excellent for the French as well as for the Americans since the French batteries were usually short handed, and of an older class of conscripts unfitted for front line trench duty. Similar to other schools in the States, like the Field Artillery one at Fort Sill, the officers to be educated at Arnouville came from batteries that were undergoing their initial period of training. A few officers were sent to the British school at Stienwerck for instruction in antiaircraft defense.

It was not until about a year after the declaration of war by the U. S. that an American antiaircraft battery was sent to the front for actual training and service. The 1st AA Battery was sent direct to start the AA defenses of Is-sur-Tille.

The primary big job at the school was the translation and preparation of training regulations from the French into English. This also meant that trajectory charts, data curves, etc., had to be prepared for American types of ammunition and materiel.

Instruction at this school covered practically all phases of antiaircraft from firing to military courtesy, convoy work, and camouflage. 240 officers and 5,000 troops were trained at the Arnouville center. There was one main difference between French and American methods. This was in the manner of conducting night firing. The French used barrage as well as direct fire by use of sound locator data. The Americans took more to the British idea of night firing which was direct fire at the target after it had been illuminated by searchlights.

By 1917, when we entered the war, the French had at last developed a satisfactory trailer mount for the 75. But, the first American guns had fixed carriages to be used with either a concrete or frame work piling. Thus even at the start we were far behind the rest of the world in design. Fifty of the guns were built and twenty-two were delivered and set up in the American defenses of the A.E.F. These first guns possessed still another great defect. They were only suitable for barrage fire.

The next American lot of AA guns were even worse than the first. At first thought, one might think that they were better because they were mounted on trucks, and a hand device for computing deflections had been invented. There was great difficulty in traversing them and they were too rough a gun for the cannoneers to "ride" during fire. At each shot, the gun would leave the ground a few inches.

We also experimented by mounting our standard rapid fire, three-inch seacoast gun on a truck. proved to be too heavy for use in France.

A thoroughly satisfactory model was not designed and manufactured in time for use in France before the war was over. This model is the familiar three-inch, trailer mount of 1918. Over 600 of these guns were ordered.

Before discussing the war time fire control systems, perhaps it might be better to tabulate the performance of war time, and modern planes.

	1914	1918	1933	
Altitude (ceiling) of planes, feet ..	4,500	15,000	30,000	
Speed of planes, miles per hour....	50	100	200	plus
Time of flight of projectile, seconds, (depending on fuse)	10	30	30	
Travel of target during time of flight, feet	4,400	8,800	17,600	

Naturally, the first methods of antiaircraft fire developed by the French were very rough. They depended largely upon correcting all successive shots from observed bursts. This was soon abandoned as well as the use of range for obtaining deflections. From this point, they developed two distinct methods of fire control. However, in order to use either system, a number of assumptions had to be made: the plane was assumed to be traveling in a straight line, at a constant speed in a horizontal plane. It will readily be seen that these methods opened the door wide for many errors and difficulties to creep in, especially so if we remember that our present-day directors, computors, use the angular travel method both for elevation and azimuth. In one system (the angle of approach system) the altitude, target speed, and the fusilage angle which the plane made with the gun-target line were assumed to be constant. All of these bits of data were computed by various instruments. In the other system, known as the angular speed method, there were two devices in use for computing the data. This angular speed method, also called the tachymetric, depended on observing the angular speed of the target both in elevation and in azimuth. Two instruments were used in the angular speed method: the Brocq, which was an electrical device, and the Routin which operated mechanically. Either of these instruments were superior to the angle of approach system.

During the war, no firing was done by Case III as we now know it. However, the possibilities of this method of firing had been recognized, and work had already commenced to devise suitable instruments, etc., at the close of the war.

During the war, the only method of obtaining altitude was by the use of a base line, one to four miles apart, and connected by telephone. Our present stereoscopic height finder is a post-war development.

Machine Guns

Probably due to the influence of French and British thought, which dictated that theoretically all ground troops would afford their own antiaircraft defense by the use of special mounts and guns that were issued to them, the American Antiaircraft Machine Gun

School did not get started until December, 1917. Major William F. L. Simpson, Infantry, was ordered to organize this school, but he died, and Major Andrew S. Drum, USMC, succeeded him in February, 1918.

Like all other classes of materiel used by the Americans in France, we had to look around and see what guns the Allies had that were fitted for our antiaircraft work. Tests determined that the Hotchkiss was the best. It was fitted with the Infantry Corrector, a French sight.

While the school itself got away to an early start, a complete unit, the 1st AA, M. G. Battalion, did not arrive until the middle of May at Langres where the school was located. A somewhat different system of education was used at this school than that of the artillery school at Arnouville. At the latter, only officers were trained, while at Langres, the complete unit underwent training together. Officers and selected noncommissioned officers were instructed in classrooms in theoretical work, while the rest of the troops underwent field training. The firing was conducted by the organization, officers and men alike turned out for all service practices.

An ideal target range had been provided, known as the Courcelles-en-Montagne ground, which permitted various ways of simulating fire at planes. What seems the most novel, and perhaps of present day use, was the scheme whereby the machine guns, which were set up in a deep ravine that ran through the range, fired up hill at a balloon towed at the end of a bamboo pole fastened to a motorcycle. The machine and rider were protected by a specially constructed rock wall.

4,500 troops comprised the 1st, 2nd, 3d, 4th, 5th and 141st AA Machine Gun Battalions, which received training at Langres. At the signing of the Armistice, two battalions had already reached the front, while the third was on its way.

Searchlights and Listening Devices

The searchlight section of the Antiaircraft Service got off to an even slower start than did the Machine Gun Battalions. Eventually, a depot was established at Gievres, while a training section was conducted at Fort Mount Valarien, near Paris, where the French maintained a searchlight repair shop.

Eventually, it was recognized that the searchlights were an integral part of the antiaircraft defenses. Thus, an additional school was formed at Langres, in June, 1918, which co-operated closely with the machine gunners in illuminating their targets for night firing. However, due to the distance of the searchlight training centers and depots from Arnouville, the artillerymen never were fortunate enough to have lights for night firing. They had to get this experience after their school training when they had been ordered into the field.

The Americans also trained their searchlight units with the French and British. The receipt of equipment was so slow that it was necessary to put into being an Advanced Searchlight Base at Colombey-les-Belles where troops who had completed their instruction could be assembled. There they remained until receipt of materiel.

Various types of lights were used—the 26 inch, 48 inch, and the 60 inch. The latter diameter became the standard for the Americans, and was the size of the Sperry-Cadillac unit, model 1918, which was about ready for issue for the front line troops at the signing of the Armistice.

Incidentally, night glasses were used during the War, as well as rockets and pyres. Apparently, these two aides to the lights have been allowed to languish in American thought until very recently when experiments were conducted at Fort Humphreys, Virginia, in 1931, with various types of night glasses. Just now, Captain Albert M. Jackson, C. A. C., is attracting attention with his work with a pyrotechnic reflector which may be tried at the coming Knox maneuvers.

The British and Americans used their listening devices, other than for the mere detection of the approach of planes, for assisting the searchlights in illuminating enemy planes. The French did not do this, they depended upon using sound locator data for firing their guns. It is not deemed necessary to discuss which system proved to be the best.

Various Instruments Used by Battery B, First Antiaircraft, Second Division, in Locating Enemy Aeroplanes. Montreuil, France. June 15, 1918.

Naturally, the listening devices were made a part of the searchlight organizations all of which, as has been mentioned, were Engineers.

Organization

The Chief of Antiaircraft Service, A. E. F., was in direct command of all fixed antiaircraft defenses, while the mobile units with the field armies were under his inspection and subject to his recommendations. Each army had its own chief of Antiaircraft Service who was under the Chief of Artillery of that army. He supervised and co-ordinated guns, machine guns, and searchlights.

The artillery was organized into sectors which consisted normally of four batteries of two guns each.

Machine gun battalions had four companies each of three platoons of four guns. The searchlight batteries, part of a regiment of Engineers, had fifteen lights divided into five platoons.

Up until the signing of the Armistice, the French had the only system of communication whereby an alert could be forwarded to a rear area. The Americans, while they were entirely dependent on the French for this service, were planning their own lines at the time of the Armistice.

In fixed defenses, the tactical control of all guns in one locality were under the "Sector Commander." He also commanded the machine guns, as well as the searchlights in that area. It was the usual thing to assign a sufficient number of searchlight companies to afford about one light per gun. It will be noticed that this is about the same today where we have fifteen lights to twelve guns in our AA regiments.

This single, and compact tactical command in the fixed defenses did not find its counterpart in the field forces. The distribution of the three component parts of the Antiaircraft Service in a field army was decided by the Chief of the AA Service. The subordinate artillery, machine gun, and searchlight commanders were independent of each other, but the Chief of the AA Service directed their co-ordination.

Air Service and the Antiaircraft

In France, the Air Service and the AA Service worked hand in hand for the repulsion of enemy attacks. The front line AA listeners phoned their warnings to our own flying fields in the rear areas where certain designated planes were ever on the alert to attack and break up enemy bombing formations. To quote from Colonel Hopkins' thesis, "An ideal case of such co-operation occurred at Toul where our squadron received information from Antiaircraft Service that two enemy planes were en route. It was cloudy and the coming planes could not be seen, but our planes were promptly sent up to meet them. No sooner had the enemy planes broken through the clouds than they were brought down, the whole episode being completed in fifteen minutes."

As is to be expected, the searchlights also cooperated closely with the friendly pursuit planes sent up to attack enemy bombers. After warning was received that bombers were approaching, the friendly planes would go aloft to await the enemy. The searchlights were ready for action, but it was thoroughly understood that no light would be turned on until ready to illuminate the enemy. Of course, the artillery and machine guns were warned of the presence of the friendly planes, and they would consequently withhold their fire. However, this plan was not put into effect until October, 1918, and there was only one opportunity to try this scheme out. An attack was repulsed although no planes were brought down. This same system was an essential part of the London defenses and worked remarkably well.

Alarm Systems and Communications

Except for short distances like inter-battery communication, the Americans were mainly dependent upon the French for all antiaircraft warnings. About the time of the Armistice, the Americans had decided to install their own network of listeners to cover all their rear areas, but this plan never got beyond plans on paper. The whole of northern France was covered by a network of telephone lines and listeners.

On the front, neighboring batteries were connected by telephone, to the balloons within their sector, and to sector headquarters which in turn were connected with flank sectors and army headquarters; and by wireless to the flying fields in the rear.

In the rear of the Army fronts, the interior was organized into zones with a commander responsible for the antiaircraft defense of his zone. From the sea to Switzerland, there were four such zones whose centers were respectively at Formeries, at Paris, at Brienne le Chateau through Troyes, and at Vaivre through Vesoul. Each army headquarters immediately sent its collected data concerning an approaching attack formation to the information center in the rear as well as to the army on either flank.

French airplane in which two spies flew over American sector brought down by American antiaircraft gun at St. Hilaire le Grande, France, July 17, 1918.

In addition to the above, there were two watching lines extending from Switzerland to the sea. Each line had listeners equipped with listening apparatus, five miles apart, and each such station was in direct communication with its own center.

Extinction of lights within army areas were prescribed by orders. Suitable warnings were given to the military personnel and civilians whenever there was a threatened attack. In the zones, all lights were extinguished at least so that there would be darkness 100 kilometers ahead of the attackers.

To quote again from Colonel Hopkins' thesis, "Paris Headquarters had a large map on which was kept posted data showing the locations of the invading planes so that the number of planes and routes being taken were known and followed. Batteries were located on this map by small lamps; red glowing indicated that batteries were in action; blue that they had ceased firing. Another map showed the cities having antiaircraft defense throughout France, on

which a similar system of red and blue lights indicated at a glance the progress of raids."

Operations at the Front

It is unnecessary to write of this phase when there is such a clear statement of the case in the Report of Antiaircraft Service, dated 31 December, 1918. The following quotations are extracted from the section headed "Operations at the Front."

"Personnel of two antiaircraft battalions (ten batteries) and three separate batteries were on our Army front during the St. Mihiel and subsequent operations.

"The 1st Antiaircraft Machine Gun Battalion (less Company A) was in the Chateau Thierry offensive. Company A was detained in order that its equipment might be used in training the 2nd Antiaircraft Machine Gun Battalion. Company A of the 1st Antiaircraft Machine Gun Battalion, and Company A of the 2nd Antiaircraft Machine Gun Battalion, joined our Army fronts on September 6, and the remainder of the 2nd Antiaircraft Machine Gun Battalion on October 4.

"Two companies of searchlights were in position on our Army fronts in the St. Mihiel advance and this number was subsequently increased to nearly four companies.

* * * *

"The French supplied a number of mobile batteries, but not in sufficient numbers to cover our entire front. As soon as the St. Mihiel salient was taken, the line from Verdun to Point-Mousson was covered by moving forward demi-fixe batteries, leaving the mobile batteries (which had followed up our advance to this line) free to support the line from Verdun west to the Argonne.

* * * *

"* * * Our own E. F. is the only one that has supplied Antiaircraft machine gun troops at the front for the specific purpose of combating low-flying planes. These guns are installed in groups of not to exceed four at intervals of not less than 1,000 yards and within range of our front line troops. This places them within easy and dangerous range of shell fire and many deaths and wounds have resulted.

"Searchlights have been placed in a band across our Army front. This band has necessarily been narrow due to lack of equipment. Our plan has been to illuminate the enemy plane so that it could be attacked by direct fire. It has been very evident that searchlights have a great moral effect on the enemy, not only because of the probable fire that will follow, but also because of the effect of the light itself. Liaison was developed with the Air Service whereby pursuit planes were to take advantage of our illumination within certain areas. There was also an understanding with the artillery and machine guns so that they would not fire on planes within these areas.

* * * *

"A comparison of the results obtained by American batteries with those obtained by the French or British is extremely in our favor. It is believed that the number of planes brought down by British Antiaircraft units is approximately one for each 10,000 shots; the French average for the first four months of 1918 was one for about 8,000 shots; toward the latter part of 1918 their average increased to one for each 4000 shots.

* * * *

"Including all batteries of American Antiaircraft Artillery serving in our Army areas up to November 11, 1918, the average number of shots per plane brought down was 1050.

"Our 23rd Antiaircraft Battery brought down nine planes in less than four months. It is believed that the best French battery record for the whole war is seventeen planes."

* * * *

Operations in the S.O.S.

The following remarks are also taken from the final reports:

"At the time of the German advance in March, 1918, our first Antiaircraft batteries were completing their training at Fort de Stain (near Arnouville). In the emergency that then existed these troops were offered to the Commanding Officer of the Paris defenses. Materiel was available (2 auto cannon) for but one battery and Battery D, 1st Antiaircraft Battalion was assigned to station at Pointoise until the end of June, when they were assigned to a battery of 105 mm guns, at St. Mesmes, also a part of the Paris defenses."

This was an important assignment. With the railroad at Amiens blocked by German artillery fire, the bridge at Pointoise was necessary for all rail communication north from Paris.

"This battery proceeded to the First Army front October 6, 1918, to join its battalion.

"Nine defense areas were ordered established by GHQ. Priority for their installation was as follows:

Is-Sur-Tille (Regulating Station)
Chaumont and Jonchery (Ordnance depot and GHQ)
Colombey-les-belles (Air depot)
Ourches (flying fields)
Langres (motor repair park and hospitals)
Gondrecourt (important center or depot)
Neufchateau (important center or depot)
Vittel and Contrexville (hospitals)
Haussimont (flying field and railway artillery park)[1]

"The delivery of the American improvised Antiaircraft mount made possible the installation of these defenses. Although these mounts were unsuited for and unequipped for direct fire, they were, with slight alterations, fairly serviceable for barrage fire.

[1]Note: The explanations in parentheses above are the author's.

"The 1st Antiaircraft Battery proceeded direct to Is-Sur-Tille from its training area (at Chaumont) in order to install as soon as possible some antiaircraft defenses for this place, which was very important and also very vulernable. Eight antiaircraft guns and nine searchlights were installed in these defenses. Notwithstanding its importance, no bombing plane ever reached it.

* * * *

"Eight guns were installed in the defenses of Colombey-les-Belles. * * * One very determined night attack by a large squadron of Fokkers, following a thorough reconnaissance by the enemy the same day, was completely broken up. Bombs were dropped in the woods nearby but no damage was done."

Results Accomplished.
(Artillery)

Organization	*Dates*	*Planes brought down*	*Shots fired*
5th AA Battery	Aug. 25—Oct. 30	1	520
22nd AA Battery	Aug. 22—Nov. 11	2	2,116
23rd AA Battery	July 17—Nov. 11	9	5,092
27th AA Battery	Sept. 11—Nov. 11	3	1,028
28th AA Battery	Sept. 11—Oct. 31	2	1,517
	TOTAL	17	10,273

Average shots per plane, 605.

Average number of shots per plane brought down, including all American antiaircraft artillery serving in the A. E. F. up to the Armistice—1050.

In order to compare the results of the Americans with those of the French, the following should be noted:

French Antiaircraft Artillery

Previous to 1916, one plane per 100,000 shots
1917, one plane per 20,000 shots
1918, one plane per 7,700 shots

For auto-cannon firing explosive shell (1918)—one plane per 3,000 shots.

It is believed that the results obtained by the Americans were better than those of the French for two reasons: First, the American antiaircraft personnel were especially chosen for this work, officers particularly, while the French personnel were from the troops unfitted for front line trench duty. Furthermore, the French AA batteries were usually short handed while the Americans were usually recruited up to full strength. Second, the Americans did their firing at enemy planes in a series of bursts. After a burst was fired, corrections having previously been applied as the result of trial fire, the battery would wait a few seconds before firing another series of bursts. The reasoning behind this was that as soon as an aviator saw that he was being fired at, he would change his course, and that if he were not brought down by the first few bursts, there would hardly be any chance of his being brought down by continuing the fire. The French did not use this burst method of firing. Consequently, it is quite apparent that the American method was more saving of ammunition with the resulting higher average of planes brought down per number of shots fired.

Machine Guns

Organization	*Dates*	*Planes brought down*
Company A, 1st AA M. G. Bn.	Sept. 6—Nov. 11	2
" B, " " " "	Aug. 1—Nov. 11	5
" C, " " " "	Aug. 1—Nov. 11	9
" D, " " " "	Aug. 1—Nov. 11	8
" A, 2nd " " "	Sept. 6—Nov. 11	5
" B, " " " "	Oct. 13—Nov. 11	4
" C, " " " "	Oct. 4—Nov. 11	7
" D, " " " "	Oct. 4—Nov. 11	1
	TOTAL	41

Passive Means of Defense

The principal means of passive defense were the protective ballons that were used at nights around important areas like Paris and London. Of course, it is quite obvious that they had no value during daylight hours. Singly, a balloon can rise over 2,000 yards, while used in tandem, a height of over 4,000 yards can be obtained. These protective balloons were spaced two to three hundred yards apart, and their mooring cables were connected horizontally about twenty-five yards apart by cables which were kept taut by a two pound weight. The British used them in groups of three with the connecting cables about a thousand feet in length. Not only did the enemy aviators fear them, but the presence of these protective balloons caused enemy bombers to fly at much higher altitudes than necessary with the resulting decrease in the effective aiming of the bombs.

Effective landmarks like the bend in a river, the artificial, cross-shaped lake at Versailles were covered by screens, and brush in order to hide the navigation landmarks used by enemy bombers. False munitions factories, and ammunition dumps were erected near important ones and given a very small amount of illumination at night. Objectives were often protected by smoke screens. The French found that chemical smoke screens were more efficient although more expensive.

Besides these passive means of defense for objectives, most of us are familiar with the use of camouflage for front line battery positions, etc. Many batteries had alternate positions prepared for use, and batteries were constantly shifted from one position to another to avoid detection from camera planes.

Results and Conclusions

At the end of the war, 12,000 troops had been trained and prepared for field use within the Antiaircraft Service. This was but a fraction of what was contemplated if the war had continued for another year. To take care of the rear areas in the SOS, 18,000 troops were planned for and 9,000 in each of the three field armies. In all, 45,000 from the Coast Artillery Infantry, and Engineers were to form the Antiaircraft Service in France. These plans were based on the requirements of 192 guns, 225 searchlights, and 720 machine guns. To give the front line troops rest, it was held desirable to rotate them with those in the fixed defenses.

To give an idea of the antiaircraft now on hand from the time it was reborn in 1921, this branch of

the Coast Artillery has gradually increased until today there are eight regiments. This compares favorably with that of the foreign powers. England has two brigades of six batteries each. Eight of these batteries are gun batteries, but naturally no one expects England to fire these guns as a single firing unit. France, perhaps the heaviest armed country of any world power, has twenty-eight batteries formed in four regiments. All of these are assigned to the metropolitan army which is the one that has the defense of Paris for its mission.

It is a pleasure to read the conclusions of Colonel Jay P. Hopkins, CAC, in his 1918 report. Of course, all reports have conclusions, but what usually happens to them? Time and time again one reads plans, reports, and proceedings of investigating committees with carefully drawn conclusions that no one seems to pay any attention to no matter how good they are. When they are signed, and have several indorsements written on them that "something ought to be done about it," that seems to be the end. Colonel Hopkins has the satisfaction of knowing that many of the recommendations contained in his report are now in effect.

The following are his pertinent recommendations:

1. All of the antiaircraft troops for guns, machine guns, and searchlights should belong to one branch. This has been done as we all know.

2. He recognized the necessity of the three component parts of the antiaircraft service; to wit, guns, machine guns, and searchlights. This has been adopted by having all three in one regiment under a single tactical commander.

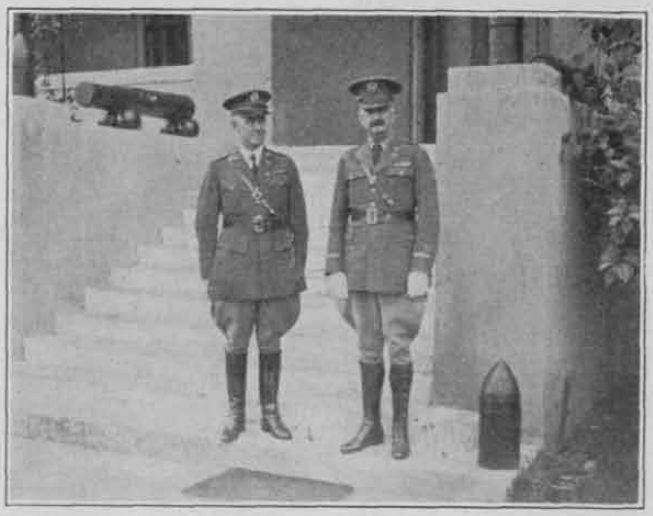
3. The location of schools (and we believe he means stations for regiments as well) should be near flying fields. All of our present stations and the school are close enough to drill and co-operate with the Air Corps.

4. There should be a school for Antiaircraft. It is now a part of the course at Monroe.

5. That the gun is the main tactical unit and the defense should be planned around that.

6. He believed that Monroe was fitted to be the peace time school of our Antiaircraft.

The Antiaircraft of today in our army should be pleased that all of Colonel Hopkins' recommendations have been accepted and made an accomplished fact, while Colonel Hopkins should be proud of knowing that he is the "prime mover" behind our skyward defense organization.



General Gulick and Col. Geary

The Army Extension Courses and the Organized Reserve

By Capt. Thomas R. Phillips, Coast Artillery Corps

HOW many officers know that their army is conducting the largest correspondence schools in the world? In the fiscal year 1931 35,000 reserve officers were enrolled in the Army Extension Schools. The number has increased materially in the past fiscal year. The courses offered cover all branches of military knowledge and, in general, parallel the service school instruction for the same grades in the regular establishment. A separate series is furnished for each grade and branch. The completion of these courses, or an examination covering the same ground, is one of the requirements that must be met by reserve officers for promotion.

The instruction given to reserve officers by this means is as important and takes as much time as the instruction received by the National Guard at their weekly drill. One might ask if the soldier business can be learned by a correspondence course; but anyone who has taken these courses or has instructed with them will answer that most of the technical and tactical matters of military training are thoroughly covered by them and that the instruction they furnish gives a thorough back-ground of military knowledge and is an extremely efficient and inexpensive method of training.

The importance of the Extension Schools has increased with the evolution of the Officers' Reserve Corps and the improvement of the instruction given. The original courses were not especially satisfactory. Until October, 1930, a reserve officer could be promoted through instruction presumed to have been received by attendance at three summer camps. Since that time the completion of the appropriate extension course has been a prerequisite for promotion. Now a reserve officer meeting normal requirements for promotion will spend twice as much time in military study of correspondence courses as he will have an opportunity to spend at camp on active duty. The extension courses have become the most important part of his training. Due to their evolution and the comparatively recent changes in regulations stressing their importance it is to be expected that the attention given to them in different organizations will vary.

But even considering this, the variation in amount of extension work done by different reserve regiments or groups and divisions is so great as to be incomprehensible. For example: The Bulletin of the *Coast Artillery Reserve* of the Third Coast Artillery District shows one regiment with an average strength of 91, with 91 officers enrolled in the extension school. They completed 1,245 lessons during the year, an average of fourteen lessons per officer in the regiment. Another regiment in the same District with an average strength of 87 officers had completed an average of 2.3 lessons per officer. This is a variation of approximately six to one. The officers of one regiment averaged six times as much military study as the officers of the other. Such extreme variations can be found in most reserve divisions and groups. One regiment in the 7th Corps Area Artillery Group, with an average strength of 80 officers, had every officer but one enrolled during the entire year and the average work done exceeded twenty-five lessons per officer. Another regiment in the same group accomplished less than three lessons per officer. In the COAST ARTILLERY JOURNAL of December, 1930, statistics were published showing that the First Corps Area Coast Artillery reserve officers averaged 21.8 hours of work per officer, while the Fourth Corps Area Coast Artillery Reserve officers averaged 5.1 hours, less than one fourth as much. The writer heard one Chief of Staff speak with pride of the fact that his reserve division leading the Corps Area had averaged 5 hours and 37 minutes extension work per officer and that the next most industrious division in the Corps Area had only averaged 5 hours and 27 minutes per officer.

There even seems to be a large variation between branches. The Infantry Reserve shows a proportion of 29% of unassigned to assigned officers, while the Coast Artillery Reserve shows a proportion of 19%. Officers are placed on an unassigned status at the end of their five year appointment if they have failed to do two hundred hours of military study or training over the period. So their failure to be reappointed on an assignable status can be attributed to their failure to take extension school work which is available to all.

The meaning of these statistics is clearer when it is explained that reserve officers must do an average of 40 hours extension or conference work a year to be promoted and credits obtained in this manner qualify them for reappointment. The inference is that in such organizations as the divisions that averaged 5 hours and 27 or 37 minutes of work per officer in a year, only one out of eight officers is doing enough work to retain his commission. In the past many officers who have not done this much work have obtained credits from active duty training that permitted them to retain their commissions. The present policy of the War Department will prevent this escape. This policy is that those officers who have taken inactive training will be given preference in selection for active duty.

It is difficult to determine from statistics available

to the writer just how many officers lose their commissions through inactivity at the end of their five-year appointment. The hearings on the 1933 War Department Appropriation Bill showed that although there were 10,630 new appointments in the Officers' Reserve Corps, there was only a net increase of 2,585 assignable officers. This would indicate that 8,045 reserve officers did so little work during their five-year appointment period that they were transferred to the unassigned list (practically a total loss) or failed to accept their reappointment. It is probable that not over 12,000 officers reached the end of their five-year appointment during the year so one can estimate that two out of three officers were lost because of failure to do the required amount of work. The figures given in the hearings on the 1932 War Department Appropriation Bill support this estimate. They show that in the fiscal year 1930, 29,059 appointments expired and of these only 10,647 were eligible for reappointment on an assigned status.

The importance of extension work in the reserve scheme is obvious and makes it difficult to understand the extreme differences in the importance attached to it in different organizations. It is hard to understand why a reserve officer who has done a large amount of work to get a commission, once he has it, will not do the small amount of study necessary to retain it. The reasons given are many. One instructor says that he has to work with his men by mail and it is a hopeless task to try to get anything out of them. He can be answered by stating that the 7th Corps Area Coast Artillery regiment which averaged 25 lessons per officer was scattered over two states and three out of four of the officers were reached only by mail.

Another reason given is that some regimental commanders are active and interested and keep their officers at work while others do nothing. The fact is that there is only one person putting in all his time working with reserve officers and that person is the Unit Instructor. One regimental commander in ten may be so situated that he can be of a great deal of assistance to the instructor in inducing his officers to work. If we are to depend on the regimental commanders to do this work the Officers' Reserve Corps will have to be organized on the same basis as the National Guard, that is, each regiment will have to be a local affair and the officers in the small towns will have to be left out. It will be found that the leading reserve regiments are not dependent on the efforts of the regimental commanders in most cases.

One again hears it said that ROTC graduates will not do any work, that they only took the advanced course leading to a commission while at school so they could get the small quarterly pay that is furnished by the United States. This may be true in rare instances. If true, in general, it speaks very poorly for the qualifications of the military instructors at their schools. If after four years of military study and training the graduates have no conception of the vital part that the Organized Reserve plays in national defense and of the practical benefits to them of their military training, the money spent on them is wasted and this training should be stopped. The writer has dealt with one hundred and fifty ROTC graduates in the past three years and has yet to find one who is not interested in further military training.

In fact, these alleged reasons are nine parts excuses. No reserve officer has a commission except because of his appreciation of its importance. He is interested or he would not be in the Officers' Reserve Corps. He worked to get his commission and he will work to keep it. How then, can one account for the extreme variations in the amount of training given in different organizations? There is only one valid reason for it and that is in the failure of the instructor and his superiors to appreciate and understand his job and to work on it.

The company commander who fails to qualify 75% of his men in marksmanship is automatically rated unsatisfactory. The instructor who does not have 10% of his reserve officers working for him is not even expected to alibi. They just are not interested and that is all there is to it. And why is this? Simply that no one has told him he is expected to do any better. The War Department has set no standard. His superiors have no yardstick to measure his accomplishment. The Army has been advancing over new ground in evolving the reserve scheme. They have not known if reserve officers would take their extension schools as the National Guard takes its drill. In some places they have and in others they have not. The time has come when those organizations who have worked and those who have not can be compared and the reasons evaluated. The writer believes that in all cases the basic reason is practically the same: the instructor has worked on his officers or the instructor has not.

"Well" growls one instructor, "if these fellows think I am going out and kiss them, they can think again. If they want to do any work, here I am. They can enroll if they want to." But another says: "Here are 90 reserve officers who are interested in national defense and the military business. But they have a lot of other things to do and if they are going to devote an evening or two a week to this work they have to be pushed; and I shall not expect them to keep going with just one push. I shall keep at them." So he fills out an enrollment blank for each one and mails it to him with a personal letter reminding him of the importance of extension work in keeping his commission and in keeping himself qualified to hold his military job. He calls his attention to the requirement that those officers who take inactive training will be given preference in selection for active duty with its concomittant pay. He strives to build up regimental pride in the training accomplishments of his unit by publishing each month a tabulation showing the amount of work done by each officer and the comparative amounts by battery and battalion. And will they work? The instructor may regret getting them started when he comes to his office each morning and finds thirty or forty lessons waiting to be corrected.

What is to be done with those reserve officers who make the grand gesture of enrolling and think that

this exhibition of military interest should carry them through the year? Keep after them until they are ashamed to get a bulletin showing them with no lessons turned in. Let them know how their failure to work is holding down the battery, battalion and regimental average. Let them know that an officer who does not know the duties and technique of his grade is an officer in name only and one upon whom the country cannot depend to fulfill his job when needed.

The instructor might write as follows:

Dear Lt. Doe:

You have now had an interesting and short extension course for two months and have so far failed to do anything with it. You could do the entire course in ~~a~~ Sunday afternoon. I know this and also know that if you were interested you would have done it before now. You are not helping me, nor the regiment, nor national defense by signing an enrollment blank and then forgetting about it. On the contrary, the postage, labor and texts you have are wasted if you do not use them; and you, instead of qualifying yourself for the grade you hold are an officer in name only, without the technical knowledge to do the job.

Doing work by mail is as much a part of belonging to the Officers' Reserve Corps as attending drill is a part of belonging to the National Guard. Extension instruction is practically the only means of instructing reserve officers. If you do not work at it you will lose your commission at the expiration of your current appointment. Do not think that taking this instruction is an extraordinary matter; it is simply a basic part of the obligation you assumed when you accepted a commission.

In your case the time has come when you are making a decision to stay a reserve officer or to lose your commission. It is too bad for the decision to be made by your inertia, that is by your failure to do work which you evidently intended to do when you enrolled.

Why not complete the course you have ~~over~~ this week end and send it in? Once you start you will find it interesting enough to keep going without being pushed.

Sincerely yours,

Instructor.

It might be added that the above is one out of many letters in the files and not a literary effort composed for this occasion. The officer who received it completed his extension course and has been industriously working since that time. He is a law instructor at night school and has a large practice.

Any instructor will find that the officers with whom he will have the most difficulty are the older officers in the organization who entered the reserve when extension work was little emphasized and who, perhaps, think their war experience gives them all the military knowledge they need. Some officers in this class have been going to camp for the pay they receive, and for the camp associations) and have been, in the past, getting promoted on account of the industry shown in attending three camps. Promotions are no longer made on such qualifications and a rigid enforcement of the present policy that only those officers who take inactive training will receive active duty with pay, will soon make officers of this type rare. Many of them will work when they find they have to. They are mostly in the higher grades and active duty pay is large enough to be a material consideration.

Almost without exception the ROTC graduates now being commissioned are enthusiastic and need no more than information of what is expected of them to induce them to meet all requirements. It is important that they should be informed as soon as commissioned that they are expected to work. They should not be allowed to drift and get the idea that any further military work is beyond the call of natural duty and only undertaken by military enthusiasts. Let them know that far from having ended their military study, they have just begun it. There is no need to plead with them to work. Let them know that they are expected to work, that doing extension work is as normal for them as is attending drill for a National Guard officer. Nine out of ten are willing and anxious to meet any reasonable requirements. It is simply a matter of informing them and keeping after them.

One sees, from time to time, statements that nine out of ten ROTC graduates lose their commissions at the expiration of their original appointments. The writer does not know how accurate these statements are, but if they are true, it is an indefensible condition. A large amount of money and effort has been spent in their training and they represent the finest officer material the nation affords. An ROTC graduate can obtain a certificate of capacity for promotion to the next higher grade after doing approximately fifty hours of extension work and appearing before a board to determine his qualities of leadership. He can be promoted after three years service, if in addition he has had a fourteen days period of active training. His certificate of capacity entitles him to active reappointment at the expiration of his original five year appointment if he has not been promoted in the meantime. A very small part of these excellently trained second lieutenants will let their commissions lapse for lack of the small amount of effort required to keep them. If they are lapsing in such large numbers as indicated, it is solely on account of the lack if attention given to them by their regular instructors.

It is a mistake to attempt to deal with reserve officers wholesale. A mimeographed statement of the desirability of taking extension work is likely to go into the waste basket with the advertising circulars; but a personal letter written with just one individual in mind will almost always get a response. Personal contact with officers is of great help but is not indispensable. Personal mail is a good second best.

Where a regiment is localized or in those regiments in which the subordinate units can be formed in localities advantage should be taken of the military organ-

ization by requiring the company, battalion and regimental commanders to demonstrate their qualities of leadership in requiring their subordinates to take inactive training. Each commander should be informed that he will be judged by his success in inducing his subordinates to train, that in this way he has his only peace time opportunity to demonstrate leadership. In the monthly bulletin the training accomplishments of each company and battalion should be published. When the time comes for promotion, leadership, which counts fifty per cent in the examination to field grades, can be assessed on the performance of these officers in such peace time duties. The use of such methods is presumed in War Department policies and instructions but are followed in very few instances. In organizations which are widely separated they are not practicable. Reserve officers do not have time or facilities to exercise leadership by mail.

A frequent and common mistake in dealing with reserve officers is one well brought out and condemned by Lt. Col. E. A. Evans, CA-Res., in the COAST ARTILLERY JOURNAL of September, 1930. This is the idea that reserve officers must be humored, must be plead with to work, or must be coddled and praised for an effort that should normally be expected of them. This attitude will destroy the influence of the instructor. As a rule he is treated with a deference that is almost embarrassing to the new instructor; he makes a mistake if in his efforts to be a good fellow he loses the respect that is automatically his.

Due to the experimental nature of reserve policies in the past, the conduct of reserve affairs has been greatly decentralized. This was undoubtedly an excellent condition in the early stages of reserve development when the greatest latitude in the operation of policies was desirable; but at the present time this policy is working a great deal of harm. Its effect has been shown in the abnormal variations of activity in various organizations previously cited. Present methods and policies are excellent and what is now needed is a rigid requirement of their fulfillment. A Chief of Staff takes over a reserve division. He has conducted CMT Camps at the last station he commanded and is especially interested in them. His main interest as Chief of Staff is the promotion of the CMTC. His reserve officers are an incident to him and he does not know if 10% are meeting reserve requirements or 1%. Another Chief of Staff considers his job that of selling the Army to the city. He makes fine speeches on national defense. He is a good fellow at the club, where his skill with dominoes is attributed to his military training, and is in demand as a luncheon speaker. In the meantime his real salesmen, the reserve officers, are dropping out as fast as their five-year appointments expire. One of the saddest sights the writer has ever seen was three Unit Instructors in a division headquarters, rigidly keeping office hours, reading books and magazines five hours out of their six-hour day, and not one of them with more than 10% of his reserve officers working on extension courses.

What needs to be done? The writer believes the remedy is simple and offers the following suggestions which will be discussed in turn: (a) Prescribe a standard of accomplishment for instructors; (b) Automatically enroll each reserve officer in the appropriate extension course for his grade and branch; (c) Enforce the present policy of requiring inactive training before active duty training is given.

A suggested standard for instructors' accomplishment is that each instructor be required to have 75% of his reserve officers working at extension courses or in conference. Included in this 75% would be those reserve officers who have met the requirement for their grade and hold a certificate of capacity for promotion, whether they are working or not. This compares to the standard required of a company commander in small arms marksmanship. A minimum average of 20 hours a year per officer might be set as to the least amount of work considered satisfactory. This may seem a high standard compared to the average accomplishments of most reserve regiments at the present time, but compared to the work done by a number it is low and easy to meet.

The objection will immediately be made that the instructor cannot require reserve officers to work. However a salesman cannot require customers to buy and he has to reach a quota of production or look for another job. Or it may be objected that it is reasonable to expect that much from an instructor whose officers are all together in one city, but that it is unfair to the instructor whose officers are scattered and can only be reached by mail. Or again objection may be made that one regiment will have an active regimental commander and the other has not. All these objections have some merit, but a reasonable standard can be met by every reserve organization regardless of its situation. In the case of the regiment in the 7th Corps Area which had all but one officer enrolled and *working* and averaged sixty hours of work per officer in one year, the regiment was scattered over two states with about twenty per cent of the officers in the same city as the instructor. The instructor who preceded him, with the same regimental commander, had no more than fifteen per cent of the officers working. The explanation is not to be found in the social graces of the instructor. All he did was work at the job as he conceived it. Any other instructor can do the same if he will work to the same end. The personality of the instructor is of small moment; he gains little by being a good fellow. Reserve officers will respect him more for his interest in his work than for his bridge playing.

Each reserve officer should be automatically enrolled in the appropriate extension course without request on his part. Let him ask for exemption from enrollment if he can show good reasons such as attending night schools or taking other extension work in connection with his business. Encourage him to get through with the study required for his grade and when he has a certificate for promotion then let him take a vacation from further work. The mere fact that a reserve officer must request enrollment builds up the

idea that he is doing something especially praiseworthy in doing extension work. Let him understand that military study is a basic obligation he assumed when he was commissioned, that it is an expected not an extraordinary thing for him to do. All reserve officers worth keeping will respond. The losses, far from being as great as at present, will not be half as great, for the large proportion of present losses is among ROTC graduates, the finest officer material we have. They are allowed to fall out through lack of attention to them.

Further emphasis on the recently announced War Department policy of giving preference for selection for active duty to those officers who have taken inactive training will be of great assistance in requiring more extension work. At present this policy is effective in regiments; that is, each regiment is allotted a quota for active duty training based on the strength of the regiment. The instructor will recommend for active duty training those officers, within his regiment, who have taken inactive instruction. But, a regiment with 10% of its officers taking inactive training will get a quota for active duty as large as a regiment that has 90% of its officers working. Quotas should be allotted to regiments, not on their strength, but on the numbers in each organization who have completed a specified minimum of inactive training. And to this number should be added those officers who hold a certificate of capacity for promotion.

More attention could well be given to those reserve officers who make military study a hobby. Such officers now take the extension courses provided for the higher grades and it is not unusual to find first lieutenants working on the Command and General Staff Extension Course. For the benefit of these officers, corollary courses in military history, history of warfare, organization of foreign armies, military policies of nations, and tactical studies of famous battles and campaigns could be written and supplied. Such reserve officers as desire should be given a chance to gain a background of military knowledge that will enable them to present the truth on these matters to the nation.

The objection will be made that there are not enough instructors to do the work that would be required if 75% of all reserve officers were to start working on the correspondence courses. In the hearings on the 1932 War Department Appropriation Bill, Major Lee, in response to a question by Mr. Barbour stated: "No; but to go further, we do not ask them all to take correspondence courses every year because we have not the facilities, and we have not the lessons or the number of Regular officers who are required to correct the papers." Computation does not indicate that this objection is valid. There are in excess of four hundred regular instructors for 80,000 reserve officers, or an average of two hundred officers per instructor. If each officer did his normal work of two two-hour lessons a month it would amount to four hundred lessons a month per instructor; an average of sixteen lessons a day. Sixteen lessons can be corrected, and thoroughly corrected, in from two to three hours.

Present reserve policies are excellent. The new officer material being supplied from the ROTC is the finest that could be asked. Most of the remaining World War officers are interested and conscientious. The loss of further large numbers of officers is indefensible. The fault lies, not with the system, not with appropriations, but with the Regular Army. It has evolved and developed a means of supply and a means of training and holding these officers, but has failed to operate it efficiently.

Maneuvers

The Stygian dark is stabbed with swords
Of silver, flaming light.
The grey guns, couched, arise to speak
Shatt'ring the silent night.
With blood red tongues of living flame
They search the rippling sea
Where lifting, hissing, pass the ships
The ships we could not see.
The servants of the great grey guns
In sleepless patience wait
Until the warders of the lights
Align their beams full straight
On gray ghosts coursing through the waves
To force the seaward gate.

Speeding Up the Orientation of Mobile Batteries

By Captain S. R. Mickelsen and 1st Lieut. E. Carl Engelhart, C.A.C.

THE installation of a mobile seacoast battery (155-mm. or Ry.) in time of war consists of four distinct operations, viz.

1. Selection of positions.
2. Emplacement of the guns.
3. Installation of communications.
4. Orientation.

No battery is prepared for efficient action until all four operations have been completed, and therefore—speaking broadly—a battery's mobility may be considered limited by the slowest of the four. Much effort has been devoted to the perfection, acceleration, and standardization of procedure in each of the first three phases. Comparatively little investigation, however, has been directed toward facilitating orientation notwithstanding the fact that orientation usually consumes more time than any other operation.

This year, the Advanced Engineering Class of the Coast Artillery School undertook an analysis of practical methods for speeding up the orientation of a battery with the direct object of discovering a means of solving a traverse trigonometrical formula in the fewest operations and with the least liability of mistake.

Projected methods were based on certain premises:

1. Accuracy of baseline determinatiin to ± 10 yards is satisfactory for mobile artillery.

2. Accuracy of orienting lines (azimuths to datum points) must be maintained to the best value obtainable with a transit and should in no case be in error by more than one mil (3 minutes of arc).

3. Computation by logarithms should be avoided, if possible, on account of the chance of mistakes—arithmetical (addition and substraction) and transposition of figures when transcribing (45 instead of 54, for instance). Furthermore, the use of logarithms is unnecessarily cumbersome and fatiguing if other calculating devices are available.

4. Five significant figures are desirable in the computations in order to obtain accuracy to one decimal place in the value of each ΔX and ΔY. Satisfactory results are possible, however, even in the azimuth computations from sun observations, by careful handling of terms to four significant figures.

5. The maximum length of a traverse leg will ordinarily be less than 500 yards.

The first and fifth of these premises permit the use of a stadia rod for measuring distances. To facilitate computation, a stadia rod may be graduated in *yards* instead of feet. This obviates converting feet into yards in the computations. The yard stadia is entirely satisfactory and permits measuring short traverse legs (200 yards) to ± 0.2 yards and long legs (400 yards) to ± 0.5 yards.

The second premise immediately precludes the use of a plane table because—at best—plane table azimuths cannot be carried to a finer accuracy than ± 15 minutes of arc.

Under the conditions imposed by the premises, a field traverse must be solved rapidly and accurately with the following limiting arguments:

Distances — 1.00 to 500.0 yards.
Angles — 00° 01′ to 89° 59′

Four possible means of handling these factors are:

Table.
Chart.
Slide Rule.
Mechanical Calculator.

Tables

The first consideration was given to preparing a table, similar in arrangement to a logarithm table, in which the arguments would be traverse distance and angle of bearing (or azimuth of traverse leg) to the nearest minute of arc. Data abstracted from the table would be the ΔX and ΔY of the distant end of the traverse leg.

Table, accuracy to nearest 0.1 yd., angle functions for every minute of arc. It was readily estimated that such a table would require 43,740 pages of print.

Table, carrying distances to nearest 0.2 yd., sight interpolation to 0.1 yd. being feasible, and with angle functions for every minute of arc would take 21,870 pages.

Table, carrying distances only to nearest 1.0 yd., with interpolation tables for each 0.1 yd. and with angle functions for every minute of arc would require 4,860 pages.

It was then seen that any sort of a table would be out of the question.

Charts

Construction of a chart to give ΔX and ΔY was then contemplated. Such a chart could be handled in the same manner as a Lewis Chart, using the same arguments considered for a table.

It is known that a 20″ slide rule produces 4 significant figures between the left index and the graduation 5.0 with a fifth place capable of fair estimation. From graduation 5.0 to the right index only 3 definitely significant figures may be read. On this basis it was decided that a chart so graduated that the smallest divisions in distance and angle function could be read

without optical aid would be contained on a sheet of the dimensions 150 ft. x 75 ft. Splitting such a chart into small sections with proper overlap would merely produce very many sheets, hard to handle.

A second solution in considering charts, that of adjacent tapes on rollers, was found to be undesirable due to the necessity of winding one tape back to its index for each setting, a considerable operation in that the tapes required would each be in the neighborhood of some thirty to forty feet long.

The chart solution was then decided to be impracticable.

Slide Rules

A slide rule normally carries a sine scale and inasmuch as the sine function has a simple relation to the cosine function, a slide rule with sufficient multiplicity of graduations is the easiest solution of the problem.

Accordingly, various types of slide rules were investigated.

Thatcher's Rule, consisting of two logarithmic scales, one on the internal cylinder and the other mounted continuously on the external bridges, is equivalent to a straight slide rule about 29 feet long. It is operated in the same manner as a straight rule and gives results correct to four figures, a fifth being sometimes estimated. It has no sine scale, however.

Fuller's Rule consists of a cylinder movable both around and parallel to its axis on a cylindrical stock to which a fixed index and a handle are attached. Another cylinder capable of telescopic and also rotational displacement lies within the stock and carries another index. A log scale 50 feet long (on the Keuffel and Esser rule) is wound in a helix around the cylinder. Logarithms of numbers on the scale are read on a scale of equal parts on the upper edge of the cylinder in conjunction with the copper index. Tables of trigonometric functions (natural 4-place functions) are printed on the stock. Calculations are definitely correct to four significant figures and with considerable accuracy to five figures on the K & E rule.

Barnard's Calculating Rule is similiar to Fuller's but the log scale is repeated twice and occupies only about one-third of the helix. The upper part of the helix carries a sine scale. Its equivalent length to a straight rule is less than that of Fuller's.

Lilly's improved spiral rule, a disk thirteen inches in diameter, consists of a spiral log scale of 10 convolutions and a scale of 1000 equal parts on the outer edge for logarithms of numbers on the spiral. A pair of hands are mounted and held together by friction so as to be capable of any radical settings. It is equivalent to a straight rule of about 30 feet long and gives results correct to four figures but has no sine scale.

Sexton's Omnimetre is a circular slide rule, the entire scale being on one circumference. With a radius of about three inches it is equivalent to a straight rule of about 18 inches in length. The necessary radius to obtain an equivalent length of about 50 feet is prohibitive.

Thacher's Rule and Fuller's Rule were tested and were found to have sufficient accuracy in ordinary multiplications. Not one of the slide rules investigated, however, is capable of solving a transit traverse *in one operation* on account of the lack of a log scale graduated in terms of sine or cosine.

It was then decided to see what results could be obtained in a two-operation method, namely:

1. Obtaining natural functions from a 5-place table listing values for each minute of arc.
2. Performing the necessary multiplication on some device.

This solution was promptly limited to either a slide rule or a commercial calculating machine.

Monroe Calculator

An old model, manually operated, Monroe Calculator was examined. This machine, of course, is entirely accurate to a superfluity of decimal places. The weight of this model is considerable, and, if carried in the field, it becomes necessary to provide suitable transportation for the computer.

A calculating machine, though, such as the Executive Model Monroe Calculator which is light and easily portable, serves readily to solve the problem.

Test

A 3500 yard traverse was run to test the adequacy and speed of these so-called quick methods. Advanced Engineering Students acted as computers, one using the Monroe Calculator, one the Thacher's Rule, and the other the Fuller's Rule. Each computer obtained natural functions of angles from a 5-place table.

Thirty minutes were required to make the hour-angle observations for azimuth on the sun. Having completed these observations, the transit party turned over the data to the computers and proceeded with the traverse. The computers were able to solve the azimuth determination, rejoin the transit party, apply their azimuth to the field notes, and then quickly solve the traverse up to that point. Thereafter, the computers easily kept pace with the transit party.

The time required to make the sun observations, run the traverse, and to concurrently compute both phases was five hours. At the end of this time, the standard grid coordinates and an orienting line had been established for each of the base-end stations and the directing point of the battery.

Later calculations proved the rapidly computed solar azimuth computation to be accurate within one minute of arc while the maximum error in the coordinates of the distant end of the traverse was found to be less than six yards. Both degrees of accuracy were entirely adequate for mobile artillery.

Conclusions

1. A transit traverse, including the determination of azimuth by the solar hour-angle method, can be solved rapidly and with the necessary accuracy by any one of the following three devices in conjunction with 5-place tables of natural functions:

Monroe Calculator.
Thacher's Rule.
Fuller's Rule.

In the solution of the sun hour-angle azimuth the following simple equation lends itself readily to slide rule or calculator operation:

$$\text{Tan } \beta = \frac{\delta \text{ Sin H.A.}}{\text{Cos } \phi \text{ tan } \delta \triangle \text{ Sin } \phi \text{ Cos H.A.}}$$

β being East or West of South when $(\phi - \delta)$ is positive and vice versa.

2. Neglecting the disparity of initial cost, the Monroe Calculator is most accurate and can be put to more varied uses. Preference for either one of the rules, Thacher's or Fuller's, is largely a matter of the personal choice of the computer.

3. Solution of a transit traverse (and the azimuth determination) without recourse to tables of natural functions is not an impossibility. A slide rule of moderate size can be constructed with one scale graduated in terms of the sine function. Such a rule, however, is not believed to be on the market at present.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF COAST ARTILLERY
WASHINGTON

Colonel Arthur S. Conklin
62nd Coast Artillery
Fort Totten, New York

My dear Conklin:

The Board of Managers of the Society of the Sons of the Revolution in the Commonwealth of Massachusetts recently decided to make an annual award of a Knox Trophy Medal to the non-commissioned officer making the best record at the Coast Artillery School.

I am pleased to inform you that after careful consideration Corporal Edward A. Weinstein, 62nd Coast Artillery, has been selected as the winner of this medal for the School Year 1931-1932. The following points were taken into consideration in making the selection:

Scholastic standing
Cooperation
Diligence
Conduct and attention to military duty
Military bearing and neatness
Character

Please extend to Corporal Weinstein my hearty congratulations on his excellent record. The Medal will be sent to him, in your care, as soon as received from the Society, which should be about the middle of January.

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

Modern Methods in Stream Crossing

The Infantry with a Tug at Its Bootstraps, Conquers the Unfordable Streams of the Philippines.

By Major Edward M. Almond, 45th Infantry (PS)

MILITARY history is replete with notable achievements of troop movements across swift and unfordable rivers. There is real leadership, and romance as well, in the commander who scorns and crosses swift waters which separate him from his objective. The military leader who, by any means, increases the power of mobility of his troops very materially improves thereby his chances of success in campaign.

When planning our present day training, however, we are content, usually, with the reading of military history and the thought that such matters are so unusual as to have little or no application to us moderns. We are prone to forget that what confronted Alexander in his passage of the Hydaspes (326 B.C.); Hannibal on the Rhone (218 B.C.); Gustavus Adolphus and his 300 Finns in crossing the Lech (against Tilly in 1632); Napoleon's crossing of the Danube (before the Battle of Wagram in 1809); Wellington and Marmot in the Peninsular Wars (prior to Salamanca in 1812); Lee's retreat from Sharpsburg (1862); Funston at Calumpit, P. I. (1899); the Japanese at the Yalu (1904); all had real application when the 5th (U. S.) Division crossed the Meuse at Dun-sur-Meuse (1918) and that, in the future, the same necessities may arise in military operations in any country where rainy seasons obtain or deep streams exist.

The real trouble with us lies in the fact that we are awed by the thought of being responsible for rapidly passing a military unit and its equipment over an unfordable and formidable stream without the aid of a bridge or the bridging equipment of engineers or locally obtainable materials. These latter not only consume valuable time for construction but may not be available. If we only knew "how" to make the crossing by our own devices, how much simpler the problem would be!

In 1866 Wrangel's Prussian Brigade received the following order: "Cross the river (Saal) some where, *no matter how,* and attack (the Bavarians) by envelopment." This force had no "special" equipment, no engineers, or pioneers, to assist it. The commander, must have thought many times "But how"; he no doubt set his column in motion with strong misgivings; he, at the time, had no way of knowing that luck awaited him in the form of an old foot bridge which the enemy had only partially destroyed.

Such luck did not await Funston at Calumpit when confronted by the same proposition and the success of whose crossing was dependent upon a single old raft (capacity 8 equipped soldiers) and the intrepidity of two swimmers towing a rope to the far bank of the stream. This, under hostile fire, being a most time consuming and restricted method of crossing; restricted, because training had not pointed out more rapid methods.

The present Philippine Department Commander, Major General E. E. Booth,—having had to ask himself the question "How?" during his service in the Philippine Insurrection,—soon after assuming command of the Department in 1932, inspired the infantry of the Philippine Division with the desire to learn "how" to speedily cross unfordable streams without the assistance of other units.

The Philippine Division and 23d Brigade (PS) Commanders,—thru their thoughtful supervision and helpful suggestions, made such training possible,—and the troops,—from regimental commander to private,—by their enthusiasm and skill have made remarkable progress and have acquired most gratifying proficiency in this training.

In 1813, Tsheritshev's Cavalry Corps swam the River Elbe; the cossack riders guiding their mounts (stripped) and dragging behind them their equipment and loot,—skilfully packed in small, wickerwoven baskets. One hundred and twenty years later we find the Philippine Scout soldier crossing wide, swift, unfordable streams employing the same principles and using only slightly different methods.

The system of instruction, and the results thereof, in one battalion of infantry[1] of the 23d Brigade (PS) has been selected in order to illustrate what may be accomplished in a reasonable period of time.

The 23d Brigade Training Directive prescribed that troops should be taught to rapidly cross unfordable streams with combat equipment on rafts (or otherwise) and by swimming the personnel and animals (in herd); that tactical exercises should be conducted; and that all troops would undergo such tests as might be prescribed at the end of the training period.

The training began early in September and continued until the beginning of December, the instruction paralleled other training subjects; the period allotted was necessarily an extended one, due to the scarcity of life saving apparatus (row boats and life preservers) and to the limited number of river crossing points suited to initiating untried troops to the unusual risks involved.

[1] It is to be noted that the equipment of all companies includes pack animal transportation for infantry weapons, rations, forage and ammunition. The rifle company machine guns and ammunition therefor are carried on 8 pack mules.

The training objectives fixed upon by the battalion commander were as follows:

a. To attain proficiency in crossing *all* personnel and *all* equipment (including animals and escort wagons) pertaining to the battalion.

b. To investigate *all* expedients known to swimming, ferrying or floating personnel or equipment over unfordable streams. This with the view to rapidly utilizing any or all of these if available at the time and place required.

c. Finally, *and most important,* to develop—if practicable—methods with which the battalion could pass rapidly over an unfordable stream (10 to 200 yards in width) with little or no dependence upon materials other than the standard combat equipment of the component units.

The obstacles selected for this training were the Pasig and the Mariquina Rivers,—near Fort McKinley, P. I.; *the Pasig, just below its junction with the Mariquina is an especially swift and unusual stream due both to the then existent rainy season and to the tidal effects of Manila Bay (when the tide is receding the current of the river is greatly increased and at rising tide a cross current results which is far from desirable).* The width of the river is 400 feet, its depth varies from 12 to 18 feet and the average current is 5 feet per second.

The Mariquina River is somewhat wider, about the same depth and slightly less in rate of current.

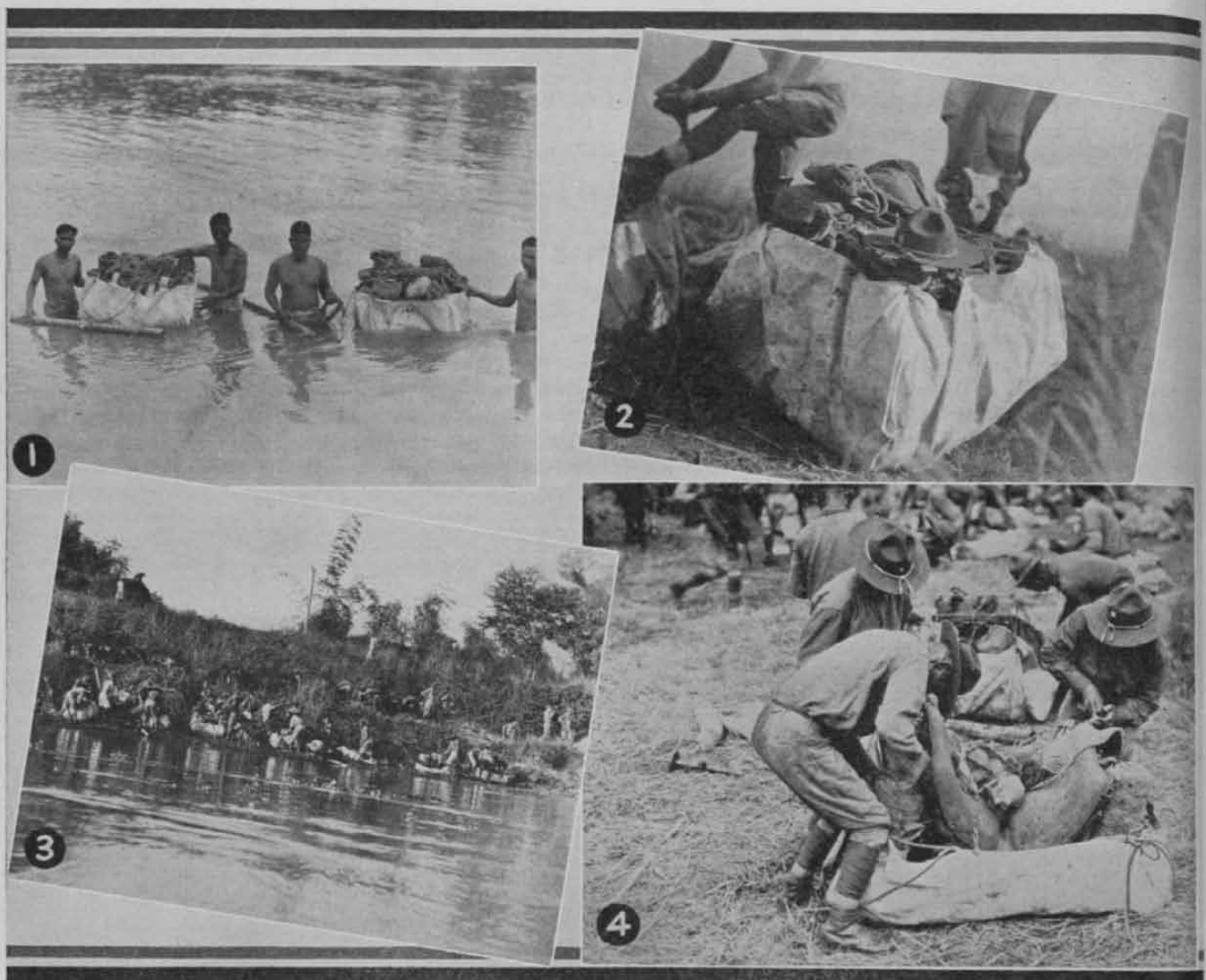
These streams can be considered to be as difficult as will usually be encountered in military operations.[2] Less formidable obstacles were to be desired but were not available.

This discussion will not include the details of the many methods investigated by the troops during the course of this training; only those expedients which proved to be the simplest, involving materials likely to be available, and which can be speedily utilized will be cited. Such assistance seems to be the most desirable in campaign; the methods finally adopted apply in any situation or in any country; and furthermore,

[2] The Meuse River (near Dun-sur-Meuse, France) is 80 to 100 yards wide and the Limmat River (famous for Messena's classic river crossing against the Prussians in 1799) is about the same width.

SERIES NO. 2

1. Infantry section prepared to swim unfordable stream; all individual equipment including arms and ammunition made into 2-man shelter half (canvas) floats. 2. The section enters the river. Scouts, first in, waist deep. 3. The 2-man rifle float on land. 4. The rifle section, with all equipment, swims the Pasig River which is 400 feet wide and 18 feet deep. 5. The 2-man float in the water.



SERIES NO. 3

1. Two machine gun company manta floats containing all equipment of one machine gun squad. 2. Machine Gun company float. Contents: Two Phillips packs and three soldier packs complete in canvas manta container. 3. Machine gun company, complete for field service, preparing to swim unfordable stream. 4. Machine gun company float. Contents: one machine gun and pack saddle, complete, three soldier packs, in canvas manta container.

most of the expedients adopted are inherent to the normal equipment of the unit concerned.

It should be noted that infantry, in the past, when required to swim unfordable streams has resorted to some or all of the following aids to crossing:

a. Wooden Rafts—if materials and time to construct permits.

b. Ropes, or cables, stretched from bank to bank.

c. Floats, such as doors, logs, barrels or boats.

In addition to the foregoing, the training of this battalion included tests of floats made of: Canvas paulins; tents (shelter and other kinds); canvas wagon-covers; canvas mantas; bamboo (single poles and rafts); banana-plant stalks; "G. I." Cans and cooking boilers (made water tight with pieces of burlap; "bahauca vine" and split bamboo (as rope); and the native canoe (banca).

The time devoted to this training in each company was approximately 1200 man-hours for personnel (or 20 hours per man) and 300 man-hours for animals (or 15 hours per animal).

It should be remembered that the above represents the time devoted to an unfamiliar subject and includes much experimentation in methods now discarded for those adopted and illustrated in this discussion. In future training, the above can be reduced 75% for personnel or partially trained animals.

The equipment floated over the streams included all items authorized in Tables of Basic Allowances (less ammunition and extra clothing) for a peace strength infantry battalion consisting of 11 officers, 306 enlisted men, 43 pack mules, 10 riding horses and two escort wagons (including 8 draft mules and harness therefor). To prepare the men and equipment of this battalion for swimming and floatation required approximately 20 minutes at a test near the end of the training period (this included all floats and escort wagons).

The final results obtained from this training in stream crossing methods can be set forth best by the following statements and descriptions of floats,—illustrated by photographs, both on land and in the water:

a. No materials other than canvas and the necessary rope for lashing same were required for the types of floats finally selected as best and simplest for the purpose of moving equipment across the water.

b. Only five types of floats were adopted for crossing the authorized equipment of the infantry battalion. The following describes, in brief, these type-loads:

i. The *"2-Man Rifle Float" (see photos: Series No. 2):* This float can be prepared by 2 men in 7 minutes. The two shelter halves (one on top of the other) are placed on the ground, and the remainder of the two packs and the clothing of two soldiers are placed in the center of the canvas. Now the rifles, (crossed to give rigidity) are placed on top of the packs and clothing. The float is completed by binding the 4 corners of the outside shelter half to the 4 extremities of the rifles by means of the shelter tent ropes.

In a similar manner (see photo of Float, 1, Series No. 11), using 2 8-foot sticks or two shelter tent poles instead of rifles; a machine gun complete can be floated in a shelter tent.

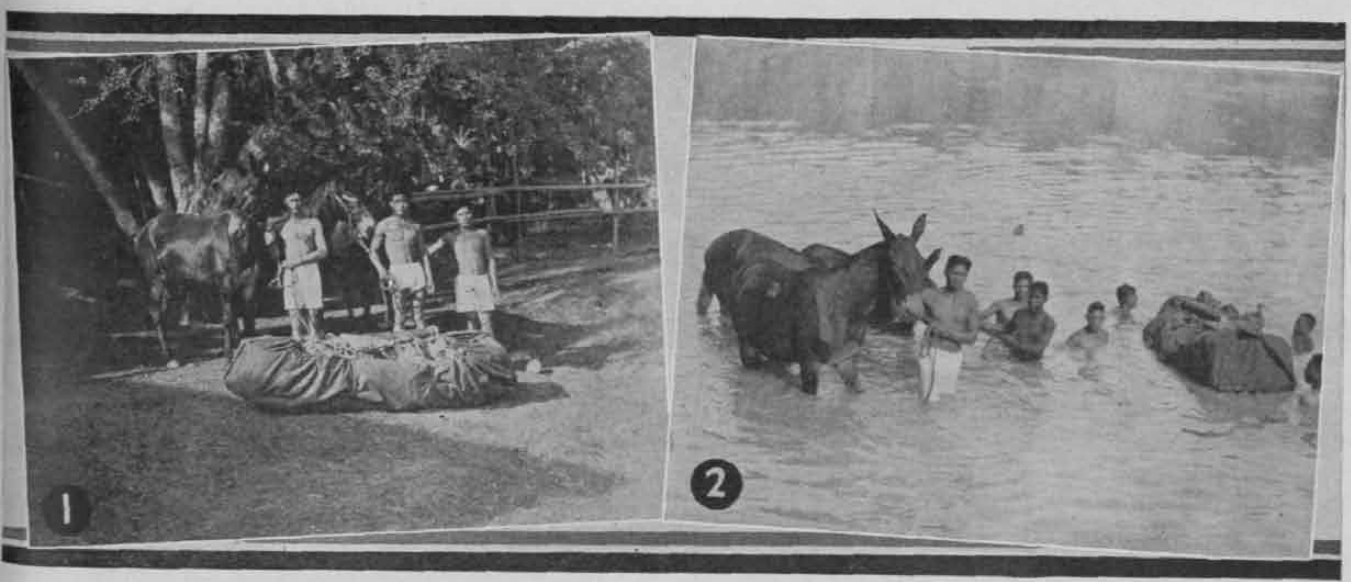
ii. *The "2-Man MG Float" (applies also to "Pack (or other type) Saddle" or to "Ammunition Loads) (see photos: Series No. 3).*

This float is prepared by 2 men in 10 minutes. A 6′ x 6′ canvas manta (having 3 to 5 metal eyelets on each side) is spread on the ground. Next, place 2 pack saddles, one machine gun (or 8 boxes of MG ammunition) and 3 individual packs in the center of the canvas. By means of a 20 foot ½″ rope (thru the eyelets) all sides of the canvas are drawn up equally against the two pack saddles (set on edge) until the bundle is practically rigid.

iii. *The "Cargo Float, Kitchen Load" (see photos, Series No. 4):* Four men can prepare this load in 5 to 10 minutes. A small 12′ x 15′ canvas paulin (part of the company Baggage Mule load) is spread upon the ground and the loads of the three company train mules (consisting of 3 pack saddles, 1 day's rations for 80 men, one kitchen, pack, (cavalry, artillery or Phil. Scout type); shovel; pick; axe and cooking utensils are all arranged as an oblong solid (approximately 2½′ x 2½′ x 6′). The canvas is drawn up against the sides and ends of this mass so that all walls are at least 1½ ft. high; lash the load with a 50′ to 75′ length of rope. This load can be propelled in the water by two men.

iv. *The Cargo "Ration and Baggage Wagon Float" (see photos: Series No. 5).* This float can be prepared in from 8 to 12 minutes by one squad in a manner similar to the "Cargo Float, Kitchen Load," by using a large canvas paulin (18′ x 39′) and placing therein all of the company property ordinarily carried in the field on the company "Ration and Baggage Wagon" (such as officer bedding-rolls, GI cans, small wall tents, etc.) except that carried in the MG floats, and in the kitchen float. Three or four men can ride on top of this float without danger of sinking it. Four men can propel it in the water.

v. *The "Escort Wagon Float" (see photos: Series No. 6):* The escort wagon is prepared for floating in 10 minutes by two squads. First remove the wagon body and place it on the wagon cover (previously spread on the ground or on the bolsters of the wagon frame). Now draw the canvas up around the body so that no side of it is less than 18 to 20 inches deep. Lash to the body with short ropes. Replace the body on the wagon and lash it to the wagon frame to prevent separation when floated. Roll the wagon into the stream and it floats. This wagon can be propelled across water by 6 men; two men guiding the wagon by means of a 10 foot rope tied to the end of the wagon



SERIES NO. 4

1. Cargo load. Contents: Pack loads of three kitchen and ration mules. 2. Cargo load afloat. Contents: pack loads of three kitchen and ration mules.

tongue while the four other men (one near each wagon wheel) swim and push the float.

c. The proficiency attained by the several companies at the end of their 1200 man-hour training period[3] was as follows:

1. One hour was the average time required by each rifle company for one round trip across the river[4] for approximately 60 men, all individual and unit equipment, and 7 pack mules.

2. One hour was the average time required for a one way crossing by the machine gun company; the slower time for this unit being due to the fact that there is equipment for 22 pack animals and 7 horses requiring about 13 cargo floats for these equipment loads. (See photos: Series No. 7).

3. "2-man Rifle Floats" and "Cargo Floats" can be prepared in 7 and 12 minutes, respectively.

4. Generally, all personnel charged with the "2-man Rifle Floats" could cross the river in approximately 10 minutes after the command "Prepare for Crossing" had been given.

d. The proficiency attained by the battalion, as a unit, may be stated by the following results of tests:

1. To cross the entire battalion, using canvas only, required:

a. 2 hours; Bn. on a 2-Co. front; under an assumed tactical situation.

b. 30 to 40 min. per Rifle Co. (incl. animals) without regard to tactical situation.

c. 1 hour; Bn. on a 4-Co. front, from march column to march column.

d. Extra equipment; (1) 31 canvas mantas 6′ x 6′ (for MGs, Ams and Pack saddles).

(2) 4 large paulins (1 per Co. for Org. Property Float).

2. The following floats were required for the crossings of 208 men and 36 animals:

i. All men crossed by swimming *(a few men in each company required assistance of towing by ropes attached to the big floats).*

ii. 42 "2-man rifle floats *(see also another test in photo. No. 1, Series No. 2).*

iii. 20 "2-man MG and pack saddle floats."

iv. 4 Cargo Floats Kitchen and Ration.

v. 4 Cargo Floats Escort Wagon Loads.

vi. 2 Escort Wagon Floats.

3. From 5 to 12 minutes was the average time necessary to launch from 35 to 45 animals (in herd), to swim them and to tie up on the far bank of the river. *(See photos in Series No. 8)*

4. It requires from 5 to 6 hours for this battalion to cross the stream at the same point as in 1 above when bamboo or other wooden floats are used. For example: 332, 20-foot bamboo poles will be required to construct the 17 rafts necessary to move the machine guns and organizational property. To procure material and construct these rafts, simultaneously, requires 84 men, assuming the material to be within ½ mile of the river bank.

5. This discussion includes photographs, with descriptive titles, (see Series No. 9) intended to illustrate "other" methods of floating equipment such as flat bottomed rafts, banca ferries, and bundle (or pole) floats, but, as has been shown above, although these may be desirable they are not necessary to a successful stream crossing.

6. During the early stages of this training one company commander prepared a large bamboo raft requiring 35, (30 foot) poles to float the loads of 5 pack mules; it required about 6 hours for 4 men to cut and transport the material to the river's edge and 6 men worked 4 hours on the raft's construction. The equipment concerned could have been transported in 4 mantas requiring from 5 to 10 minutes preparation. The foregoing is illustrative of the selection of simple, effective, and speedy methods of crossing expedients at the beginning and at the end of the training period.

Having determined the suitability of canvas for floating the equipment of the battalion, it was decided to conduct a battalion tactical exercise *(copy attached)* in Stream Crossing Methods. *The situation required the troops to approach the Pasig River; the battalion commander to issue necessary orders which included dispatching a covering force (of five squads) to secure the high ground beyond the stream on a front of some 2000 yards, and then to cross the main body of the unit,* less its wheeled transportation (the ammunition and heavy baggage loads). This crossing was accomplished on a two-company front in a period of two hours; the rifle companies following the covering force and these, in turn, were followed by the remaining rifle and machine gun companies.

In order to present a real problem in the technique of crossing unfamiliar streams, the battalion was immediately assembled on the far bank of the Pasig and then moved in route column across country for a distance of two miles to the vicinity of a railway bridge over the Mariquina River,[5] this area had not been visited, previously, by any officer or man of the battalion. The column was halted while a patrol crossed the river by the railroad trestle bridge to make a reconnaissance of the far bank for suitable landing spots for the animals. Having selected localities, all equipment was removed from pack and riding animals and the crossing began.

Some 35 animals swam the stream (one man accompanying each animal) and were tied up on the far bank in 12 minutes from the starting time. In one hour all personnel, carrying all the equipment (thus utilizing the bridge as far as practicable), had crossed the railroad trestle and the unit awaited further orders.

Having successfully crossed the Pasig and Mariquina Rivers numerous times both from the technical and the tactical standpoint and having adopted effective methods for crossing its equipment by means of

[3] It must be remembered that most Filipinos are excellent swimmers; no claim is made herein to teaching non-swimmers to be expert in this period. However, some 3 to 10 men per company were trained over a period of 3 months and these men crossed the river with their unit.

[4] The Pasig River is 400 feet wide, 18 feet deep and has an average current of 5 feet per second at this point.

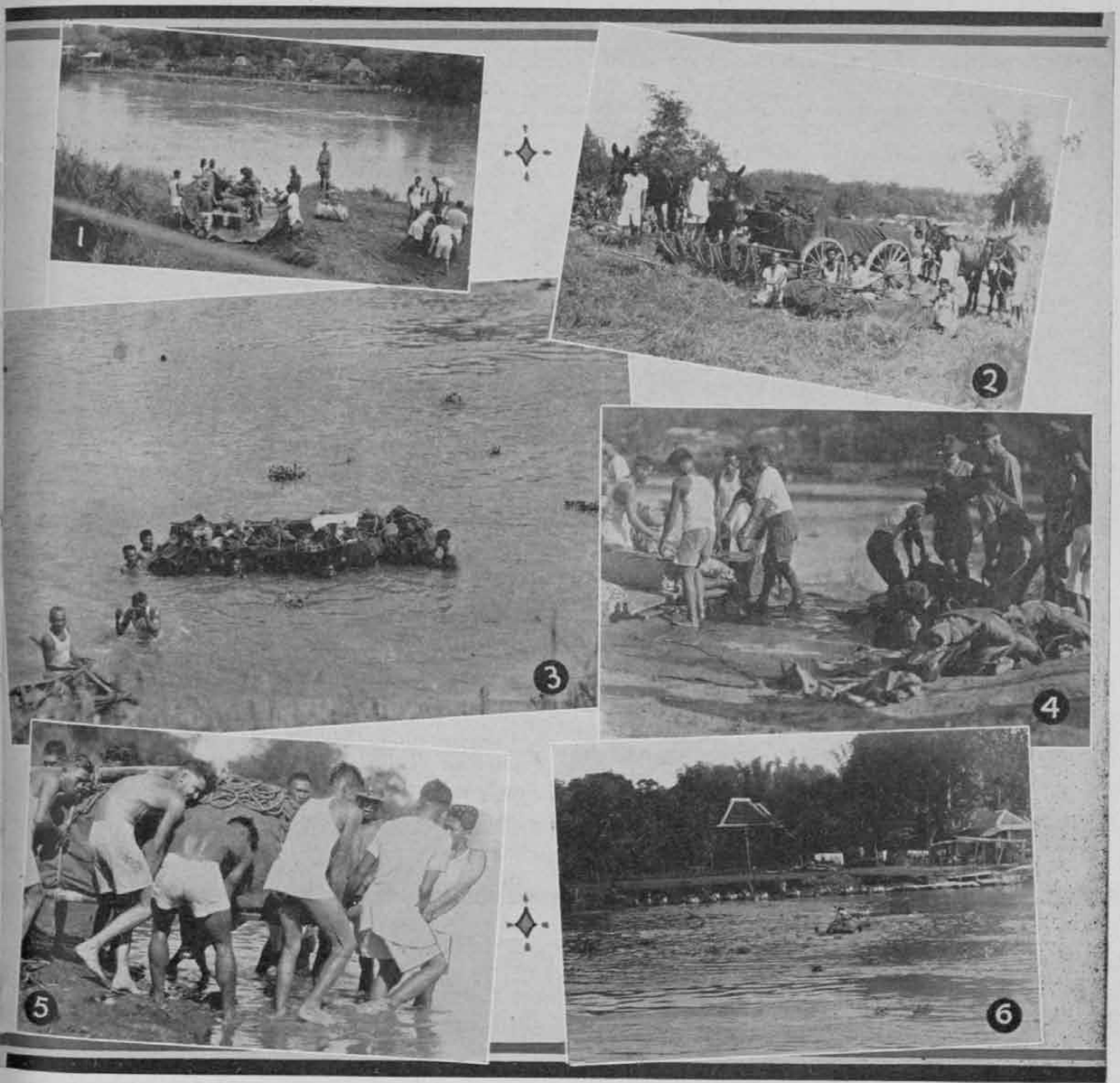
[5] Width 450 feet, depth 12 ft., and current 3 feet per second.

the unit's own canvas, training of this nature was suspended pending the test to be prescribed by higher authority. This test was held in the form of a demonstration for the Brigade Commander in "Methods of Crossing Unfordable Streams." The demonstration was performed in the presence of most all of the officers and men stationed at Fort McKinley, numerous visitors from various Army and Navy Posts of the Philippines and prominent civilians in the City of Manila.

This training has shown, conclusively, (by demonstration and by the records of the included photographs) the following:

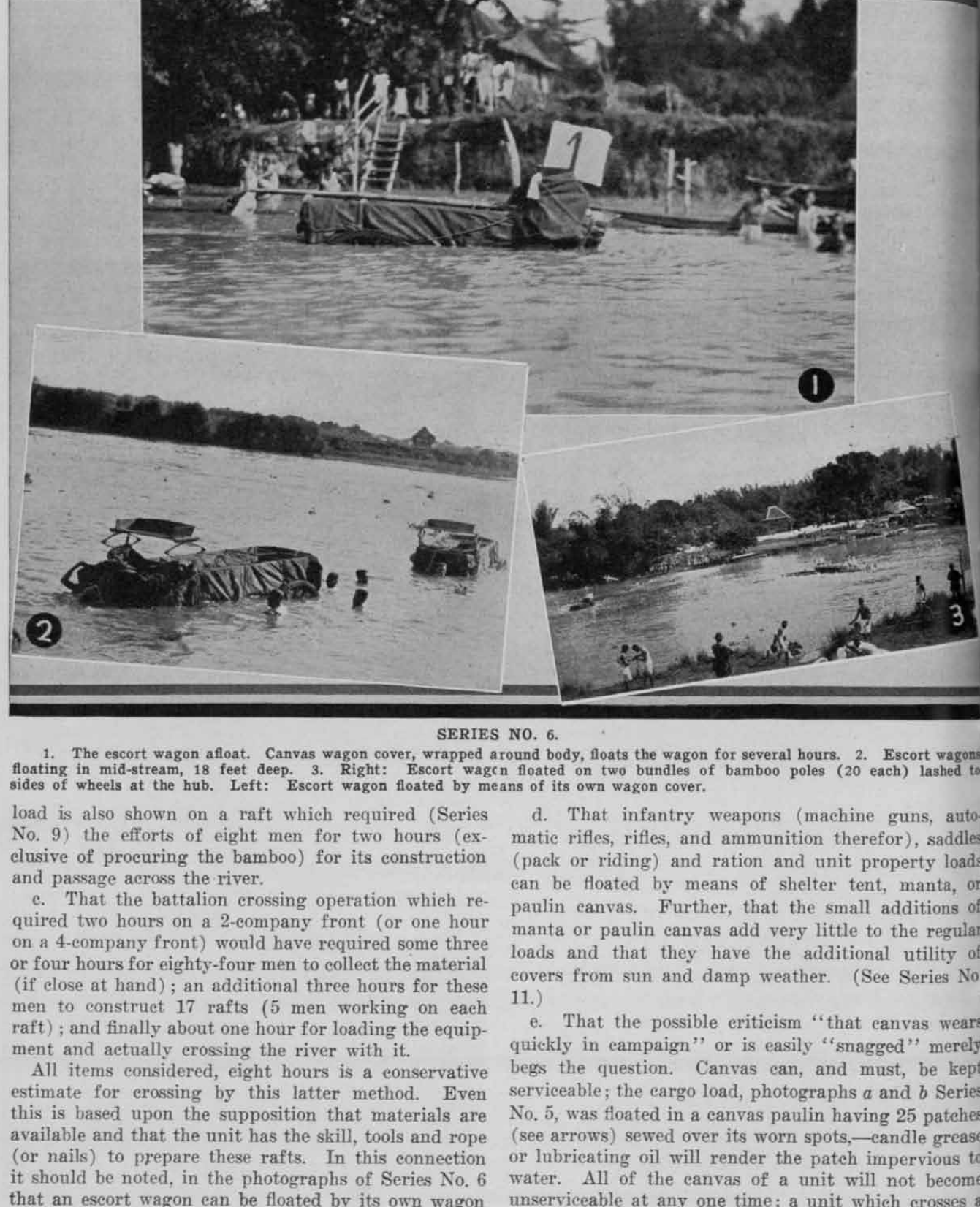
a. A unit whose men and animals are familiar with swimming and floating equipment by methods, somewhat similar to those described in this discussion, need fear no unfordable stream as an obstacle to military operations.

b. That our combat units, as equipped at present (with a trivial addition of rope and canvas), need no other assistance for the accomplishment of a successful stream crossing. *Wooden floats, rafts, boats, etc., can be classed as "luxuries" to be depended upon only where there is much time and when materials are available.* The canvas contained load shown in photographs, Series No. 4, was prepared in 4 minutes and floated across the Pasig River in 8 minutes; the same



SERIES NO. 5

1. Preparing the company heavy property for floating. 2. The 4-line ration and baggage wagon and ½ its load prepared for floating. One company's baggage. 3. Escort wagon load. Organizational property floating in canvas paulin (size 18' x 38'). 4. Cargo Float Preparation of R & B wagon load. (Company property) 5. Launching the R & B wagon load float. 6. R & B wagon load of a company being floated over stream. Note the individual soldier on top.



SERIES NO. 6.

1. The escort wagon afloat. Canvas wagon cover, wrapped around body, floats the wagon for several hours. 2. Escort wagons floating in mid-stream, 18 feet deep. 3. Right: Escort wagon floated on two bundles of bamboo poles (20 each) lashed to sides of wheels at the hub. Left: Escort wagon floated by means of its own wagon cover.

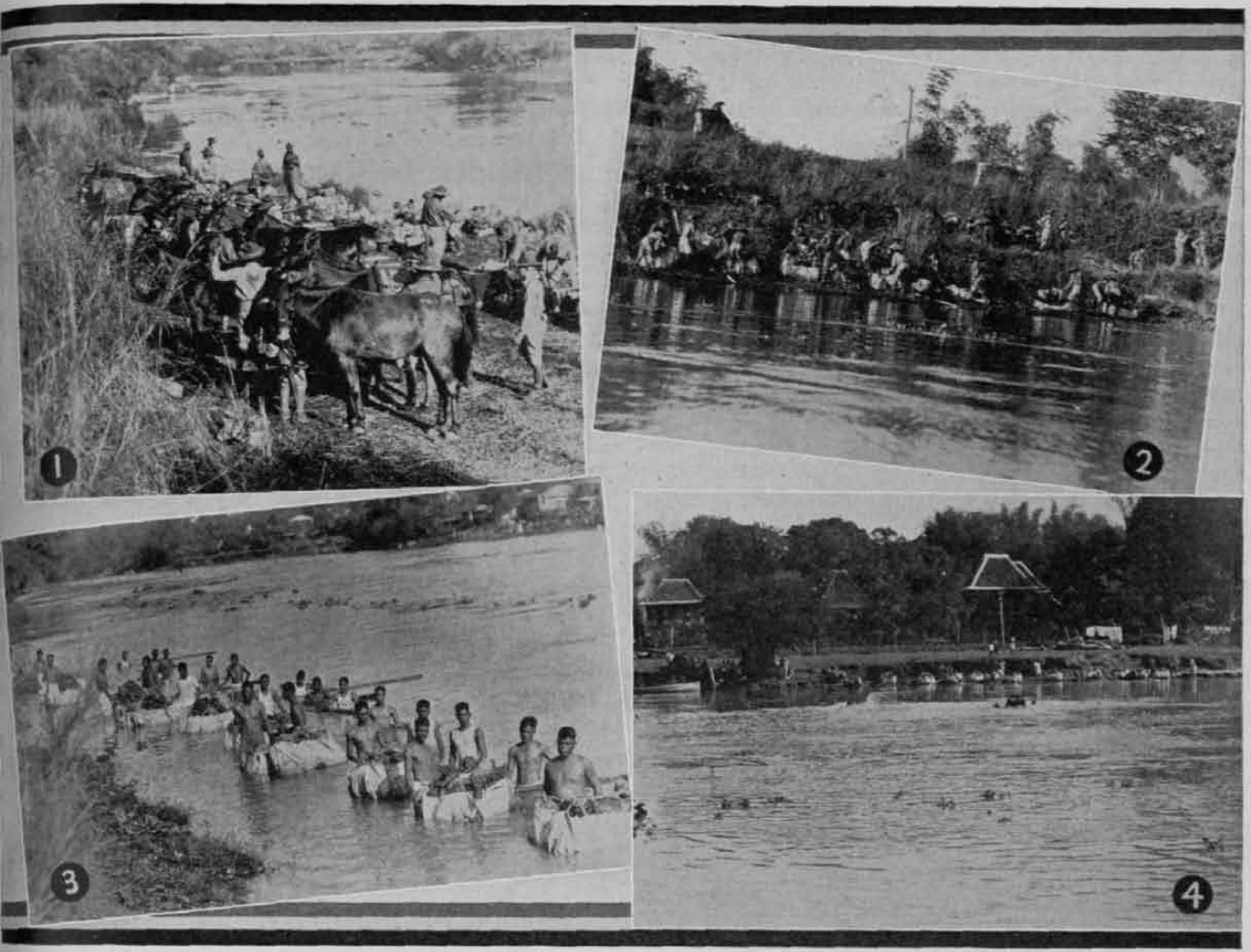
load is also shown on a raft which required (Series No. 9) the efforts of eight men for two hours (exclusive of procuring the bamboo) for its construction and passage across the river.

c. That the battalion crossing operation which required two hours on a 2-company front (or one hour on a 4-company front) would have required some three or four hours for eighty-four men to collect the material (if close at hand); an additional three hours for these men to construct 17 rafts (5 men working on each raft); and finally about one hour for loading the equipment and actually crossing the river with it.

All items considered, eight hours is a conservative estimate for crossing by this latter method. Even this is based upon the supposition that materials are available and that the unit has the skill, tools and rope (or nails) to prepare these rafts. In this connection it should be noted, in the photographs of Series No. 6 that an escort wagon can be floated by its own wagon cover (canvas) and that the ration and kitchen pack mule loads (see photographs in photo. Series No. 4) by means of the manta (canvas) containers (wrappers) or the small canvas paulin.

d. That infantry weapons (machine guns, automatic rifles, rifles, and ammunition therefor), saddles (pack or riding) and ration and unit property loads can be floated by means of shelter tent, manta, or paulin canvas. Further, that the small additions of manta or paulin canvas add very little to the regular loads and that they have the additional utility of covers from sun and damp weather. (See Series No. 11.)

e. That the possible criticism "that canvas wears quickly in campaign" or is easily "snagged" merely begs the question. Canvas can, and must, be kept serviceable; the cargo load, photographs *a* and *b* Series No. 5, was floated in a canvas paulin having 25 patches (see arrows) sewed over its worn spots,—candle grease or lubricating oil will render the patch impervious to water. All of the canvas of a unit will not become unserviceable at any one time; a unit which crosses a stream by using serviceable canvas for its floats will require approximately twice as much time for its crossing when one third of its canvas becomes unserviceable since some canvas must be brought back to the



SERIES NO. 7.

1. Preparing machine gun company floats. 2. Machine gun company completing the preparation of manta floats for all machine gun and individual pack equipment of the company. 3. Machine gun company machine guns and individual equipment prepared to swim unfordable river, two men propelling each load. 4. Machine gun and individual equipment loads of a machine gun company being floated over stream, two swimmers propelling each load.

near bank for other loads. Incidentally, all canvas, old or new is less liable to leak (or seep water) if, before using as a float, it is thoroughly soaked in the stream.

f. That the buoyancy of a float and the method of packing it is a matter of test, therefore all units require some training on the subject. Narrow floats or rafts capsize easily; all floats should be at least from three to six feet wide, if possible, and it is always best to have the center of gravity of the load as low as practicable. For weight carrying purposes, deep, wide floats are more stable than shallow ones.

g. That animals which may at first appear impossible to accustom to swimming soon become used to the water and we can expect them to be trained to the extent that they herd into the water as readily as ducks move in flocks. (See Series No. 12.)

A 15-foot length of rope tied to the halter of an animal with two men at the other end and one man in rear to urge the animal will usually succeed in getting the most stubborn mule or horse to enter the water. An individual swimmer by clinging to a stubborn animal's halter (the long rope being removed once the animal is launched) can pilot it across the stream. A free swimming animal should be selected as a "lead-off" and once across, it should be tied on the far bank in plain view; a cow-bell occasionally jingled from the far side is an inducement for crossing to animals used to herding with the bell. Four or five trips across a stream is sufficient training for individual animals; they should then be crossed by herding; a few men are necessary to start the leading swimmers. In the beginning of herd training 8 or 10 men on the bank with a long rope, surrounding the group, can easily launch the balance of a large herd after a few animals have been led into the water and start for the far bank of the stream.

h. That all training, especially in the early stages, should contemplate adequate safety measures; this may prevent the loss of men or equipment. Whenever training is in progress, boats (motor boats, if available) containing life preservers and several good swimmers should be near at hand. Long ropes with buoyant floats attached should be tied to all loads; these mark the spot of a float which may capsize due to faulty preparation and the long rope serves as a cable by

which the weight may be lifted or dragged to the bank of the stream. Long bamboo poles, logs, planks or life preservers should be used by swimmers of questionable strength. All of the foregoing measures constitute aids to the successful training of the unit.

All companies were required to prepare reports on their experience in developing ways and means for passing over unfordable streams, which,—when approved by the battalion commander,—were filed as a company training document to be used as a reference for future training on this subject.

Such training as has been described herein has particular application to troops in the Philippine Department, especially during the wet season, where units,—perhaps as small as battalions or companies,—may be required to operate independently and, due to the requirements of the situation, at places other than along good roads and over well established stream crossings. These units must depend upon their own ingenuity and devices in order to cross unfordable streams where there are no bridges; they cannot expect to have engineer troops provide the means for crossing.

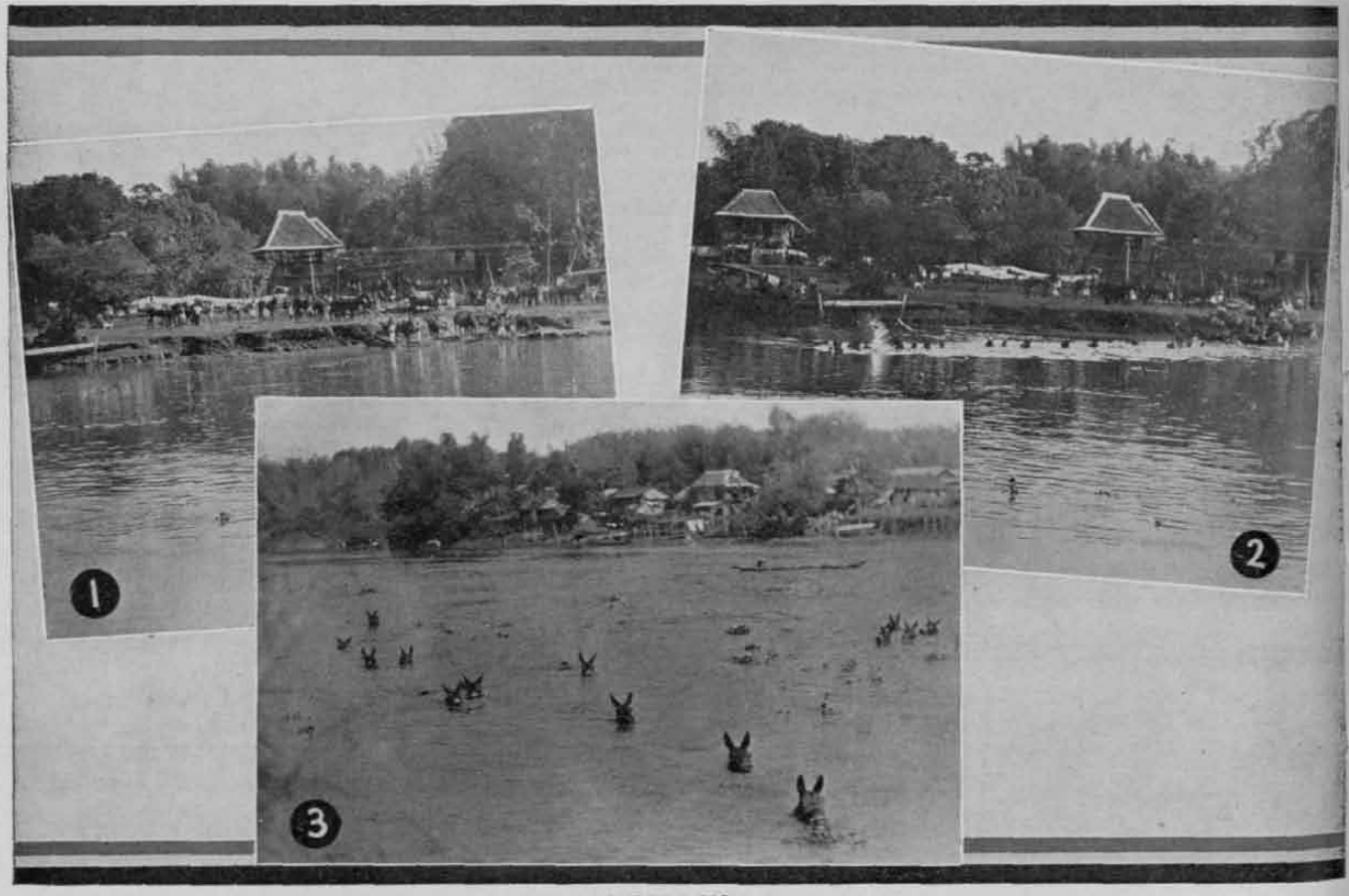
Moreover, it is believed that one of the prime virtues to be desired by a military unit is that power of mobility which is independent of any aid or service not a part of itself. If this be true, stream crossing training has general application to the proper combat efficiency of all combat troops throughout our army, especially the infantry and cavalry.[6]

The well known and accepted texts on the technique of crossing unfordable streams enumerate many suitable expedients and how to construct them but it is the purpose of this discussion to emphasize the fact that combat units (especially covering forces of larger bodies) should know that they can cross these obstacles and "how" to do so without using extraneous equipment, without losing valuable time collecting materials, and for the construction of rafts therefrom. "How true it is," wrote Wellington, "that, in all military operations, time is everything." Any unit which is capable of crossing an unfordable stream by means of its own individual and organizational equipment not only has widened the scope of its maneuverability but at once has minimized the time required for such maneuvering.

It should not be sufficient for combat troops to know how to use special troops (engineers, pioneers, etc.) and bridging materials in campaign; it is proper that such units should know "how" to pass over the unfordable obstacle when the special troops or materials are not available to assist them (the usual case).

Training on this subject may prevent costly errors due to faulty estimates by unit commanders. The

[6] During the 1930 Philippine Division Staff Ride the Staff of a cavalry regiment estimated that it would require 14 hours to move the regiment across a stream similar to the Pasig River near Fort McKinley.



SERIES NO. 8.

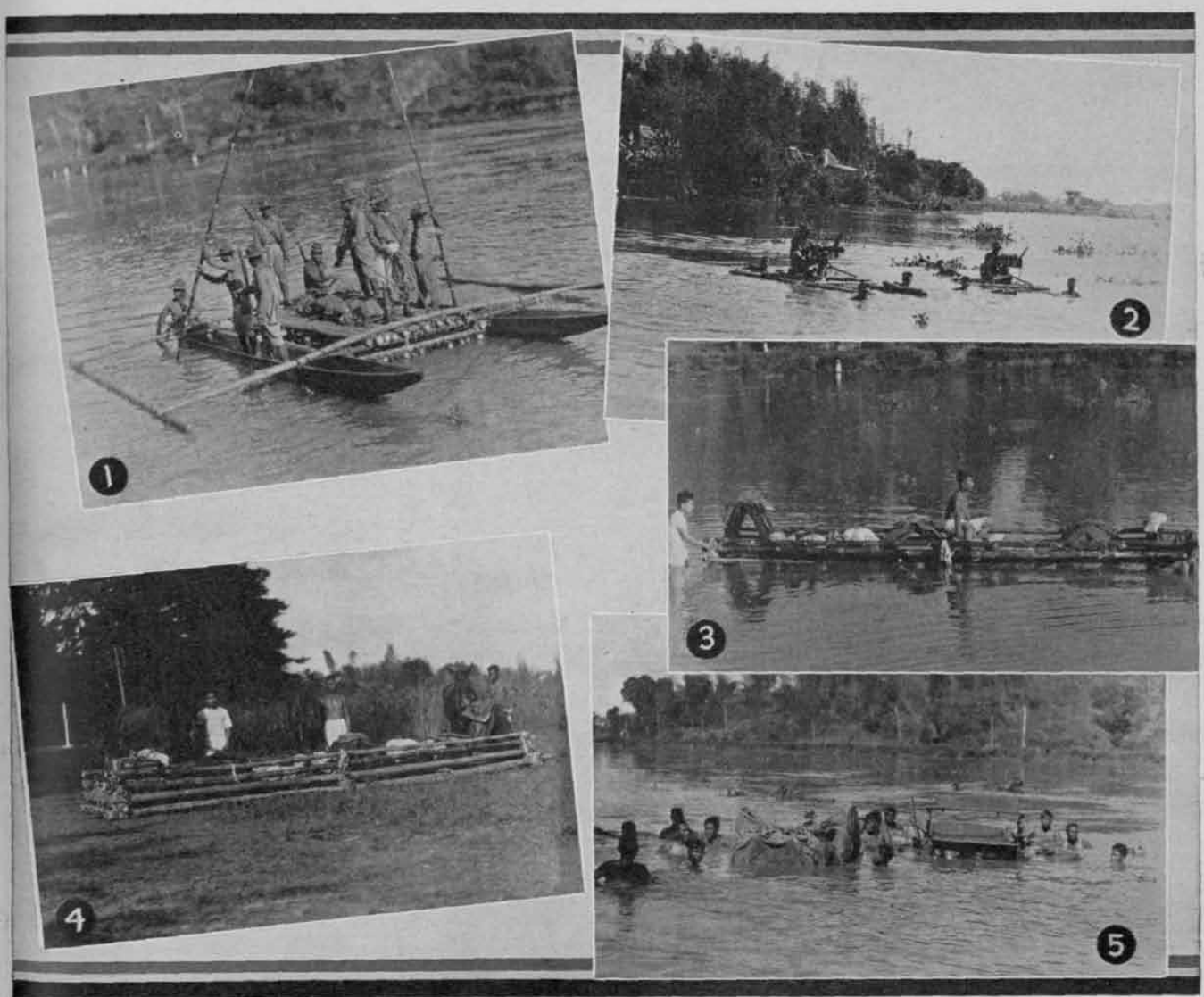
1. The start. 2. The herd approaching mid-stream. 3. Nearing the finish. Mules and horses of infantry battalion returning from the far side of an unfordable stream fifteen minutes after swimming across.

bridge upon which an operation depends may not exist (or be untenable) when the troops reach it (this was the case with Funston at the Quingua, (P. I.) in 1899). Unit leaders should know how to issue appropriate orders; they should be taught to realize that there are no constant rules for stream crossings; that each operation is unlike any other but that all are made easier by both technical and tactical experience resulting from training. Training experiences of other troops and historical examples may serve the unit well which includes river crossings in its training program. Bismark once said, "People say that they learn by their mistakes; I prefer to learn by the mistakes of others."

The situations in which practical methods in crossing unfordable streams may have application are varied and extensive; combat troops may have occasion for their uses both in offensive and defensive operations:

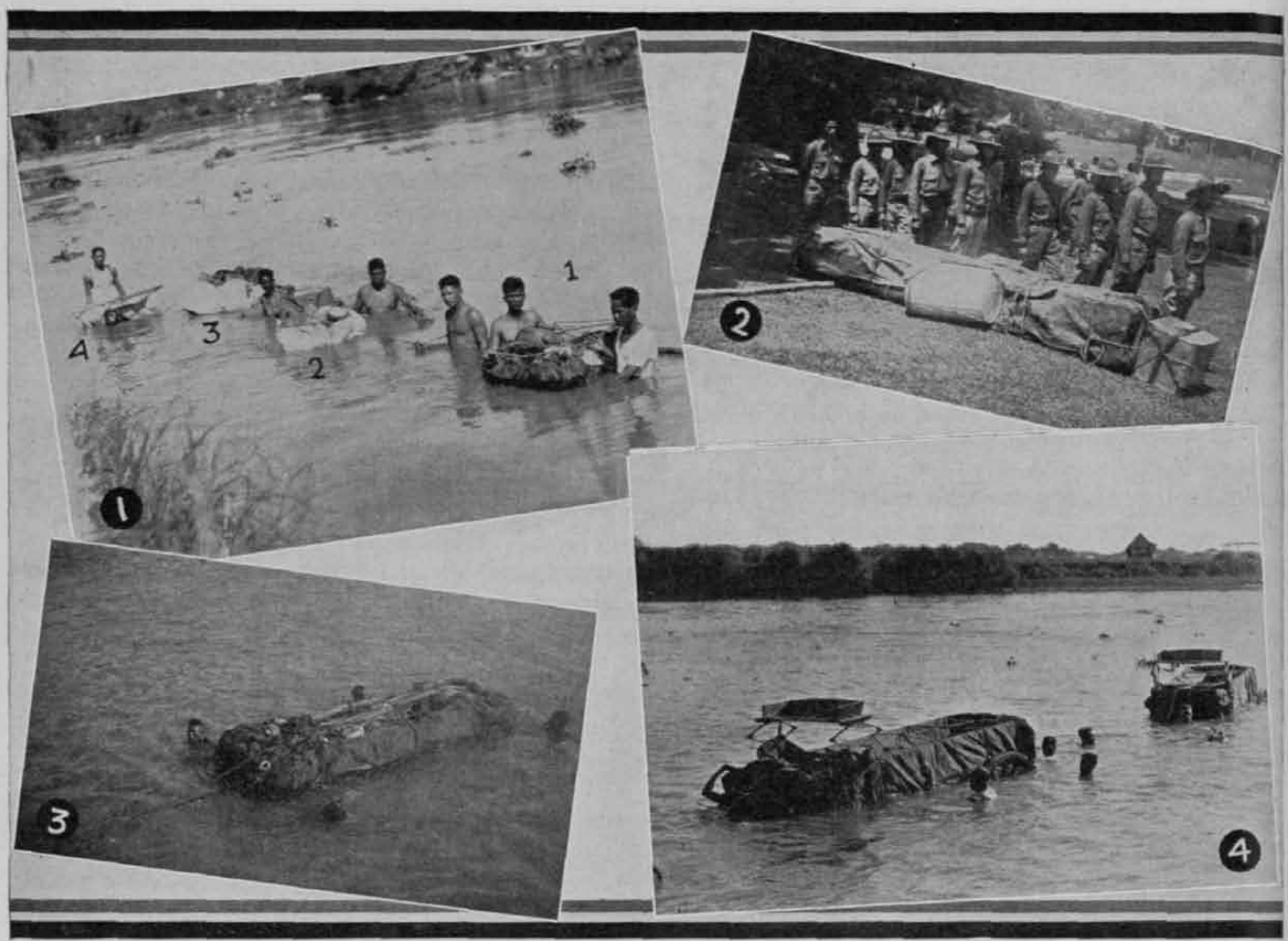
Advance detachments (battalions, regiments or even brigades) sent forward to seize strategic localities may meet with many unforeseen water obstacles; the time required to overcome such interruptions may be the vital element to the successful accomplishment of the mission. All elements of the command should be able to cross the unfordable streams encountered; there may be no secure line of communications in the rear of such unit where baggage, vehicles or animals may be left temporarily.

Covering forces,—screening an advance on a movement to concentration by a large force,—operate to best advantage, especially when opposed by hostile elements, by crossing streams on a broad front; each component unit (platoon, company, battalion, or regiment) should be independent of assistance and capable of effecting a crossing by its own means.



SERIES NO. 9.

1. Banca-bamboo ferry, raft with outriggers, one rifle squad. A heavier load can be carried. 30 bamboo poles, 2 bancas, one hour to cut bamboo and ½ hour to construct. 2. Browning machine gun on bamboo machine gun raft. One gunner and three men propel the raft. 3. Bamboo float for pack loads of three kitchen and ration mules. 4. The loaded raft afloat. 5. Left: Communication (or machine gun) cart floated in canvas 8′ x 10′. Right: Escort wagon floated by means G. I. cans (made airtight with burlap under cover) lashed to the frame of the wagon.



SERIES NO. 11.

1. Fig. 1: One machine gun and two boxes of ammunition in shelter tent: Fig. 2: The ammunition mule load in canvas manta 6′ x 6′. (pack saddle and four individual packs and eight boxes of ammunition) Fig. 3: The machine gun mule load in canvas manta 6′ x 6′. Machine gun, pack saddle and four individual packs. Fig 4: 2400 rounds cal. .30 ammunition (two cases) in 6′ x 6′ manta float. 2. The escort wagon float. Water tight cans give additional buoyancy when weight is increased. 3. The company escort wagon load: 1100 pounds afloat. 4. The escort wagon afloat. Canvas wagon cover, wrapped around body floats the wagon for several hours.

Crossings, forced against hostile opposition, must be protected by covering fire from the near bank of the stream while the first crossing elements accompanied by their equipment make for the far bank. These leading elements must begin operations against the enemy with as little delay as possible; control must be maintained; and arms and ammunition must be kept dry and with the elements to which they pertain.

The elements which arrived on the hostile river bank at the Bag-Bag and at Calumpit (in the P. I. in 1899) were naked and without weapons; and so they remained for from 15 to 30 minutes at the mercy of an enemy which at the particular moment did not act aggressively and so they survived.

Wide envelopments may require rapid stream crossings by swimming and floating combat equipment. Hannibal sent Hanno farther up the Rhone for this purpose in 218 B.C. The occasion to apply these methods may occur on the battle field itself where the enemy has used an unfordable stream, as a natural obstacle, to increase his powers of defense. Such was the case when Wrangel's Prussian Brigade crossed the Saal below Kissingen. The methods of 1932 would have simplified the problem of 1866 if that brigade had been trained in such matters.

Combat patrols or flank detachments may be required to cross unfordable streams at some distance from the main body in order to make a reconnaissance beyond the stream or for security to the main body's crossing. In 1899 General Funston, then a regimental commander, with one rifle company made such a crossing (800 yards to the flank of his brigade) over the Quingua (200 feet wide and 10 feet deep) but his leading elements had to leave their arms and ammunition behind. In the case of such a strong protecting patrol or detachment it is most important to know "how" to cross the present day machine guns, automatic rifles and other necessary equipment by means other than the time consuming method of raft building.

In retreats and delaying actions the rear guard

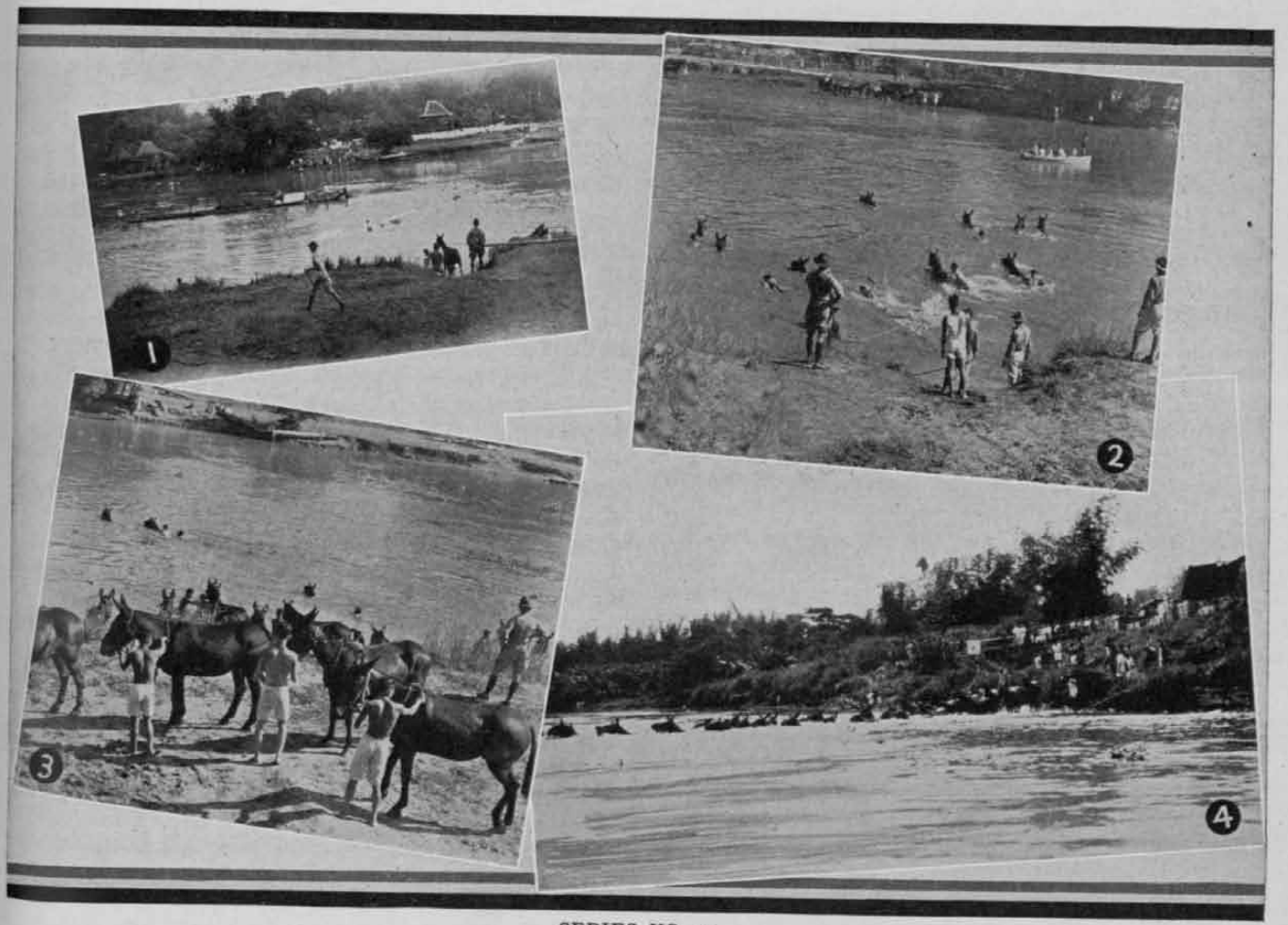
elements may be able to delay the enemy considerably longer if it is known that a regiment can cross the stream in its rear in from two to six hours instead the fourteen hour estimate for a cavalry regiment in the 1930 Philippine Division Staff Ride. In such operations there may be no bridges or boats and perhaps there are few fords and no ferries to be expected. Lee's retreat from Sharpsburg after the Battle of Antietam (in 1862) was confronted with only one ford practicable for the wagon train of his entire army and a few deep fords for men and animals.

Covering units, (particularly battalions or companies) for the flanks of retreating forces may be required to use all sorts of expedients and to move cross country entirely in order to perform the assigned mission and rejoin the main body later on.

The foregoing situations can be satisfactorily met if simple never-failing methods are sought for in a reasonable amount of training on the subject. Troops should know how to operate when confronted with the difficulties presented in this discussion. It is believed that the fear of deep streams,—inherent in most of us,—and the mystery of just "how" to pass a military unit over such an obstacle by swimming and floating can be practically eliminated by methods of training somewhat along the lines suggested herein.

It is hoped that the foregoing will serve to refresh the memory of older officers to whom the subject is not new and will inspire inquisitiveness in the minds of the younger officers in the service; thus serving as a guide to all to show how our present equipment lends itself to advantageous uses when military operations require that deep streams be rapidly crossed.

It is well enough to be satisfied with the old proverb "Do not cross the bridge until you come to it" but we should go further in our troop training and be prepared to cross the stream if the bridge is not there.



SERIES NO. 12.

1. Stubborn animal being towed into stream by long rope tied to its halter. 2. Guiding untrained animals in early stages of crossing practice. 3. Teaching the untrained animal to swim. 4. Mules and horses of an infantry battalion beginning the crossing of unfordable stream. The end of the training period.

Russia's Original War Plan and Its 1915 Modifications*

By General Youri Danilov, Late Assistant Chief of Staff in Charge of Operations of the Former Russian Army

THE end of the last century saw the formation and strengthening in Central Europe of the bonds uniting three powerful countries, Germany, Austria-Hungary, and Italy, which joined the Triple Alliance under the leadership of Germany. Realizing its own importance, Germany felt the urge to enter the World arena, or, as was modestly said in that Country, "to secure a place under the sun." To do this, it built a powerful navy in order to dominate the main sea routes, and originated the Hamburg-Constantinople-Bagdad Railroad, thus moving East, through Turkey and Persia, to the Persian Gulf.

These developments instilled fear and suspicion in its neighbors. England was concerned because her influence on European affairs was based on world trade. France, the closest neighbor, because she had just lost to Germany Alsace and Lorraine as the result of the unfortunate War of 1870-71. Russia, cut off from the Southwestern Slavic States, had sustained considerable losses at the signing of its Commercial Treaty and serious damages to its influence in Persia. Under a common threat, these countries became in turn inclined to unite.

An exchange of views between the Russian and French Governments took place, for the first time, in 1891. As is usual in such cases, the basis of the discussion was the strictly defensive concept of a military convention, insuring mutual assistance in case of an attack by a Power of the Triple Alliance. The negotiations resulted a year later in the signing of a project of Military Convention by the Chief of the Russian General Staff, General Obroutcheff, and the Assistant Chief of the French General Staff, General Boisdefre. At the end of 1893, the Convention was ratified by both Governments, and notices thereof exchanged.

The terms of the Convention were as follows: Both parties—Russia and France—assumed a mutual obligation, at the first news of a general mobilization by Powers of the Triple Alliance, to mobilize their own armies and to concentrate them along the threatened frontiers.[1] In order to coördinate further activities of both Allied Countries it was agreed that, in case of an aggression by Germany, or of another Country, supported by Germany, on either Russia or France, the other Country, party to the convention, should come to the rescue of the attacked, throwing all its armed forces against Germany.

It will be seen that in the Convention the mobilization of the armed forces is clearly separated from the opening of military activities. This distinction was, apparently, the result of the fact that, while in Russia both acts were within the powers of the Emperor, in France, on the other hand, the President of the Republic can only decree a mobilization, the declaration of a war must be voted by the National Assembly.

In 1899, the gradually strengthening bonds between France and Russia resulted in a political agreement, in which was incorporated the above mentioned military convention. Finally, in the summer of 1912 an agreement on naval matters was reached. This instrument however, had only a minor importance in view of the weakness of both navies as compared to the German one.

Nevertheless, it was important for Russia to protect herself on the shores of the Baltic. She had reasons to fear German landing parties and an unfriendly attitude on the part of Sweden. Therefore, Russia could only welcome the adherence of England to the Alliance, which would create an almost complete naval security for her. In the meantime, leaving the question of the admission to a Triple Entente to the future, Russia changed her suspicious ways with England. Their relations assumed a more trusting character. In 1907 a Treaty was even signed with England in regard to Asiatic Affairs. The following year the Imperial and Royal Couples met at Reval.

The relations between France and England had always been closer. Therefore, in 1912 an exchange of opinions took place between the respective General Staffs. According to this exchange, the "possibility" of English assistance was recognized in case of attack against France. The extent of this assistance was defined as six English infantry divisions and one cavalry division, which should form an expeditionary corps.

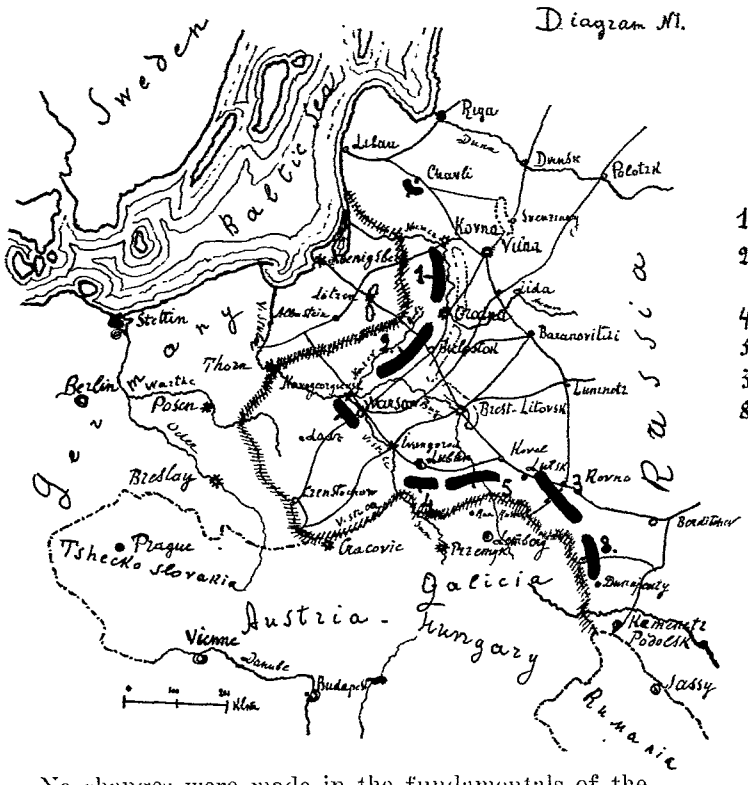
Such was the military and political situation at the time of the murder at Sarajewo, on July 23, 1914.

The Franco-Russian military convention covered only the basic points, leaving out all details. In order to decide on these, meetings between the respective Chiefs of Staff were arranged. Beginning with 1910 these consultations took place every year, in Paris and in Petrograd by rotation. They were surrounded by extreme secrecy. Russia was represented by the Chief of Staff only, who, by the way, was frequently changed. France, on the other hand, was represented not only by the Chief of Staff, but also by his closest associates. The secretarial work was handled by the Military Attachés concerned, who were in attendance at the meetings.

*EDITOR'S NOTE: Books written by General Danilov include *The Russian Army in the World War*, reviewed in the *Army Quarterly*, October, 1925; *Dem Zusammenbruch entgegen. Ein Abschnitt aus der letzten Epoche der russischen Monarchie* (Towards the Catastrophe. A section from the last epoch of the Russian Monarchy), reviewed in the *Army Quarterly*, April, 1929.

Le Grand duc Nicolas; sa vie son role, reviewed in *Revue de Cavalerie*, March-April, 1932.

[1] Marshal Joffre in his recent Memoirs does not describe entirely accurately the basis of the Convention.



No changes were made in the fundamentals of the Convention. The discussions concerned the question of the initial operations, and more particularly, the regions and forces connected therewith.

Colonel Nikolaeff, writing in the September-October issue of the INFANTRY JOURNAL, is greatly mistaken when, analyzing Russian operations in the initial period of the war, he suggests in his article, "The Russian Plan of Campaign in the World War," that Russia's help to France should have taken the form of an offensive against Austria-Hungary.

The agreement of 1893 provided that in case of a German attack on France, Russia was bound to come to her assistance, utilizing for the purpose all her *free troops against Germany*. Apparently, this wording was included because Germany was considered the head and the inspirer of the unfriendly alliance.

I fail to see how Russia, having entered into an agreement with France, could refrain from carrying out her part by directing against *Germany* at the beginning of the war all her free troops. Of course, the term "free troops" had to be defined. I presume, however, that this had been done with due conscientiousness inasmuch as *nine* army corps had been assigned against Germany, instead of the five or six requested by General Dubail.

Indeed, I should like to see the expression of the responsible French strategian upon being advised that, instead of a direct offensive against Germany, provided for in an agreement entered into some twenty years before, Russia's help would assume the indirect character of an advance against Austria-Hungary! Germany would have simply disregarded it, and would have kept on with her triumphal march through France to the very end.

Eastern Prussia—this is an entirely different story. It was the home country of the Hochenzollern themselves, a country of large landowners, surrounding Emperor Wilhelm and influencing his decisions. Actually, not to carry out an offensive into Eastern Prussia was quite impossible. To do so, to disregard the official requests made in this connection, would have simply meant to break our agreement with France, and this, in very ominous moment!

Indeed, a *psychological* moment!

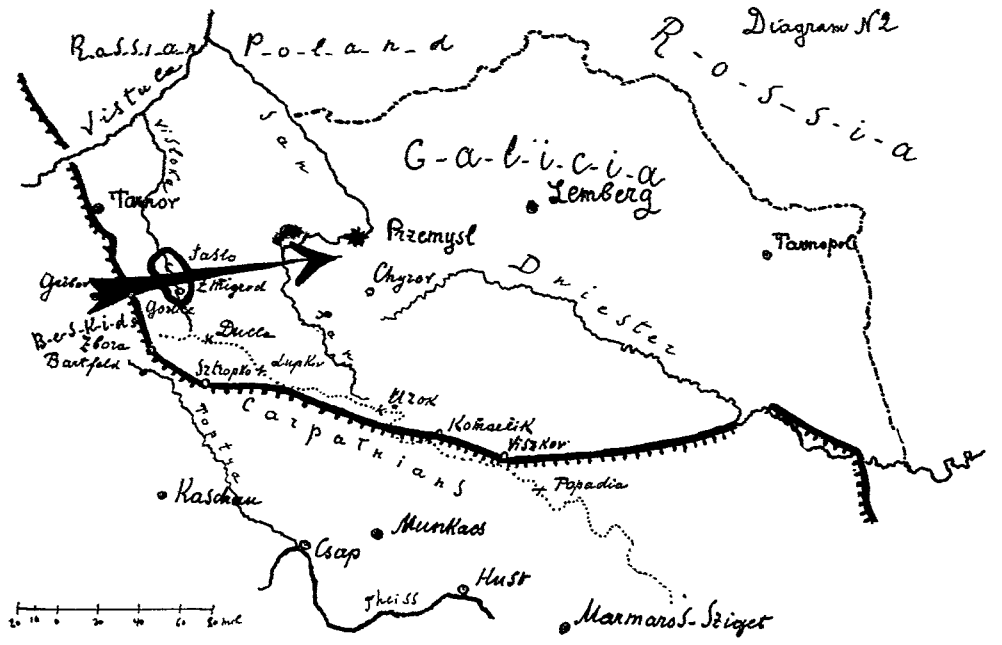
"I beseech (je supplie), Your Majesty," pleaded the French Ambassador in Petersbourg, Monsieur Paleologue, with the Russian Emperor, "to order your troops an immediate offensive. *Otherwise, the French Army is in danger of destruction.*"

One of the French Deputies, Monsieur Tetenger, said only recently: "We were *then* saved by the Russians, who threw their troops into Eastern Prussia. They perished in order to make the Marne miracle possible." This momentous "then" was the end of August, 1914.

To help France later—at the end of August our victory in Galicia had not yet fully materialized—would have been equivalent to promising medical assistance to a dying man after his death!

Some technical questions were also taken up, such as the railroad building in Russia, as a means to speed up the mobilization and concentration of the Russian Army, which was notoriously slower than that of the Western States. Indeed, hard though it is to imagine—there were, in Russia, such Godforsaken places, deprived of any means of communication. Obviously, under these circumstances, the mobilization of the Russian Army and its concentration on the frontier was bound to lag behind, an unfavorable factor as far as simultaneous actions with Western States were concerned. At the time, Russia was short of capital. As a matter of security, France deemed it expedient to assist Russia financially, which in turn made the latter dependent on French policy. We were never fully informed about the French plan of operations. In fact, we felt that the question should not be tackled officially. On the whole, it became customary for the military representative of France to outline his demands, which we did our best to satisfy.

There was also another reason for this predominance of France. Both France and Russia felt that in case of a war between the Central Powers of the Triple Alliance and the members of the Triple Entente, the armed forces of Germany, i.e., of the strongest enemy,



would mainly be directed against France. In that case, the object of Russia was to come, in the most effective manner possible, to the rescue of her Ally. France, as has been pointed out, could start fighting much sooner than Russia. Therefore, she would be a more dangerous enemy for Germany in the initial period of the war. These considerations were of prime importance when trying to decide on which of the two fronts—Eastern or Western—Germany was most likely to gather her main forces. Furthermore, the western regions of Germany were the most heavily industrialized. Hence, in case of war, the most important. Finally, the newly acquired territories of Alsace and Lorraine, which formed the bone of contention between France and Germany, were lying immediately west of Germany, and it was natural to expect that necessary arrangements would be made to protect them against the possibility of an invasion. The last two considerations alone spoke highly for the adoption by Germany of an offensive course on the West, for an offensive is the best defensive device. On the other hand, the slowness of the Russian army in getting lined up was well known. In fact, the notion of this slowness was considerably exaggerated. The German General Staff had reasons to assume that a small number of German troops, and the whole Austro-Hungarian army would be sufficient to check any Russian offensive. True, the Austrian army lagged behind the German in speed of mobilization and concentration. Yet, it could be gotten into readiness more rapidly than the Russian army. It must be noted in passing that the Austrian army was ably led by its Chief of General Staff, General Conrad von Checendorf. At the time of the outbreak of the war, it had developed into a serious offensive factor, entirely able to carry out the assignment given to it.

These considerations were taken as a basis for the common plans of operations of France and Russia. It was computed in Russia that Germany could afford to leave on the Russian front from three to six field corps, provided the distribution of the Austro-Hungarian forces were as follows: 12 to 13 corps against Russia and 3 to 4 against Servia, which was assumed to maintain a friendly neutrality toward Russia. Under these circumstances we had to figure as having against us from 200 to 300 German together with some 650 Austro-Hungarian battalions, with a possibility of reinforcement, in case of necessity, with troops from the Servian front. It was taken for granted that the Italian army would be operating against France and, in the event of the conflict spreading out, on the Balkans.

Accordingly, the representatives of France at the Conference of Chiefs of Allied General Staffs outlined their wishes in regard to the three main problems.

In 1911, at Krasnoïe Selo, near Petrograd, General Dubail[1] declared that he would be satisfied with a Russian offensive conducted against Germany with such forces as to immobilize on East Prussian front from five to six German corps.

Concerning the moment of launching of the Russian offensive, the French representatives emphasized the importance of a *simultaneous* offensive on both fronts, and pointed out that the concentration of the French army on the "North Eastern" border would be mostly completed by the tenth day of the mobilization, whereupon any further offensive might start beginning with the following morning.

In regard to the direction of the Russian offensive, the French spokesmen repeatedly emphasized the necessity of striking deep into the territory of the enemy in order to hit the vital centers of Germany. In 1912 and 1913, the French Chief of Staff, General (later Marshal) Joffre advocated our assuming such a starting position, which, in case of concentration of German troops in Eastern Prussia, would enable us to develop a decisive advance northward against Allenstein (see diagram 1); or better still, along the left bank of the Wistule toward Berlin, in case of a concentration of German troops against us in the region of Thorn-Posen.

With reference to the first point—*that of the number of troops*—our operating plan, in spite of the ever increasing armaments of Austria-Hungary, provided for nine field corps to be used for an offensive in Eastern Prussia. These troops were selected from units which could be most readily brought into action. They consisted of 480 infantry battalions, including certain reserve troops which formed the garrisons of the fortresses of Kowno and Grodno, and 220 squadrons of Cavalry, excluding the Frontier Guards and Corps

[1] The present High Chancellor of the Legion of Honour.

Cavalry. This 50 per cent numerical predominance over German troops was decided upon because the Russian Army Corps were considerably weaker as far as Artillery and Technical Equipment were concerned.

As far as *the starting time of the offensive was concerned,* all possible steps were taken in order to speed up the mobilization. However, at the last conference of Chiefs of General Staffs it was pointed out that in spite of the improvement which we had been able to accomplish in this respect, by no means could we be ready at the beginning of the French Offensive. This, by the way, was well understood by our Allies. As a matter of information the statement was made by them that our offensive would have for them the more importance, the sooner it would start. The Russian Chief of General Staff, General Gilinsky, after due consideration, made the announcement that the concentration of Russian troops against Germany could be essentially completed by the fifteenth day of the mobilization, and that the offensive into Eastern Prussia might start immediately on the next day.

The matter was not so easy in regard to choosing *the proper operating* line, or the direction for the offensive.

As is well known, the western frontier of Russia before the War consisted of Russian Poland, which projected deeply into Germany and was cut in its western part by the middle course of the Wistule. Had our ability of getting ready quickly considerably exceeded that of the army of our enemy, we might have been inclined to take a chance and carry out an offensive along the left bank of the Vistula into the depths of Germany. Alas, such was not the case. We were slower than our western neighbors. Under these circumstances, our army of offensive was running a fair chance of being cut off from the rest of the troops. A movement of Germans toward Leitzen-Bielostock, and German operations in the region of Bielostock were sufficient to do this. Thus we were obliged to limit our offensive to the right bank of the Wistule, in its lower course. This, obviously, was less advantageous for the French. Nevertheless, as will be shown a little later, we were prepared, in case of success on the right bank of the Vistula, to develop our offensive deeper into Germany.

At the same time, while trying to satisfy the best we could our French Allies, we could not entirely dismiss the thought of the danger which might develop on the part of Austria-Hungary, whose troops might penetrate into the rear of our armies advancing in Eastern Prussia. Between Germany and Austria-Hungary, the principal enemy was, of course, the former. It was Germany, which led and inspired the Triple Alliance. But, on the way to fight Germany, we were bound to run into the armed forces of Austria-Hungary. Furthermore, we had to get square with her on some accounts of our own, essentially of a Slavic character. For a long time, Austria-Hungary had been oppressing the Slavic nations along the Danube, which had become accustomed to think of Russia as their only defender. We felt duty bound to help them in their fight for independence.

An army consisting of three and a half corps was assigned to Petrograd, capital of the Empire, in order to protect this important industrial center during the initial period of the War against possible German landing parties, or unfriendly action on Sweden's part. At the same time a certain number of troops had to be reserved for Caucasus and for the observation of Roumania. Taking all this into account, all we could at first oppose Austria-Hungary were only 16 Army Corps (744 battalions of Infantry, and 444 squadrons of Cavalry, exclusive of Frontier Guards). These were divided into two groups: the Northern along the line Luiblin-Kowel, and the Eastern, along the line Lutzk-Dounaewtzy. Such a distribution of armed forces gave us an excess of only some 100 battalions over the Austrians. There was, however, no other way until the arrival of additional troops from the Caucasus, Tourkestan and Siberia. We were limited in our possibilities. It was to be regretted that, as an Ally of France, the terms of the Treaty deprived Russia of some of her freedom in disposing of her own armies. Nevertheless, the obligations we took remained our obligations and the agreement reached with our Ally was not treated as the famous "scrap of paper." This point of view was very firmly indeed adopted by our ruling spheres. We counted on defeating Austria with our gallant troops. Thus, having regained the necessary freedom of our next steps, we would be able to develop our progress into Germany itself. Should success favor us in both directions—Eastern Prussia and Galicia—the ensuing campaign was pictured by us as follows: The Eastern group of armies reaching the lower Vistula, and a wide offensive along the left side of the Wistule following a victory over the Austrians by the Galician group of armies, freshly reinforced by troops arriving from the interior and far away regions of Russia. The length of our front would not only be shortened by some three hundred kilometers. It would also be relatively strengthened by the loss of Eastern Prussia by the Germans. The anticipated victory over the Austrians would also bring the left wing of our strategic front in a very favorable position, bringing it close to Bohemia and Slovakia, whose friendliness toward us was expected. True, we had to contend with two fortresses: Posen and Breslay, but, with no field army to support them, they were doomed.

Such were, very broadly speaking, our suppositions, based on the assumption that, in the initial period of the War, with Central Powers, the principal forces of Germany would be directed against France. This was known as PLAN A. In that case, the development of the Russian armies would follow the course indicated on the diagram.

The uncle of the Russian Emperor, Grand Duke Nicholas, was appointed as Generalissimo of all these armies. He was a man of high military training, an ardent patriot and a great friend of the Slavs and the French.

At one time, certain people belonging to the influential and conservative circles of Russia did their best to prove that France would not be bound, at the decisive minute, by her alliance with Russia, which she

would not hesitate to revoke, particularly if the conflict originated as a result of Balkanic affairs. This, they felt, would also hold in the case of a premeditated aggression of Germany against Russia, the former having previously made whatever concessions were necessary to check in France the burning desire for a revenge.

Should France have actually failed to come to Russia's assistance the situation of the latter would have assumed a threatening character, since she would have been forced to conduct, single-handed, an uneven War with the Powers of the Triple Alliance. It was the duty of the Russian General Staff to give even these suppositions the consideration they deserved. Therefore, the portfolio of the Russian Ministry contained not only the above mentioned plan A, but also an alternative plan, known as plan G. The latter provided for a strictly *defensive* course, with the principal Russian forces concentrated along the line of fortresses Kowno-Grodno-Brest-Litowsk, with an offset at Nowo-Swentziani. The change from plan A to plan G was so worked out as not to disturb unduly the fundamental layout, which was continued to be considered as plan A.

Germany declared war on Russia on August 1, 1914. On August 3rd, the German Ambassador at Paris handed a note to the French Minister of Foreign Affairs, which stated that, in view of French aggressive actions, Germany considered herself in a state of war, and that France was held responsible for the situation. The same night, German troops crossed the Belgian border. On the 4th of August, it became known in Russia that, as a result of this, the Government of Great Britain had presented an ultimatum to Berlin, stating that, unless Germany refrained from violating Belgian neutrality, England would be forced to declare her war.

The World War had broken out. Russia turned to the execution of plan A.

The mobilization was carried out according to schedule and in complete order. The offensive of the 1 and 2 Armies, known as the Armies of the Northwestern front, began on the morning of August 17th, that is, on the 16th day of the mobilization of the French forces.

It is only fair to point out that the organization of the rear of the 2nd Army (General Samsono), which was to proceed in a region without railroads, was not entirely completed, and that the main forces of this army did not start out until the 19th of August .

Unfortunately, the operations of the Northwestern Armies ended in a disaster. The 2nd Army, proceeding from Narew, was entirely surrounded by the enemy. Two of its corps, after a gallant struggle in the woods north of the Neudenburg-Willenberg road, were forced to surrender. In despair, General Samsono committed suicide on the battlefield. "De mortuis nil nisi bonum." The Germans have christened this battle the battle of Tannenberg.

The causes of the defeat lie outside of the field of general strategy. They are of a local character and can be traced to poor direction of the troops, absence of liaison, and unsatisfactory supplying of troops with the newest technical means. Lack of space will prevent me from dwelling too long on these causes. It must be noted in this connection that a defeat at the beginning of a campaign has always a bad effect on the morale of the troops: it brings lack of self-confidence. Eastern Prussia, with its lakes and forests, became known as a "wasp's nest". All our operations there later in the war invariably bore an altogether too hesitating character.

Fortunately, our offensive in Galicia proved to be victorious. We were first able to check the advance of the enemy into our territory, which was caused by its more rapid concentration. We then were able to subject it to a crushing defeat, which, during the winter of 1914, brought us on the crest of the Carpathians, with all the gorges in our possession. The Slavic population of Austria-Hungary welcomed the approach of our troops as savers from their political serfdom.

About the same time, on the left bank of the Vistula, a German advance on the middle Vistula and Warsaw failed. Hard fighting near Lodz brought about a reinforcement of the German troops by a transfer from the Western front of four army corps and two cavalry divisions. The armies finally settled down to their winter positions along the rivers Bzoura, Rawka and Nida. The troops were thoroughly exhausted by a five months' field war. They were short of fresh men and ammunitions, both for rifles and artillery. These shortcomings, in many places, were simply terrific. The original personnel had gone. There remained only insufficiently trained soldiers and reserve officers. Horses were in a bad shape; and the transport was worn out. Under these conditions, proceeding down the Carpathians was not a safe proposition. While this move appeared promising, it must not be forgotten that the whole Austrian Army was waiting at the foot of the hills, and that this army, while having been subjected to a defeat, had had time to recover, and also was supported by some German troops. Furthermore, our armies were drawn out, and the reserves almost lacking. True, the Commander in Chief of the Front had at his disposal a full and complete Army Corps, which was located at Jaslo and Smigrod, in support of the threatened right wing. This was not sufficient, however, for a front extending over hundreds of kilometers. There were too few railroads in the rear, and these were lacking the necessary rolling stock. Therefore, any regrouping and rearranging of troops along the line was difficult of execution. The associates of Generalissimo at the Headquarters held the view that, despite the temptation of invading Hungary and definitely crushing the Austro-Hungarian Army, it would be wiser to limit ourselves to purely local actions, concentrating our efforts on Eastern Prussia, whose possession would not require as large an outlay of men and munitions. However, the Grand Duke, in his enthusiasm, was wont to give particular consideration to the opinions of the Commander in Chief of the Southwestern Front, General Ivanov. The latter, however, did not judge the situation correctly. His opinion was

based on exaggerated reports of his agents, who claimed a complete collapse of the Austrian Army and the possibility of readily liberating the Slavic populations by one single and decisive stroke.

"Far be it from me to over-emphasize the importance of the affairs of my group of armies," said and wrote General Ivanov. "In my report I am guided merely by the general situation. My understanding of it requires: 1, our maintaining the left bank of the Vistula; 2, checking the enemy on the northern front; 3, a decisive stroke in the South."

The objections of people pointing out the arrival of German troops on the River Dounaetz in such quantities as to easily outnumber the corps stationed at Jaslo, were overruled. The forcing of the Carpathians was decided upon by the Generalissimo.

The outcome is well known. The German Comamnd was already alarmed by the possibility of Austria-Hungary withdrawing from the struggle. It had, therefore, decided to transfer from the Western Front to the Eastern nine crack divisions, led by the Guard itself. These troops, combined with the fourth Austrian Army, formed a storm group, consisting of two Armies, and numbering from 16 to 17 infantry and two cavalry divisions. They spread along the front from the Vistula to the foothills of the Beskids. The 1st and 2nd of May this group went into an offensive. Field Marshal Mackenzen, at the head of his German Army, moving in the direction of Gorlitze, broke through the Russian lines and forced them to a difficult retreat, first to the San, and then, out of Galicia. We had lost all our conquests and were obliged to carry on a long defensive war within our own territory.

"Strategic considerations should never be subordinated to political ones." This fundamental rule of Strategy had been, thus, disregarded, for the first time during the War. But this did not prove to be the last time, either.

Army Amateur Radio System and the Los Angeles Earthquake

The following letter was received by the Chief Signal Officer:

"At about 11:40 P.M. E.S.T. last night, March 10, while combing the 7 mc. amateur band for dx stations in the ARRL tests I heard W6AOR, Los Angeles, Calif., trying to raise Sacramento in vain, saying he had an emergency message for Sacramento. I immediately called him on our 7020 kc. freq. and asked him how we could help. He replied by giving me the following message with the words, "My God, get it through:"

FROM LONG BEACH, CALIF., VIA W6AOR TO ADJ. GENERAL, SACRAMENTO, CALIF.—RUSH HELP MANY LIVES LOST—sig. MAYOR HARRIS, LONG BEACH.

The frequency was immediately shifted to 6990 kc. (the special Army Amateur frequency) and signing WLE, the first C.A.NCS call. I called CQ XXX Sacramento. This was answered by W6EJC, Sacramento. The message was received by him and phoned to the addressee, the total time elapsed being probably fifteen minutes, but I did not notice the time exactly.

It is hardly probable that Sacramento would have been raised on 7020 as 6AOR remarked in a later ZAG (contact) that the ZMF (interference) on 1YU was very bad.

The signals of W6AOR would break at intervals. He would come on again in about ten seconds or so with the words "another shock." This operator kept at it, and probably did not know when his house would come down on top of him.

73 and ZAU,
(Signed) ROBERT F. WILSON."

This emergency communication furnished to the Mayor of Long Beach, California, is just one more example of the trained radio amateur stepping in and acting when established commercial agencies fail.

Mr. Wilson is the operator of amateur radio station W1YU, the net control station of the First Corps Area network of the Army Amateur Radio System.

The Army Amateur Radio System is a network of approximately one thousand of these trained amateurs voluntarily affiliated with the Signal Corps, U. S. Army. It was two members of this same nation-wide network who, for two days, furnished the only means of communication from the stricken area in the disastrous hurricane in Florida in 1928.

The Evolution of Infantry Drill

By Major Fred M. Green, Coast Artillery Corps

INFANTRY drill, as a preparation for war, has as its primary object the training of a command to execute the most essential functions, (such as the formation of a column for road marching, or deployment into line for firing), in a rapid and orderly manner. To quote the delightful phrase of a military manual dated 1634, it is intended to enable the command "to fall into battle with grace and brevity."

A new infantry drill regulation has recently been issued by our War Department for test. It forms the most radical change we have had in our close-order drill for 65 years. When so profound a change is to be made, we shall all reconcile ourselves more cheerfully to the inevitable inconveniences and annoyances of the period of transition if we understand how and why such changes come about.

A certain pious cavalryman is quoted as having said that God made horses 8 feet long and 2 feet wide so that they could wheel by fours. I think that we all, unconsciously, have accepted the column of fours (or column of squads, as we call it now) as something inevitable—possibly Divinely inspired. Certainly we form in two ranks without ever thinking of the origin of, or the former necessity for, that arrangement. The following notes are designed to indicate how these formations originated, why we use them now, and why the new drill, which contains neither a column of fours nor a double-rank formation, is not wantonly iconoclastic.

The tactical methods of different nations are colored by their strategic situation, racial peculiarities, and military traditions. Thus the French, lacking man power (other than colonial troops) for infantry, tend to place extreme weight on artillery preparation, leaving it to the infantry merely to occupy the ground which the artillery fire has conquered; the Japanese, with their racial enthusiasm for cold steel, attach great importance to the bayonet charge; we traditionally lay much stress on rifle fire, and (since the bulk of our armies will always be relatively untrained men), we must attempt to simplify our drill in every possible way.

A profound factor in altering tactics from time to time, and especially during and after each war, is found in the changing relative importance of the various weapons then in use. Each new weapon, or each marked improvement in an existing weapon, will have its effect upon tactics. The latest drill is our first to provide simple formations for use against hostile attack aviation (a new weapon), and in its admirable provisions for deployment it illustrates the evergrowing effectiveness of the fire of artillery, machine-guns, and self-loading rifles.

Now drill necessarily must accord with the tactics and combat formations of the day, so it is clear that drill will tend to change with the evolution of weapons. Let us see how weapons and combat formations have developed during the last few centuries, and then follow through their effect upon drill.

In the Middle Ages, the bulk of every army was made up of a dull, practically untrained rabble, armed mostly with pikes. These pikes were so long that the points of those carried by the sixth rank stuck out in front of the breasts of the front-rank man. The men were formed in solid squares or heavy columns, which maneuvered much like the Macedonian phalanx of almost 20 centuries before. (See Fig. 1.) This arrangement was partly to encourage the men by the presence of their comrades; partly to terrify the enemy at the sight of a compact, orderly mass bearing down on them; partly to permit losses to be replaced instantly from the ranks behind; and partly because a footsoldier, caught alone in the open, would promptly fall a victim to the first armored horseman, or knight, who discovered him. The men huddled together for mutual support and protection, and the mass moved along a good deal like a gigantic porcupine.

When bows and arrows were used, the archers could fire not only from the front rank but also from the interior of the mass; as there was a good deal of "drop" to the flight of an arrow, the bowmen had to aim quite a bit upward anyway, and the ranks in rear could loose their arrows over the heads of the men in front until just before the opposing forces came together.

Even after firearms had been introduced, the use of these mass formations continued. At first the proportion of musketeers was but small, for the earlier matchlocks had inspired but little confidence. They were limited in range, and both slow and inaccurate in fire; the slow-match fuzes by which they were to be fired would be extinguished by a rain, and there was then no way of relighting them; due to their weight, and also since it was never certain just when the priming would ignite, the pieces had to be fired from a forked rest, and the butt was placed against the chest, "vi inches belowe ye chinne," sometimes with disasterous effects. Such musketeers as there were would fire from the front rank, and then fall back to the rear of the column, or to the interior of the mass, hoping there to find sufficient time and freedom from interruption to reload their pieces—an operation which, when reduced to a drill, required 94 distinct motions! Most of the men were still armed with pikes alone; the musket was looked upon as a freakish and barbarous contrivance, (just as gas is today), and at least one military leader announced he would give no quarter

to men captured bearing so unheard-of and so unsportsmanlike a weapon. The bow was retained by English "trainbands" until 1595.

Throughout the 16th century, cavalry had steadily declined as a menace, due to the dawning fire-power of infantry and sanguinary evidence that the armor of a horseman no longer conferred invulnerablity. As the infantry dread of a mounted charge diminished, musketeers were placed on both flanks of the pikemen. Improved matchlocks led to a gradual rise in the ratio of musketeers to pikemen; early in the 1600's their numbers had become approximately equal. (See Fig 2.)

About the time the Pilgrims landed here, improved types of firearms were coming into use. First came the wheellock, but this proved "too curious, and too soon distempered with an ignorant hand" for general military purposes. The flintlock was better suited to army needs, and by the middle of the 17th Century more than half of each company had been equipped with firearms. Says a writer of the time: "Fire-locks are apter to misgive than muskets" (i.e., than matchlocks), "through the defects of the flints and springs." Obviously, they were less rugged and less durable,[1] but they were less subject to malfunction from wet or windy weather (which would deaden or blow away the priming of a matchlock); they were quicker to make ready; they required no forked rest; there was no risk of accident from sparks dropped from smouldering matches into loose powder; there was no glow of matches to betray men's positions at night; there was no longer a heavy load of slow-match to be carried, and the troublesome task of drying it out after each rain. Finally, with the flint-lock the instant of discharge could better be controlled; (one tells, with apparent relish, how he "let flye the guts of his gunn"); and this rendered it possible to take aim, with the butt against the shoulder and the eye glancing down the barrel. Fire-power was not a reality.

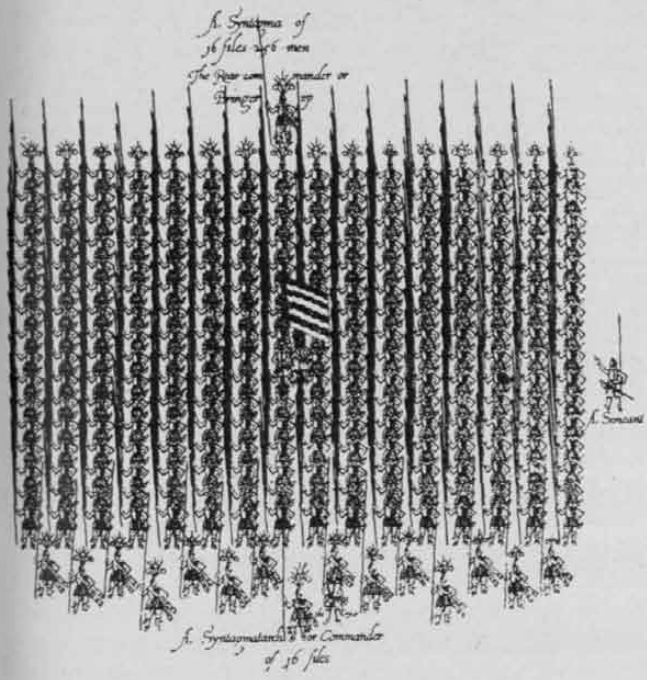


Figure 1.

Basic organization of the Greek phalanx, shown in "The Tactiks of Ælian, or Art of Embattailing an Army after ye Grecian Manner," printed at London in 1616. This translation from the Greek was apparently intended less as a military manual for current use than as a reference text for the use of professional soldiers and students. However, as in 1916 only about half the English soldiers bore fire-arms, the organization and "tactiks" of pikemen were still live issues.

The figure leading the square is labelled: "A Syntagmatarch or Commander of 16 files." The solitary figure in rear is marked: "The Rear-commander or Bringer-up," which suggests that for our "second-in-command," who act as battle-police for every unit in the 1932 drill, there is ample and ancient precedent.

The doom of the remaining pikes came from the introduction of the bayonet. Hard-pressed musketeers had found it expedient to insert daggers (or even the spikes of their forked rests) into the muzzles of their pieces, and in 1647 the first "plug-bayonets" were issued. Not until the "ring-bayonet" or "socket-bayonets" were issued in 1689 was it possible to load or fire with the bayonet fixed; to the end, the presence of a bayonet on a muzzle-loading weapon hampered the operation of loading, and diminished the effectiveness of its fire.[2] The French finally discarded pikes in 1703, and the English shortly afterwards. All infantrymen were now musketeers.[3]

These rapid successive improvements in small-arms led to equally rapid changes in combat formations. Artillery, no longer restricted to siege operations, had meanwhile assumed an important role on the field of battle, and its round shot proved very destructive against dense masses of troops. Both to exploit the rapidly-developing fire-power of their new weapons, and to diminish vulnerability to hostile fire, a general drift to more nearly linear formations became inevitable. A formation 10 ranks deep was first used; Gustavus Adolphus reduced the number of ranks to six, which deployed for firing into a formation only three ranks deep. As loading of the pieces was so slow, it was important that a considerable proportion of the men should always be prepared to receive an attack; to this end, the firing was at first by rank; later on, all men of every second or third platoon would fire[4], the other platoons reserving their fire to

[1]The British army adopted the flintlock musket in 1690. Nominally the French had adopted it in 1630, but for almost 90 years after this there was no uniform arming of French troops. Some organizations actually used the match-lock until 1708, but members of units so equipped often individually armed themselves with flint-locks captured in battle. During this chaotic period, higher authority asserted its prerogatives in at least one instance: an irascible commander directed his inspectors to destroy any fire-locks found in the hands of troops, and to have them replaced by match-locks at the company commander's expense! Issue of the model 1717 flint-lock finally standardized the armament of all French infantry.

[2]Almost a century later, it was enjoined that: "Great Care ought to be taken in making up the Cartridges to such an exactnefs, that after they are placed in the Muzzel, one Thump with the Butt-End on the Ground, may make them run down to the Breech of the Barrel; but as the ramming down of the Cartridges is, for many Reafons, very neceffary, it ought by no means to be Difufed."

[3]Toward the end of the 17th Century, there were actually four kinds of infantry: pikemen, musketeers (armed with match-locks), fusileers (armed with fire-locks), and grenadiers. During the War of the Spanish Succession (known here as "Queen Anne's War", 1702-1713), these differences disappeared, and all British infantry were uniformly equipped with the fire-lock and socket-bayonet.

[4]The frontage allotted each file was originally about 3 feet. When firing was by rank, considerable interval was required to permit the passing of pieces, and still more when the ranks actually interchanged places after firing; the complicated ritual of loading the earlier muskets also demanded elbow-room. As firearms improved, as uniforms and equipment were simplified, as the sword was abandoned, and as platoon-firing came into use, the frontage per file was reduced to 2 feet or less. This greater density of formation in each rank naturally encouraged a reduction in the number of ranks, as the line required fewer ranks to give the same number of bayonets per unit of frontage.

meet unexpected contingencies until reloading by the first was well under way. (An echo of this practice is found as late as our 1891 drill.) Troops with empty pieces were not only at a grave disadvantage, but were also especially susceptible to panic, and consequently great attention was given to this point.

By the middle of the 17th Century, large mass formations had generally disappeared, and the number of ranks in every European army had been fixed at either three or four. When the former system was in use, the front rank habitually fired kneeling; the rear rank "locked" with the center rank by stepping off to the right front. The pieces of the day were so extraordinarily long (from 5 feet, 2 inches to 5 feet, 10 inches) that firing in double rank was not in itself difficult, but Marshal Saxe pointed out an inevitable inconvenience as regards the kneeling men in front: ". . . all those who labor under any degree of fear, are naturally desirous to continue as long as possible in such an attitude; and after they have fired, do not rise up, in order to load again, with that briskness which is necessary." Between the whistling of hostile bullets overhead, and the probability of a hang-fire in one of the temperamental flint-locks behind them, this diffidence is not hard to understand.

[5]Early in the 18th Century, the French actually prescribed volley firing in four ranks; the first two knelt, the third "stooped," and the fourth stood erect. At a later time, when the French had adopted the 3-rank formation, they provided that in cases where the front rank could not kneel, only the two leading ranks should fire, and the third rank was merely to load for the second. St. Cyr protested, however, that in the excitement of battle these orders were never obeyed; the rear rank, designated only to load, would fire too. It is not surprising to learn that so many accidents occurred among the young conscripts that Napoleon himself at first mistook them for self-inflicted wounds. The formation in four ranks was continued by the Russians until the latter half of the 19th Century.

Where the four-rank formation was used, the two rear ranks generally loaded the pieces, and passed them forward to the two front ranks to be fired.[5]

From the middle of the 17th Century to the middle of the 18th, there was but little change in tactics. Then Frederick the Great, grasping the importance of fire-power, reorganized his infantry. Seeing that musket-fire was now effective at 100 yards, and capable of hitting large bodies of troops up to 150 yards, he reduced the number of ranks from four to three and speeded up the fire to twice the rate attained by any other army.[6] By a very rigid and precise drill he attained the ability to wheel instantly from column into line of battle.[7] Baron von Steuben, the first drill-master of our Continental Army, naturally trained our Revolutionary troops along these general lines, but with one surprising difference—he prescribed a double-rank formation, as will be discussed later.

[6]Other armies of the time could attain a rate of 2 to 3 rounds per minute only at the expense of such hurried loading that many misfires resulted. Frederick's troops attained a rate of from 4 to 6 rounds per minute. This was secured partly through thorough drill, partly by the use of a tapered touchhole (which eliminated the need for adding priming), and partly by the replacement of wooden ramrods by iron ones which were alike on both ends, and so need not be reversed before and after ramming. Leather patches were issued to guard the left hand from the heat of the barrel.

[7]During the 17th Century, it had been quite customary for the length of a force in column to be twice or three times its front when in line of battle. After the head of the column had halted, time was required to permit the force to "close up" before facing into line. Diminution of the frontage for each file from 36 to 21 inches (to increase fire effect and enhance accuracy of movement) naturally accentuated this difficulty. By reducing the number of ranks to 3, at one pace distance, columns could be formed with frontage suited to ordinary roads without excessive elongation. The Prussians marched in column of sections (10 files front); on narrow roads, in column of subsections (presumably 5 files front); from these formations they could *wheel* into line almost instantly, making their movements rapid though unhurried. ("Common time" varied from 76 to 90 steps per minute in those days apparently to permit attaining the accuracy required.)

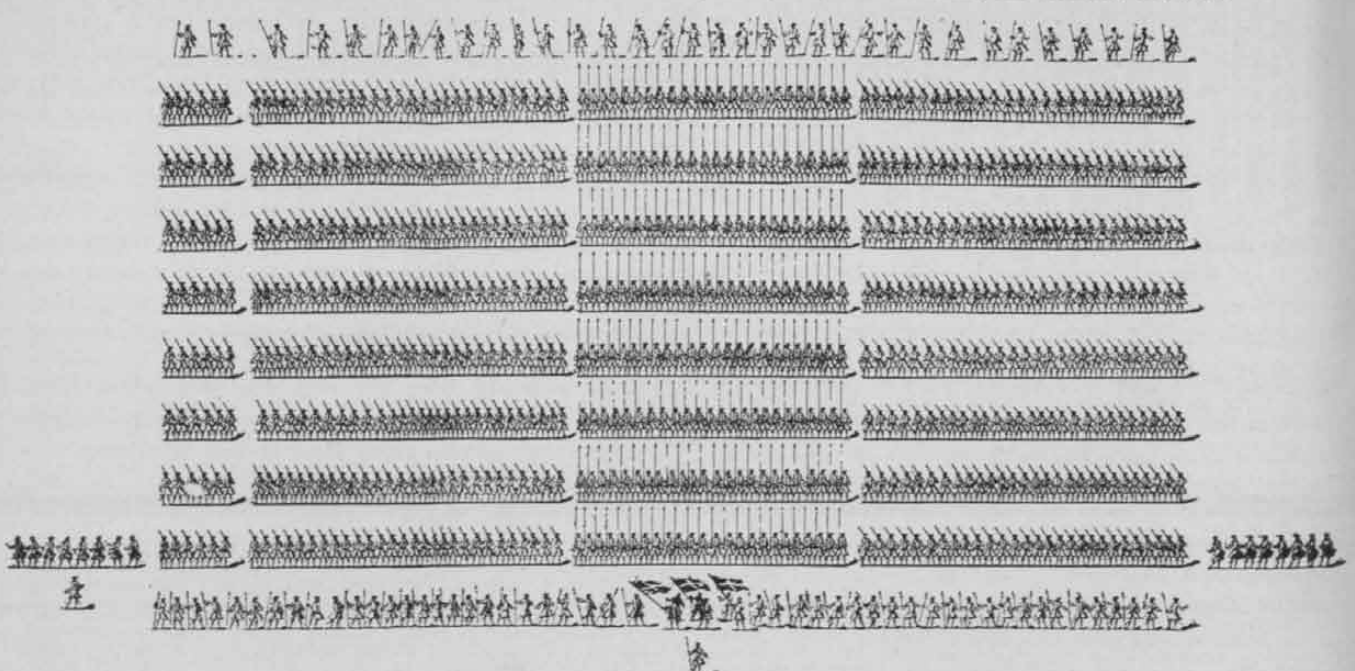


Figure 2.

A French battalion of the 17th century, containing 17 companies, each of 3 officers and 50 men. One company was a fusileer-grenadier company; each of the 16 other companies consisted of 12 pikemen and 38 musketeers. The battalion is shown in line of battle in 8 ranks. Each rank consists of two line companies, each in single rank with pikes massed. The 24 files of pikes in the center made what was called the "Corps de Bataille"; on either side of this a wing of 28 files of musketeers; on the right of the right wing, 6 files of fusileer-grenadiers. Field music in line with the front rank on either flank; officers and colors in front; other officers, apparently subalterns, in the file-closers.

Among the American forces there were many hunters and woodsmen who had learned the Indian methods of warfare. Being self-reliant, and skilled in the use of arms, they tended to fight individually from behind cover rather than in ranks. Here the use of skirmishers is first seen, though only for certain limited purposes: in the attack, they preceded the assaulting wave as scouts; in defense, they gave warning of hostile approach, and delayed and harassed the enemy's advance —in short, as we would say today, they formed an "outpost." But only about 10% of the men were so employed; the bulk of the force was held in a rigid "line of battle" (like our close order of today), with supports and reserves in rear of it. When the French

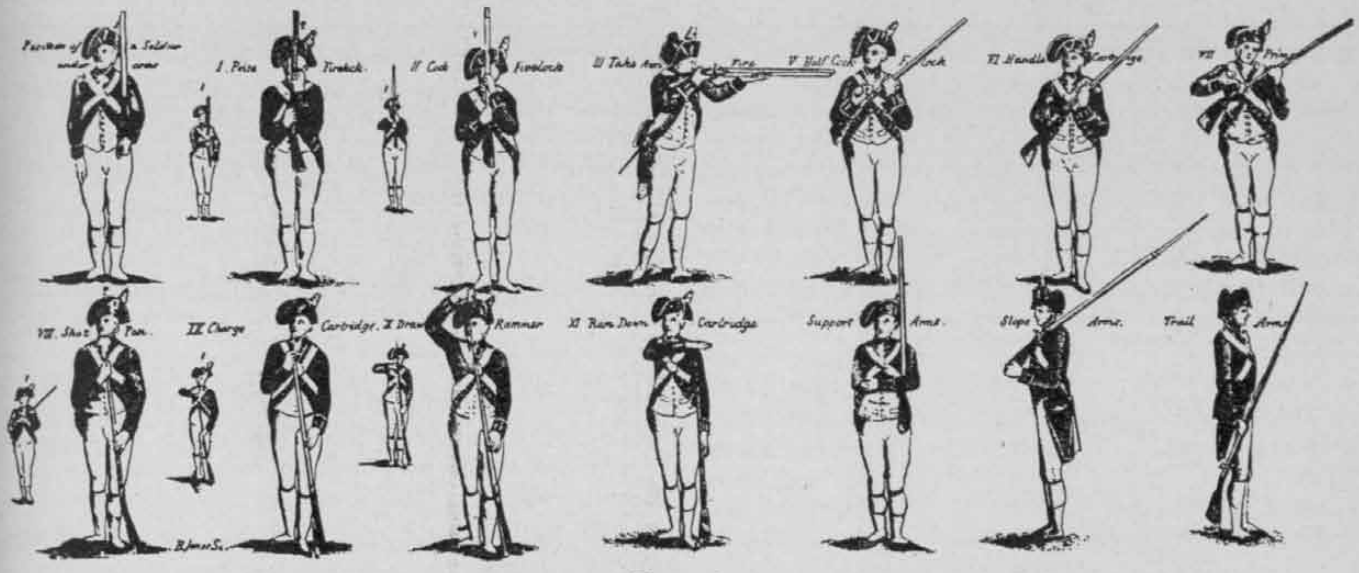


Figure 3.

An illustration from our first Infantry Drill Regulations. Ten out of the fourteen cuts show various stages of the operation of loading and firing a flintlock musket.

officers who accompanied Lafayette returned to Europe after the war, they carried with them this idea of a thin skirmish line, and it was generally adopted abroad during the Napoleonic Wars which followed.[8]

Much of Napoleon's earlier success can be attributed to his use of small columns of infantry for maneuver and assault, and of deployed lines for firing. It is hard for us today, thinking in terms of modern weapons and modern tactics, to understand the persistence of the column as an attack formation, until we visualize the moral effect it must have had on the defense. It provided an almost irresistible impulse, and if it broke the enemy line, the column divided, faced outward, and rolled up the defense in both directions. Losses at the head of the column were inevitable, but replacements were immediately behind them. We read of a column 24 ranks deep at Waterloo; of Packenham's columns—one of them 60 men front and 50 men deep—at the Battle of New Orleans; of the penetrating attack at Wagram, where men were formed 72 ranks deep. We must remember, too, how limited were still the reliability, range, rate of sustained fire, and accuracy of the flint-lock musket, and the consequent predominant importance of the bayonet.[9] Napoleon used small columns of infantry for the approach march, for maneuver, and for assault, because the men could thus be kept under better control; they could be led better; straggling and skulking were diminished; confusion from obstacles was reduced; a line of columns advanced to the attack more easily, with less exhaustion, than could a deployed line; and the small columns could quickly deploy into line if the attack were checked and the force had to shift to the defensive. The advance was covered by a thin line of skirmishers which preceded the assault wave by a short distance, firing as they went. By this time 20% of the men of an attacking unit were often deployed as skirmishers. But the shock of assault was delivered by the bayonets of the line of battle which followed them.

The growing effect of artillery fire, and the improved range, accuracy, and rate of fire of musketry inflicted ever-increasing losses on all dense formations.[10] A reduction in the number of ranks from three to two came about somewhat gradually. It is said that in 1759

[8] In 1805 the Austrians, and in 1806 the Prussians, having each in turn been defeated by the French Infantry, adopted combat formations copied from the French; skirmishing, and the use of light columns of attack, were among these.

[9] That from 24 to 36 cartridges was the ordinary issue to an infantry soldier in any army of the 18th Century is eloquent in itself. By the time of the Napoleonic Wars, the French carried 60 rounds.

The fact that with the flint-lock some surprisingly rapid firing has been recorded should not be taken to indicate that fire could long be sustained at any such mad rate. The vent frequently had to be cleaned, the pan wiped out, a fouled barrel would prevent reloading, and after a certain number of rounds (averaging perhaps 20, but varying widely from one flint to another) the dulled flint had to be removed from its clamp on the "cock" or hammer, and replaced by another. (The soldier usually carried in his pouch some spare flints for this purpose, as the dulled flint had to be "knapped," or chipped to a new striking edge, before it could again be used.) Misfires were still frequent, and if the soldier failed to recognize one, loaded again, and succeeded in firing his piece on a subsequent attempt, the barrel not infrequently burst.

Nor does it seem to have been wholly a question of the low rate of sustained fire; military writers of extended battle experience speak disparagingly of the limited effect of fire upon the enemy—volleys by battalion causing the enemy the loss of only a very few men.

[10] As the quality of French troops declined, and skilled leadership became increasingly rare, the French had employed heavier columns as a matter of necessity. The inevitable consequence was evidenced by the loss of three quarters of MacDonald's 10,000 men in his famous column at Wagram.

Wolfe formed his men in double rank[11] at Quebec, but there is no record of his example being followed abroad. So far as I can learn, the double-rank was standard practice for American troops from the first momentous encounter at Lexington, and it was definitely prescribed for our army by von Steuben's regulations of 1779. During the Revolutionary War, the British troops in North America also came to make use of it, even though this change was bitterly criticized by many of their own officers.[12] Columns were still retained for maneuver and approach, but they were often separated by such intervals that they could deploy into line for firing before coming within effective range. Where the main blow of an attack was to fall, each regiment was usually formed two companies abreast, and four or five companies deep, to insure that the assault with the bayonet would drive home.

The introduction of percussion-lock muskets, about 1840, increased the rapidity and improved the accuracy of infantry fire, lessened recoil, and reduced the proportion of misfires. Some ten years later the elongated bullet, with a hollow expandable base, rendered it possible to employ rifling in military arms.[13] This greatly improved the accuracy of fire. The next decade witnessed the introduction of rifled artillery, and of a breech-loading military small-arm (the Prussian needle-gun).

In our Civil War, where rifled muskets effective up to 500 yards were used on both sides, dense formations became impossible. The alternation of fire and movement—advancing the attack by a rush and then pausing to fire—was introduced. The attack learned to beat down the fire of the defense; if it succeeded in gaining fire superiority it could advance with but small losses until the defense could recover enough to get their heads up, and aim.

Where depth was essential, successive lines (each in double-rank) came into use, but with a distance of 200 or 300 yards between them, instead of being jammed together in a compact column. The trajectory of the Civil War musket was so curved that the danger-space of its bullet was small; fire directed at one of these lines was unlikely to hit another line 200 yards or more away. Perhaps the most important tactical development of our Civil War was the heavy skirmish line preceding the attack; not merely a thin line of scouts, but a line of such density that it could, by its fire, materially further the progress of the assault. In Sherman's army, half the men of an assault regiment were sometimes deployed as skirmishers. This scheme marks the dawn of the combat formations of today. Skirmish lines of varying density have been used in all subsequent wars, with intervals varying from half a pace up to 10 paces, followed by supports either in line or small columns.

The Germans meanwhile reasoned out that it is preferable to form each unit down to the company in depth, so that as supports go forward to replace casualties in the firing line, they will find themselves among friends, and under leaders whom they know. Men also have greater pride, and fight better, among those who know them. "Mixing of units" always leads to confusion and to consequent loss of control; to avoid this, it is desirable for each unit to replace losses in its assaulting elements. Our present organization provides for each unit, down to include even a platoon, being deployed in depth.

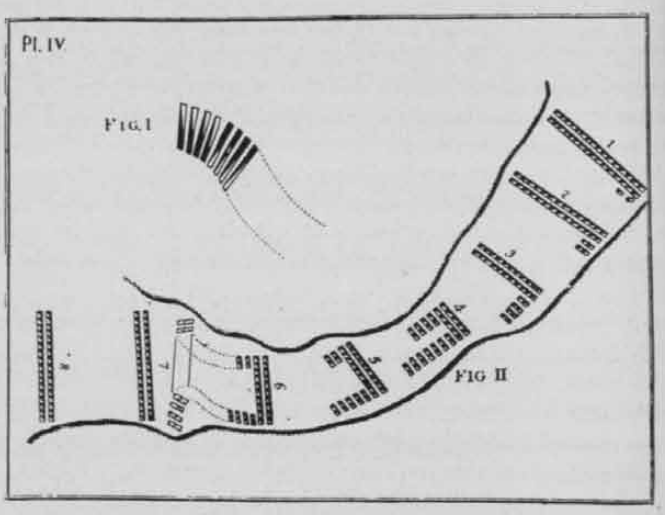


Figure 4.

From the "Regulations for the Order and Discipline of the Troops of the United States," by Baron de Stuben (sic), printed at Boston, 1794.

Fig. II in the above cut shows the method of "breaking off." Platoons numbered 6 and 5 show successive stages of diminishing front to pass a defile: No. 4 has been reduced to a frontage of but five files; 3, 2, and 1 show how the platoon front was restored.

The subsequent development of weapons is sufficiently familiar to most readers to make it unnecessary to pursue this subject further, and a resume of our drill regulations will now be undertaken. Baron von Steuben's Infantry Drill, authorized by an Act of

[11]The evidence on this point is somewhat conflicting, but W. T. Waugh, in "James Wolfe, Man and Soldier," 1928, page 289, is quite specific: he says that the six battalions of Wolfe's force which faced Quebec, and did most of the fighting, were formed in double-rank. This force of 1800 men had to cover a front of one-half mile; possibly only Wolfe's inability to cover this frontage in the normal order induced him so to extend his men. (Although the Canadian militia lacked bayonets, the French regulars, which this force confronted, were equipped with them.) Waugh says that both Wolfe and Amherst had indicated previously that they favored a double-rank order, but that this was its first actual use in battle by the army of any civilized power. Although the phrase "the thin red line" was not coined until the Crimean War, nearly a century later, its first actual appearance was on the Plains of Abraham. Not until 65 years later was the two-rank order formally adopted by the British.

Was it sheer coincidence that 16 years later the American colonists exhibited a preference for the double-rank formation for battle, no matter what the drill-book said? It would be interesting to trace the connection, if any such exists.

[12]Some of them even attributed their defeat at Cowpens (1781) to the "excessive extension" of this formation. They insisted that a double-rank was too weak for determined fighting, incapable of resisting mounted attacks, and suitable for use only against irregular troops of poor quality, some of whom who lacked bayonets and the rest of whom lacked the courage to use them. In the special case of a campaign where mobility was the paramount issue, and where the enemy skulked behind cover, it might be permissible, but the perpetuation of such a system was decried as perilous. No other army in Europe formed with less than 3 ranks! (A few years later Jomini was to remark: "What European army, except the English, could be trusted in line only two deep?") At the outset of the Peninsular Campaign (1808), the British reverted to two ranks, but not until 1824 did this become the normal formation for British infantry. The French experimented with two ranks in the Peninsula, and at the Battle of Leipzig, but retained the third rank as an optional formation until 1859. The Austrians and Prussians adhered to it even longer, though in the latter case the third rank deployed as skirmishers to cover the other two.

[13]Rifles had been used for sporting and target purposes since early in the 16th Century. Although more accurate, their military use was limited, due to the difficulty of reloading; mallets were issued for driving the bullet home in a fouled barrel, but even then reloading was prohibitively slow. About 1750 the wrapping of each bullet in a greased patch of linen or leather improved the rate of fire, and rifle regiments appeared, even though the necessity for special ammunition was a drawback. The expending type (e.g., Minie's) bullet finally solved the problem.

Congress in 1779, and authenticated by John Jay as President of the Second Continental Congress, forms our starting point. (See Fig. 3.) It would be interesting to know why von Steuben prescribed a double-rank when every army in Europe used at least three, and when he himself had grown up in an army so definitely wedded to the triple-rank that even a century after his time the use of three ranks was continued, for sentimental reasons, at ceremonies. It is possible that he was a man ahead of his time; it is possible that he shrewdly estimated the formation best adapted to our national traits; it is possible that he merely codified what he found already in use.[14]

Von Steuben makes no mention of skirmishers, which seems strange in view of the important influence which these humble woodsmen exerted in developing the subsequent combat formation of every army in the world. I suspect that the old gentleman may have been something of a military pedant. Very possibly his reaction was like that of an elderly retired general with whom I was talking years ago, just after the present short rifle had been issued. I said I thought it was a splendid arm. The old general scornfully replied, "Yes, but a goddamed *undignified*-looking gun!" Possibly von Steuben felt the same way about our skirmishers.

I was curious to see how the formation of a road column was executed in those days. Oddly enough, the column of platoons (about 10 to 15 men front) seemed the only provision for a column of route. Of course even today there are not so many roads that will accommodate so great a frontage; during the Revolution there could have been very few. The method provided for passing defiles was called "breaking off"; the excess overlapping files on one or both flanks dropped back in rear of such part of the platoon as could still march abreast, until the platoon front was sufficiently diminished. (See Fig. 4.) A more flexible arrangement represents the first approach to our present method, although it did not definitely form part of our drill until 75 years later. Von Steuben says:

"The roads being two (sic) narrow to admit the front of a platoon, and the troops being continually obliged to 'break off,' which fatigues the men; to prevent this, where the road is not sufficiently wide throughout, each platoon is to be told off into sections of four files. . . . They wheel by fours and march." Strangely enough, this very practical suggestion appears over in the back of the book, long after he got through discussing infantry drill, and is found near "Instructions for the Commanders of Regiments" and a passage entitled "Care of the Sick." As to why so practical and so eminently necessary a movement was not included in the routine company drill, I can offer no suggestion; the frequent need for some such movement is apparent.

In the 1808 system, route column was formed by sections of one-half a platoon.[15] Also, of course, the line could simply be faced to one flank, thus forming column of twos, but without comfortable marching distance between the men. Such a column must have straggled badly, and been slow in forming line to the front or flank.[16]

The regulations of 1835 (Scott) were based on the French drill of 1831. They present nothing of especial interest, except that skirmishers are provided for, at an interval of 10 paces. No convenient and adequate method of forming a column of route had yet been incorporated in our company drill.

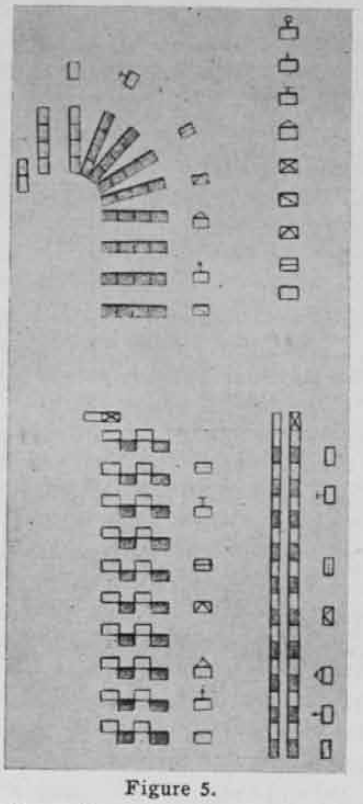


Figure 5.

Lower figure shows Hardee's method of forming a column of fours by "doubling." All this was executed at the simple commands: 1. Company, right—Face. 2. Forward. 3. MARCH. Upper cut shows Hardee's equivalent of our present "Column left." Then executed at the command, "By file, left, MARCH."

Hardee's Tactics of 1885 (based on the French drill of 1845) is the earliest one I have found in which a

[14]Although I can find nothing to indicate that the triple-rank was ever actually used by American troops, its ghost continued to haunt our drill regulations for nearly 60 years after this, though often coupled with collateral comment which indicates that the third rank was theory, rather than practice. The last apparition appears in Scott's Tactics of 1835, wherein he prescribed that the formation would be in 3 ranks if 72 or more men of the company were present; otherwise in 2 ranks. The Secretary of War (Cass) approved this text for use, except as regards the third rank, "the provisions of which are suspended." Possibly the worthy General would regard our 1932 drill as a vindication of his principles.

[15]One must remember that the companies of those days were very small—often only 40 to 60 men even on paper, and much reduced by details, by sickness, by absence without leave or desertion, and by battle casualties. There was no proper system of replacing such losses. Hence a platoon of 10 files could break into sections of five files front, and thus form a practicable road column.

The British companies at Lexington and Concord averaged only 32 enlisted men each.

[16]Many of the old regulations prescribe a "lock-step," which was designed to permit a command to be marched by the flank with the very minimum of elongation. It is surprising to learn that the lock-step, which we now associate with penal institutions, was of military origin and was prescribed for a very definite and useful tactical purpose.

column of fours was formed by "doubling" as I believe the British now do it; that is, by the rear rank dropping back, all men facing to the right, and the even-numbered men stepping up abreast of the odd-numbered men. (See Fig. 5.) This same method was used in the Casey system (during the Civil War) and until the issue of Upton's Tactics in 1867. Deployment was apparently so regulated that one company, as skirmishers, could cover the entire regimental front.

In none of these regulations were the corporals assigned to command squads; their posts were on the flanks of each platoon, in the front rank, next the sergeants who acted as right and left guides of the platoon or company. The usual interval between skirmishers was about five paces; the men were instructed to keep in touch by groups of four, called "comrades in battle," but, with true American democracy, no leaders for these groups were provided, and it is to be inferred that whatever the "comrades" did was decided after debate, "three-fourths of the members present concurring therein."

In 1867 came the first approach to our present close-order drill; wheeling by fours to form column from line, or line from column. The close-order drill, from that time on, was quite similar to what we use today; but the extended order appears awkward and not well organized. We find no conception of the need for platoon-, section-, or squad-leaders; corporals were not assigned to squads; (their chief function in those days, I believe, was mainly to command reliefs of the guard, and to act as substitutes for the guides). Thus when the company deployed, the captain handled the entire line of skirmishers as a unit.

The 1891 drill regulations show the first real squad organization, with a corporal posted as No. 4 in the front rank in close order, and leading the squad in extended order. The platoons were nominally divided into sections for extended order only, but the arrangement was clumsy, an extemporized force of one section from each platoon forming the assault echelon. The interval between skirmishers was two paces, and under heavy fire the advance was made by alternate rushes of half the line, its movement being covered by the "fire *and smoke*" of the other half. (This, of course, was written when the old .45 Springfield, firing black powder, was the standard arm.)

The 1904 regulations were generally similar, except that the squad was accepted whole-heartedly as a unit for both close and extended order. The company acting alone held out a support and a reserve, but if it formed part of a battalion it deployed in a single line, and was led by the captain as a single platoon—a most undesirable arrangement. Also, when a battalion deployed, any reinforcement of the firing line involved a mixing of units.

The 1911 drill was based largely upon the formations employed by the Japanese in their war with Russia, which in turn followed the German tactics of the "gay nineties." The normal interval between skirmishers was reduced to half a pace. This radical change was based on the theory that a line could advance only when fire superiority had been attained, and to gain this superiority of fire a great number of rifles in the firing line would be required from the very start. The Japanese accepted the losses incurred by this more vulnerable target as a lesser evil than mixing of units, which otherwise would result from efforts to build up the firing line to adequate strength during the attack.

In our 1911 drill the company, when in battalion, still deployed in a single line—too wide a front to be controlled by a single leader. The war strength company was accordingly divided into four (instead of two) platoons, but these platoons were of only three squads each—what today we would call a "section." Of course there were then but two lieutenants per company, so two of the platoons were commanded by officers, and the other two by sergeants. At last our system provided for direct leadership of elements of a size capable of being controlled by a single individual. Another innovation was the provision of "platoon guides," whose tactical function was to act as battle police, to prevent straggling, skulking, or panic, and to maintain fire discipline—a system which subsequent regulations have extended down to include the squad. A further improvement is found in the provision for "squad columns" and "platoon columns"—the former then prescribed mainly for crossing difficult ground, and the latter for passing through the zone of artillery fire while advancing to the attack. (The use of columns by supports was revived for several reasons previously indicated: better control; better opportunity to gain cover in ravines; less exhaustion to the men; less confusion than a deployed line. The interval between columns was great enough so that not more than one group would be included in the burst of a single shrapnel. Finally, an irregular line of columns—staggered, checkerboard fashion—formed a target on which it was very difficult for hostile artillery to range.) A formation for infiltration, advancing by thin lines (one man per squad) was also added. These formations proved their worth in France.

Our present regulations were based largely upon experience of the World War, and upon the larger company organizations now recognized as essential to avoid mixing of units in combat. The three platoons are separated, even in close order drill, as definite combat groups; each platoon is given an officer; each platoon may be deployed in depth (that is, with one section in support of the other). The method of deployment, and that of replacing casualties, were somewhat simplified. The interval between skirmishers went back to five paces, both because of the unprecedently destructive effect of machine gun fire, and because the deployment in depth made less necessary so great an initial density in the firing line.

By an odd coincidence, the 1932 drill prescribes a normal formation which resembles strikingly the order of battle of about two centuries ago: the men are in three ranks, and at about the same wide interval then used. Each squad forms in single rank; the three squads of a section form one behind the other; the intervals are such that by facing to the right the men

find themselves at 40 inches distance, thus forming a route column of threes in the simplest possible manner. Each squad normally marches in column of files, and deployment is easy since the flank squads can run immediately to their places without interference. Against attack aviation, a simple and systematic plan for scattering is prescribed. The arrangements for control of the men are admirably worked out, and the drill is simplicity itself.

Summing up what we have learned about the origin of our drill, the case can be stated this way:

First: The double-rank was the normal formation of the line of battle from the Revolution to the Civil War. It was used because it gave the most compact formation in which all the men could use their pieces, and compactness was desired both for control and for the final bayonet charge. Since the early battles of the Civil War, the double-rank has been constantly declining in importance as a combat formation, but has been perpetuated by tradition, as a formal drill for disciplinary and parade purposes. Even were such a formation not prohibitively vulnerable, double-rank formation would now have no practical reason for existence, since the short rifle of today cannot well be used except in a single rank, even when the men are standing erect.

Second: The column of fours originated from necessity; ordinary country roads will seldom accommodate more than about four men abreast. (In some of the very old regulations, I find columns of threes and columns of sixes mentioned.) Beginning about 1855 we find that the normal marching column was formed by "doubling" in the British manner. (Shown in lower cut, Fig. 5.) This placed the men at easy marching distance apart, thus avoiding the lock-step effect of a line merely faced to either flank. It made the column no longer than the line, so as to avoid straggling of the column when in march, and a necessity for closing it up after halting, and before facing into line. Upton (1867) accomplished the same result more simply when he gave us the "fours right" (equivalent of our present "squads right"), which von Steuben had suggested in the previous century, and which is still in use today. The method of "doubling" gave us a column of fours simply because each rank consisted of two front-rank men and two rear-rank men. When Upton prescribed "*fours* right," he doubtless did so from observation of the fact that this frontage was about the maximum for use in campaign.

If (as is often the case) half the road must be kept clear for the passage of staff officers, mounted messengers, and motorcycle orderlies, we must now come down to a column of twos. Also, since the column of fours is a somewhat thick formation, we may also have to pass to a column of twos to diminish losses from distant artillery fire, or from attack aviation. Now, under our present regulations, deployment as skirmishers from column of twos is somewhat awkward, and column of twos also demands excessive road-space. A column of threes would make a fair compromise.

Third: All our drill regulations from the Civil War until the current Training Regulations were apparently written on the basis of close-order drill, with extended order as an after-thought—combat deployment had to be adapted to the close-order drill. In the 1932 regulations, for the first time, the problem has been approached from the extended-order angle, and close-order formations have been made to conform thereto. In this way, the utmost simplicity has been attained, and the task of training recruits at the outbreak of war has been correspondingly minimized. The loss of the spectacular aspect of our present close-order drill is regrettable, but the gain in efficiency warrants the sacrifice. The new drill makes it possible to pass from close to extended order—from column of route to a dispersed formation—with the speed demanded by the ever-growing threat of air attack. There is nothing sacrosanct about either the double-rank or the column of fours; if both disappear, nothing but an ephemeral tradition will suffer.

East of Suez — Singapore

(The Impressions of an American Woman)

By Maida Davis Turtle

DO you remember the good old rubber plants of two decades ago—the kind that grew and flourished in boarding-house hallways? I was told in my youth that those were rubber trees, and I, in my innocence, believed it. So naturally I expected a rubber plantation to be a huge funereal grove of those self-same montrocities transplanted from their native heath—the above mentioned hallway—for commercial purposes. My disappointment was bitter when I found that instead of the well-known dark shiny leaves, those of the plantations are unfamiliar, being daintily shaped and pale green, on trees not unlike maples—nothing gloomy about them. That just goes to prove of what stuff illusions are made. But I simply loved the little chow-bowls that they tie, like a baby's bib, around the trunk to catch the sap or latex when the tree is tapped. My preconceived idea of tapping was all wrong, too—I didn't exactly think that they kept a flock of woodpeckers to do it, but I was under the impression that a tap was a smart blow which in this case would puncture the bark. Not so. Far from being so rough as to impart a blow, the tapper gently peals off a thin shaving of bark with a knife such as might be used in fine wood-carving, and so in a day or two the wound is healed over and only a slight scar is left.

I visited friends who lived in the midst of a large rubber estate on the outskirts of the city and it was delightful. To be sure, a few days before our arrival a full-grown tiger had been killed just a hundred yards from the house and its mate was popularly supposed to be at large in the immediate neighborhood, but aside from that little bit we were quite safe. In Singapore the Europeans—the term includes Americans, of course—usually live in compounds or estates, for almost all of them are in the employ of some big corporation which provides places of residence conveniently located in large and well-kept grounds. These houses are attractive and completely furnished. Even the servants are left-overs from the preceding employer and often work for the same company for years and years. Each compound has at least one tennis court, but usually there is one for each house—for where ever there is British influence, sports are sure to flourish in spite of the heat.

As is ony natural in foreign countries, people of the same nationality stick together and even grow quite clannish. The American colony in Singapore is, of course, much smaller than the British and it is surprising how little they intermingle, each having quite a gay social life of its own. This has advantages as well as disadvantages—it makes for esprit de corps, so to speak, but may also have a tendency to limit an otherwise broad and cosmopolitan contact. A caller has little or no chance of admittance the first time, as the lady of the house is perpetually "not at home," according to the little sign on the inevitable mailbox, so in theory it is only by special dispensation that acquaintances are made. But in practice the newcomer in Singapore is welcomed cordially. Each colony is so small as to know the most important movements of everyone else, so when there is a new arrival his fellow countrymen hasten to make him feel at home. There are practically no theatres and the cinemas are not patronized by Europeans because of the age and inferiority of the films, so aside from dining and dancing, the social activities take place in late afternoon, usually as tennis and bridge-teas.

All guide books give the rickshaw fares by the day or half-day, as well as by the mile, but in reality no one would think of taking a rickshaw to go long distances—it simply isn't done. Unlike those in Japan and China, most of the rickshaws carry double and it doesn't look right to see a tiny black man playing horse for two fat, slick Chinamen each twice his size. If one's heart is too tender, one may ride in a gharry, another native vehicle drawn by a well-kept pony. This is a square box-like affair which sits low between four wheels and is modestly screened from the gaze of the common herd by wooden slats. It looks like a cross between a chicken coop and a hearse.

Bullock carts quite put automobile trucks out of business in the Far East and they are particularly impressive in the Straits Settlements, for many of the animals are sacred—though what use there is in being sacred if not to escape arduous labor is beyond me. They are about the size of ordinary cattle, but have much longer horns—not spreading wide like Texas long-horns, but growing straight up to a magnificent height or sweeping sharply back at a rakish angle. Those of the religious ones have shiny brass tips from which dangle bright colored tassels made of woolen yarn.

It is a distinct shock to the western mind to see a skirted, long-haired figure right out in broad daylight, without one stitch of clothing above the waist—and it is a decided relief to see that it is further clothed in a long mustache and a fierce black beard. These are Tamils, natives of southern India, quite as black as Negroes but with fine features and narrow bodies. The men wear a single garment called a sarang, which is a piece of bright colored material casually knotted round the waist and falling to the heels. They are

proud of their long hair, which is more often than not shaved away from the forehead for several inches. One of the employees in the compound, the foreman of a group of coolies, wore a tailored occidental coat, a bright pink sarang, a smart European felt hat on his flowing black locks and went absolutely barefooted.

The streets are alive with Malayans, Tamils and Chinamen, but a woman is rarely seen and there are few children. Except for the ayahs or nurses, all the domestic servants are men who even do the laundry work and, so doing, are called dhobies. Every family has at least five menials—the cook, usually a Chinaman, is the autocrat of the menage and would not come out of the kitchen on a bet; a "boy" who does nothing at all except keep the house spotless, shine the brass and silver, clean and polish the family boots and shoes, wash all the dishes, wait on the table, tuck in the mosquito-bars and turn down the beds, run errands, shake a wicked cocktail and, in fact, do everything but drink it for the white man, for which he receives about one-half of the cook's pay, which is about one-half of almost nothing according to New York wage standards; a "syce" or chauffeur, who is generally a Malayan; a Tamil gardner or "kabun"; a water-carrier, also a Tamil, who acts as a garbage collector and is the very lowest in rank. Then if there are children, an ayah is added and a resident laundryman. The army has nothing on a staff of eastern servants for rank, and even in modest establishments a strict caste line is drawn—the cook would no sooner eat with the gardner than the master would dine with the cook. They seldom eat European food, but each has an allowance of about two cents a day with which to buy his rice, the staff of life in the Far East.

Which brings us to curry, that spicy Indian dish that adds so much to the call of the East. I had eaten it before in modified form which bore small resemblance to the elaborate meal it makes in Malay. You heap your plate with dry snowy rice and pour over it a delicious succulent mixture made with chicken or fish and so hot with curry as to bring tears to the eyes. But to temper this burning there are many surprising trimmings to go over the curry—grated fresh cocoanut, diced pineapple, hard-boiled egg, bacon fried to a crisp and beaten to a powder, cubes of bananas, chopped nuts, crinkly bits of fried onion, and last of all, chutney, sweet and spicy. You never know when you've had enough, so in self-defense the custom is to have curry-tiffin only on Sunday so that nothing can interfere with the inevitable siesta. A dessert called gula-mallacca completes the meal. This is a pudding made of tapioca with a rich caramelly sauce made from the sap of the cocoanut palm, over all of which is poured the fresh milk of the cocoanut—delicious.

In addition to chicos, pomelos, bananas, papayas, mangoes, pineapples and limes, common to most tropical countries, Malay has a number that I had never seen in the Philippines. The one most famous in song and story is the mangosteen. It is nothing at all to look at, being small and rough-skinned, but when open the meat is dazzling white against the bright red of the rind. The flavor is very delicate and like nothing else on earth, and even the nut-like seeds are good to eat.

It is indeed a brave person who ever actually eats of the durian. The ordinary mortal, to which large class I belong, alas, never gets any further than the odor—the odor that is famous around the world and absolutely indescribable. It is rather more like a putrid mass of spoiled onions than not—only more so. They say that if once you brave this line of first defense that you are sure to fall a victim to the charm of the durian. I for one will take anybody's word for it that it tastes like vanilla ice-cream that has been pushed through a gas-pipe.

To my mind the flower of the passion-tree is much more worthy of romantic praise than is the fruit which belies its name and is much like the common garden variety of plums—not nearly so good as the modest, unsung ramputans. This bright red fruit grows in clusters on immense trees and except for their vivid color might be taken for big chestnut burrs. The meat is very juicy and tastes like a cross between a white grape and a peach and it clings to the seed with the most exasperating tenacity.

The most fascinating thing in Singapore is the sultan's deserted palace. That dignitary is not allowed to stay more than twenty-four hours on the island, so the impressive chateau, once so gay, stands empty and forlorn in the midst of its beautiful park. There is not even a caretaker, so being impudent and inquisitive Americans, we alighted from our car at the "keep out" sign and went on foot up the winding path to a heavily bolted entrance. Nothing daunted, we followed the moss-carpeted, pink-paved terrace around to the back where a fire had destroyed the doors. Then with footsteps resounding like thunder we crept down an immense hall with spacious, high-ceilinged rooms on one side and what was once a patio, now strewn with debris of the fire on the other. At the end of this hall were two forbidding doors and when one of them gave way under our combined efforts, we were petrified. But alas, there was only another empty chamber with a securely bolted door leading to the main part of the house. We gathered courage to venture up the stairway, where it was even more ghostly, and when something fell with a crash in a distant part of the building we flew down the steps like scared rabbits. The place is redolent with the colorful life of the old regime and many romantic tales are woven about it that smack of the Arabian Nights.

Not nearly so interesting as this is the present governor's mansion, which is spick and span and airy in significant contrast. It, too, is set on an eminence in spacious, beautifully kept grounds with rolling lawns and stately trees and flower gardens with artistically bridged streams and smooth tennis courts. There are certainly no ghosts in this thoroughly British, modern establishment.

Unlike many eastern cities, Singapore is roomy and open, with wide streets and parkways. Even in the heart of the business district there are unexpected

plazas and small grassy squares, not to mention the long, windswept water front, and the Chinese shops, huddled together in groups, are on clean, wide thoroughfares. In the residence sections, instead of cut-and-dried straight streets making the conventional checker-board lawns, the roads wind about the comfortable homes accommodating themselves to the lovely shaded grounds in all shapes and sizes.

Either the natives are very clean, according to our way of looking at it, or very dirty according to the French, for the whole city seems to be one big bathroom. On the sidewalk of almost every block there is an ever-running tap around which at any hour you may see a group of natives or Tamils scrubbing themselves blissfully unconscious of the gaze of the passing multitude. Then when their ablutions are completed, off they go wrapped in a soaked sarang, shaking their long wet hair.

Which reminds me of the bath in polite society. Even the better houses do not all have running water, so there is a big round Javanese bath jar, filled each day by the family Gunga Din. I almost made a serious faux pas by getting into the thing, mistaking it for a Chinese tub, but I was speedily informed that the supply is very uncertain and that amount of water must needs last for several days. And sure enough it did, used in Malayan style—which is to stand on wooden slats and take a hand-made shower with a little tin bucket. At first it is a trifle awkward, but very soon one can feel quite respectfully clean.

Ferns and luxurious tropical plants grow in profusion all about the city and the botanical gardens are a marvel of beauty. The most gorgeous orchids grow around in the most casual fashion—orchids exactly like the ones that are worth five dollars apiece in New York—out of gnarly old trees in the woods or in private yards or maybe along some shady street. That is the sort of thing I never believed until I saw it with my very own eyes.

Another thing hard to believe in this civilized day and age is that self-inflicted torture is still practiced as religious ceremony. Once a year the pious enthusiasts mortify the flesh and shame the devil in horrible pilgrimages to their temples. One native walked for miles in sandals lined with sharp spikes and through his cheeks two long, narrow spears. Another had over a hundred arrows stuck in his limbs and back, so long that at every step they quivered and covered the flesh with blood, while still another one had countless heavy iron cups suspended from the skin of his chest and shoulders by cruel iron hooks. These are only a few of the tortures too revolting to dwell upon.

That is the sort of thing one does not care to see a second time and makes the parting from that delightful city less hard. The harbor is beautiful with its green islands and tropical foliage growing close to the water's edge, and it is made interesting with many outlying army posts and government settlements. The diving-boys follow the ships in their unbelievably narrow canoes out of which they dive for coins and clamber back without overturning or even filling the tiny crafts with water. A picturesque sight they are, too, with their shining dark bodies, arrayed solely in a gee-string, darting with such ease and grace through the clear water. And so the local color follows you out to sea from this, the "coal hole" of the East.

American Military History

By Major C. C. Benson, Cavalry

"In my opinion the proposal with which this article concludes offers a sound and practicable solution of the problem presented, which merits the careful consideration and support of officers of the Army and all others interested in a comprehensive and accurate recording of the facts of American Military History."

GEO. S. SIMONDS,
Brigadier General, U. S. A.

THEODORE ROOSEVELT, speaking about American military history at Boston on December 28, 1912, said: "I know my fellow countrymen, and I know that no matter what general resolutions they come to in advance, no matter what the lack of preparations, they would go to war on the drop of a hat if the national honor or the national interest was seriously jeopardized. The way to prevent the possibility, therefore, is to keep ourselves, our whole military system, the Army and Navy as part of the whole military system, in such a condition that there won't be any temptation on the part of anyone else to go to war with us. You can't do that unless you make our people wake up to the real meaning of our past history."

To "make our people wake up" to the real meaning of our military history is especially difficult. Many of our citizens are satisfied with histories that recount only our ultimate success in every war in which we have engaged. There are others, of pacifistic tendencies, to whom military history is a subject for avoidance rather than study. They may consider the study of military history to be antagonistic to their aims; but it would appear that, under present world conditions, efforts to promote peace must take into account the facts about war. The human factors that make for war have not disappeared; they recur in both hemispheres as strongly today as at any time in the course of recorded history. Many nations are crowding each other in their struggle for existence; some are seething with revolution. Wars are now in progress in various parts of the world, and have been continuously since the close of the Great War which was to have ended war. War is not a latent disease; it is a virulent pestilence. To limit its ravages, and to avoid having our nation subjected thereto, are the heartfelt wishes of every American. Despite the fact that war would bring to our professional soldiers opportunities for increased rank, pay and reputation, those who have experienced the horrors of war sincerely desire peace. Both military and non-military advocates of peace are here on common ground. If both can find secure footing on this common ground, there is hope that peace movements will develop along lines that hold the greatest promise of success.

The surest way to guarantee continued peace for the United States is to develop in the American people a broad knowledge of the facts of our military history, and an appreciation of their true significance. Let them know how close this nation has come to the brink of disaster; in addition to exploiting our triumphs, dwell on the humiliating defeats that we have suffered. Failure to investigate thoroughly our military history, and to apply its teachings, has added to our public debt billions that might otherwise have been devoted to the maintenance of peace. Before, during and after each great national emergency, we have repeated many of the costly errors that could have been avoided had experience been our guide. If our people could but know the truth, it would constrain them to recoil from war until there is, with honor, no alternative. All the peace societies in the world could do no more. Instead of antagonism between students of American military history and those who advocate peace at any price, there should be close cooperation.

It is essential that we know the strength and weaknesses revealed by our past military experience. This experience should be studied, in its proper relation to economic, social and political factors, as an integral part of our national life. It involves not merely the strategy, logistics, organization, training and tactics of military forces; it involves an analysis of our national growth, and of the attitude of our people towards their federal government, towards their national military system, and towards foreign nations whose interests have conflicted with our own.

The work necessary to the proper study of our military history includes four distinct operations:

Assembling historical evidence
Preserving the evidence
Writing history
Publishing and distributing historical material.

No one agency, official or otherwise, is capable of performing efficiently all of these operations; nor is it desirable that any one of them should undertake the whole task.

Assembling Historical Evidence

To establish historical facts, it is necessary to assemble evidence, evaluate it, and then, from a study of all available data, to deduce the truth. The evidence required may be in the form of an authentic contemporary written document, map, photograph, an article of uniform or equipment, field fortifications, and so on in endless variety. The important thing is to bring together in one place as much evidence as possible, in order that personnel trained in modern historical methods may evaluate it, index it, and prepare it for the use of students and historians.

It might be supposed that the evidence necessary to cover the comparatively brief period of our national life would be readily available; but that is not so. In the Congressional records, the printed official records of our Civil War, and in many unofficial publications pertaining thereto, we have a wealth of documentary source material for that war. And there are, in various publications and museums, fairly complete and reliable data on the Revolution. The same can not be said about our Hundred Years War with the Indians, the War of 1812, the War with Mexico, the Spanish-American War, or the World War. Until the evidence relating to each of these wars is assembled, evaluated, and made available for research, the facts can not be established, nor can the lessons of our past wars become known.

How necessary it is to assemble the evidence is indicated by the efforts of the 1st Division Association to complete the World War records of that Division. Soon after arrangements were made in 1927 for representatives of this Association to examine the official files, it became evident that there were great gaps in the records. Important field orders, situation maps, operations reports, and similar documents were missing. They were found, after diligent and systematic search, in other official files; among the current records of 1st Division units; and in the possession of individuals. The search was made by former members of the 1st Division who were well acquainted with its war-time personnel and operations. They wrote thousands of letters and made hundreds of personal visits. Curiously enough sergeants who had served at battalion and regimental headquarters were able to produce carbon copies of many documents for which no originals could be found. The official 1st Division files originally filled nine filing cabinets; when the job was done, there were nineteen.

The experience of the 2d Division Association parallels that of the 1st. Their initial efforts along this line preceded those of the 1st Division, and blazed the trail. One brigade of the 2d Division was composed of Marines; consequently, it was necessary to search the historical files of the Navy Department and the Marine Corps files at Quantico, Virginia, where this brigade was demobilized. Had the former members of the 2d Division not been determined to complete their records, and willing to support the project with approximately $5,000, the work could not have been carried on to a satisfactory conclusion.

These examples have been cited to show the unsatisfactory condition of the official historical records of typical World War units. The assembling of World War records is still practicable because so many of the participants are living. They can be reached by mail or personal visit; and, on the whole, are seriously interested in helping to preserve the history and traditions of their units. Even for the World War, however, the situation is rapidly changing for the worse. The papers of deceased veterans fall into unappreciative hands, are mislaid, consumed by fire, eaten by mice, are simply thrown away or otherwise destroyed. It will not be long before the great mass of the documents in the possession of individuals has passed beyond the hope of recovery. That condition now applies to many of the scattered records of our prior wars.

Although official records will usually provide the backbone of our military history, much additional evidence must be assembled. Official documents are generally too restricted in scope to meet the historian's needs; an order, for example, states what certain troops are to do, but the commander's reason for issuing the order must be sought elsewhere. It may be found in his diary, in personal correspondence, or in the private papers of officers who were on duty at his headquarters. For periods in which small groups of observant educated people lived in isolation on the frontier, as Army garrisons commonly did during our Indian Wars, the casual letter of an officer or lady may establish facts of great value to historical research. The private correspondence of George Washington is invaluable as historical evidence on many matters connected with our early military history. Similarly, the letters of General Robert E. Lee to his wife throw much light on certain events of the Civil War. The diary kept by General Charles G. Dawes, and published in 1921 under the title "A Journal of the Great War," contains historical material of primary value that can not be found in official documents.

The assembly of this non-federal but none the less authentic evidence presents a serious problem. This material includes letters sent and received, diaries, account books, drafts of reports and studies on military and non-military subjects, miscellaneous notes and memoranda. Some of it is probably assembled now, in the archives of state and other historical societies in this country, where it could be reproduced or consulted; but no one knows exactly where to look for the remainder. Even when found, the present owners may be reluctant to part with it, or to permit the unrestricted use of documents that reveal the intimacies of family life. These obstacles can often be overcome by returning original documents after true copies have been made; and by safeguarding certain papers through suitable restrictions. Typical restrictions that might properly be imposed are that ownership is not relinquished; that examination will not be permitted during the lifetime of the donor; that the documents may be examined only by serious scholars or upon specific authorization of the donor. Persons who are justly proud of the achievements of their ancestors should regard it as both a duty and a privilege to deposit historical papers where they will be preserved for the future use of historians. The principal difficulty is the lack of a responsible central agency of unimpeachable standing that could undertake to assemble this non-federal material.

Little can be said, without over-extending this discussion, about evaluating evidence and making it available to students and historians. These additional steps must be taken to complete the assembly. When the Historical Section, Army War College, completes its

present primary task of assembling, collating and indexing the official historical records of World War organizations, it will know what records are missing and will have ready for use a directory for all the important documents that are now in the files. The experience of the Historical Section in evaluating evidence contained in organizational records, shows that this work should be done by those who have a broad background of military experience and knowledge—in general, by officers who are qualified for duty on the General Staff. Their work on official records should be supplemented, in the non-federal field, by that of qualified civilians and retired officers who are especially interested in our military history. Anyone who has attempted to dig out facts on a particular subject from a mass of documents, will appreciate the value of having all the pertinent evidence indexed in advance.

The task of assembling this evidence falls naturally into three parts. That connected with the official service records of individuals belongs exclusively to The Adjutant General. That which deals with the official historical records of organizations is, as stated in Army Regulations 345-105, the particular concern of the Historical Section, Army War College. The assembly of all non-federal evidence relating to important individuals and to organizations, must be entrusted to a non-governmental agency which has yet to be created. To insure progress there must be complete co-operation between responsible and competent agencies. The most urgent historical task that now confronts these agencies is to assemble such evidence as is readily available, and then to search out more, before it is destroyed.

Preserving the Evidence

The necessity for preserving the evidence needs no discussion; this is simply a question of who is to do the work. The Adjutant General is the legal custodian of official War Department records, and should remain so. The Historical Section, Army War College, is made responsible for assembling the official historical records of organizations, because this work can best be done by an agency which makes it a primary function. These records must be set up separately from those pertaining to routine administration and personnel; but they should be kept under the official custody of The Adjutant General. Thus, they are available for both administrative and historical purposes until they are ready for transfer to the Federal Archives Building.

Legislation governing the transfer of records to the Archives Building has not yet been enacted; but the building is now under construction, and we may reasonably anticipate that it will be in operation within two years. Hearings on bills that have been introduced in Congress indicate that deposits will be strictly limited to the official Federal records, and that the documents will generally be fifty years old when they become eligible for admission. Once they are in the Archives Building, the official records will be more completely safeguarded than would be possible elsewhere.

Preservation of non-federal evidence is another matter. Assuming that an assembly of this material is to be made, as it must if we are to know the truth, adequate facilities to preserve it must be provided. It finds no proper place in the files of The Adjutant General; nor will it be admitted to the Archives Building. Some of it might prove acceptable to the Library of Congress where it would be classified, indexed, safeguarded and held under any reasonable conditions that the owner might prescribe. As the funds available to the Library for these purposes must be applied to manuscript collections of outstanding importance, most of the non-federal evidence pertaining to our military history must be housed and cared for by a non-governmental agency. Until that agency is properly established, there can be little progress towards this objective.

Writing Military History

Through the control that a government has over its archives, it can influence the writing of military history. It may restrict the use of its material so that only facts which support a predetermined viewpoint will come to light. This course has been pursued so consistently by some nations that their "official" histories are now regarded as mere propaganda. No matter what precautions are taken, the truth turns up from some unsuspected source. The action of our government in publishing the records of the Civil War without comment, has been widely recognized as the greatest contribution to the study of military history that any nation has ever made. Our policy has been to make all the important evidence readily available, and to let historians use it as they see fit.

Though many of the more spectacular episodes of our military history have been admirably presented by various historians, no history has as yet been written that adequately covers the whole field. Once the evidence is ready to use, there will be as many different histories written as there are military historians. Many will be written by civilians, and it is highly desirable that this should be so. There are some things that must be said which would come with poor grace from military men. We can not, with propriety, criticize Congress, the President, the Executive Departments or the American people for their shortcomings. These matters should be left largely to civilian historians.

There are, however, many phases of our military history which must be handled primarily by military men. Under the provisions of Army Regulations 345-105, which require the preparation of organization histories, certain officers have acquired some experience in writing military history. In addition, the Army War College, the Army Industrial College, and the General and Special Service Schools have seriously undertaken the study of military history. These factors operate to educate Army officers in the methods of historical research, and to make them appreciate its high professional value. Thanks largely to a good Army school system, our Army is better prepared to undertake its share of this work than it has ever been before. Some of these historical studies will deal with special and technical subjects; others with broader

subjects such as the coordination of land, sea and air forces; the control of manpower, munitions and finance in war; the selection of proper strategic objectives; and methods of cooperating with allies. The responsibilities of those entrusted with these studies will be great, for decisions that control the expenditure of large annual appropriations will result from their work.

The possibility of collaboration by military men and civilians on the most important parts of our military history should not be overlooked. If such collaboration could be arranged, it would provide the most favorable conditions for first class work. Professor R. M Johnston of Harvard has enumerated four qualifications that he considers essential for the writer of military history, i.e., technical knowledge of the military art, erudition, critical skill, and literary skill. To find a well-balanced combination of these qualities in an individual, soldier or civilian, is rare; but in a properly organized group, the best qualifications of both elements would be in mutual support. If a group of qualified officers and civilians could be *permanently* organized, with adequate financial resources, it would provide the stability and continuity that are essential to the planning and execution of extensive historical projects. There will be need for just such an organization as long as there is need for an American Army.

Publication and Distribution

There are several routes that a military author's manuscript may take to appear in print. The manuscript must first be submitted to the War Department, and authority obtained for its publication. It may be published privately, in which event the author pays the cost of printing and distributing his product. Military men can rarely afford this luxury. Commercial publication affords another route. To find a publisher who will assume the expense of publication and distribution is difficult. Few worth while books on military history have a sufficiently wide appeal to justify their publication commercially. As commercial publishers must make profits if they are to remain in business, they are seldom eager to publish military histories. The third route to publication is through subsidization. Should an officer write, for example, a meritorious History of American Cavalry, he might persuade the Cavalry Association to publish it. Neither the author nor the Association could expect to profit financially; but both would have the satisfaction of having contributed something of value to the Service. The fourth route is through the Public Printer, who publishes and distributes "official documents" for all branches of the Federal Government. Military historical studies may reach him through the efforts of Congressmen or through the War Department. The size of each edition is fixed by law or by the sum that the Department can devote to a particular project. War Department funds for printing are so limited, and current demands for technical and administrative publications are so great, that but few crumbs fall from the table to nourish the publication of historical studies.

The War Department can not issue an "official" history without assuming full responsibility for its contents and the manner in which the material is presented. Whenever it does so, it has to weather a storm of abuse because of the expressed or implied criticisms that a truthful history is sure to contain. Current War Department instructions to the Historical Section, Army War College, on the writing of historical narratives, prescribe: "The narrative of facts will contain no comment, estimate, comparisons or conclusions." The publication of narratives thus written may serve some purposes; but would it not be better for the War Department merely to publish the official records?

It would appear that the publication and distribution of military histories can best be managed by a non-commercial organization that is entirely independent of the government. Such an organization could collect and disburse funds for historical work, and could integrate specific projects into a broadly conceived plan. What might be accomplished is well illustrated by the "Chronicles of America," published by the Yale University Press. With a definite, coordinated plan of this kind, covering our whole military experience, it should be possible to secure the necessary funds from interested individuals and societies to publish and distribute the books on American military history that the American people should have. Lacking such an organization, progress on this work will continue to be haphazard.

New Organization Proposed

There are in the United States hundreds of historical societies, including national, state, county and local organizations. Two of them, the Military Historical Society of Massachusetts, and the Naval Historical Foundation, are of special interest to us. The former, organized in 1876 by the distinguished military historian, John Codman Ropes, has rendered invaluable service to students of our military and naval history. Its publications, library and museum contain materials that greatly facilitate research.

The Naval Historical Foundation was incorporated in 1926 under the laws of the District of Columbia, with its objects defined mainly as: "The collection, acquisition, and the preservation of manuscripts, relics, books, pictures, and all other things and information pertaining to the history and traditions of the United States Navy and Merchant Marine, and the diffusion of knowledge respecting such history and traditions." Supported largely by regular contributions from the United States Naval Institute and occasional sums from interested individuals, it has operated on a modest scale and has gradually built up its resources. Among other things, it has sponsored the preparation and publication of an accurate history of the Revenue Cutter Service, in accordance with the terms of a bequest made with that end in view. Its greatest value has been in providing a rallying point for the

diversified activities of those who desire to foster the history and traditions of our Navy.

What is being done for our naval, economic, political, social and religious history, can and must be done for American military history. A permanent non-governmental organization is essential for this purpose. It might be possible to organize a military history branch of an existing national organization, such as the American Historical Association; but it would probably be better to create an independent society which could later affiliate with that Association. Government agencies, such as the Library of Congress, the National Museum, the Smithsonian Institution and certain parts of the War Department, have done and are doing military historical work, to the extent of their capacity; but no one of them is in position to coordinate this work. Some of the things which can best be accomplished by a permanent non-governmental organization, may be briefly summarized as follows:

1. To make detailed, comprehensive and coordinated plans for work on all phases of our whole military history.
2. To affiliate with organizations that are willing to cooperate.
3. To consolidate data on the location and contents of deposits of source materials pertaining to our military history that now exist in governmental archives, libraries, museums and historical societies, both in this country and abroad; and to facilitate the use of these materials.
4. To assemble, collate, index and preserve all the pertinent non-federal historical evidence that can be found.
5. To establish a National Military Museum in Washington, D. C., which would serve as headquarters for the organization, provide proper housing for its archives and educational exhibits, and facilitate the research work of students and historians.
6. To arrange for the collaboration of military men and civilians in the writing of a complete series of first class military histories.
7. To subsidize the publication and distribution of these histories.
8. To develop in the American people a broad knowledge of the facts of our military history, and an appreciation of their true significance.

The establishment and maintenance of such an organization will require ample funds. Some financial assistance may be expected from interested civilians; but the responsibility for initiating and carrying on this work will devolve upon active and retired Army officers. It may be difficult at present to assemble funds for all eventual purposes, but there is no immediate need for large sums. The project can be launched and maintained for the first five years on the income from $100,000. There will be time enough to seek additional financial resources after the organization has perfected its plans for the future. To provide a definite basis for discussion on this subject, it is proposed that there be established a non-commercial corporation—THE AMERICAN MILITARY HISTORY FOUNDATION—whose principal business and objects will be as outlined above.

This proposal has received serious consideration during the past two years from a group of active and retired officers in Washington, D. C. After consulting with a number of distinguished military and civilian historians, they have drawn up tentative articles of incorporation for the proposed Foundation, and have drafted its constitution and by-laws. If the publication of this article evokes sufficient response to warrant the formation of a permanent organization, a meeting for that purpose will be held in the near future. All who desire to cooperate in the further development of this project are invited to communicate with Lieutenant Colonel Charles E. T. Lull, Chief of the Historical Section, Army War College.

A Course in Personnel Administration

By 2d Lieut. Robert J. Wood, C.A.C.

SO the colonel says to me, says he: "You fix up a course in personnel administration for the young officers coming out on the next boat. And make it thorough! If there's one thing junior officers don't know anything about, it's paper work!"

Now, having been a second lieutenant for nearly two full years myself, and having behind me already a long line of correspondence with the Adjutant General regarding Private Joe McSwilch's allotment of pay, or the final indorsement on Corporal John McSworgle's service record, or how many days Bill Gilch lost that time he was on furlough and got picked up by the civil police for breaking a bottle over some girl's head, the furlough expiring just at that moment, or something,—well, as I say, having all this behind me, (and some others I won't tell about) I could look back with pride and say to myself:

"Old fellow, dig up a few things for the boys to read in the Regs and get them off on this paper work on the right foot."

So I grabbed an armful of Army Regulations and sat myself down to bone up a few pointers before writing out my course of instruction.

Well, you may not believe it, but after ten days I was still sitting there making notes on all the Regs which concerned paper work, and nary one lesson fixed up for the troops. So, I pulled myself together and on looking over the stuff I'd read, the idea muddled through that it fell into four rather natural classifications. The first of these, I decided, should be called, "Data for the Service Record." Anybody knows that the service record is the backbone of army paper work and the *piece de resistance* of the personnel section. The idea hit upon was to explain each entry required in the service record, showing the why, when, where, or what-have-you.

Equal in importance as personnel work, and of primary importance to the rank and file, is "Pay of Enlisted Men," so it must be the next natural heading. Here, I decided to cover all the regulations concerning regular pay, additional pay, stoppages, and the forms to be made out or blanks to be filled in.

The third classification seemed to be "Rosters and Returns." This involved, as you might guess, morning reports, strength returns, monthly rosters, reports of changes, ration returns, and reports of survey.

The last group, then, should be designated to bear the all-encompassing title: "Separation from the Service." There are so many ways—each of which should be known to the personnel adjutant—in which an enlisted man may depart from the army that the authorities seem to demand special consideration for this subject. Discharge certificates, final statement, papers for retirement, and reports required in case of death should be given attention under this classification.

Now—I had a nice list of Army Regulations grouped according to subject matter, showing paragraphs to be studied and the number of pages to be read. Does it look like a very hefty two weeks' work? Not much, I guess, but here it is:

Data for the Service Record

	Subject	*Reference*	*Pages*
A.	Army serial numbers	AR 345-10	2
B.	Immunization	AR 40-215 (par 1-6)	2
C.	Transfers	AR 615-200	6
D.	Furloughs	AR 615-275	3
E.	Foreign Service	AR 615-210	13
F.	Sex morality	AR 40-235 (par 2)	1
G.	Articles of War	110th AW MCM 1928	1
H.	Apptmt & redetn of NCO's	AR 35-2340 (par 1)	1
		AR 615-5	7
I.	Rtng and disrtg of specialists	AR 615-10	7
		AR 35-2400	2
J.	Time lost to be made good		
	(1) AWOL or in desertion	AR 615-290 (par 1-5)	3
		AR 35-1420 (par 3-6)	1
	(2) Sick not in line of duty	AR 345-415	8
		AR 40-235	5
		AR 35-1440	2
K.	Deserters	AR 615-300	11
L.	Trials by court-martial		
	(1) preparation of charges	MCM	
	(2) pay detained or forfeited	AR 35-2460	5
M.	Bonus for reenlistment	AR 35-2420	5
N.	Designation of beneficiary	AR 600-600	2
		AR 35-1540 (par 1)	1
O.	Allotments and Insurance	AR 35-5520 (par 1-24)	9
P.	Deposits	AR 345-75	2
		AR 35-2600	3
Q.	Clothing accounts		
	(1) Allowance & Charging	AR 30-3000	10
	(2) Requisition & Issue	AR 615-40	31
		AR 35-6560 (par 13)	4
	(3) Semi-annual settlement	AR 35-2520	1
R.	Gunner's Pay	AR 35-2380	9
S.	The Service Record (Review)	AR 345-125	19

Pay of Enlisted Men

A.	General	AR 35-2320 (par 1-5)	1
B.	Rates	AR 35-2340	3
C.	Longevity	AR 35-2360	2
D.	Preparation of Rolls	AR 345-155	19
E.	Pay as Gunners	AR 35-2380 (par 1)	1
F.	Pay as Specialists	AR 35-2400 (par 1)	1
G.	Pay on authorized absences	AR 35-1400 (par 5)	1
H.	Allowance for rations & quarters	AR 35-4520 (par 1-14)	8
I.	Pay while SNLD	AR 35-1440 (Sec IV par 1)	1
J.	Stoppages against pay	AR 35-2440	6
		AR 35-1420	4
K.	Court-Martial Fines	AR 35-2460	4
L.	Allotments	AR 35-5520 (par 4, 15, 25-28 incl)	5
M.	Statements of Charges	AR 345-300	3

Rosters and Reports

A.	Morning Report	AR 345-400	17
B.	Ration Returns	AR 30-2210	10
C.	Monthly Rosters	AR 345-900	8
D.	Strength Returns	AR 345-50	4
		AR 345-55	26
		AR 345-80	
E.	Reports of Changes	AR 345-800	6
F.	Reports of Survey	AR 35-6640	19

Separation from the Service

	Subject	*Reference*	*Pages*
A.	Discharge	AR 615-360	25
		AR 345-470	4
B.	Final Statement	AR 345-475	6
		AR 35-2480	7
C.	Retirement	AR 615-395	6
D.	Travel Pay	AR 35-2560	3
E.	Death	AR 600-550	15

The next problem for the gray matter seemed obvious: "How best to get all this information over to the eager young minds about to become students of personnel work?" Well, the ultimate decision (after considerable research work, attempts at this and that, the destruction of several packs of cigarettes, etc., etc.) turned out to be as follows: An assignment of 20 to 25 pages to be read and about eight to twelve questions to be answered daily, entries to be made in a dummy service record and blank forms to be studied or filled in where necessary. In addition, a review after each classification had been completed in order to take up special, odd, or unusual cases.

So, looking over the thing, we seemed to have a course which covered custody and maintenance of records, rendition of reports and rosters, preparation of payrolls, and a discussion of the labor incident to separating a soldier from the service.

But the course wasn't complete. It must have an introduction, like all high powered courses do. So, the following was arranged:

Introduction

	Subject	*Reference*	*Pages*
A.	Duties of the personnel section	AR 345-10	6
B.	Correspondence, how conducted	AR 340-15	30
C.	Blank forms	AR 310-100	2
		AR 310-105	3

As now devised, the thing looked very formidable—five sections, each with a series of regulations to read, each crammed with potent information—in fact, it looked too formidable. It resembled a well-intrenched enemy. Ah! An estimate of the situation was obviously necessary. We must introduce our brainchild gently, else we will scare off all the prospective students.

A speech! That's the thing. They always did it at the Academy—even Colonel Echols when we first started Math. So, gathering my formidable-looking papers, I addressed the gathering of three befuddled-looking recent additions to the list of second lieutenants as follows:

"Men! (never "boys" or "gentlemen") You are about to embark on twenty-two days of interesting and instructive work. With a bare hour of your time daily, I contemplate increasing your stock of knowledge in army paper work and personnel administration from a cold zero to practically on a level with my own. (Ahem!)

"It has been said that filling the position of personnel adjutant involves nothing more complex than being able to sign your name and knowing when to sign it. Ay, there's the rub. For do you know how to sign it?

"In this course you will acquire a valuable fund of information regarding the records, vouchers, reports, returns, which a personnel adjutant is called upon to sign. You will acquire a fine sense of discrimination in handling battery details, an accurate working knowledge of that stilted, redundant, top-heavy, but withal simple language which is Army Phraseology, and a thorough acquaintance with a long dull line of Army Regulations. You will acquire, moreover, what is important both to you and to enlisted men alike, a high degree of carefulness with the pay accounts of the troops whose records are entrusted to your care.

"To your untrained minds this may seem much or little. Many may consider it a large assignment. Let me assure you, however, that there exists a vast number of officers who will tell you that personnel adjutants are very, very worthless individuals and that their work is useless and insignificant. They will tell you that if you are lucky enough to get this job you will have the greatest deadbeat on the post, that you will be able to read magazines all morning and play golf all afternoon. Organization commanders will inform you that the personnel adjutant usurps their prerogatives, keeps their clerks when same are needed in the orderly room, infringes upon all the rights and duties which a battery commander possesses.

"Many of these allegations are, in a sense, true. At least, it will seem that way if you take as casual a glance as some do. It all depends on the viewpoint. Organization commanders were glad enough, a few years ago, to be relieved of paper and record work, but they dislike the interference in the affairs of their batteries which personnel adjutants appear to exercise in order to do this very paper work.

"The situation is one, men, fraught with interesting but dangerous angles. It will call for the utmost in tact and diplomacy. Particularly is this true if you happen to be a second lieutenant and your unit commanders are captains since 1920. Impress upon yourselves, men, the necessity of boning up the orders and regulations and sticking closely to them. Enforce them gently but firmly, call the attention of all concerned to changes which affect personnel work, and when griping ensues, remember to pour oil of pacifism on the troubled waters. In short, keep one eye cocked on your battery commanders and the other on your records—but don't forget to be able to focus both on the inspector who comes assiduously to seek overlooked or forgotten entries. Does Private Joe Gilch have a Rusco shoe size entered in his service record? Did Corporal Jake Schmaltz have the Articles of War read to him during the past six months? Hasn't a mistake been made in figuring Private Oscar McDougall's clothing settlement for December 31st?

"But men, even if occasionally you do run into difficulties over trifles, remember that as personnel adjutant you control on one extreme that which is most important to the shiniest of the brass hats in the A. G. O.—the service records of the enlisted men; and on the other, that which is of utmost importance to the lowest ranking buck private in the outfit—his pay account.

"Pay rolls—the actual preparation of which takes but a few hours each month—is one subject which must be kept in every clerk's mind all the time. Each

day some change occurs which affects some soldier's pay—a rating or promotion, a charge for Quartermaster or Ordnance property lost, a change in longevity pay, a reduction from non-Commissioned grade, an allotment or insurance deduction. These things must be closely watched or someone's pay will be in error.

"Then, there is this business of clothing accounts, almost as important as monthly pay; of rations, with many, many opportunities for error; of morning reports; daily strength; reports of changes; preparation of court-martial charges; and that bane of any personnel adjutant's life: the handling of a deserter's papers. In no place is the complexity of the Army paper system, the lack of standardization in the size of forms, shown so remarkably as in the preparation of papers incident to a desertion, to the apprehension of a deserter, to the awarding of a dishonorable discharge pursuant to the sentence of a general court-martial, or in the keeping of such records while the enlisted man is in the guardhouse. Of course, everyone would like to make changes in the paper system—which is probably one of the things wrong with it now. Everyone who has gained enough authority to make a change has implanted his ideas among the heterogeneous collection of the thoughts of many who have gone before him.

"But, whatever you do, don't worry. If you have trouble with any of these lessons, ask me, and if I don't know the answer to your question, we'll ask the Sergeant-Major. So, here's your first poop sheets—on your way!"

Speaking thus, you can see with half an eye that the course was launched most auspiciously. Even the Colonel thought it a very beautiful launching.

The course ran for approximately a month and at the end of that time the students were at least able to tell a morning report from a discharge certificate—something no one ever learned at West Point. What was more important, they had an excellent general idea of where to look for information regarding the subject in hand, and a John Doe service record filled to the brim with entries some of which must have been amazing even to John himself.

In order to convey an idea of the type of question employed, a list of fifteen, selected at random, is published herewith. How many can you answer? Ah, I thought so! Well, send along a couple of pesos to the author to cover cost of mailing and mimeographing, and you will receive the course of twenty-two lessons, beautifully bound with Acco fasteners. Then you will be all set to increase your own knowledge, in addition to being armed with a weapon to spring on the fresh young lieutenants who come to your organization.

The questions:

1. In matters pertaining to correction of records, should the Personnel Adjutant address the Adjutant General through channels?

2. Does desertion automatically terminate a Sgt's appointment?

3. How much would a soldier forfeit if his sentence were written: "To forfeit $14 of his pay for six months?"

4. An enlisted man informs you that he has heard of allotments and desires to make one for $15 per month to his mother, commencing Nov. 1, 1932, and running 40 months to Feb. 29, 1936. Is this possible? Make out Form No. 29 for correct period, assuming soldier enlisted October 20, 1932. Make proper entry on the service record.

5. Is an enlisted man, absent with leave, required to make good time lost while in confinement by civil authorities if convicted of the offense for which held? Where does the entry go in the service record?

6. If a deserter returns to military control within 3 months of date of desertion, what action is taken with regard to the supplementary payroll prepared at date of desertion?

7. What is the entry on the March, 1932, payroll of Battery A, 69th C.A. (AA) opposite the name of Private James B. Banks, 6735961, Specialist 6th class, over 4 years service, who has authorized a Class E allotment of $10 effective March 1, 1932 and expiring June 30, 1933, who was absent without leave from March 3 to 6, inclusive and who owes $7.89 for Quartermaster clothing and equipage lost?

8. Can travel pay be used to satisfy debts due the United States?

9. How many days are deducted for an absence without leave from February 26, 1932, to March 3, 1932, inclusive?

10. Is a reward paid for information leading to arrest of deserters by the military authorities?

11. How many rations are due Battery C, 59th C.A., for July 1, 1932, if the following data are true Total present: 117; Sick in hospital: 3; Sick in quarters: 1; In confinement: 2; Attached for rations only 2; Sergeant Blair from duty to furlough 11 A.M. Private Jones to DS HPD, 2:30 P.M.

12. What is the purpose of a basic strength return and when is it rendered?

13. You are the Personnel Adjutant of the 62nd Coast Artillery (AA) Fort Totten, New York. Battery A of your organization is ordered by paragraph 3, S.O. No. 56, Headquarters, 2nd Corps Area, to proceed by motor transportation on September 15, 1932, to maneuver area in the vicinity of Fort Knox, Kentucky. The trip should not take more than six days, but the places at which stops are to be made are left to the battery commander. Battery A has 89 enlisted men and 2 officers available for the journey. One officer, Medical Corps, and 3 enlisted men, Medical Detachment, and 21 enlisted men, Battery B, 62nd C.A., are attached for the journey. Make out strength return on attached form as required by regulations. What other paper is required to be submitted in such a case?

14. What evidence is required to support an application for discharge by reason of minority?

15. What is the attitude of Army Regulations regarding promotion of an enlisted man prior to retirement in order that he may retire with a higher grade than that he would normally hold?

Fort Delaware

By Harris Samonisky

ITS importance and iron strength glorified by three great conflicts, historic Fort Delaware, in peacetime, has become more or less of a red-headed step-child in the official ranking of forts.

In fact it may be designated as the Rip Van Winkle of American coast defenses. In the intervals between the Civil, Spanish-American and World Wars the fort on Pea Patch Island acquired severe cases of "sleeping sickness."

But with the first rumbles of war Fort Delaware sheds its shroud and with guns bristling and soldiers hurrying to and fro emerges to take its rightful place as the "Gibraltar of the Delaware."

Situated on Pea Patch Island in the middle of the Delaware River between Delaware City and Finn's Point, N. J., the fort was one of a formidable trio standing sentinel over the great waterway, a much desired object of prey to the enemy.

Although never the center of a great battle Fort Delaware has played an outstanding role in the military history of the nation. During the Civil War it became famous as a Union prison camp, as many as 15,000 Confederate soldiers being confined there at one time.

When the Spanish-American War opened the fort was fully garrisoned, it being feared that the Spanish fleet might descend upon the Eastern coast in a daring raid. Consequently the state of readiness for combat of Fort Delaware and its sister forts, Fort du Pont and Fort Mott, on either side of it, was a source of much comfort to the cities of Wilmington, Chester, Camden and Philadelphia.

In 1903 the garrison was withdrawn from the island and the post turned over to the U. S. engineer office of Philadelphia. However in February, 1917, when the participation of the United States in the World War was foreseen, the post was again garrisoned. This garrison was maintained until December, 1918, at which time all troops were withdrawn and the fort was turned over to a caretaking detachment of four men.

So today—in peacetime—Fort Delaware sleeps peacefully on, dreaming of the glories which were hers when the war god held sway.

There is a legend connected with the fort which relates that a sailing vessel loaded with a cargo of peas sank over the site of the island in early colonial days. Upon disintegration of the vessel the peas sprouted and grew, the vines of the peas accumulating the deposit of mud that eventually became to be known as Pea Patch Island.

The island before being enlarged by being filled in with mud from dredges was a flat mud bank, irregularly oval in form, having an area of eighty acres. The island is surrounded by an embankment faced with broken stone, eleven feet above mean low water, and is drained by a series of ditches varying in width from three to thirty feet.

The island attracted little attention, except as a fishing resort until 1813. At that time the State of Delaware, thinking Pea Patch Island a good site for fortifications for the Delaware River and adjacent country, ceded the island to the United States on condition that fortifications be erected and maintained at the expense of the Federal government.

In 1814, Captain Clark, accompanied by 100 soldiers and 30 laborers, took possession of the island and began building dikes, wharves, and fortifications.

This work was carried on for ten years or more when in 1831 a portion of the fort was burned. It was then decided to raze the entire fort and build new fortifications. This was done but later Dame Nature interfered and a high tide destroyed the second set of fortifications.

Still undaunted, the Government proceeded with a new plan and in 1859 all the principal buildings were completed. The water supply of the new works was secured from the rainfall, which was conducted from the roofs of the buildings to 22 cisterns after having passed through filters of broken brick, gravel, sand and charcoal.

During the Civil War the fort was heavily garrisoned and the armament increased until finally about 200 guns were mounted on the embankment guarding the river approaches. The emplacements for many of these old guns can be seen at the present time, and many of the old cannon balls supplied for use against the Confederates are in their original piles.

Fort Delaware was situated close to what was the dividing line between the North and the South and it constituted one of the major fortresses of the North.

Later during the Civil War Pea Patch Island was converted into a large prison camp for captured Confederate soldiers. The number of prisoners varied considerably but at one time 15,000 men from the South were "guests" there.

It was necessary to erect additional wooden barracks around which a huge stockade of wire was constructed for housing the prisoners. Refractory prisoners were placed in solitary confinement in dungeons built into the fortifications themselves at the time of construction of the works.

These dungeons, which may be viewed today by visitors, were entire without light except for a huge oil lantern which was placed in each dungeon. Ventilation was secured by air passages too small to admit the most slender of men. The passages ran from the dungeons to the top of the works.

The drinking water supply obtained from the rainfall was found insufficient, so that it was necessary to bring water from Brandywine, near Wilmington, in order to care for the needs of the garrison and the prisoners.

For the purpose of transporting all supplies needed a regular boat service was maintained with Wilmington. The bread for the garrison was baked in a large oven built into the fortifications.

The number of mortalities among the prisoners on the island was not excessive. Ordinarily the remains of the prisoners were interred at the National Cemetery at Finn's Point on the New Jersey shore. There are 2600 bodies in the Finn's Point Cemetery, the greater number of which are Confederate soldiers who died of disease and illness at Fort Delaware.

A beautiful memorial was erected in the cemetery some years ago by the Federal Government to honor the memory of Confederate soldiers who were buried there.

There were few escapes from Pea Patch Island, but in cases when prisoners did succeed in swimming the river they were nearly always successful in making their way back to the South through the efficient underground railway which was maintained in this portion of the country.

A point of interest which is usually sought out by visitors is a dungeon in which one of the Confederate soldiers wrote his name on the wooden ceiling of the dungeon. The inscription reads: "Thomas Wensley, Fort Delaware, April 5, 1862."

At the time of the Civil War Fort Delaware was considered impregnable. It was a counterpart of Fort Sumter but was much larger and, of course, stronger. Union Army men of the 60's were confident that no attacking force could ever capture the Delaware stronghold. For one thing the embankments were from six to eight feet high and docks were constructed on east and west sides. Flood gates were constructed at their heads so that the entire surface of the island outside of the citadel could be covered by water should the occasion arise.

The moat, twenty feet in width and eight feet deep, encompassed the solid masonry of the fort. It was crossed by a single stone bridge, comprised of three arches, and opening upon the huge sally port or gateway under the great arch of which visitors find entrance and exit.

At that time Fort Delaware mounted three tiers of guns. The exterior walls of the fort were made of granite blocks four feet thick, solid brick walls were built within these twelve feet thick, and archways constructed within the solid walls reached at least thirty feet additional thickness. Provisions also were made to flood the foundations of the fort to a depth of four feet, should an enemy ever gain access to the fort.

Many incidents of interest occurred during the Civil War period, but one of the most interesting reached its climax when the Vermont Legislature passed a resolution commending Mrs. Bettie Van Metre, of Berryville, Va., for her care of Lieutenant Henry H. Bedell, of Westfield, Vt., after he was injured in a battle. She cared for him at her home despite the criticisms of her friends.

When Lieutenant Bedell reached Washington he told of the woman's kindness and the Secretary of State immediately ordered the release of the woman's husband, who was imprisoned at Fort Delaware.

Today Fort Delaware, because of its glorious past, is a sort of unofficial museum a mirror for the reflection of bygone days.

Old Fort Delaware

The Foreign Military Press

Reviewed by Major Alexander L. P. Johnson, Infantry

CANADA—*Canadian Defense Quarterly*—January, 1933.
"Military Education," by W. R. P. Bridger, M.A.

The author, professor of modern languages and history at the Royal Military College at Kingston, Ontario, refutes some of the pet arguments advanced by pacifists against military training in colleges and universities. The idea often expressed by that ilk, that military training is bound to make the pupil militaristic, the author states, is entirely erroneous, even mischievous. Were war to be abolished, he writes, some species of international police force would still be necessary. He observes, that throughout Canada there are a great many more men being put through a semi-military course of training for police duty, yet the complaint is still to be heard that such training has a militarizing effect.

The pacifist charge, that military training turns out men of one stamp, the author brushes aside with the remark, that the same holds true of all great colleges and universities, but as long as the stamp is good, there is no harm done. Contrary to pacifistic belief, the author states, individuality and initiative are not only cultivated by military training, but these qualities possess far greater value in military life than in any other calling. The charge of subserviency to superiors often alleged by those opposed to military training the author dismisses by pointing out the fact, that subserviency is of no avail to the soldier who lacks in the ability to think on his feet and think quickly. On the other hand, he adds, a little subserviency to superiors is not harmful in an age when boys who respect and obey their elders are a rarity.

After dilating upon the curricula of military colleges and the advantages of military training, the author concludes, that military training is not only of great educational value, but necessary for the safety of the country. "It serves . . . many and distinct purposes . . . lays a solid foundation of health and knowledge on which a boy can safely build a future career . . . finally it trains together the mind and body so that they may be used to the fullest extent and in perfect unison."

AUSTRIA — *Militarwissentschaftliche Mitteilungen* — November-December, 1932.
"The Infantry Journal," by Lieut. Col. Lothar von Rendulic.

A very flattering review of the July-August number of the *Infantry Journal*. Commenting upon the fact that while there is an abundance of periodicals serving the interests and needs of the artillery, cavalry and the technical branches of the military profession, the author points out that only France and the United States produce military periodicals worthy of the importance of the infantry arm. In the author's opinion, the *Infantry Journal* deserves particular attention because of the great wealth and high professional standard of its contents. "Its recent development is remarkable," he adds, "and it has become a veritable storehouse for infantry knowledge." General Fuqua's review of the varied activities of the infantry; Lieutenant Kent's suggestions as to the use of the sand table for the training of troops; Colonel Shartle's study of "Forts and Fortresses" in the light of war experiences; Captain Hilldring's essay, "Four Days of Infantry Combat;" Lieutenant "Merriweather's" skit "Khan Dhu" all come in for favorable comment. Colonel Vestal's historical essay, "Frederick William von Steuben," the author comments, evinces gratitude and appreciation for the German drillmaster.

We appreciate the compliments, but do hope that the reviewer will not make the mistake of taking "General Abner Zilch," whose "photograph" and pointed comments appeared in a subsequent issue of the *Infantry Journal* as an officer of the U. S. Army. Be it said for the benefit of our reviewers abroad, that the good General like Lieut. "Merriweather" are but pseudonyms.

FRANCE—*La Revue d'Infanterie*—October, 1932.
"Organic Cavalry of Infantry Commands," by Lieut. Raymond Sereau, Cavalry.

The resumption of the war of movement in 1918, the author writes, demonstrated the fact that the divisional cavalry troop was too weak, and that given increased strength and fire power, these cavalry units might have obtained important results. The author believes that the infantry needs an organic medium of reconnaissance capable of functioning. Aviation can supply general and positive information only. It can determine that the enemy is in a given locality, but cannot say that he is not there. The presence of small bodies of hostile troops frequently escape aerial observation altogether. Not only does the infantry need a dependable agent to secure the detailed information that is essential for the conduct of its operations, but the added security provided by the presence of such reconnaissance elements to its front and flanks, especially in the absence of large bodies of screening cavalry, is of inestimable value. Intelligence and security thus became interdependent.

The author visualizes a divisional reconnaissance squadron consisting of a field officer of cavalry with staff; one cavalry troop of two platoons of two sections each, plus one squad of scouts and a machine gun group with pack animals; one cyclist (or motorcyclist) troop comprising a headquarters platoon, three combat platoons of three sections each, and one motorized machine gun platoon of two sections; one automobile platoon consisting of four semi-armed touring

cars each armed with a machine gun capable of being operated from the car or the ground; four motorcycles with side cars armed with automatic rifles; a small radio truck; and the necessary field and combat train. This reconnaissance force, according to the author, will consist of 15 officers, 454 men, 268 horses, 175 bicycles, 21 motorcycles, 22 autos, 16 animal drawn vehicles. The fire power of this force would amount to 190-208 rifles, 22 automatic rifles, 10 machine guns and 2 anti-aircraft machine guns.

The cavalry troops, the author writes, serves as the agent of reconnaissance. On horseback or on foot, the troopers comb the terrain, avoid hostile centers of resistance they cannot overcome, in order to secure for the infantry the needed vital information. The cyclist unit with 9 automatic rifles and 4 machine guns possesses the bulk of the fire power and can effectively support the horsemen in the execution of their mission. The automobile unit with its machine guns is essentially a medium of transportation for the reserve fire power. It can be employed on rapid reconnaissance missions over short distances before contact is made with the enemy. The motorcycles armed with automatic rifles, the author considers as media of liaison and eventually as a reserve of fire power.

Discussing the tactical employment of this cavalry force, the author emphasizes the necessity of close cooperation with the divisional infantry. In order to attain the highest degree of efficiency in this respect, the author believes joint training in time of peace is essential. He concludes his interesting study with a few remarks regarding the desirability of incorporating a cavalry reconnaissance unit in each regiment of infantry. This regimental cavalry platoon consisting of 1 officer, 6 N C O's and 19 privates would be charged with distant reconnaissance missions, security for the infantry on the march and in case of need might be employed as mounted messengers.

GERMANY—*Deutsche Wehr*—December 2, 1932.
"French Policy of Alliances and the League Covenant."

The anonymous author cites Premier Herriot's stirring address before the League of Nations Assembly on October 29, 1932, in which the latter declared that "the Covenant, nothing but the Covenant, the whole Covenant is our Law." Herriot, the author states, further declared, that the termination of secret diplomacy and the old system of the balance of power must be the principal goal of the League of Nations. "All states, big and small, must be accorded complete equality; they must cooperate in the creation of a new kind of public opinion, which must be free of all thought of hegemony." With these high ideals expressed by M. Herriot as a background, the author undertakes to analyze actualities in the French foreign policy which is indicated by the following facts:

On September 7, 1920, France and Belgium concluded a treaty of alliance in which the signatories pledge mutual armed support. It required reorganization of the Belgian Army which in the case of war becomes a part of the French military forces in the field.

Since October 18, 1918, there is in existence a treaty between France and Czechoslovakia pledging mutual support in the event of political difficulties. A secret clause added in 1921 obligates Czechoslovakia and Poland to act in concert against Germany "whenever in the judgment of France the peace of Central Europe is in danger." A further convention entered into on January 25, 1924, provides for full military cooperation against Germany between France, Czechoslovakia and Poland.

On September 15, 1922, France concluded an alliance with Poland against Germany and Russia. This treaty was renewed in 1926 and 1932. The military clauses cover all details of armed cooperation and provide for a French military mission in Poland and the training of Polish officers in France.

A treaty of alliance between France and Roumania concluded on August 28, 1926, provides for military cooperation against any third party. It is primarily directed against Germany and Russia. It obligates Roumania to obtain 75% of all her military equipment and armament from French sources.

On November 28, 1927, France concluded a treaty of alliance with Jugoslavia primarily against Italy.

In addition, the author notes, these alliances are supplemented by a series of treaties between the several allies of France. As a practical result of these alliances, the peace strength of the French army of 650,000 is augmented by the combined peace strength of her allies amounting to some 850,000 men. The combined war strength of France and her allies the author estimates at 13,300,000. Of these, ten million men are mustered in territories contiguous to Germany.

—*Militar Wochenblatt*—January 11, 1933.
"Review of the Military-Political Situation," by No. 64.

The *Little Entente,* the author writes, manifests increased activity. The Chiefs of Staff of these states comprised by the Little Entente held a conference at Belgrade last November. A month later the several ministers of foreign affairs met at the same place for an extraordinary conclave. The fear of an impending attempt to secure revision of the Paris peace treaties, the author believes, motivated these conferences. Possibly difficulties, which have arisen between some of the member-states of the Little Entente, the author thinks, might have been an additional motive. He also notes a distinct feeling of resentment in these countries against the Great Powers because of their exclusion of the Little Entente from the international conversations regarding equal rights demanded by Germany and the other defeated nations in the matter of armament. The French and Polish non-aggression pact with Soviet Russia evoked strong resentment in Roumania. The periodic attempts to reconcile France-Italian difficulties, and the tightening of French credits are equally fruitful causes for anxiety in the chanceries of the Little Entente states. Hence, the author concludes, the cementing of the bonds that unite the nations of the Little Entente seems to have been the principal object of the recent Belgrade conference. With that end in view, they created a permanent coun-

cil consisting of the several ministers of foreign affairs of the Little Entente states, which is to meet three times annually. The new accord also establishes a permanent Secretariat at Geneva. "Matin," great French daily, considers the new arrangement as a definite alliance with unity of command.

The author points out, that the states of the Little Entente are in thorough accord as to the preservation of the peace treaties and the resulting territorial arrangements. They are also in complete accord as to the necessity of suppressing Hungarian revisionist aspirations. They are likewise in agreement as to their own inability or, as the author observes, unwillingness to disarm, and in their opposition to the granting of equal rights to the defeated nations. Furthermore, the author notes, Little Entente statesmen are unanimous in the opinion, that their respective countries should pay as little as possible on their own war and liberation debts, but collect to the last sou all debts owed them, especially from Hungary.

As to existing military agreements, the author states, France insisted that Jugoslavia and Roumania make provisions for sufficiently large forces to operate against Hungary to relieve Czechoslovakia and leave the latter free to throw her entire strength against Germany. Similarly Roumania is to relieve Jugoslavia's rear, in case of a conflict with Italy, against Hungary and Bulgaria. The author believes that Roumania rejected this demand on the ground that the French and Polish non-aggression pacts with Soviet Russia leave her own rear exposed to grave danger, and neither Czechoslovakia nor Jugoslavia are said to be willing to support Roumania against Russian aggression. *Czechoslovakia,* military appropriations for 1933, the author writes, amount to one and a quarter billion crowns, a reduction of 57 million crowns of the preceding year's appropriations. The bulk of this saving was effected by furloughing to the reserves the class of 1931 about the middle of January instead of the end of March, 1933.

The Czechoslovak Army is in course of reorganization. Each of the 48 infantry regiments will consist of two full strength battalions and one cadre battalion. The latter will furnish the nuclei for 12 reserve divisions in case of mobilization. This, the author observes, is represented abroad as a 25% reduction of the military establishment. Actually, the author notes, the 12 infantry brigade hearquarters, which have become surplus as a result of this reorganization, will, nevertheless, most likely be continued in existence in some other form, possibly as headquarters for the 12 reserve divisions. The Czechoslovak high command has been reorganized along French lines.

Yugoslavia, the author writes, appropriated for military purposes during the fiscal year 1933-1934 two billion dinars, which represents about 21% of all budgetary appropriations. Fortifications along the Italian frontiers are being feverishly pushed to completion. Two frontier regiments of infantry have been converted into alpine troops.

Roumania, the author writes, is gravely disappointed because of the Polish and French non-aggression pacts with Soviet Russia. The author believes he discerns signs of possible rapprochement between Roumania and Italy, encouraged by recent reassurances given by Mussolini regarding treaty revision.

Hungary, under the leadership of General Gombos, premier and minister of defense, follows a foreign policy of definite Italian orientation. There were rumors of secret conferences of the general staffs of Italy, Hungary, Albania and Bulgaria for the discussion of war plans against Jugoslavia. The author believes, that General Gombos is too good a soldier to commit his country to a path of adventure knowing, as he does, Hungary's present military impotence.

Hungarian military appropriations for 1933-1934 were materially reduced. The sum appropriated amounts to 96 million pengö, representing about 7% of all budgetary appropriations.

Austria, the author writes, owing to the economic situation allowed the actual strength of her army to drop to 17,000, from a maximum of 30,000 authorized by the terms of the treaty of St. Germain. The military budget amounts to 80 million shillings, or 4% of all appropriations. Recruiting to full strength, the author states, has begun in anticipation of the funds apprpopriated. It is noteworthy, that there were 27,000 applicants to fill 4,500 vacancies, notwithstanding the substantial reduction of army pay.

Italy, on the tenth anniversary of the Fascist march on Rome, the author notes, occupies a leading place among the great powers. Italy has felt the economic depression less than any other country. Her military establishment is maintained at a high degree of efficiency, while the record of achievements of the Royal Italian Air Force is indeed notable. The Black-shirt militia likewise attained a high degree of efficiency and effectiveness. The author believes, it will prove a valuable adjunct to the army in case of war. The principal value of the Fascist organization, the author believes, is its sponsorship of physical and moral development of the nation, and its fostering of a spirit of national consciousness.

Switzerland, the author states, as a result of the recent riots at Geneva, has had a valuable object lesson regarding the usefulness of troops in active service to meet sudden emergencies. The Swiss Federation, the author believes, will sooner or later have to reorganize her military establishment which is now based upon a purely militia plan. In fact, various reorganization plans are said to be actually under consideration.

GREAT BRITAIN—*Journal of the Royal United Service Institution*—February, 1933.

"The Japanese Army," by Lieut. Col. J. W. Marsden.

Organized in 1875 on the basis of compulsory service, the Japanese Army was modelled along German pattern which imprint it still bears. The Emperor is the supreme commander. He is assisted by an advisory board of marshals and admirals who are personally selected by him. The Supreme War Council includes the advisory board, the ministers of war and the navy, the chiefs of their respective general staffs, and

a number of distinguished army and naval officers chosen by the Emporer.

The Army at present consists of approximately 15,500 officers and 200,000 men. The organization of divisions varies. In general, the division consists of two brigades of two regiments each; a cavalry brigade of two regiments; one artillery brigade of three or more regiments, heavy, light or mixed according to circumstances; one battalion of engineers and one commissariat battalion (supply troops). The infantry regiments consist of three battalions of 600 men each. The cavalry regiment consists of three or four squadrons (troops) of 100 sabres each. The field artillery regiment contains six batteries of four pieces; the engineer battalion has three companies of 150 men each. The supply battalion comprises 300 men. Telegraph, railway, aviation, antiaircraft units, mountain and coast artillery units are distributed among the various divisions. There are, in addition, two tank regiments, one attached to a line division, the other to the infantry school. The Military Gendarmerie is organized as a separate corps.

Infantry service with the colors was reduced in 1925 to eighteen months. This reduction was compensated by compulsory cadet training at secondary and high schools under the supervision of regular army officers. The service is intensive. Passes are granted only on Sundays and holidays. Officers are particularly hard worked. A feature of the soldier's so-called hardening process is the "snow march," carried out annually in mid-winter, when troops spend a week marching, bivouacking and engaging in tactical exercises in the nearest mountain districts.

Military education under control of a special department covers the entire scope of training from the preparatory schools for boys intending to become officers, up to the general staff college. In 1930, the latter listed 56 instructors, 160 students and 560 graduates.

The air service developed on a French model under French and British tutelage, played an important role in recent military operations. The principal achievements of the Japanese air service include a 700 mile night flight over Japan and a non-stop flight of 1,800 miles to Formosa. Others, overshadowing these, are said to be in contemplation.

HUNGARY—*Magyar Katonai Szemle*—January, 1933.

"The Political-Military Situation of the Central Powers at the Close of 1915," by General vitez Louis Nemeth, ret.

A very interesting historical discussion, in which the author undertakes to show that the ultimate outcome of the World War was actually decided at the close of 1915. Although the second year of the World War brought a series of important victories to the Central Powers, they were unable to secure a decisive victory anywhere, such as might have induced even but one of their enemies to the conclusion of separate peace The Allied plans for 1916 contemplated, the author writes, a general offensive on all fronts, but they found it impossible to agree as to the time of the attack. Unified command, although recognized by all to be highly desirable for the success of Allied arms, had not yet become a pressing issue.

In the camp of the Central Powers, Germany and Austria-Hungary, the author states, shared political as well as military leadership. Turkey and Bulgaria followed their lead. There was, however, a growing disagreement between the German Chief of Staff and his Austro-Hungarian colleague. The author believes that after the disasters of 1915 Russia was actually inclined to make peace. That this failed to materialize, the author attributes to the bungling of German diplomacy. He points out, that in the summer of 1915, even before the recapture of Lemberg, General Falkenhayn, German Chief of Staff, was reluctant to continue military operations against Russia on the ground that a decisive victory would be wholly out of question. Later, however, after the fall of Warsaw, Brest-Litovsk and other important Russian fortresses, Falkenhayn hesitated in bringing the Russian campaign to a close. As a result, the author writes, the Austro-Hungarian armies penetrated Russia too far and caused the Serbian campaign to be initiated too late.

When, upon Italy's entry into the war, General Conrad insisted upon offensive action against that country, Falkenhayn opposed the plan for political reasons. Italy had not yet declared war on Germany Falkenhayn would neither furnish troops to assist in such offensive, nor would he relieve Austro-Hungarian forces from the Russian front for that purpose. The author blames General Falkenhayn also for the escape of the Serbian army. Conrad had planned a campaign of annihilation against the Serbo-Montenegrin armies with a view of securing the Albanian coast and Saleniki. Falkenhayn opposed this plan, because he felt that success would unduly enlarge Austro-Hungarian prestige. Believing the rupture of the Western front to be impossible, General Falkenhayn favored offensives with limited objectives, and committed the German army to the abortive Verdun operations. Conrad took a chance at Asiago with inadequate strength at his disposal. The friction between the two leaders not only emphasized the necessity of unity of command, but in the author's opinion, it was responsible for ultimate defeat of the Central Powers.

General Information

SPAIN—The Madrid newspaper *Haralde* reports a sensational invention in the field of camouflage, which achieves the complete invisibility of troops and materiel. The inventor, Hilario Omedes, calls it "invisible armor." The newspaper reveals only the general nature of the invention, which was acquired by the Spanish Government.

According to this report, the "invisible armor" consists of smooth, unbreakable particles of mirror. In time of war, it is proposed to provide all personnel and materiel with this mirror-armor which, by reflecting the surrounding terrain, is said to reduce everything to absolute invisibility at a distance of 200 paces. Masking of big guns becomes wholly unnecessary. (*Pesti-Naple,* Dec. 3, 1932.)

NATIONAL GUARD NOTES

Adjutants General Convention

DELEGATES from thirty states of the Union assembled at the Militia Bureau in Washington on March 6 for the annual convention of the Adjutant Generals Association and carried through the program with dispatch under the able direction of Brigadier General Ralph M. Immell of Wisconsin, who is president of the organization.

The opening feature of the program was the address by Major General George E. Leach, Chief of the Militia Bureau, in which he reviewed the operations of the Bureau and the National Guard since the meeting last spring. He discussed at length the processing of the Militia Bureau Budget through its several phases down to its final enactment as an item of the Army Appropriation Bill for the fiscal year of 1934. He expressed his high appreciation for the loyal support which has been given by the Adjutants General throughout the country, and expressed the belief that with the amounts in the Bill the National Guard can function on a normal basis through the year and with a possible saving of a material sum. He put it squarely up to state authorities to effect economies in all departments. General Leach discussed his plans for the motorization of the field artillery of the National Guard and expressed the belief that when that is effected the National Guard will be the most mobile component of the Army. He paid a tribute to Honorable Ross A. Collins and his colleagues of the War Department Appropriations Committee in writing a proviso into a prohibitive law which makes this motorization possible. General Leach discussed the matter of effecting a reduction in the number of sergeant-instructors on duty with the National Guard down to the point where there will be one on duty with each regiment and separate organization. This reduction is to be effected in grade four only and will be made as vacancies occur in the corps areas due to natural causes. No non-commissioned officer of the first three grades is to suffer a reduction in rank as the result of this process.

The National Guard camp building program was also discussed at length. This program failed to be included in the Wagner Bill which was passed by Congress in the last days of the session. The opinion was advanced that now the National Guard should have its own Bill introduced and processed through to the point where it can be included in any employment relief measure that may be considered by Congress in the future. This construction work will provide employment for workers on the job to the extent of 75% of the appropriation while the remaining 25% will be devoted to the purchase of material.

General Leach paid a high tribute to General MacArthur whom he characterized as the best friend the National Guard has ever had in the history of the organization.

The delegates were included in the reception which was tendered to the new Secretary of War when he received all officers on duty at the War Department on Monday morning. They were presented along with the officers on duty in the Militia Bureau.

The initial feature of the first day's afternoon session was the showing of a three-reel movie film of the experiments conducted by the Field Artillery Board with the motorized battery, at Fort Ethan Allen, Vermont. This outfit was sent north last month for winter tests at the northern posts and the movies demonstrated conclusively that the motors can take the battery over all kinds of country and under adverse conditions as well as if it were horse-drawn. In addition, the battery can travel on hard roads at the rate of 30 to 35 miles an hour with ease.

The remainder of the afternoon was given over to the points brought out by General Leach in his address of the forenoon.

The forenoon session of the second day was devoted to the presentation of the plans for the conduct of the selective service process in case of a national emergency and the enactment of a draft law. The presentation was made by General Andrew Moses, and the officers of the G-1 Division of the General Staff who prepared the plans. They were gone into in much detail and impressed upon the Adjutants General that they and their state staff and detachments are the ones upon whom the task of putting over the proposition devolves. Each Adjutant General was supplied with detailed information on which the preparation of his state plan could be based and they were all impressed with the necessity of getting ahead with these plans.

At noon the Adjutants General and the Property and Disbursing Officers were guests of the officers on duty at the Militia Bureau at a luncheon at the Army and Navy Country Club at Arlington Heights. War Department guests were Generals Drum and Moses and Colonel A. T. Smith.

The final afternoon of the conference was devoted to a discussion of the subjects included in the agenda for the meeting. These were a report of the legislative committee covering their work in connection with National Guard legislation over the past year; the reduction of state staffs and detachments, which matter is now being studied by a special committee of the National Guard Association; the selection of candidates for the Military Academy which subject is also under consideration by a special committee of the National Guard Association; the coterminous appointment of air officers which is being worked out in cooperation with the Chief of Air Corps; and the economies to be

effected in the conduct of the National Guard during the coming year.

The next convention is to be held at Chicago in September on the day preceding the assembly of the National Guard Association Convention in that City.

The final feature was the election of officers for the ensuing year. They are Brigadiers General Ralph M. Immell, Wisconsin, President; Herbert T. Johnson, Vermont, Vice-President; and Carlos E. Black, Illinois, Secretary and Treasurer. The Executive Council for next year are Brigadiers General David J. Davis, Pennsylvania; William F. Ladd, Connecticut; Charles H. Grahl, Iowa; Hartley B. Moon, Alabama; and John S. Bersey, Michigan.

Many of the U. S. Property and Disbursing Officers attended and participated in meetings devoted to subjects of special interest to them in connection with the supply and finances of the National Guard.

Automobile Damages

THERE is no authority by which the Chief of the Militia Bureau can authorize the expenditure of public funds for the payment of damages to private automobiles taken to National Guard field training camps by their owners.

Those National Guardsmen who use their own machines for transportation to and from camp receive reimbursement at a specified rate per mile. If they use their cars during the camp period for either personal or for official business they do so at their own risk and if they suffer damage there is no way through which they may be reimbursed.

This is not an arbitrary ruling or policy. There are just no funds available for such a purpose in the Militia Bureau Budget. Any property and disbursing officer who makes payment of such damage bills may expect to have them held up and disallowed by the general accounting office.

Command Post Exercises

AT ITS annual convention in Norfolk, the National Guard Association adopted a resolution advocating the conduct of a command post exercise in each of the Corps Areas each year for the instruction of higher commanders and their staffs and for the field training of communications units in their wartime functions. Such a CPX is held in one of the Corps Areas each year. One for the Fourth, Seventh and Ninth Corps Areas are yet to be conducted to complete the circuit one time.

Due to the economic situation and the lack of funds, it will not be practicable at this time to consider favorably the resolution. It costs anywhere from $40,000 to $80,000 to put on one of these exercises. The Militia Bureau's share for the National Guard is about $10,000 and that is all that can be spared from the budget for the purpose.

Due to the fact that the Army Appropriation Bill was passed so late last summer, it was not practicable to prepare for the exercise schedule for the Fourth Corps Area, and it had to be dispensed with. The Seventh Corps Area is scheduled for one in 1934, and the Ninth Corps Area for 1935. The one for the Fourth Corps Area had to be deferred until 1936.

All concerned appreciate the value of these exercises in the training of commanders and troops, but the money situation precludes any extension of the activity until such time as it may ease up and additional funds can be made available for the purpose.

Protecting Guardsmen on Duty

A DISTURBANCE in the southern Illinois mine district necessitated calling out units of the National Guard to preserve order and protect life and property. In the course of the performance of this duty, which involved the necessity for arresting one Andrew Gyenes, a ring leader of the movement, he was shot in the leg by Corporal Russell Myers, 130th Infantry, who was in command of a patrol charged with the duty of dispersing a mob that had assembled at the home of a working miner. Gyenes subsequently died from shock and loss of blood.

The local attorney for the striking miners had a complaint sworn out against Corporal Myers who fired the shot and included Lieut. Colonel Robert W. Davis and Captain Carl J. Meacham, who were Myer's immediate superiors, in it. All three were charged with murder.

The National Guard authorities convened a board of inquiry immediately. The board conducted their investigation and exonerated the three accused Guardsmen.

In order to forestall further action on the case in the civil courts, all three of the men were tried by a General Court Martial. The charges and eight specifications were drawn to cover every conceivable offense with which the accused could properly be charged under the State code. The courts found them "not guilty" on the charge and all specifications. The findings were approved by the Governor.

Through this procedure the Guardsmen are protected from further action in the civil courts. The fact that they have been tried by a General Court Martial has established jeopardy, which may be pleaded successfully to bar further trial for the alleged offense.

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or material 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, must be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration.—A. H. Sunderland, Colonel, C.A.C., President.

THE COAST ARTILLERY BOARD

COLONEL A. H. SUNDERLAND, C.A.C., *President*
MAJOR IRA A. CRUMP, O.D.
CAPTAIN H. C. MABBOTT, C.A.C.
CAPTAIN S. L. MCCROSKEY, C.A.C.
COLONEL J. C. OHNSTAD, C.A.C.
MAJOR J. D. MCCAIN, C.A.C.
CAPTAIN J. T. LEWIS, C.A.C.

Projects Completed During January-February, 1933

No. 936. Test of Firing Dynamo T1.—This was a hand operated dynamo which had for its object the firing of primers for seacoast artillery. This dynamo was tested by the Coast Artillery Board and found unsatisfactory. It was therefore recommended that the T1 Dynamo not be adopted and that no further tests be made of this dynamo.

No. 942. Firing Tests of Antiaircraft Director, T-8.—The T-8 Director is a development based on the Sperry Director M-2. It was given a firing test at Fort Monroe, Virginia. As a result of this test, the Coast Artillery Board recommended that (a) unless very definite results are shown in Project No. 886 (Comparative Test, A. A. Directors), further tests be conducted; (b) all directors be carefully checked before issue to insure that predictions are made in the proper direction; (c) the pointers of the tachometers be attached to their shafts firmly enough to prevent slipping; and (d) the action of the tripping levers of the tachometers be made more positive.

No. 949. Correction Device for Use on Panoramic Sight, M1917 (Featherston).—A design of the movable pointer to be attached to the 1917MII Panoramic Sight was tested by the Coast Artillery Board. The design was submitted by Lieutenant J. H. Featherston, 52d Coast Artillery. The Coast Artillery Board recommended certain mechanical modifications to the original design and further recommended that drawings and instructions for the construction of the attachment be supplied to local Ordnance officers in order that the device may be made locally upon requisition of battery commanders.

Projects Under Consideration

No. 608-A. "Duco" Surfacing for Guns.—Painting completed—report will be made about July 1, 1933.

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

No. 873. Service Test of Long Distance Seacoast Data Transmission System T-6.—Test completed—awaiting arrival of Major Cotter.

No. 874. Service Test of Seacoast Data Computor T-3.—Test completed—awaiting arrival of Major Cotter.

No. 886. Comparative Test of AA Directors (T-8; M-2; and M1A1 uncoupled).—Report in preparation—will probably be submitted within a few days.

No. 926. Test of Homelite Generating Unit (12 Volt, 600 Watt D.C.)—Awaiting receipt of material.

No. 927. Test of Radio Set, Type SCR-177.—Partial report submitted February 10th. Complete report is awaiting receipt of reports of test from Panama.

No. 929. Experimental Field Chronograph (Jackson).—The construction of the chronograph is about 75% completed. As now constituted the equipment will consist of three parts, a recording instrument (camera), a control box containing dry batteries, operating panel, etc., and a tripod. The control box is completed. The camera is practically completed except for final adjustments. The tripod is incomplete. Tests are now being made on the camera. The timing system is practically completed. It is proposed to make preliminary velocity tests at an early date, certainly before February 1st. It is probable that the equipment will be in such shape that actual velocity tests in comparison with standard chronograph may be made about March 1, 1933. A complete description of the apparatus cannot be given at this time as it is probable that modifications will have to be made as a result of preliminary tests.

No. 931. Test of Roller Bearing, 3″ Antiaircraft Gun Truck Mount T1.—No change.

No. 937. Test of Submarine Mine Equipment.—The four mines planted on January 31st are still in the water. The fuze of No. 8 mine (1930 circuit closer) had to be blown immediately after planting. Mines 9, 10 and 11 have functioned perfectly to this date.

No. 939. Blast Shields for 12-inch Barbette Carriage, M1917.—Awaiting receipt of replies to questionnaire.

No. 941. Markings for Projectiles and Storage Cases.—Tests at Fort Monroe completed.

No. 943. Service Test of Reel Unit, Type RL-26-T1.—Test completed. Report will probably be submitted during March.

No. 944. Water-Proofing of Battery DeRussy, Fort Monroe, Virginia.—Under test. Test delayed due to weather conditions.

No. 945. Chamber Swabbing Sponge T3, 12-inch.—Awaiting receipt of material.

No. 946. Test of Range and Height Finder T-12 for Use with Tractor Artillery.—Under test. Test about 80 per cent complete.

No. 947. Test of Oil Clothing for Use by Army Mine Planter Personnel.—Under test.

No. 950. Test of "Adlake" and "Yankee" Tail Lights for Use with Aiming Post M1.—Test completed—report in preparation.

No. 951. Proposed Instructions and Prescribed Ammunition Allowances for Coast Artillery Target Practices, Fiscal Year 1934.—Undergoing preparation—will probably be submitted within a few days.

No. 952. Photostating by the Photoflor Process.—Report will probably be submitted during the month of March.

No. 953. Radio Controlled High Speed Target.—Under study.

No. 954. Test of Modified Traversing Mechanisms for 10″ and 12″ D. C. Carriages and Modified Azimuth Pointer for 12″ D. C. Carriage.—Under test.

No. 955. Depression Angle Indicator for Use in Airplanes.—Under study.

The Coast Artillery*

Melody: *The Wearing of the Green*

Come all ye gunn-ers tried and true
Of Coast Ar-til-ler-y
The foe-men's ships thro seas of blue
Ride to their des-ti-ny.

When du-ty calls there is no choice
In north-'en land or south
In time of war the na-tion's voice
Speaks thro the can-non's mouth.

Our rail-road guns are stand-ing by
Our count-ry to de-fend
Our long range ri-fles e-ver cry
"To raid-ers we'll at-tend."

The hos-tile ships so strong and brave
Race o'er the brin-y deep
They'll find a grave be-neath the wave
For them e-ter-nal sleep.

How-ev-er late, our mine fields wait
The si-lent sub-ma-rines
With mines for bait, they tempt their fate
A-long our coast-al streams.

The bomb-er's whir like mus-ic sweet
Strikes thro the chill night air
Pre-pare to greet the air-borne fleet
While in the search-light's glare.

Sa-lute the planes, with speed and care
And high ex-plo-sive shell
Who an-ti-air-craft guns shall dare
Will crash the road to hell.

That cloud a-gainst the mid-night sky
Is smoke and poi-son gas
Tho fly-ing high they'll drop and die
Heed well "They shall not pass."

For those that die in bat-tle grim
Saint Pet-er will pro-vide
Their souls to heav-en ent-er in
What'er on earth be-tide.

Chorus

Old Glo-ry leads to vic-to-ry
On land and o'er the sea
From Coast to Coast join in the toast
The Coast Ar-til-ler-y.

L' Envoi

Our guns and gear, with pow-der near
Were not designed for play
We need more men, to care for them
And keep the rust a-way.

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PROFESSIONAL NOTES

Air Corps Materiel Developments in 1932

THE Coast Artillery (Antiaircraft) is vitally interested in the development of aviation materiel and the improvements accomplished in design and performance of aircraft. By the nature of our mission we are compelled to keep abreast with these developments in order to meet our "natural" enemies on even terms (or better).

The type of plane which concerns us mostly is the bombardment type. Next in order of importance is attack aviation. These two are the normal targets of our antiaircraft guns and machine guns, respectively. However, there is no type of aviation which, under certain circumstances, may not become the proper target for antiaircraft artillery. The design of our own materiel, our tactical training and the methods of employment of our weapons in time of war are dependent, in large part, on the limits and capabilites of military aviation.

In obtaining information of aviation developments we are greatly handicapped in the foreign field by the secrecy exercised by those governments. However, we have our own Air Corps available as a source of information. The cooperation between the Air Corps and Coast Artillery, which now exists 100 per cent, keeps us informed of the latest wrinkles and assists us not only to meet our present problems but to anticipate those of the future. If we can make the grade against our own Air Corps, acting as our temporary enemies, there is no reason to worry concerning what foreign air forces may spring on us when we meet them.

In this connection it is believed desirable to publish in the JOURNAL extracts from an excellent article by Major C. W. Howard, Air Corps, which appears in an issue of the *Air Corps News Letter,* concerning Air Corps developments during the year 1932. Major Howard is chief of the Engineering Section, Materiel Division, Army Air Corps. In his article he omits, naturally, reference to devolpments which are of a secret and confidential nature but the article as published gives an excellent picture of general developments up to 1933 and enables us to anticipate the trend of future developments.

"A brief explanation of the duties and activities of the Engineering Section, Materiel Division of the Air Corps may be of interest. The annual appropriations for the Air Corps provide approximately $1,500,000 for the purchase of experimental and service test equipment and from the funds that are allotted for payroll purposes the Engineering Section is allotted approximately $900,000 for the salaries of the engineering and administrative personnel. The activities of the engineering personnel are largely directed to plans, preliminary designs, testing, and the details of engineering administration in connection with the development and construction of new types, and the improvement of existing airplanes, engines, and the numerous accessories that are obtained from the industry. Research and experimentation carried on are confined to projects that are not covered by the aircraft manufacturers or other government laboratories.

"In the expenditure of both cash and labor the Materiel Division, and in turn the Engineering Section, is guided by an experimental program which is first prepared and submitted to the Chief of the Budget by the Air Corps as supporting data for the annual estimates. The program receives the approval of the Chief of the Air Corps. In addition to the experimental and research program, directives are published at the Materiel Division after approval of the Chief of the Air Corps. The directives contain the general requirements in non-technical language of the new types of airplanes that are to be developed. The requirements are set up by a board of officers appointed by the Chief of the Air Corps for each specific type. The members of this board are selected from the personnel of the Office, Chief of Air Corps, tactical organizations, and the Materiel Division. The current directive for Tactical Types provide for the following: Corps Observation Airplane, Army Observation Airplane, Light Multi-motored Bombardment Airplane, Heavy Bomber, Attack Airplane, and Pursuit Airplane. Tests conducted during the past year for the various types resulted as follows: (See frontispiece):

"*For the Army Observation* service test quantities of the O-35 (Douglas) and the O-27, maufactured by the General Aviation Corporation are being delivered to the activities that have been designated for their service test. The high speed of the YO-27 has been appreciably increased. The O-35 for service testing has undergone only the usual refinements of an experimental article that goes into service test design. The continued development of this type of observation airplane will depend largely upon the experience of the tactical units in which it is tested. Both of these types are equipped with retractable landing gears. There have been a number of instances of landings with the wheels up. The damage has been slight but has led to experiments on positive methods of warning the pilot of the position of the wheels.

Light Bombardment. Development of the Light Bombardment Airplane has resulted in procurement of a service test quantity of the B-7, manufactured by the Douglas Company. The experimental model

designed and constructed by the Glenn L. Martin Company was submitted to the Division for test but was returned to the manufacturer for alteration and improvement. It has been resubmitted as a heavy bomber and its performance greatly exceeds the requirements of the directive for both types of bombardment airplanes.

"*Heavy Bombardment.* The service test articles of the Heavy Bombardment type B-9, manufactured by the Boeing Airplane Company, are now being delivered. This airplane represents a marked improvement, from a structural and maintenance standpoint, over the first articles that were received at the Division. The use of a geared engine has been definitely proved to be advantageous for airplanes of this class. For example, flight tests of the Curtiss B-2 airplane with direct drive, a 7:5 reduction gear, and 2:1 reduction gear for the propeller indicated an increase in high speed of approximately 20 miles per hour for the 2:1 gear over the direct drive.

One of the original experimental models of the B-9 (Boeing) is being equipped with a V-1570-F (Curtiss) engine and supercharger. The exhaust-driven supercharger improves performance above 20,000 feet, but it is questionable whether this type of installation is justified from a tactical standpoint.

"*Attack:* The YA-8 Attack airplanes, manufactured by the Curtiss Company, are now undergoing service test at Fort Crockett. Preliminary reports indicate that the requirements for the Attack type have not been met. The Division now is conducting tests on the YA-10 (Curtiss) which is simply a YA-8 equipped with a Pratt & Whitney Hornet (R-1690) engine, instead of a Curtiss V-1570-F. Performance estimates indicated that the difference in speed would be negligible by this engine change and that there would be certain advantages in the take-off characteristics. Actual flight tests have revealed the air-cooled engine installation results in a loss of 12 miles per hour in speed; although the take-off characteristics are greatly improved. The difference in speeds of YA-10 and XA-8 amounts to 25 m.p.h. One of the service test articles is now under test powered with a GIV-1570 geared Conqueror (Curtiss) engine. This increases the weight with some improvement in high speed and marked improvement in take-off characteristics.

"*Pursuit:* The P-26 has passed through the service test stage, and is now ready for procurement as a standard type. The P-26, built by the Boeing Company, has a high speed that meets the Directive requirements specified for the maneuverable type at the time this airplane was laid down. The XP-934, built by the Curtiss Company, recently arrived at the Materiel Division. This airplane is designed primarily for high speed at low altitude. An air-cooled engine installation was made at the plant of the manufacturer but failed to give the desired performance.

"There have been various preliminary designs submitted by manufacturers of airplanes to meet the high speed at low altitude requirement based on the results obtained on the small high speed air-cooled types such as were used in the National Air Races. In general, however, the Division will not encourage manufacturers to lay down new types until high high-powered engines now in experimental stages have been proved to meet military requirements. Preliminary designs and calculated performance on a considerable number of combinations of airplanes and engines are under way.

"During the past year a great deal of sentiment has crystallized in the Air Corps towards the substitution of air-cooled power plants in practically all existing types that are now in the experimental and service test stages. In view of this it is desired to set forth a few of the principles based upon which the continued development of the liquid-cooled engine is considered to be necessary and expedient.

"The variables which enter into the design problems of airplanes and affect performance are power, weight, drag, and wing efficiency. The power plant design affects directly three out of four of the above variables. The power plant and its accessories actually represent a greater percentage of the total weight of the modern airplane than the airplane structure, including the fuselage, wings, landing gear, and permanent installations. The criteria upon which the relative usefulness of military power plants are based include, in the order of their importance, weight per horse power, specific fuel consumption, and reliability. To compare the liquid-cooled with the air-cooled engine, one should first take into consideration the prerequisites for engines of the present power class used in military aircraft. The air-cooled engine is superior from the standpoint of weight per horsepower and reliability. With respect to streamline installations and fuel consumption, the liquid-cooled engine ranks at present with the air-cooled engine. However, new developments in the air-cooled field make possible a lower fuel consumption than that of any conventional liquid-cooled engine. The ring cowl on some air-cooled installations has reduced the drag to equal that of the best liquid-cooled installations, even taking into consideration the savings obtained through the use of Ethyl Glycol as coolant.

"Experience has shown, however, that the interference effects in high speed airplanes are so great that the best designs come from the designer who has the faculty of foreseeing interference and inter-effects and is able to produce the best compromise of the characteristics desired. A maze of conflicting information has resulted from the studies at the Division and from data obtained from actual flight tests. In some instances, the same airplane (such as the BO9), flown under identical conditions with air-cooled and liquid-cooled engines, has shown superior performance with the air-cooled engine. In other instances, notably with Attack airplanes, the reverse is true. However, from the developments of the last year it can be concluded that for engines of the 600-h.p. class, the air-cooled engine can be used in the military airplane to better advantage than the liquid-cooled engine, and with a gain in reliability. At present one exception

is the V-1570 (Curtiss liquid-cooled) with a side type or centrifugal type of supercharger. This type of supercharger has distinct advantages over the gear-driven supercharger which is used in all conventional air-cooled engines. These advantages result in performance above 20,000 feet far in advance of those that have been obtained with the air-cooled engine. The P-6D airplane, for instance, at 20,000 feet, with this equipment had a high speed in excess of 200 miles per hour; and the P-6D is a 1925 airplane.

"In considering engines of the 1000 h.p. class for military airplanes, we should consider precedent and experience abroad in like developments. There are now a number of examples of liquid-cooled engines of the 1000 h.p. class developed for racing purposes. The air-cooled engine has yet to prove itself in the larger units. It is well known that there is a limiting cylinder size for an efficient power output. This applies especially to air-cooled radial designs, and the present displacement of 1800 cu. in. for a 9-cylinder radial engine appears to be approximately the limit. Or, in other words, the air-cooled cylinder is limited to about 200 cu. in. With the liquid-cooled engine it is possible to increase the displacement by increasing the number of cylinders, but for radial air-cooled types this is limited by the cooling problem. At present manufacturers are working with the two-row radial. This development shows considerable promise.

"The relative weights of the liquid-cooled and air-cooled engines with increased power and displacement should be practically the same as those of the smaller units. It can be concluded, therefore, that the question of cooling is the obstacle which in the light of present knowledge prevents the practical realization of air-cooled radial type engines in power units of more than 600 h.p.

"The problem of reduction gears for both air-cooled and liquid-cooled engines is slowly correlated with propeller design. The three-bladed propeller has proved to be a distinct advantage for many installations. It is a simple means of reducing propeller tip speeds. Also a propeller of small diameter makes it much simpler for the airplane designer to provide for proper clearance between the ground and the propeller, and allows the engines to be placed further inboard, thereby improving, in many cases, the aerodynamic characteristics and structure of the airplane. There are three types of controllable propellers in service test. The controllable pitch propeller has two applications; one for improving the take-off of heavily loaded airplanes, which with a fixed propeller requires a compromise between the take-off and high speed characteristics; the other for permitting the most efficient angle of propeller setting at all altitudes where supercharging is used.

"The problem of silencing aircraft in flight involves two major elements—the propeller and the exhaust. Silencing can be accomplished through the propeller by special design, and reduction gears for the engine. It has been found that above certain critical tip speeds the intensity of sound increases very rapidly. This has led to the design of broader blades and the use of three blades as means of decreasing diameter. In each instance special attention has been paid to the shape of the tip. Long narrow tips give higher efficiency but this will have to be sacrificed for silent operation. The controllable pitch propeller is a simple means of reducing the sound, since the r.p.m. can be reduced by increasing the pitch when in flight. The matter of silencing by means of exhaust mufflers is more troublesome. The use of mufflers results in loss of speed and means added weight. Also, long exhaust stacks have for many years been considered one of the principal sources of fires. This is simply another case where new demands have made it necessary to effect compromises.

"Experimentation with instruments and radio aids to navigation has resulted in the development of the radio compass, Type E-4, now in service test status; the flight indicator, Type C-1; turn indicator, Type A-1 (artificial horizon); and directional gyroscope now ready for standardization. The problems of blind flying involve experimentation in the highly specialized fields of radio communication devices and flight instruments. These involve the development of equipment for both aircraft and ground installations. The work of the Division, which has been directed to three systems, has extended over a period of four years and has resulted in the design, construction, and test of both radio and mechanical devices, some of which performed satisfactorily from a purely laboratory standpoint, but were either too complicated, too delicate, or too heavy for military use. As an example, a French system of underground cables which marked the boundary of the landing field both in horizontal and vertical dimensions was tried out on a miniature scale installation. It was found that not only the special equipment required for installation in the airplane was too heavy, but that the adoption of a cable system for emergency airdromes in war times would be of questionable use in view of the difficulties in transporting and installing cables. Another system utilized the airways radio beacon to guide the pilot to the airdrome and a portable direction beacon to show the direction for landing, together with instruments that had been developed primarily for avigation. The aim in these developments was to utilize instruments for installation in the airplane that could also be used for flight aids under normal conditions. The ground installations must be portable, light, and simple to set up, install and operate. This had led to the substitution of the Radio Compass and two small radio transmitters for the airways and portable directional beacons. This latter principle was demonstrated to be practical. The apparatus that was installed in the airplane consisted only of the radio compass, flight indicator, (gyro horizon), turn indicator, (gyro compass), sensitive altimeter, airspeed indicator, and the usual engine instruments. For the ground installation a small transmitter was used at the end of the landing runway in the vicinity of the boundary, or a little beyond; a similar transmitter was located

one or two miles farther away in prolongation of a line drawn through a point in the landing area and the transmitter near the boundary of the area. In the use of this system for blind landings the pilot is directed to the approximate position of the airdrome by radio compass if there is a broadcasting station in the vicinity; if not, by the magnetic compass and dead reckoning. Upon nearing the airdrome the pilot tunes the radio compass in on the field localizer transmitter nearest the boundary of the landing area. When the airplane passes over this point on the ground, the indicator of the compass oscillates from one side to the other. The pilot then tunes the radio compass to the second transmitter. This is accomplished by simply a flip of the tuner. The airplane now can be headed along the reverse bearing of the landing direction. Upon crossing the outer station a 180-degrees turn is made by the use of the turn indicator at an altitude of 500 feet. The airplane is placed in a gradual power glide headed towards the transmitter nearest the boundary line (Station No. 1) of the landing area. An altitude of at least 150 feet above the ground, indicated by the sensitive altimeter, is maintained until the boundary transmitter is crossed. The engine r.p.m. is then set so that an airspeed of about ten miles above the stalling speed of the airplane is maintained in the position of level flight. The rate of descent should then be about 300 or 400 feet per minute, which is readily indicated on the sensitive altimeter.

"It should be understood that the radio compass is an accessory to the conventional radio installations and therefore two-way communication is possible between the ground and the pilot where the airplane is equipped with two-way radio. In such cases the pilot can determine the exact setting of the sensitive altimeter to show the barometric height of the landing field. The sensitive altimeter is subject to errors as a result in changes of the atmospheric pressure. Under ordinary conditions errors from this source will not exceed 40 feet. In case the barometric altitude of the landing field cannot be determined by the operator of the ground stations, a safe blind landing can be made by simply locating the two markers or field localizers in such a position that an error of a hundred feet can be made in the altitude at which the airplane crosses the boundary transmitter. The pilot must know the actual height of the landing area above sea level.

"In summarizing the engineering accomplishments for the past year, the development of the P-26 airplane to a stage where it is now ready for production will place the Air Corps in a secure position in relation to performance judging from what we know of developments of this type abroad. For bombardment the B-9 (Boeing) and the XB-907 (Glenn L. Martin) are ready for production and occupy even a higher position on the scale of comparative performances. However, it is anticipated that there will be additional engineering required before they will be accepted by the tactical organization as enthusiastically as the Pursuit type. The O-31 (Douglas) and the O-40 (Curtiss) are faster than any Observation types in a like stage of development. The P-25 (Consolidated) shows great promise.

"It is believed that the urgency of replacement of standard types will be the justification for the procurement of existing attack airplanes rather than the merit of the present type. For a light Bombardment airplane the B-7 (Douglas) is considered satisfactory, from an engineering standpoint, for the purpose of determining the usefulness of this specific type from a tactical standpoint.

"As it now appears there will be no outstanding increases in performance or changes in design during 1933, since the step taken in adopting the metal monocoque and low wing monoplane was a long one, and for engineering and economical reasons it will be well to continue these new types in production for some time."

The Reserve Officer in the Regular Unit

By Captain Harold B. Bliss, Coast Artillery Corps

EDITOR'S NOTE: *Quite a long time ago something was said in the pages of the* JOURNAL *of the dissatisfaction which many Reserve officers felt over assignment to an active regiment of the Regular Army. A number of these officers complained that assignment to one of these units was less desirable than assignment to a Reserve unit. They stated that they felt altogether out of the picture; that little or no interest was taken in their affairs; that they failed to receive information which was important to them; that they had trouble in getting their extension course lessons corrected; that even where active duty training was concerned they had to make individual inquiry as to the dates and availability of such training. In other words, they were treated like stepchildren.*

It is certain that this condition does not exist in every Regular Army regiment having Reserve Officers assigned to it. Since publishing this article our attention has been called to the activities of the 6th Coast Artillery, in the Harbor Defenses of San Francisco, which has Reserve Officers assigned and knows how to take care of them. Our attention was first attracted to this regiment by reading a bulletin which we received regularly, setting forth and describing various activities conducted for the benefit of Reserve officers and for the purpose of assisting them in their training as well as giving them the idea that they actually belonged. We wrote to Colonel E. D'A. Pearce commanding the 6th Coast Artillery. for a description of the system used in that regiment. He designated Captain Harold B. Bliss to write the article which appears below.

LAST year the 9th Corps Area led all the other Corps Areas in hours of Extension School Courses, the record attained being 58.17 hours per student.

The 6th Coast Artillery, with 20 Reserve officers assigned, not only led the other Regular Army units but also all of the 16 Reserve units of the Corps Area, attaining the enviable record of 86.8 hours per officer. This attainment of the 6th was a big factor in placing the Corps Area at the top of the list as the 8th Corps Area was a close second with 55.27 hours to its credit.

The success of the 6th Coast Artillery was largely due to the interest exhibited by the District Commander, Brigadier General James H. Reeves, and the Regimental Commander, Colonel E. D'A. Pearce, and

the close co-operation they gave to the Regimental Unit Instructor, Captain Harold S. Johnson, whose initiative, resourcefulness, and close personal contact with the Reserve officers reaped the merited reward.

It must be recognized that the mission of the Regular Army today in peace time is primarily one of instruction and training of the other components of the Army, the National Guard, the Organized Reserve Corps, and the sources from which the man power of the Army will be drawn in future emergencies, the Senior and Junior R.O.T.C. units and the C.M.T.C. units.

If this function is fully recognized then it becomes the duty of each regimental commander to efficiently train the Reserve officers assigned to his command as well as the Regular officers of his command.

It is further his duty to insure the training of the enlisted personnel of his command and likewise the training of any C.M.T.C. units which come under his jurisdiction, this training to extend beyond the period of the month's encampment of the C.M.T.C. and to other civilians desirous of training and who are potential officer material.

The 6th Coast Artillery Extension School is organized with a view to instructing and training civilian applicants having necessary qualificatons as well as the Reserve officers assigned to the regiment. From the membership of the school as well as from R.O.T.C. and C.M.T.C. may be drawn Reserve officers for assignment to the 6th or to other units of the Corps Area.

The success of the 6th Coast Artillery Extension School results from arousing and holding the interest of the Reserve officers of the 6th—in building up a high esprit. The Reserve officers are made to feel that they are just as much a part of the regiment as if they were on active duty with the regiment twelve months of the year instead of a possible two weeks of the year.

The officers and their wives are welcomed to all the post activities of the regiment and it is extremely gratifying to note the interest they show in these functions.

Monthly stag dinners are held at some club or hotel in San Francisco where the Regular and Reserve officers of the regiment meet in good fellowship and discuss topics of common interest.

When on active duty with the regiment they are assigned to a battery for training, and a definite program is laid out intended to give them the maximum experience in the limited period of active service. They take up their duties just as any regular officer and the battery officers are required to assist them and instruct them. It is not a case of buck passing and handing out the niggardly duties to the "Reserves" as, unfortunately, often exists in some regiments. Instead a mutual understanding and co-operativeness exists.

In their inactive training they are encouraged by personal contact with the Unit Instructor, by personal letters of encouragement, by prompt correction of their written work, with helpful comment when necessary.

They are kept in close contact with the post life and activities through the medium of a monthly bulletin. This bulletin contains digests of current events, articles of a military nature, activities of the active units of the regiment, changes in officer personnel, accomplishments of reserve officers, etc.

A further feature of this bulletin and an important one is that it fosters a spirit of competition with the Regular Army units as well as the Reserve units of the Corps Area as to subcourse accomplishments.

Monthly standings of all the regiments are published and individuals are kept advised of the standing of their particular regiment in competition with all the others.

Reserve officers throughout the country have the same characteristics. They are fascinated by the appeal of the military. They are patriotic young men. They, however, have civilian interests and pursuits and unless their interest in the military is maintained and nurtured it rapidly wanes and the completion of subcourses becomes a drudgery. Make them feel that they are a part of the regiment, attain and maintain a high esprit and results will follow.

The JOURNAL salutes Captain Thomas R. Phillips for his article in the *Saturday Evening Post* of March 4

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 O. L. SPILLER
MAJOR J. H. COCHRAN

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

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

Antiaircraft-Air Corps Exercises at Fort Knox

THE Commanding General, Fifth Corps Area, has published, in final form, the plans for the Antiaircraft-Air Corps exercises to be held at Fort Knox, Kentucky, during the period May 15-27. They will be preceded by a preliminary training period of approximately three weeks during which the Air Corps will fly over the area to be covered by the regulating station and the intelligence net thereby giving pilots and observers an opportunity to familiarize themselves with the terrain in the immediate vicinity of the objective and with the routes of approach thereto. At the same time they will give the antiaircraft troops on the ground an opportunity to familiarize themselves with the types of planes which will be used with the formations and the methods of attack which will be employed in the exercise proper.

The Air Corps will start their preliminary training at Patterson Field about April 5. The Coast Artillery will start its training about April 25. The 1st Signal Company, Fort Monmouth, New Jersey, will start the installation of the communication system to be used in the intelligence net about May 1.

The exercise proper will be conducted in two phases. In the first, the intelligence net extending to a distance of 100 miles from Fort Knox will be in operation. It is expected that the funds for the maintenance of this net will be sufficient to keep it in operation for about one week only. During the second phase of the exercise the net will not be in operation. This will necessitate the use of some artificial warning system to give advance notice to the defending pursuit aviation of the approach of the bombardment. All details as to personnel have been completed so as to provide a staff for the Director, the Commanding General of the attacking aviation and the Commanding General of the attack forces. These staffs consist of Air Corps, Coast Artillery, Signal Corps and Chemical Warfare officers, in addition to the post staff at Fort Knox which will assist the Commanding General of the defense forces.

A great many experimental methods will be tried out by both the attacking and defending forces. These will include experimental formations for attack aviation in approaching the target to drop bombs over the objective and in maneuvering away from the objective so as to minimize the effect of antiaircraft gun fire. Similar maneuvers will be practiced at night to avoid detection by the sound locators and illumination by searchlights. Attack aviation will be employed in conjunction with bombardment to harass all elements of the ground defenses and to minimize their fire effect against bombers. Attack aviation alone will be used against the objective with a view to determining to what extent machine guns will be able to deliver fire upon it. Smoke screens will be laid from the air to blind the observing instruments of the gun batteries and the gunners of the antiaircraft machine gun batteries. Camouflage will be used by the antiaircraft batteries to conceal their positions.

Intelligence net communications will be principally telephone but a limited amount of radio and commercial telegraph will be used to test the possibility of using those means in war time. The use of commercial telephone systems both by leased wires and toll calls over local lines should give some valuable information as to the efficiency of such a system when being operated by civilians in war time.

A number of Quartermaster vehicles of various experimental types have been assigned to the 62d. These vehicles will make the trip from Fort Totten to Fort Knox and return with the 62d and during the exercises will be assigned for use by all antiaircraft troops. This practical field test will develop additional

important information as to the type of vehicles best suited for antiaircraft artillery.

Arrangements are being made to assign reserve officers to important positions on active duty pay. The observation squadron which is to be employed in conjunction with the defending pursuit will be manned entirely by reserve officers.

A great many of the observation posts in the intelligence net will be manned by infantry personnel from Fort Benjamin Harrison, Indiana, and Fort Thomas, Kentucky.

The members of the board which drew up these exercises are either on the staff of the director or on the staff of the commanding general.

Lt. Col. J. A. Green, 61st C. A. (AA), Fort Sheridan, who will command the intelligence net, will write a report on the operation of the intelligence net for publication in the JOURNAL after the exercises are completed.

Fort MacArthur

FORT MACARTHUR has been very much in the lime light lately, what with the Los Angeles earthquake and all. Major H. A. Pierce reports that the quarters at MacArthur were shaken just as a terrier shakes a rat and caused everyone in the garrison to take to the wide open spaces. Outside of a few broken dishes (what a chance for the supply sergeant to get even) no damage was done and everyone sneaked back and pretended that he hadn't been scared. The whole thing was treated as a joke until reports began to arrive from Long Beach telling of the death, disaster and destruction which had taken place there and calling for aid from the troops. From that point on the Coast Artillery ceased to laugh at being scared and went into action.

You may have read in the papers that the Marines had everything in hand but it was the Coast Artillery that were first on the job.

Major Pierce says:

"By 8:30 P. M. a relief detachment composed of 5 officers including Capt. Ben Blair, Capt. Chauncey Gillette, Lt. Lee Donson, Lt. J. C. Reynolds and 67 men accompanied by Lt. Col. C. W. McMillan, Med. Corps, and 4 Corps men, was on the road mounted on trucks and headed for Long Beach.

"After reporting at Police Headquarters in Long Beach, this detachment was assigned and proceeded to Compton where destruction was, perhaps, the worst of the entire devastated area compared to its size.

"During the night and continuously until 10:30 the following day when additional guards were obtained from the Navy, the Police and the American Legion, this detachment did guard duty in and around the danger zone to prevent persons from entering toppling structures and to prevent looting. As organized relief made itself felt, and as Ft. MacArthur had been left nearly manless, the employment of our soldiers became less necessary and at 5 P. M. on the 11th, the detachment had returned to Ft. MacArthur.

"Relief work by Army personnel was not, however, at an end for during the week following officers, men and trucks worked overtime, generally, it seemed, during the night-time to deliver where needed, tents, cots, mattresses, blankets, field ranges, etc. One tent camp of 78 pyramidal tents was established at Recreation Park, Long Beach on March 14, and our personnel was employed there during the following days in running it for the benefit of refugees whose homes had been demolished.

"By March 17, the emergency, as such, seemed to be pretty well in hand by the civil authorities and steps were started to withdraw military personnel and equipment."

Fort MacArthur publishes a live wire, breezy, mimeographed sheet called *Ye Ole Megaphone* for which the pressure is furnished by Sergeant Major Kieve. The last number contains a description of the annual march of the 63d and is well worth repeating. It appears that the regiment takes its work seriously and has a good time doing it. Here is the story, with side lights:

"As Ed Wynne would say to Graham, 'The 4th Annual Tactical March was *different.*' In a slight fog, the regiment moved out of the post, Thursday, March 2d, at about 7:30 A. M., making San Clemente, the first stop, for lunch—about 54 miles. A dark night, a quiet town and so to sleep. But alas! A rude awakening about 1:10 A. M.! What's up! Why, a night hike. So, on to San Diego, tarrying for breakfast near Rose Canyon Junction. Then into Camp Balboa close by the open air organ and bandstand in Balboa Park. Passed there the week-end and enjoyed the true San Diego hospitality as furnished by the Army and Navy Y.M.C.A., the 251st Coast Artillery, California National Guard, and lastly but by no means least—Captain Charles F. McManus, 63d CA (AA)-Reserve, the manager of the San Diego Fox-Orpheum Theatre. Through the kind offices of Mr. Eddy, Social and Religious Director, free baths, towels and soap were furnished each and every 63d member who applied. The Guard invited the regiment to their regimental championship basketball game and dance which followed and otherwise displayed a friendliness which will always be remembered! And our own Captain McManus declared 'open house' to the 63d to any performance during our stay.

"Broke camp early Monday, the 6th, getting out on US 80 for our third stop—Pine Valley—but 47 miles distant, but some 4,100 feet above sea level. Warm and dry by day, but 25 degrees above in the early morn—necessitating the draining of all radiators. The next day's march on El Centro (74 miles), proved an interesting trip down the mountain sides—so many different types of stone and granite formations. Not over 10 miles between San Diego and El Centro are under reconstruction. The rest is Class 'A,' from plus 4,100 ft. to minus 56 ft. below sea level into El Centro brought us into the heat zone, but four blankets over you at night didn't make you perspire as it drops to about 50 degrees at this season of the year.

Well we moved into the city park—a lawn, shade trees, benches, lunch tables and all that sort of thing—with the truck park in the adjoining auto camp. Tactical problems Wednesday, Thursday and Friday mornings, with band concerts on Wednesday and Thursday P. M's. The Wednesday program, with Lt. Weible, announcing and Mr. Resta conducting was broadcast over KXJ the Imperial Valley Station, right from the park via remote. Band well received on both occasions. Calexico, some 11 miles to the south, proved to be the spot of interest, i. e. 'baja,' Calexico, but then we'll soon have our own. Truly a wonderful camp. Came 5:55 P. M., Friday evening, March 10, and we felt a fairly good shake. The regimental bulletin board, hanging loosely by one nail from a tree, rocked like a pendulum. Nobody gave a thought as to what was happening elsewhere. Quite a few were near the environs of Calexico when the word was spread by our officers that martial law had been declared in L.A., and that we'd break camp immediately and march on the stricken area. This was about 8:10 P. M. At 9:15 P. M., the fast column, minus the guns, under Major French 'went to town' making the first roadside halt in Brawley, when and where it was first hinted that we might not go straight in. After policing the camp and loading everything the slow column pulled out of El Centro at about 10:15 P. M. Meanwhile, the prime movers did an about-face going to El Centro for the guns. The searchlights with the advance detachment proceeded to Westmoreland. S-1 and S-4 then set out for Coachella, (84 miles from El Centro), at Union oil gasing station, where (later) all of our rolling equipment filed by to be gased, anywhere from 2:00 to 5:00 A. M. Arriving at the outskirts of Indio, (87 miles from El Centro), the camp site right off the main highway was spotted and the camp laid out. The chief of police, Indio, was 'looking' for our C.O. to stand by for a long distance phone call. 'Adhere to your original schedule'—Not needed in Long Beach—Navy has situation in hand. All of which meant that as good soldiers we would obey orders. The one chance for the 63d to render some real service in a crisis—blown! Would the 'Amor Patraie' ever be able to live it down, was the topic of discussion amongst the troopers. During the night word had been received from Ft. MacArthur that everything and everybody at or nearby the post was okay, which brought a sign of relief from all of the married personnel. Daylight and Saturday, warm and calm. Nothing else to do but to rear back and like it. A Major Hayes, World War veteran, showed his hospitality to the regiment. The owner of both date palms and grapefruit groves, Major Hayes permitted a detail to pick grapefruit, load it on a GMC and bring it into camp with his compliments. What a treat. Sunday was plenty different. A healthy wind which grew into a raging 40-mile sandstorm penetrated the camp practically the entire day and night. With all, the tents stayed up, but those who could, slept in their trucks or cars to no little advantage. Supper was hard to serve, and breakfast on Monday was even worse on account of the sand. A 27-mile jog off the main highway (99) took us into the ritzy Palm Springs, where, a mile from the heart of town, we pitched camp on another sandpile, but this time, it was calm. Sensing our feelings, the manager of the Tahquitz Hotel, an ex-1st Sergeant, provided showers and the use of the plunge for all who applied. The band, with Tech. Sgt. Ernest Gentile, assistant leader, conducting, rendered a splendid concert on the school premises with a flag-lowering ceremony.

"Came Tuesday morn—14th. Off for Redlands—45 miles and back on US 99. A fairly nice camp site. Got in for dinner. Camp all made. Well, life in the Army, sometimes, is bound to be like that. So all the nice oranges donated by some patriotic grower in Redlands, were loaded aboard, and the last 87 mile leg of the journey was started. The last elements of the slow column arrived back at the post after 12 midnight, the 15th, so that fourteen calendar days were consumed as laid down for such hikes. A good policing, a good sleep, and the 63d was ready to roll again. Which means we may expect to move out on or about March 22 or 23 for an as yet unannounced destination where we may expect to pitch camp and 'pull' a problem as part of our annual tactical inspection by the Corps Area Commander."

Coast Artillery Wants a Song

IT HAS long been felt that the Coast Artillery Corps should officially adopt a song dedicated to that arm. Many attempts have been made to compose a suitable song for the Coast Artillery, but unfortunately these efforts were based on the conditions existing at the moment; when conditions changed they were relegated to the discard. Also, these efforts, while commendable and noteworthy, failed to catch and hold popular fancy and favor. Believing that in this respect the Coast Artillery should be on an equal footing with some of the other arms of the service which have adopted songs, and in order to stimulate competition, the Coast Artillery Association has decided to offer cash prizes for the lyrics and the music. Believing that it is easier to adapt the music to the words, rather than vice versa, the question of selecting the lyrics will be disposed of first. The theme should fulfill the following general requirements:

a. It should be inspiring.

b. It should not apply solely to the conditions of the moment but should be of general application.

c. It should portray the activities of the Coast Artillery Corps in any or all of its phases.

d. The words should be such that they can be adapted to a martial air as distinguished from the popular jazz music.

No entries are barred. Those who desire to enter the contest should send their entries, without name or other identifying mark on the manuscript, to the Editor of the COAST ARTILLERY JOURNAL who will then affix a suitable identifying mark, but the author-

ship will remain unknown until the judges have made the award. This will obviate any possibility of personal favoritism. There is no objection to any contestant submitting two or more compositions.

Here is the best part of all—to the winner of the contest, the Coast Artillery Association will pay a cash award of fifty dollars ($50.00).

The method to be employed in selecting the best composition has not yet been definitely decided. Several schemes have been proposed, one of which is that the final selection will be made by popular vote from the five best compositions as selected by a board of disinterested officers.

After the selection of the lyrics, an additional award of fifty dollars ($50.00) will be made for the best musical adaptation.

All compositions must be in the office of the Editor of the COAST ARTILLERY JOURNAL not later than October 15, 1933.

Patent Granted on Single Conductor Mine System

THE issue on March 14, 1933, of Letter of Patent No. 1901185 for the single conductor mine system again recalls the distinctive and outstanding service rendered by the late Master Sergeant Paul R. Nelson who spent the latter years of his life in designing and perfecting this system. Sergeant Nelson assigned the patent to the Secretary of War who received it on behalf of the Government of the United States. The Secretary (then the Honorable Dwight F. Davis) commended Master Sergeant Nelson for his accomplishment and his unselfish assignment of the patent to the United States.

The invention of Sergeant Nelson saved the Government a stupendous amount of money in the purchase of submarine mine cable alone. Prior to the adoption of his system our submarine mine defense depended upon the use of multiple (19) conductor cable. Not only was the 19 conductor cable more expensive but it deteriorated fast in use and storage and was otherwise unsatisfactory. Furthermore it was difficult to obtain in an emergency since it was not produced for commercial purposes and had to be specially manufactured.

It is estimated that the saving effected by the use of the single conductor system will amount to approximately a million dollars in peace time alone. In time of war the saving would be considerably greater depending upon the number of our harbors which would be mined. In time of war it is not inconceivable that a proper submarine mine defense of some of our important harbors might not be possible if we were still dependent on the multiple conductor cable. If an enemy were to gain a foothold in one of our principal harbors it is possible that such an advantage would cause our defeat. The importance of Sergeant Nelson's invention may be realized when these possibilities are taken into consideration.

It is a sad fact that Sergeant Nelson never lived to see the patent issued for the invention on which he spent so many years of his life. However, he did live to see his system installed in one of our harbor defenses and his dream was realized when the system was subjected to severe tests and approved by the Chief of Coast Artillery as the *standard* mine system. Let others worry about patents.

The satisfaction which comes to genius is in the accomplishment itself and does not take into account material rewards. Often these go to others. So it was with Sergeant Nelson. He never received any emolument for the great service he rendered his government and he could have used it well. He died leaving a widow none too well provided for and hoping that a grateful government would pass such monetary reward to her as would enable her to live in comfort after he was gone.

Master Sergeant Paul R. Nelson.

Prior to his death General Hero, when Chief of Coast Artillery, initiated correspondence with a view to giving Sergeant Nelson something more substantial than commendation. General Gulick, the present Chief, has interested himself actively along the same line and since Sergeant Nelson's death his efforts have been redoubled. As a result Congressman Withrow of Wisconsin introduced a bill in the last Congress granting Mrs. Nelson a pension in recognition of Sergeant Nelson's important contribution to the Government but it died in the House. It is understood that Mr. Withrow will reintroduce the bill in the present Congress.

Atlanta Reserve Notes

THE Coast Artillery Reserve interest in Atlanta has taken quite a spurt recently. This is due not only to the initiative of the reserve officers themselves but to the quality of the ration which is being served by the Unit Instructor. The proximity of the 69th Coast Artillery (Antiaircraft) to Atlanta offers an opportunity to utilize the services of some of these field soldiers in reserve instruction.

In addition to the regular school meetings twice a month, the artillery reserve officers of Atlanta have

one meeting monthly, as a get-together. At these meetings a qualified speaker is on hand. On February 23 Captain E. S. Cowan, 69th Coast Artillery (AA) talked on Materiel and Tactics of the Searchlight Battery. On March 9 Captain W. L. Claxton, 69th Coast Artillery (AA) talked on Materiel and Tactics of the Machine Gun Battery. On March 23 Captain H. A. McMorrow, 69th Coast Artillery (AA) spoke on Materiel and Tactics of the Gun Battery. The final talk will be on April 6 and will be an illustrative problem on the Tactical Employment of an Antiaircraft Regiment. Major J. L. Scott of the 69th will be the guest speaker of the evening.

Some diversity in reserve training is highly desirable. The procurement of guest speakers is an excellent way to obtain this diversity and the opportunity exists at all reserve headquarters. At some places it is possible to secure Naval officers who can give the Navy slant on our Coast Artillery missions. Perhaps an Air Corps officer is convenient who can tell the Antiaircraft officers how the Air Corps looks upon the antiaircraft guns. Reserve officers appreciate talks of this kind and if their interest is to be maintained they must feel that they are getting something worth while.

San Francisco Chapter, Coast Artillery Association, Holds Meeting

THE most enjoyable and attractive meeting yet held by this chapter was in charge of the officers at Fort Scott, February 23. As guests of the Regular Army component, members of the association representing the National Guard and Organized Reserve were royally entertained. Warned in advance that the dinner would be strictly a "soldier's meal," all the guests brought along spare appetites so as to get in on the "seconds." And there were seconds—and thirds if desired. Never before were ham and beans prepared with such excellent taste. The dinner was served in the mess hall of Battery A, 6th C.A.

Presiding at the dinner was Colonel Earle d'Arcy Pearce who guided the program wisely and well. Guests of more than ordinary prominence were introduced "appropriately" and a good time was had by all.

The arrangements for the entire party were in the hands of Lt. Col. L. L. Pendleton. His job was well done. Captain C. H. Armstrong (pardon us—Major C. H. Armstrong) told a very interesting story of searchlight maneuvers recently conducted by his unit. To those of us not familiar with searchlight technique his remarks were very illuminating. (There goes one of those puns—but it slipped.) Captain P. F. Biehl, aided by men from his Battery gave a very clear and interesting description of the functioning of Antiaircraft Artillery.

A film showing antiaircraft units in operation was run off and a display of firecontrol equipment completed the formal program. The meeting was quite well attended. More Reserve Officers turned out this time than usual and Major Frank E. Emory, Jr., brought a large contingent of R.O.T.C. men from University of California.

The plans of this chapter are running quite smoothly. As previously announced, the meetings are held under the auspices of the National Guard, Regulars, and Organized Reserve in rotation. The National Guard meeting last fall was held in the National Guard Armory, San Francisco. The next meeting, to be held later in the spring, will be in the able hands of Colonel E. J. Mund, 627th C.A. It is tentatively announced as a social affair, probably a dinner dance.

Army and Navy Club of Chicago

NOTICE has been received that the Army and Navy Club of Chicago has recently occupied new quarters comprising the entire fifth floor of the Lake Shore Athletic Club at 850 Lake Shore Drive. Members of the Army and Navy Club are accorded full privileges of the Lake Shore Athletic Club and are invited to participate in all its activities. More than 500 members are enrolled in the Army and Navy Club of Chicago and with a membership of this number the success of the Club is assured.

The Club is already a center for military social activities in Chicago. Many reserve units hold their social and business meetings here. The National Sojourners will make the club their headquarters during their National Convention on June 22-24. A dinner dance was held recently at which Major General Frank Parker, commanding the Sixth Corps Area, and Rear Admiral Wat T. Cluverius, commandant of the Ninth Naval District were the principal guests of honor. Over 3,000 persons attended the Army Relief Society Ball on Washington's Birthday when $4,000 was netted for the society.

The JOURNAL wishes the Army and Navy Club of Chicago every success and hopes that this notice of its activities will bring it to the attention of any of our readers who may visit Chicago.

New Orleans Reserve

THREE New Orleans Coast Artillery Reserve officers attended the course for Reserve officers at Fort Monroe, Va., last fall. Those taking the field officers' course were Capt. Cornelius W. O'Leary, CASC, Fort Bragg, and 1st Lieut. Harry C. Prevost, Jr., 545th CA (AA). Capt. Clarence J. Hutson, Commanding 1st Battalion, 545th CA (AA) finished the Battery Officers' course.

The sessions of the Coast Artillery Branch School are well attended. Coast Artillery Officers from Gulfport, Miss., Hattiesburg, Miss., Baton Rouge, Patterson, and Plaquemine, La., attended the last meeting. There were present also many New Orleans officers of other branches.

Due to the shortness of the month and our local carnival season, no branch school was held during February. However, the Coast Artillery was well represented at the two meetings of the 87th Division Combined Branch School on February 7 and 21.

The March 14 session of the C. A. Branch school was held in the St. Charles Hotel in the same room used by Combined Branch School. The attendance had grown too large for the CA-res-87th Div. office in the Custom House. The attendance was large, but regretful as it may seem, there were fewer Coast Artillerymen present than representatives of other branches.

The proposed schedule for the March 28 session is as follows: "The Human Side of the Army"—by Capt. Roark Bradford, CA-Res. Capt. Bradford has seen active service as an enlisted man and as an officer. He is known to the public as an author and playwright, rather than as a Coast Artillery Reserve Officer.* We also expect slides from the Coast Artillery School, showing the latest antiaircraft materiel. Capt. Clarence J. Hutson, 545th CA (AA) recently at the Coast Artillery School will deliver the lecture accompanying the showing of the slides.

The local C. A. Reserve Instructor, has lately received from Colonel F. H. Lincoln, Commanding Fort Barrancas, Florida, one of the old Coast Artillery war game Balopticans. This will be used for instruction purposes by the Coast Artillery and the 87th Division.

R.O.T.C. University of Alabama

THE R.O.T.C. of the University of Alabama has a strength of 1,748 organized into a Brigade of three regiments as follows: 1st Regiment (Infantry)—two battalions of four companies each; 2d Regiment (Coast Artillery)—two battalions of four batteries each; 3d Regiment (Engineer)—two battalions of three companies each; and a band of 100 pieces. The Brigade is commanded by a Cadet Colonel, a honorary Colonel for the Brigade and a honorary Lieut. Colonel for each regiment is elected from the Junior and Senior class of Co-eds. Their uniforms (paid for by popular subscription) are crimson and white—the school colors. The honorary Lieut. Colonels march with their regiments at parades.

Cadet officers wear a uniform similar to regular officers except for insignia, braid on sleeves, the R.O.T.C. insignia on the sleeve, and a white "A" on crimson background on the left sleeve. The Basic Course wear a cadet gray with red stripe on the trousers and red braid on sleeves, overseas cap and gray shirt, black leather belt with an Alabama buckle of white metal.

Each unit has been rated "Excellent" for a number of years. The administration, faculty, and student body all have a high regard for the R.O.T.C.

The following Regular personnel are on duty at the University:

Major E. H. Underwood, C.A.C., Prof. of Mil. Sci. and Tactics.

Infantry: Major N. P. Groff, Capt. J. F. Farnsworth, Capt. L. P. Hodnette, 2d Lt. O. M. Hewitt, Sgt. L. P. Jenkins, Sgt. W. D. Green.

Coast Artillery: Capt. E. R. Barrows, Capt. E. R. Crowell, 1st Lt. J. H. Rousseau, Jr., 1st Lt. F. N. Parsons, Tech. Sgt. C. H. Wolfe, Tech. Sgt. C. C. Lemmond.

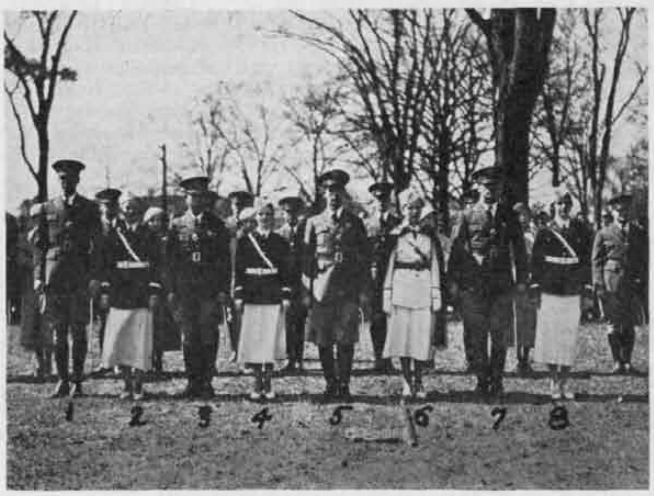
Engineer: 1st Lt. B. C. Snow, 1st Lt. H. Ker, Sgt. Buck Carter.

*Captain Bradford is the author of the book from which the play "Green Pastures" was dramatized.

Old Timers, Attention!

HAVE you ever served as a member of Battery K, First Artillery, or Battery B, Fourth Artillery prior to February 13, 1901, or of the 2d, 7th, 20th, 21st, 22d, or the 25th separate batteries of the Field Artillery prior to June, 1907, or of the Sixth Field Artillery (Regular Army)? If you have the following will be of vital interest:

The Sixth Field Artillery (Regular Army) is now about to present to those interested in military history,



BRIGADE AND REGIMENTAL COMMANDERS OF THE R. O. T. C. UNITS OF THE UNIVERSITY OF ALABAMA.

1. Cadet Lt. Col. R. D. Cotton, commanding Engineer Regiment. 2. Honorary Lt. Col. Gladys Helberg. 3. Cadet Lt. Col. P. N. Derzis, commanding Coast Artillery Regiment. 4. Honorary Lt. Col. Lucy Dawkins. 5. Cadet Colonel E. J. Lyman, Brigade Commander. 6. Honorary Colonel Mary H. Van Pelt. 7. Cadet Lt. Col. M. W. Swaim. 8. Honorary Lt. Col. Sue Thames.

and especially to its veterans, a complete history of its career.

The story of this famous regiment commences at West Point, New York, in 1798. It is as fascinating a tale as one reads in a book of adventure or romance for it includes both.

The history of the Sixth Field Artillery is now in manuscript form and ready to go to the printer. It will be sold at cost. The Adjutant, Sixth Field Artillery, Fort Hoyle, Maryland, is anxious to obtain advance information from those who would like to purchase one of these histories. THE COAST ARTILLERY JOURNAL is giving its cooperation in carrying out a worthy project.

COAST ARTILLERY ORDERS

Colonel George A. Nugent, 11th, Fort H. G. Wright, Second Corps Area, Governor's Island, as Chief of Staff, May 20.

Lt. Col. Clair W. Baird, student, Army Industrial College, Washington, to instructor, N. Y. N. G., New York, June 25.

Lt. Col. Edward A. Evans, C. A.-Res., to active duty, March 8 and from Monrovia, California, to student, special course, Command and General Staff School, Fort Leavenworth, March 12.

Lt. Col. Myron S. Crissy, 63d, Fort MacArthur, to Org. Res., 9th Corps Area, Los Angeles.

Lt. Col. Lewis Turtle, 52d, Fort Hancock, to Second Coast Artillery District, New York.

Lt. Col. George A. Wildrick, student, Army War College, Washington, to office Chief of Coast Artillery.

Major Alva F. Englehart, from student, Command and General Staff School, Fort Leavenworth, to Coast Artillery Board, Fort Monroe, June 30.

Major Stewart S. Giffin, Office of Chief of Coast Artillery, Washington, to 62d, Fort Totten, June 25.

Major Monte J. Hickok, from Hawaii, orders to Org. Res., Second Corps Area, Schenectady, revoked.

Major Hazen L. Hoyt, Jr., C. A.-Res., to active duty, March 10 and from Great Neck, Long Island, to student, special course, Command and General Staff School, Fort Leavenworth, March 12.

Major Manning M. Kimmel, Jr., instructor, Va. N. G., Richmond, orders to Panama, revoked.

Major Willis C. Knight, promoted Lt. Col., March 1.

Major Kenneth McCatty, from Panama orders to 13th, Fort Crockett, revoked.

Major Randolph T. Pendleton, student, Army War College, Washington, to office Chief of Coast Artillery.

Major Alden G. Strong, student, Army War College, Washington, to student, Naval War College, Newport, July 1.

Major Sidney S. Winslow, from Hawaii to Quartermaster Corps, Philadelphia.

Captain Clare H. Armstrong, promoted Major, March 1.

Captain Marvil G. Armstrong, promoted Major, February 1.

Captain Thomas R. Bartlett, 63d, Fort MacArthur, orders to Philippines revoked.

Captain Coburn L. Berry, 52d, Fort Hancock, orders to Philippines revoked.

Captain Thomas J. Betts, Army War College, Washington, to 61st, Fort Sheridan, June 30.

Captain Maitland Bottoms, from Hawaii, to 52d, Fort Hancock.

Captain Alexander H. Campbell, promoted Major, February 1.

Captain John S. Crawford, from Panama to 62d, Fort Totten.

Captain William Hesketh, 8th, Fort Preble, orders to Philippines revoked.

Captain Daniel W. Hickey, student, C. A. S., Fort Monroe, to instructor, C. A. S., upon completion of the course.

Captain William R. Maris, 6th, Fort Winfield Scott, orders to Philippines revoked.

Captain Stanley R. Mickelsen, instructor, C. A. S., Fort Monroe, to the Philippines, sailing New York, May 9.

Captain Lawrence C. Mitchell, promoted Major, January 1.

Captain Harry R. Pierce, promoted Major, January 1.

Captain Henry H. Slicer, 52d, Fort Hancock, orders to Philippines revoked.

1st Lt. John R. Burnett, 2d, Fort Monroe, orders to Panama revoked.

1st Lt. Wilbur R. Ellis, 2d, Fort Story, orders to Hawaii revoked.

1st Lt. James F. Howell, Jr., 3d, Fort Stevens, orders to Philippines revoked.

1st Lt. Robert H. Krueger, 51st, Fort Monroe, orders to Philippines revoked.

1st Lt. Howard H. Newman, Jr., from Panama to 52d, Fort Monroe.

1st Lt. Pacifico C. Sevilla, student, Coast Artillery School, Fort Monroe, to the Philippines, sailing New York, May 9.

1st Lt. Vern Walbridge, 2d, Fort Monroe, orders to Panama revoked.

1st Lt. Arthur E. Watson, Jr., retired account of physical disability, December 31.

1st Lt. Clark C. Witman, from Philippines to 6th, Fort Winfield Scott.

2d Lt. Wallace H. Brucker, 52d, Fort Monroe, orders to Philippines revoked.

2d Lt. Joseph F. Carroll, transferred to Air Corps, January 25.

2d Lt. Edwin W. Chamberlain, promoted 1st Lieut., January 1.

2d Lt. William S. Colt, 6th, Fort Winfield Scott, to the Philippines, sailing San Francisco, June 2.

2d Lt. Frederick E. Day, promoted 1st Lieut., January 1.

2d Lt. Albert E. Dennis, transferred to Quartermaster Corps, March 4.

2d Lt. Marcellus Duffy, transferred to Air Corps, January 25.

2d Lt. Everett C. Dunham, promoted 1st Lt., March 1.

2d Lt. Parmer W. Edwards, promoted 1st Lt., January 14.

2d Lt. Robert F. Fulton, transferred to Air Corps, January 25.

2d Lt. Edward B. Hempstead, from Panama to 2d, Fort Monroe.

2d Lt. Hubert deB. Lewis, from Hawaii to 14th, Fort Worden.

2d Lt. John R. Lovell, promoted 1st Lt., February 1.

2d Lt. William L. McNamee, promoted 1st Lt., February 1.

2d Lt. Paul G. Miller, transferred to Air Corps, January 25.

2d Lt. Robert F. Moore, relieved from Air Corps, Randolph Field, to Hawaii, sailing San Francisco, March 23.

2d Lt. Russell M. Nelson, 62d, Fort Totten, orders to Philippines revoked.

2d Lt. George F. Peirce, promoted 1st Lt., January 1.

2d Lt. William F. Spurgin, 13th, Fort Barrancas, orders to Panama, sailing New York, May 4, revoked.

2d. Lt. Robert A. Stunkard, transferred to Air Corps, January 25.

2d Lt. Charles E. Wheatley, Jr., 51st, Fort Monroe, orders to Philippines revoked.

2d Lt. Millard C. Young, transferred to Air Corps, January 25.

Warrant Officer Claude Hinkley, C. A. S., Fort Monroe, to Hawaii, sailing New York, May 9.

Warrant Officer Nelson W. Raymond, from Hawaii to C. A. S., Fort Monroe.

Warrant Officer John Belardi, bandleader, from Hawaii to 6th, Fort Winfield Scott.

Master Sgt. Patrick Aouger, 64th, Fort Shafter, retired, February 28.

Master Sgt. Fred W. Kellar, 15th, Fort Kamehameha, retired March 31.

Master Sgt. White L. Roberson, 15th, Fort DeRussy, retired, December 31.

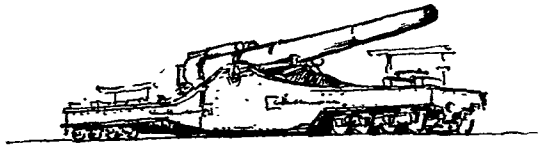
1st Sgt. Larney Dorsett, 13th, Fort Barrancas, retired, February 28.

1st Sgt. William R. Field, 6th, Fort Winfield Scott, retired, March 31.

1st Sgt. Edward F. Reilly, 6th, Fort Winfield Scott, retired, December 31.

1st Sgt. Charles P. Smith, 1st, Fort Sherman, retired, March 31.

1st Sgt. William G. Smith, 6th, Fort Winfield Scott, retired, March 31.



BOOK REVIEWS

INEVITABLE WAR, by Lieut. Colonel Richard Stockton, 6th. Published by Perth Company, 393 7th Avenue, New York. 873 pages, 112 chapters, 51 illustrations, fully indexed and annotated. Price $7.50. Service discount, ordered through the JOURNAL, 35%.

Lieutenant Colonel Stockton, in writing this book, has rendered a distinguished service to his country. The result of five years research and consultation with competent authority, it makes available to all intelligent readers a clear account of the conflict between adverse legislation and sensible military policy which has continued in this country for 150 years. The real meaning of our military history has never reached either our political representatives, as a body, or our people as a whole. School histories are but narratives of success. No attempt is made to point out failures of policies or the causes of disaster. Colonel Stockton, from established historical facts, has assembled evidence which, duly evaluated, makes clear the lessons which history contains. He shows the reader that the military policies of our thirty Presidents have been consistently sound and in accord. He further shows that these policies have been consistently rendered ineffectual by the legislative branches of the government, with the result that our national defense at the present time exists only in paper plans and theoretical training, insofar as the army is concerned, and has resulted in a navy which, for no good reason, now occupies third place among the navies of the world. With pitiless logic Colonel Stockton answers the arguments of the pacifists and by historical examples shows that the centuries prove them to be wrong. Also, in the last analysis, that the successful pacifist is more destructive of life and wasteful of money than any amount of prepared defense has ever been. With figures checked by professional accountants and economists, the author furnishes sound criticism on actual cost of purely military and naval defense as contrasted with the expenses brought on by wasteful unpreparedness, which are carried by legislative camouflage to the minds of the people as charges against the military establishment.

Colonel Stockton develops the theory that, inasmuch as centuries of constant effort have failed to produce lasting peace, there must be a basic and deep-rooted cause of war. This basic cause of war he explains and defines; shows that it has always existed; that the present plight of China is due, in part, to this basic cause of war plus the result of pacifism. He makes clear that all conditions at the present time point to the continued existence of that type of political disagreement which is called war.

If it is granted that the unchanging characteristics of the human race are the basic cause of war, then future war is inevitable and Colonel Stockton de-

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scribes the armies of the future. With sound common sense and wide knowledge he clips the imaginative wings of the ignorant, the faddist and military technocrat. Machines and gas are given their proper places as component parts of future fighting teams and are not credited with powers which practical men already recognize as dreams, fostered by selfish propaganda and fear, but refuted by field test and experiment.

Since the days when the musket obliterated the armored knight, the cheap gun and inexpensive bullet have neutralized the expensive armored fighting unit, and modern development indicates no change in the outcome of this ancient race.

By the aid of men like Colonel Stockton the fog is cleared away from current events, and the citizens of this country are enabled to see where the present course is leading. Colonel Stockton brings home to the nation that its losses at disarmament conferences have been greater than the losses that could reasonably have been expected from a major war. He shows that future security and low taxation depend upon measures taken by peace time administrations and that frenzied effort when an emergency arises always results in great expense and long continued taxation.

The writer shows that when national defense is handled in a business-like way, that then, and only then, will the United States become the great and s'able country which its geographical position and its natural resources enable it to be.

From Washington to Hoover, from Von Steuben to General MacArthur, from the Continental Army to the new Four Army Plan, this volume is complete and up to date. Nor has the Navy been forgotten. The soldier will derive as much benefit from the author's treatment of the Navy as the sailor will from the broad view given of the Army.

By means of an excellent index and bibliography, data on all the specific subjects which the book contains are made readily available to the reader and to the military student.

The man in public office, the intelligent citizen and the army and navy officer now have available a source of information which none of them can afford to be without.

RADIO TELEGRAPHY AND TELEPHONY, by R. L. Duncan and C. E. Drew, 1046 pages. John Wiley and Sons Inc., New York. Price $7.50.

The book is suitable for non-technical students and for those desiring a simple explanation of most of the subjects of radio science. The clear diagrams and analogies make the book an excellent one for experimenters and practical radio men. The authors must have had these groups in view, during its preparation, for very little in the way of basic knowledge is assumed. Consequently the various discussions are lengthy and involve considerable detail which results in a volume of approximately 1050 pages. Due to its size and the extent of the discussions it contains, the book can hardly be considered an engineers handbook.