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January-February, 1933

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THE COAST ARTILLERY JOURNAL

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Notes of the Coast Artillery Association

The Secretary wishes to announce the election of the following to the Executive Council:

President: Major General John W. Gulick vice Major General John W. Gulick.

Secretary-Treasurer: Major Stewart S. Giffin vice Major Stewart S. Giffin.

Additional Members: Brig. Gen. J. J. Byrne vice Brig. Gen. Howard S. Borden, Lt. Col. F. C. Tenney vice Col. Bowman Elder, Major E. B. Gray vice Capt. John H. Wilson.

Of the new members, Brigadier General J. J. Byrne is well known as the Commanding General of the New York National Guard Coast Artillery Brigade. This brigade consists of three fine regiments (see page 46) whose location in New York would result in one of the most important assignments in the Coast Artillery in time of war. General Byrne has been an ardent and efficient Coast Artilleryman for twenty-five years. His election to the Council is a fitting recognition of his long and faithful service in the Coast Artillery.

Lt. Col. F. C. Tenney of Duluth is the executive officer of the 955th Coast Artillery. It was due principally to the efforts of Colonel Tenney that this regiment won the Association Trophy. Colonel Tenney's interest is not confined to the Coast Artillery alone. He is state president of the Reserve Officers Association in Minnesota and as such is a "doer." He is quick to discern any movement inimical to the National Defense and fights it tooth and nail.

Major E. B. Gray is the unit instructor on duty with the Coast Artillery Reserve in Washington. His belief in and devotion to the Coast Artillery Reserve is putting Washington on the map as a Coast Artillery Reserve center of the highest importance.

The outgoing members of the Council—General Borden, Colonel Elder and Captain Wilson—have earned the thanks of the Association. Their wise counsel during the embryo stage of the Association has been invaluable.

In looking back over events of the past year it is agreed that the Association meeting at Monroe in May was outstanding. Our hosts, Colonel Cloke and the officers at Fort Monroe, left nothing undone to contribute to the success of the meeting. General Byrne and the New York National Guard supported the affair, not only verbally, but by their attendance. These meetings, which combine the professional with the social, will become traditional. In happier times the attendance would be greatly increased. Due to the economic stress the Council has not fixed a date for the meeting of the present year. The reaction of our membership would be appreciated.

Probably the greatest accomplishment of the Association during the year was the award of trophies to the outstanding regiment in each component. The winners were:

For the Regular Army—The 15th Coast Artillery Fort Kamehameha, T. H.

For the National Guard—The 243d Coast Artillery Providence, R. I.

For the Organized Reserve—The 955th Coast Artillery, Duluth, Minn.

A better method of promoting interest in the Association and fostering that friendly competition among units which can only result in increased efficiency could not have been chosen. The rules and regulations laid down for the competition is by no means perfect. This is particularly true for the Reserve Trophy. Several letters containing comments and suggestions have been received. The Council invites all members to submit their ideas and recommendations.

The Secretary wishes to offer his personal (and public) thanks to Major E. W. Moore, 243d C.A. (R. I. N. G.), the representative of the Gorham Company of Providence for the design and manufacture of the Trophy. The beauty of the trophy is commensurate with the high motive which actuates its award.

Towards the close of the year the Association received a gift of \$1500—a generous donation by a member of our Association who wishes the income from this fund to be devoted to the annual award of an additional trophy which will increase the efficiency of the Coast Artillery and strengthen the National Defense. It is unfortunate that the donor will not permit his name to be published. His past generosity, his intense devotion to the Coast Artillery, and his unvarnished patriotism are so well known to many of us that it would be impossible to conceal his identity from those who have ever been associated with him. The Council has appointed a committee to consider ways and means of carrying out the wishes of the donor. Suggestions from our members will be welcomed.

The membership of the Association now numbers 4437. While this is a respectable number for an organization which has been in existence for only two years it does not include many who are eligible for membership. The dues are \$0.00 per year and no assessments are authorized by the Constitution. All members are requested to induce these eligibles to make application for membership. The organization of branch chapters is a healthy sign of interest which exists locally.

These notes would not be complete without reference to the COAST ARTILLERY JOURNAL, the official publication of the Association. On the first of this year the number of subscribers was 77 less than on the first of last year. This indicates that the JOURNAL has weathered the storm very well. However, we expect our hardest pull will be during the first half of this year. We beseech the support of our membership and appeal to their moral obligation as members to subscribe for the JOURNAL.

THE UNITED STATES COAST ARTILLERY ASSOCIATION



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



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MEMBERSHIP

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

"The following shall be eligible for Active membership:

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

"The following shall be eligible for Associate membership:

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

"The following shall be eligible for Honorary membership:

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



The bright lights of Broadway fade into insignificance before the beams from billion-candlepower searchlights of the 62nd Coast Artillery (AA) during a recent demonstration in Bryant Park, New York City.

The Air War and the Home Territory of Germany

By Major Hermann Hans Grosskreutz, German Army*

THE great problems that were raised during the war in the purely military field, were far exceeded in importance by the fact that the war, in the literal sense of the words, became a "War of Nations."

Not only armies and fleets, but entire populations, collectively considered, stood opposed to each other in arms, with the avowed purpose of destroying each other from both the physical and moral point of view. In addition to the weapons of starvation and of hounding with false propaganda, there appeared—at least during the last years of the war—an entirely novel combat method. This rose out of the fulfilment of that age-old dream of mankind—the conquest of the air. It became possible thereby, to carry the war across and beyond the front and the communications zone, into the home-land of the opponent, and there, by bombing attacks from the air, to strike not only at his nerve and power centers, but also, by means of direct action, to work upon the hostile population's capacity of moral resistance.

During the war we Germans experienced only the mere initial stages of the development of the new combat method, the so-called "independent air warfare." This was because the bases, the airdromes of the enemy, from which the attacks were launched against us, were kept by our army, for the most part, far from our frontiers; and because the existing state of development of aircraft did not yet permit the hostile aviators to advance over Germany, any great distance. Only a small part of the Fatherland was actually subject to air attack. The great mass of the people remained untouched. Since that time the situation has changed greatly to our disadvantage. The German Reich, reduced in size, located in the midst of well-armed neighbors, may now be reached in every part by hostile aircraft. By means of the air weapon alone, whose operative power has greatly increased, every other state is in a position to exercise heavy pressure upon us, especially as the Treaty of Versailles has robbed us of all means of defense.

But even though conditions were less unfavorable, the experience of the world war should not be forgotten, and as part of this is the fact, that the working capacity and power of resistance of the population of the home area have, at least, as much importance as the fighting power of the troops at the front. Independently-acting air forces, however, can strike at both.

There are therefore plenty of reasons why we should occupy ourselves with these questions. They should command the attention, not only of statesmen and soldiers, but the attention of the mass of our people as well, since the effects of independent air warfare spare neither the hut nor the palace; they affect everybody.

Up to date it has been principally aviators who belong as a class to the arm carrying on war in the air, who have expressed their views. Consequently some illumination of the question emanating from the other side, i. e., that of air defense, is perhaps essential in order to bring out the whole picture.

The air defense of the German home-area furnishes us with the proper basis for treating the subject, for the air defense reflects as in a mirror, the workings of air war in its independent form.

A review of the development of the German air defense, during the years from 1914 on, to and including 1918, will now be attempted. Following that, I will describe briefly the course of development and the effects of the hostile air attacks on Germany. I will then attempt to deduce the lessons that these attacks teach, for the practical purposes of the present, taking also into account the progress that has meanwhile been realized in aviation. It is not intended to arrive at any exhaustive or final conclusions as to the future possibilities of air forces acting independently, but I will try in a small way, by means of the production and comparison of data which I have collected, to establish a standpoint from which position we may then be able to pass upon those questions existing at the present time, which are of such vital importance for every country.

The Air Defense of the German Home-Area During the World War. 1914-1918.

It is not an exaggeration to say that the prevailing opinion in Germany concerning the home air defense, was to think of it as consisting of one or more cannon, set up at some place or another, which would wait until a hostile plane came along, and then shoot at it.

This mental picture corresponds in a general way to the condition of our air defense at the beginning of the World War. Now at the time of mobilization, the German army possessed only 18 anti-aircraft guns. Six of these were already mounted on motor trucks, and were taken into the field.

Our opponents were not in any better position. France had then only one anti-aircraft gun mounted on a motor truck.

* During the war Major Grosskreutz served on the staff of the Commanding General, German Air Forces. He is now Counselor of Archives in the Federal Archives at Potsdam.

In our case, therefore, only 12 anti-aircraft guns remained for the home air defense. These were employed for the protection of the Rhine bridges at Dusseldorf and Mannheim, the Zeppelin airship works in Friedrichshafen, and the airship airdromes at Metz. In addition, the Krupp works and the "Rheinische Metallwaren- und Maschinenfabrik" (Rhenish Metal Products and Machine Works) protected their plants with a few anti-aircraft guns that belonged to them personally. These guns were the results of some of their former experiments in this direction. Later on, various anti-aircraft guns that had been ordered built in Germany by different foreign governments, were confiscated and added to the home air defenses.

The headquarters of our depot corps (stellvertretende Generalkommandos), were first of all made responsible for the handling of the home air defense measures. While they did receive general directions from the War Ministry, as to the basal methods to be followed, as well as instructions, also of a general nature, they were not as a matter of fact placed under the War Ministry, but remained on an equal footing with it. Therefore the War Minister as such, had no power of command over them.

Thus, a strong, central, directing command over the air defenses was not established.

Within the depot corps areas, the question of local air protection was placed in the hands of all sorts of authorities, and this too, in addition to their other duties.

Now, the anti-aircraft guns, already mentioned, were not sufficient in number. It therefore became necessary to draw on other types of cannon from the fortresses, as well as to requisition field pieces from the depot formations, which pieces were thus diverted from their basal use for which they were intended, that of supplying replacements for the field.

It must be admitted that the result was a kaleidoscopic picture. No system, nor co-ordinated organization whatsoever, existed as a foundation for the measures that were taken. Expedients in small number, were resorted to, as a substitute for things that could not possibly be achieved. It may be interjected here, that in 1914, the importance of the air arm could not be properly appreciated. As an instance of views that then prevailed, the arm, prior to the war, had been incorporated with the transport and communications troops (Verkehrstruppen). On this account, it is interesting to know, that in February 1914, the War Ministry had already issued "Principles governing the taking of measures necessary to protect important structures and works, against the attacks of hostile aircraft." These "Principles" laid down, with what for the time revealed astonishing foresight, the broad basal lines of the home air defense system, just as it afterwards necessarily developed during the course of the war. That such regulations were not put into practical force during mobilization, was caused in part, by the short space of time available that intervened between February 1914 and the outbreak of hostilities, but mostly on account of the limitations then controlling in human nature, which was then

bound down to earth in thought, and could not accommodate itself quickly to the idea of war waged in a three-dimensional space. Then too, the thought of the diversion of personnel necessary to build up the organization called for according to these "Principles," was alarming. For it read in one place in the publication of the War Ministry, as follows:

"The defensive measures that have so far been laid down, require the detailing of personnel in large numbers, and the employment of entire, fully-organized troop units. But such demand should only be compiled with, in so far as the scheduled plan of mobilization and the quality of the troops, be not affected thereby."

The impossibility of achieving the proper organization of one of the most important branches of air defense, that of an observation and communications service (Flugmeldedienst), was felt particularly keenly.

This service is a basal pre-requisite, so that air defense may be set up at the right time. For if the defensive formations wait, and then first commence to function when hostile airplanes come within the area of their hearing or sight, their defensive measures will always come into effect too late in point of time. This fact is true, owing to the great speed of airplanes, which, even in 1914, had already reached 80 to 100 kilometers (48 to 60 miles) per hour. It is only when preparations have been made in advance, by means of warning messages preceding the approach of hostile aviators, that defensive units are able to bring their force to bear at the right moment.

To have such a system that will work, it is necessary to possess a carefully organized and developed air observation and communications service, having trained personnel, with the proper installations and equipment, for determining the approach of airplanes and for distinguishing between their own aircraft and hostile aircraft.

In 1914 all this was lacking. Besides their own look-outs, air defense units had to rely solely on warning messages sent from various headquarters and other places of duty of different sorts of military authorities, and also on those sent from offices of nondescript civil officials; the personnel of all of which had, up to this time, been only in slight touch with aviation, or had no contact with it whatsoever. In addition, there were private concerns and individuals who joined in this warning game, in such degree as they felt spurred on by the excitement of the first months of the war.

I will let a few facts speak for themselves, in order to justify my somewhat-harsh comment.

In the diary of the air defense group of the Krupp Works, there stands an entry under date of August 4, 1914, as follows:

"About 10 o'clock P. M., an airship was reported going towards Werden. At 10:10 P. M., two aviators were reported flying towards Duisburg-Essen; at 11:00 P. M., an airship going from Bochum towards Dortmund; likewise an airship over Huelgel. There were also reported as follows: at 11:10 P. M., an aviator flying in the direction of Rotthausen-Essen who was working a searchlight; at 11:20 P. M., two hostile avia-

tors flying from Bochum-Sued towards Essen; at 11:25 P. M., an airship going from Dortmund towards Essen; at 3:10 A. M., an aviator flying in the direction of Frinrop-Essen; likewise one airship going towards Bredeney-Essen; at 3:35 A. M., another airship going towards Bredeney."

Thus, during the elapsed time, from 10:00 P. M., until 3:35 A. M., six airplanes and six airships were reported.

In the diary of the air defense group just mentioned, an entry then follows:

"None of the above-mentioned aircraft were seen here, yet the overcast sky permitted good observation."

Under date of August 26, there is also an entry:

"At 11:30 P. M., the police at Borbeck reported a flyer circling over Borbeck, Frinrop, and Overhausen, who was alleged to be still in sight while the report was being made. At 11:10 P. M., the police at Essen, through the channel of the Muelheimer police, reported several airships in sight: at 11:20 P. M., they reported that the same airships were being watched by crowds of spectators."

On the same day, furthermore, the following business concerns in Essen, joined in and took part in this warning service: the local electric railway, the Ledigenheim Karnap Works, and then, with these, the headquarters of the local Fire Department.

Under date of September 5, there is entered:

"At 7:30 P. M., District Headquarters No. 1, reported an airship over the little wood at Berner. On our inquiring at the above-mentioned headquarters, it was discovered that some woman had made this report. Nothing has been sighted from here."

These choice selections, which, by the way, could be added to ad libitum, should be enough. When to these quotations is added the following extraneous information; that during the nights in question, and also during the evening of September 5, none of the three German airships which might be considered in connection with the case, were in the air; furthermore, that at this date, flights in airplanes at night were looked upon as something quite extraordinary, and therefore were not included in the standing missions required of our aviation troops; the recklessness in statement proved by all of the reports that I have mentioned, is clearly shown.

That which was alleged to have been seen, existed only in the imagination of the observers. Still, as far as the inhabitants were concerned, such reports were the cause of much anxiety. On the other hand, they were a real danger to the air defense service, whose personnel became worn out by the frequent and unnecessary alarms, which resulted in the dulling of their faculty of attention.

Proof that this condition of things could not go on, even at this period, is evidenced by the attempt of the depot corps headquarters to remedy the situation. Special observation and listening stations were established, and in a few cases, central stations were installed. These places of duty were charged with the

responsibility of sifting over, and then transmitting, reports concerning aircraft.

But, not even by such means could a unified and co-ordinated organization be secured, capable of covering the whole territory exposed to danger.

It is true that these conditions should be inquired into at some future time, somewhat more thoroughly, by reason of the fundamental importance of the facts. Then too, these facts are of importance with reference to existing conditions, as Germany, at the present time, (1932), from the standpoint of the technique of air defense, stands not only on the same footing as in 1914, but is even in far worse case, on account of the dictates of the Treaty of Versailles. Those disadvantages under which we labored in 1914, would now make themselves felt to a much greater extent, as we would have to reckon with quite a different effectiveness of the air arm.

The hostile air attacks that set in at once in 1914, occurred only at intervals and were carried out with forces weak in strength. On August 23, Muellheim, an unprotected and unfortified city in Baden, became the first target for the bombs of hostile aviators. At this place in my story, should also be mentioned the attack of a British aviator on the airship hangar at Duesseldorf, on October 8. This attack destroyed the airship Z IX, and seriously damaged the airdrome.

From December, 1914, on, regularity of plan appeared in the offensive activities of our opponent. The unfortified city of Freiburg in Baden was bombed on three separate occasions, one after the other, at brief intervals. This indicated the beginning of the method of concentrating attacks against a single objective. It so happened that this objective lay entirely outside the theatre of operations.

During April, 1915, came the first night attack, while the following months marked a turning point in the hostile offensive tactics, inasmuch as not only separate airplanes, or a few airplanes, were engaged in an attack, but entire squadrons of bombers were used. On June 15, 1915, 28 dead and 68 wounded from among the civil population of the unfortified city of Karlsruhe, became victims of such an attack.

It was on account of such happenings that the urgent need of greater co-ordination and increased effectiveness began to make itself much more strongly felt, both in the organization and in the disposition of the air defense of the German home area. The War Ministry took this state of affairs into consideration, and, on September 1, 1915, created the position of Inspector of Anti-balloon-guns for the Home area (Inspekteur der Ballonabwehrkanonen* im Heimatgebiet). This officer was placed directly under the War Minister, and became the advisor of the depot corps headquarters commands. The latter, however, as before, remained responsible for the proper functioning of the air defense within their corps areas. The Inspector himself, had no power of command over the air defense formations. He had only the right to supervise their training and to inspect their materiel. It was therefore a step in advance, when he was charged with

*The original designation for antiaircraft guns, later termed "Flugabwehrkanonen," abbreviated to "Flak."

the further duty of giving his expert opinion to the War Minister, as to the necessity of granting the demands of the depot corps headquarters commands, when the latter submitted their requirements for air defense, and as to whether or not the existing means of defense that they had at their disposal, should be increased in strength,* or added to by new allocations.*

It also became one of his duties to make recommendations to the War Minister, in the sense of providing for the further development of air defense in general.

The most important result of this new organization in September 1915, was the beginning of the systematic and unified building up of the air observation and communications service (Flugmeldedienst) by the Inspector of Antiaircraft guns in the Home area (Inspekteur der Flak im Heimatgebiet). Provision was made for the establishment of two parallel lines of stations, composed of main aircraft observation stations (Flughauptwachen), and aircraft observation sub-stations (Flugwachen), extending continuously from the North Sea to the Lake of Constance. It was the duty of their personnel to watch for the approach of hostile aviators. The advanced line of these stations followed closely the west frontier of Germany as it then ran, while the stations of the second line were placed about 15 kilometers (9 miles) in rear, so as to cover the intervals between the stations of the first line. The carrying out of this project in its details, was effected by the depot corps headquarters commands. The latter still remained responsible for the air observation and communications service, so that complete unity of organization had, therefore, not yet been attained.

The practical working of the air observation and communications service, in its main features, was so arranged, that messages, either from the front, or from the communications zone, or from the occupied hostile territory, were transmitted over the main and sub-stations to the antiaircraft defense units of the Home area. Testing stations (Pruefungsstellen), which were installed at various points, attended to the proper functioning of the communications service proper.

Besides these measures, an increase in the active means of defense was not neglected. These included: the antiaircraft cannon, the antiaircraft machine guns, and the searchlights.

Great attention, too, was paid to the passive means of defense. To this category belonged all the means of giving the alarm to the civilian population, the construction of bomb-proof dugouts, and the creation of a camouflage system of decoy imitations of structures and objects whose protection was of importance. Under the head of passive defense came also the matter of spreading explanatory information, and a system of popular education and instruction, covering the action to be taken by the people during the course of air attacks. Here also belonged the matter of measures to make night attacks difficult, by the dark-

ening of entire stretches of country zones, and by the darkening of cities, towns and industrial districts. In a few cases, and this at the special request of certain industrial plants, and partly at their cost, the construction of standing balloon barrages, using both spherical and sausage balloons (Ballon- und Drachensperren), was begun.

1916.

The general increase in the means of air defense made a reorganization necessary. This took place in February, 1916. Antiaircraft groups (Flakgruppen) were organized for the depot corps areas. In each area they were placed under an Antiaircraft Staff Officer, called Staff Officer for Antiaircraft Guns in the Home area (Stabsoffizier der Flak im Heimatgebiet). One such officer functioned in each corps area. He was placed immediately under the corps commander, and it was only when he was directly authorized by the depot corps commander, that he could deal directly in matters relating to officer personnel training and replacements, with the Inspector of Antiaircraft Guns for the Home area.

Even though the creation of these various grades, especially of those of the Staff Officers for Antiaircraft Guns in the Home area, was undoubtedly a great step forward, yet this fact did not change the basic regulation, that the commanding generals of the depot corps areas were held primarily responsible for the home air defense.

However, the first breach was soon driven into the system. The increase in the number of hostile air attacks had led to a search for new ways and means of protecting the German homeland. These were finally found by making use of the flying troops, in the form of one-seater pursuit units (Kampfeinsitzerstaffeln). These airplane formations were distributed throughout the western industrial districts, from Cologne as far south as Freiburg. Their mission was to protect the industrial plants that were so vital to the existence of our sources of war supplies, from bombing attacks. This was accomplished by counter air attacks fought out to a finish. On October 1, 1916, these units were placed under the immediate command of a Staff Officer of Air Forces in the Home area (Stabsoffizier der Flieger im Heimatgebiet).

It was now clear that the organization of the air defense of the Home area had not, up to this change, been properly adapted to the nature of air warfare as it was being carried on. So now, just as the one-seater pursuit units were neither under the command of the depot corps commander, nor under that of the Inspector of Antiaircraft Guns in the Home area; so was a like state of affairs true in the case of the Staff Officer of Air Forces in the Home area. The latter's immediate superior did not belong to the Home area, but to Great General Headquarters; he was the Chief of the Air Forces (Chef des Feldflugwesens).

Perhaps such conditions may seem strange to the observer who happens to be standing at some distance. When, however, the following facts are taken into proper consideration: that the air war had spread far across the front lines and communication zone, into

*Refers to both personnel and materiel.

the German homeland; that the theater of air war now consisted of a continuous terrain from the furthest-advanced lines, to the furthestmost city in inner Germany that it was possible to reach by aircraft; that the one-seater pursuit units of the air defense, operated not only hand in hand with the pursuit units belonging to the army sectors in Alsace and Lorraine, that immediately adjoined their stations, but also were even engaged temporarily in front line air operations (as in Flanders) on account of the requirements of the air situation; that, in addition, such decisions had to be made and carried out with great speed; it will then be understood, that only a single will and a single post of command could be entrusted with the control and disposition of the air force.

Yes, the conditions governing air warfare had developed along such lines, that it became necessary to draw all means of air defense too, within the purview of the new conception of things. This eventuality had already been recognized at an earlier date, by far-seeing and open minded men, alive to the possibilities of development of war in the air. Yet it is true that their plans and advice first found their fulfilment when the new High Command, known by the names of Hindenburg and Ludendorff, came into power. The event was actually brought about by the imperial order-in-cabinet of October 8, 1916, which created a basal change in the existing conditions relating to the exercise of command functions, in the matter of all arms and branches of the German Army that were taking part in the air operations. In a brief and clear form that could not be improved upon, the introductory portion of this order laid down the reasons for, and the purpose of, the new regulations, as follows:

"The increasing importance of air operations renders it necessary to unite under a single command, all of the aircraft and anti-aircraft forces of the Army, both in the field and in the Home area.

With this purpose in view, I ordain:

The building-up on uniform lines, the placing on a war footing, and the operative employment of these forces, will be under a Commanding General of Air Forces, directly subordinate to the Chief of the General Staff."

A slight digression may be permitted here. One who has himself lived through those days; who knows how both Field Marshal v. Hindenburg and General Ludendorff decided upon this solution of the question, after hearing all of the pros and cons; and who knows what a blessing this new regulation proved to be in the air war, and especially in the air defense of the German homeland, can only express a single, fervent wish: That the text of the imperial cabinet order of October 8, 1916, quoted above, might be engraved with tools of steel, in the memory of all those, who, in the future, may have to occupy themselves officially in posts of duty, with these questions.

We have no longer any air forces: the flyers, the men of the airships, and our means of air defense, have been taken from us. In spite of this, it is theoretically, of the highest importance to establish, for

the coming day, the true, basic principles governing the subject.

To return to our subject:

In connection with putting the imperial cabinet order into effect, a new position was created, i.e., Commander of Home Air Defense (Kommandeur des Heimatluftschutzes). He was placed directly under the Commanding General of Air Forces. The position of Inspector of Anti-aircraft Guns in the Home area, was now abolished, the incumbent officer, who had been functioning up to this time, being incorporated in the staff of the new Commander of Home Air Defense. The entire matter of Home Air Defense was placed under the latter. The agents that executed his orders, were the Staff Officers for Anti-aircraft Guns in the Home area, and the Staff Officer of Air Forces in the Home area, who was later named the Commander of Air Forces in the Home area; also three newly-appointed Staff Officers of the Air Observation and Communications Service (Stabsoffiziere des Flugmeldedienstes), a new grade. These last-named officers commanded and supervised the extensive territorial districts of the Air Observation and Communications Service, such size being best adapted to the special and peculiar nature of this service. It was the duty of these officers to see that the service of transmitting reports and messages to adjoining districts, functioned smoothly and without hitch.

1917-1918.

The basic organization of the Home Air Defense was thus laid down and up to the end of the war no further changes in it were made. From now on its whole power could be exerted in the direction of increasing, both in quality and quantity, the existing means of air defense. Such action was no longer hampered by references through official channels, by the difficulties that crop up in bureaus and departments, or by red tape in general.

During the last two years of the war, the Air Observation and Communications Service was further extended by the addition of four new districts.* It was then brought to a point bordering on perfection, by the use of wireless telegraphy. This supplemented the telephone net, and where wires had been destroyed by air bombs, it afforded the only means of quickly transmitting the messages** of the Air Observation and Communications Service. Later on, there were installed in the different army sectors which lay closest to the German Home area, special wireless receiving stations for the purpose of maintaining connection with the wireless stations of the Home area. The army stations received from the Home area stations, information with respect to the return flights of hostile bombers, thus affording to our pursuit squadrons on the front, a chance to attack these homeward-bound opponents.

Another case emphasizing the close inter-relationship of front and Home area in the air war, should also be borne in mind. This was evidenced by the fact that the front, which itself was suffering from the lack of anti-aircraft guns, had actually to turn over

*Flugmeldebezirke.

**Flugmeldungen.

some of this equipment to the Home area. In addition, the front had to furnish officers of especial efficiency, to the chief command posts of the home air defense.

Due to the great demand of defensive means at home and at the front it was impossible to equip all endangered regions at home with modern antiaircraft guns. The majority of the antiaircraft guns consisted of captured French, Russian and Italian field guns that had been adapted to air defense. Only in the last years of the war could be assigned modern 8.8 and 10.5 cm antiaircraft guns to the most important points that required protection. Their greater range, combined with the more powerful effect of the single shell, forced the enemy planes to greater ceilings thereby considerably diminishing bombing accuracy. Hand in hand with the improvement of sights and range finders went fire accuracy. The antiaircraft school of fire for officers and men was established at Blankenberghe near the Belgian coast. This location afforded numerous opportunities to fire on enemy planes. An effort was made to increase the effectiveness of antiaircraft guns by combining them in batteries of four guns. However, there were not sufficient antiaircraft guns available to complete this organization in spite of their great increase. The majority of the antiaircraft guns had to be used in pairs. At night the antiaircraft guns were used in conjunction with searchlights. When a searchlight located a plane aimed fire was employed, just as in daylight firing. In case there were no searchlights or the plane could not be located, a curtain of fire was placed between the planes and its object. For this purpose special plans and tables of curtain fire were prepared in advance making it possible to suddenly open fire and to keep under fire the area to be bombed, by placing irregular shots at the ceiling and side.

The searchlight mirrors that were used in the war had a diameter of 110 cm, 115 cm and 200 cm respectively; as an emergency, use was made, at times of searchlights with a mirror diameter of 90 cm. The location of the searchlights depended upon the position of the antiaircraft guns, so that the area illuminated by the searchlights was within range of the antiaircraft guns. The distance between the searchlights was so arranged that the area between them up to 3000 m. was completely covered by the beam of the neighbouring searchlight. For the efficient protection of a location, two lines of searchlights were established, an interior and exterior. The searchlights of the exterior lines were placed at the most probable lines of approach of enemy planes, so as to pick them up in time and to pass them to the interior lines of searchlights who worked in cooperation with the antiaircraft guns. At the same time, the searchlights, especially of the exterior lines, acted as an aircraft observation substation (Flugwache). To facilitate the early location of enemy planes at night, that could be heard but not seen, the searchlights were equipped with listening apparatus.

The operation of our searchlights was finally so perfected, by means of technical improvement and by the

systematic and thorough training of the crews serving them, that their action had a very unpleasant effect upon the hostile flyers. The result was, that the aviators of the enemy made frequent attacks with bombs and machine guns, on our searchlight organizations. This fact, together with the statements of hostile aviators themselves, furnished the best proof of the efficient working of the searchlights.

The machine guns that were set up for the purpose of defense against low-flying aviators, were, at first, served by workers from the industrial plants protected by them. Finally, however, as this makeshift system could not be continuously kept up, independent machine gun platoons (selbständige Flugabwehr-Maschinengewehr-Züge) for air defense, were organized in the summer of 1917, and given the requisite military personnel.

An organization was also formed, which was called the Mobile Reserve of the Home Air Defense (bewegliche Reserve des Heimatluftschutzes). This consisted of a number of antiaircraft gun batteries and searchlight platoons; all of such batteries and platoons being mounted on railway flat-cars. These formations could be rapidly moved to points that were especially threatened by air attack, owing to the excellent network of railway lines that covered Western Germany.

One of the most effective means of defense were the one-seater pursuit groups (Kampfeinsitzerstaffel). They consisted first of six groups, which number was afterwards increased to nine. In the very nature of things, the employment of these groups remained, for the most part, limited to daylight hours. In the first place, it was a difficult matter to make our own aircraft recognizable at night, without, at the same time, betraying their presence to the enemy; then, on the other hand, in such case, the noise of the motors of our airplanes, made it impossible for our observation stations, who were mostly dependent on their sense of hearing, to get any reliable and timely warning of the approach of hostile aircraft. As a direct result of these things, there often ensued false alarms with all of their detrimental, accompanying consequences for the civilian population, and for industry. Shortly before the Armistice, experiments with pursuit operations at night, were again attempted. A number of fast-climbing two-seater pursuit planes were assigned to the one-seater pursuit groups. Their mission at night was to rise to the attack, only after a hostile plane had been caught in the rays of our searchlights. But within the brief space of time that I have just mentioned, sufficient experimental data could no longer be collected.

Now, even during the daytime, there was difficulty enough with respect to the successful employment of the one-seater pursuit groups. They could not be expected to constantly remain in the air, for the sole purpose of fencing off, from attack, the object to be protected. This would have been a purposeless and unjustifiable waste of personnel and materiel. It might have resulted from the carrying out of such regulations, in our flyers having to alight, just at the time when the hostile planes arrived, because they

might have used up their supply of motor fuel, whilst they had previously been circling in the air. Consequently, our pursuit groups could only rise for defense, after warning messages (Flugmeldungen) had made it clear, to a reasonable certainty, that a bombing attack on the object to be protected by them, was to be expected. Even then, it often happened that the opponent turned aside from his initial flight direction, at the last moment, to throw his bombs upon another objective. If, by this time, our aviators were already in the air, only the directing shots (Richtungsschüsse) from our antiaircraft guns, for guiding purposes, and the ground signals (Sichtzeichen) that had been laid out, could point out the way so that they might come upon the enemy. Success in this matter depended upon the closest possible liaison with the Air Observation and Communications Service, which was so installed, that to each pursuit group was allocated one aircraft observation sub-station (Flugwache).

Orders going into full details, for the combined operation of the different pursuit groups as between themselves, and also with the other defensive air branches; a carefully thought out system of visual signals (Sichtzeichen) establishing liaison between the airplane and the ground, to which later on, even wireless stations were added; were intended to provide the highest possible margin of insurance, with respect to the successful functioning of the one-seater pursuit groups. There can be seen from this one instance, what a complicated apparatus the home air defense represented.

Parallel to the development of these defensive means that had already been tested out, increased attention was given to the building up of a branch of the Home Air Defense, that had, up to this time, received scant consideration. It was the desire of our industrial plants for an increased use of balloon barrages, both of spherical and of sausage balloons, that led to certain orders, that were issued in March, 1917, for the appointment of a Staff Airship Officer in the Home area (Stabsoffizier der Luftschiffer im Heimatgebiet). He had under him five balloon barrage sections (Luftsperrabteilungen). The barrage proper, consisted of spherical balloons or, during stronger winds, sausage balloons that were sent up attached to cables at intervals of from 300 to 400 meters, around the plant to be protected. Thin wires, the so-called "Seitenaeste" (side branches), of from 150 to 200 meters in length, (being suitable distances apart), were strung between the vertical cables of the balloons, horizontally, and were supported where they joined up in the middle of the intervals between balloons, by open wind cylinders. In this way, a loose, wire net work hung in the air, that was sure to spell disaster for the hostile aviator caught in it. It must be admitted that the highest altitude which the balloons could attain under the most favorable circumstances, amounted to only 2500 meters, at the outside, so that it was possible, without more ado, to fly over the whole obstruction. An evident, visible success, that was proved by the crash of a hostile flyer, took place only once. This

was in 1918. Furthermore, the installation of the balloon barrages, and the keeping of them in operation, demanded a disproportionate amount of time, labor, equipment and raw material. If, in spite of all this, these balloon barrages were not only maintained as installed, but were even increased in number, there lay at the bottom of this, their double moral effect. In the first place, they raised a feeling of insecurity in the minds of the attacking bombers; in the second, the feeling that they were surrounded by a protective wire obstruction in the air, exercised a calming influence on those who were exposed to attack.

The Meteorological Service* played a part in the air defense of the German Home area, that should not be underestimated. More and more, the connection that existed between the state of the weather and hostile bombing attacks, became apparent. It, therefore, became necessary to determine with care, by means of regular and continuous meteorological observations, those weather conditions which were either favorable or unfavorable to hostile air operations as the case might be, and then, to convey this information to the various headquarters and centrals of the Home Air Defense. For practical purposes these weather reports were subdivided into five classes, that were designated and ran in a graduated series, from "very favorable," to "very unfavorable." The state of readiness of the different defense formations was governed in accordance with these reports, so that, for example, under weather report No. 1, the alarm would be sent in to all defense organizations; while under weather report No. 5, only part of the personnel would be ordered to stand to. In this way, the Meteorological Service increased the efficiency of the Home Air Defense, on the one hand; it helped to spare the troops, on the other. The handling of the service was, therefore, coupled with a great responsibility.

Including the Balloon Barrage Sections** and the Meteorological Service, all arms and branches of the German Air Forces proper, were from now on, represented in the organization of the Home Air Defense. By means of a process of gradual organic development, each arm and branch, one after another, had fallen into line. An idea of the final result of this development, may be gained by means of the following brief synopsis.

At the end of the war, the Home Air Defense had in active service, the following organization:

- 1 Commander of Home Air Defense;
- 1 Commander of Air Forces in the Home area (Pursuit Groups);
- 11 Staff Officers for Antiaircraft Guns in the Home area;
- 7 Staff Officers of the Air Observation and Communications Service;
- 1 Staff Airship Officer;
- 41 Antiaircraft Gun Groups;
- 900 Antiaircraft Guns (in round numbers);
- 376 Antiaircraft Searchlights;
- 206 Antiaircraft Machine Guns;

* Wetterdienst.

** Luftsperrabteilungen.

- 9 One-seater Pursuit Groups;
- 8 Balloon Barrage Sections;
- 1 Central Meteorological Station of the Home area;
(Die Wetterwarte des Heimatluftschutzes);
with various Sub-stations (Heimatwetterwar-
ten); in all a strength in personnel of about
1050 officers and 21,000 other ranks.

This was indeed an imposing organization. It gives a good idea—especially when it is compared with the 12 antiaircraft guns existing at the outbreak of the war—of the importance that the Home Air Defense achieved as an organization, during the course of the war. Moreover, in no field of the air war, did the absolute necessity of amalgamating all arms and branches of the Air Forces, so as to secure the unified and coordinated functioning of the whole, appear so clearly as an evident fact, as in the case of the Home Air Defense organization.

**The Development of Allied Bombing Attacks and their Effect,
With an Estimate of their Importance in Relation
to the Future.**

The development of the hostile air attacks in 1914 and 1915, has already been traced in Part I. The year 1916 brought with it an increased activity on the part of the enemy's bombing squadrons. The chief objectives of hostile enterprise were, respectively, the industrial region of Lorraine-Luxemburg, and the industrial region of the Saar. But unfortified cities and towns were not spared. Once again did Karlsruhe, as one of such places, have to pay a high price in blood. A bombing attack on Corpus Christi Day, June 22, 1916, laid low as victims: 119 dead and 140 wounded persons.

In 1917, along with an important increase in the number of bombing attacks, a fundamental change in the tactics of attack, could be observed. While formerly, bombing flights were about equally distributed over the whole of the course of the month, such attacks were now confined to a short period of time, and were carried out in great strength; after which a series of days of complete rest would follow. These tactics appeared most clearly during October, 1917. Out of 39 attacks, that were executed during this month, 17 alone fell from the first to third of the month. The remainder occurred during the second half of the month, and here again, chiefly during the last third. It is also noteworthy, that frequently, several squadrons, one after the other, were engaged against the identical objective of attack. The purpose of this was twofold: in the first place, it was intended to wear out the defense and to bring about a premature exhaustion of ammunition; in the second place, the object was to interrupt work in the industrial establishments for as long a space of time as possible, by means of the successive waves of attack that often followed each other for hours at a time. There was thus brought about a very appreciable decrease in industrial production, even when no actual damage was caused by the bombs.

A striking example of the close relationship between

the air operations at the front and those of the home area, was afforded by the events of 1918. While in March of this year, 29 air attacks were visited upon the western regions of Germany, their number sank in April to 2. Here is clearly shown the influence of the great German offensive in France, begun on the 21st of March, which was making itself felt. It compelled our antagonists to concentrate all of their available aircraft at their threatened front.

Gradually thereafter, the tide of air attacks again crept up, until in July, August and September it reached high-flood with 49, 47 and 49 bombing flights. As far as the methods used were concerned, there was no essential difference as compared with 1917. Only the attacks and the attacking planes, waxed in numbers.

The following tabulation, covering the years 1915-1918 inclusive, presents a picture of the constantly increasing efforts of our foes to cripple, first of all German industry, and then to exhaust the moral powers of resistance of our civilian population. Both before and afterwards, they selected unfortified and unprotected cities and towns as their victims. The following hostile air attacks took place:

During 1915,	51 attacks, including 7 night attacks—	13.1%
" 1916,	96 " " 75 " " —	78.1%
" 1917,	175 " " 130 " " —	71.4%
" 1918,	353 " " 234 " " —	66.3%

In connection with these figures, it must be taken into account, that the operations of 1918 only covered a period of 10 months and a few days, up to the date of the Armistice. If the months of November and December, 1918, for purposes of argument, could be included in the above tabulation, we would get, in round numbers, the grand total of 424 air attacks on the home area for the year 1918. Thus there would have taken place more than one air attack per day for the whole year. Even then, 1918 did not signify as such, by any manner of means, a final peak with respect to the possibilities of such attacks, but rather only the very beginning of developments. As was well known to us at the time, our opponents were preparing to enlarge this very field of the air war, on a most gigantic scale.

The Effect of Air Attacks.

In considering the effect of air attacks it seems advisable to draw a distinction, taking into consideration the nature of the particular effect. There must be taken seriously into account, not only the damage that is caused by the direct action of hits by bombs, but also the indirect damage. Among the direct damages are to be numbered the loss of life and the destruction of property; among the indirect damages, the decrease in industrial production (Produktionsminderung) and the morale effects.

According to a compilation of statistics gotten up by the Commander of Home Air Defense, the bombing attacks on the home area, during the whole World War accounted for 746 persons killed and 1843 persons wounded; in all, 2589 killed and wounded. These figures, considered both absolutely and relatively, are very small. Of great interest, however, is a compar-

ison of the losses of different years. In spite of a constant increase in the number of air attacks, the losses of 1915 and 1916 were only slightly greater, counting both killed and wounded together, to-wit: 445 casualties in 1915 and 512 in 1916, while in 1917 the number even fell to 402. The explanation of this very striking phenomenon must be ascribed, aside from the good effect of the military means of defense, to the behavior of the civilian population during air attacks. The people gradually accommodated themselves to conditions, owing, no doubt, not only to the intense activity of the directing authorities in the dissemination of information, but also owing to the practical experience gained by the masses of the population themselves. In this connection, reference should again be made to the information sheets, posters and pictures circulated by the public authorities. Even though the printed instructions and directions were brief, their contents were very comprehensive.

By following these basic directions, every individual can, all by himself, play an essential part in the home air defense. In this way, he is not only acting in accord with his own interests, but is serving higher ends as well. For it is quite understandable, that the witnessing of the destruction of human life in one's own immediate presence, should exercise a powerful effect on the human capacity of moral resistance. To wear out this capacity is the duty of every individual.

The fact that loss of life appreciably increased in 1918 (it amounted to 1177 killed and wounded) does not stand in contradiction to what has been said here. The increase in losses is to be attributed to the great intensification of the air attacks, owing to the increased number of distinct attacks, the increased strength in numbers of the aircraft used in them, and the higher destructive power of the bombs thrown. Even then it is important to re-state the well established fact, that the total loss of life was small.

One of the immediate effects of bombing attacks, which we have already alluded to, was the destruction of valuable material property and objects. To this category belong the destruction and damaging of buildings, that of the working portions of industrial plants, and also that of the installations and equipment of railways and of the surface damage done to gardens and fields under cultivation.

A rough method of determining the amount of such damage is furnished by the possibility of calculating the consequential financial losses. This method relies on the estimates of damage figured out by the persons suffering the damages, that were handed in to the authorities shortly after air attacks. It can therefore only furnish real values approximately. In spite of this drawback, it affords a standpoint from which we can draw general conclusions and make comparisons.

The total amount of the damage to property gives, in round figures, the sum of 25 millions, gold marks. This sum is inconsiderable in comparison with the total amount of the expenditures for the various military purposes of the war. The latter sum is given in Volkmann's book "The World War, 1914-1918" (Der

Grosse Krieg, 1914-1918), 5th edition, as amounting to 147.3 milliards of gold marks, of which the first-mentioned figure amounts only of 0.017 per cent. In the different years, computing the year as running from the 1st of August to the 31st of July of the following year, the proportional loss in percentage, was as follows:

1914-19150.006 percent	} of the entire war expenditures.
1915-19160.002 "	
1916-19170.02 "	
1917-19180.02 "	
From August 1, 1918 on0.03 "	

In connection with the figures in the last line (from August 1, 1918 on....) the fact must be taken into account that the figures given in Volkmann's book, use as a basis the period from August 1, 1918, to December 31, 1918. On the other hand, the estimate of damage due to air attacks, terminates with the last attack on the German home area, that took place on November 6, 1918; therefore, almost two months earlier in point of time.

However, of more significant importance than the absolute amount of the damage in money, was the fact that the property damage wrought in 1918, amounting in round numbers to 15 million gold marks, exceeds the total sum of the damages in all of the preceding years of the war, by 6 millions of gold marks, in round figures. Taken by itself, it amounts to 62 percent of the entire damages.

So, even though the property damage, as well as the loss of life, when viewed in cold figures, are seen as establishing only the relatively inconsiderable effectiveness of the actual bombing attacks that took place; yet, from another point of view, these figures show by reason of their absolute rise in 1918, the potentialities of development inherent in what we may term "Independent Air Warfare."

Taking up the indirect effects of air attacks, we will first pass to the question of the decrease in industrial production. In spite of the fact that there are no accurate figures showing the total loss of production, there are a few examples demonstrating how effective these air attacks were.

The chairman of the executive committee of the steelworks in Duesseldorf, commercial councillor Roechling, sent a report to G.H.Q. in which he expressed the following fears:

"In the meeting of the executive council day before yesterday, a serious complaint was made regarding the air attacks on the steelworks that are situated on the western border. These attacks cause such interference, that the program of deliveries, as required by the Army administration, can not be maintained. The continual interruptions of nightwork created by these attacks result not only in a diminution of steel production averaging 30%, but will very soon result in a complete cessation of night operation." However the grounds for the foregoing complaints were occasional hits only. The main disturbance of work can be traced to the air alarm. How high were the number of lost working

hours due to these alarms in the Saar region, can be seen in the report of the staff officer of the anti-aircraft guns of Saarbrücken. According to these reports, the total time lost by alarms in the Saar region from Sept. 10, 1916, to Nov. 6, 1918, was 300 hours. According to statistics of the steel industry the number of employees in the five Saar steel mills, during the years of the war averaged 30,000 men. Multiply this figure with the number of alarm hours, (300 x 30,000) and 9 million lost working hours per man is the result. But even with these figures, the real loss of production is not realized, because they do not take into consideration the fact that the course of production can not simply be taken up where it leaves off.

A past director of the Lothringian industry presents a very clear picture of the difficult process of manufacture:

"Let us assume, that the blast-furnaces were just ready to be tapped. All at once 'Air Alarm.' They were not tapped, the draft to the furnaces stopped, but the furnaces continued to decrease. The slag and the iron rose, the molds burned and had to be exchanged immediately or later. The converters in the steel mite had been put on the side, the iron had become cold and was so hard to get out that the mouth of the converter was ruined. The men during these air raids got under cover, and after the attack was over considerable time was consumed before they were back at work. I have the impression that we lost at least 25 percent to 30 percent on production. If the defense had not been as efficient as it was, we would have had to stop altogether."

In England they had similar experiences. For instance, I will quote from a work by Captain Mc. A. Hogg, a British Officer, entitled "Aircraft in the War of the Future," as follows:

"During thirteen different weeks in 1916, hostile aircraft appeared over the Cleveland district. As a result, the iron production dropped by 390,000 tons, or one-sixth of the yearly output. In some of the munitions works, it was observed that on days after air attacks, the skilled workmen made more mistakes in work demanding precision, than usual; that the quality of the work turned out was inferior; and that air attacks made a regular rate of production an impossibility."

Taking all things together, it may be said very justly, that air warfare presents a very serious problem from the standpoint of war-time economics, and, for this reason, a serious problem with respect to the whole conduct of a war.

There only remains, as the last point to be treated, the morale effects of air warfare. I have already briefly mentioned the influence on morale that losses in killed and wounded exercise generally. This influence naturally reacts with greater intensity on the population of the home area, than it does on the troops at the front, whose chief mission in life is to kill, or, if Fate so wills, to die. Now populations of the home area must be educated to a new point of view as to this same question of dying for the Fatherland, for,

like the soldiers, they must also prepare themselves to make bloody sacrifices for the Fatherland—and this applies to women, children and old men also. It is beside the question here, to go into the absolute measure of the mental and morale transformation that the facts call for. To effect this transformation and to maintain the resulting state of mind in permanence, is one of the most difficult problems presented by the war of today to the statesmen and leaders in whose hands lie the fate of nations.

Besides this there is another point that is expressed very clearly in two articles: one written by an Italian general, the other by an English air commander.

The Italian* states: "Up to the present time, the non-combatant folk of nations carrying on war, could live in the rear of the battle front, and, under its protection, could work in absolute safety with respect to their lives and possessions, and in corresponding peace of mind. This was so, and had necessarily to be so, because the general character of war was determined by the fact that man only controlled the surface of the earth. But this will not be the case in the future, nor can it longer be the case, because man has succeeded in reaching the stage where he has freed himself from the earth's surface."

The Englishman** completes the picture by stating:

"All populations, when bombed, undergo three mental phases: the first is a state of fear which may degenerate into panic; the second is a state of indifference, when it is seen that the materiel destruction wrought, is small; the third is a state of feeling utterly crushed, as a normal life becomes more and more an impossibility. Not only the air attacks, but the alarms, including the false alarms, will cause most of the population to seek cover. When rest at night is disturbed, the people, the next day, will be disinclined to work. Now, if our own attacks are really carried out on a grand scale, the normal life and the business activity of our opponents will come to a standstill. Things will not go on as usual. The shocks and disturbances, the discomfort and indignity of all this, will bring forth from the people, a cry to end the war. The nation will first go through the three mental states already described: fear, indifference, and a feeling of being utterly crushed. Our aim must be to destroy the morale of the enemy. He must be made to feel that life has become impossible, that it is preferable instead, to conclude peace under our conditions."

Whether, in fact, this objective can be reached, to bring about a final decision solely through air attacks is a much mooted question in professional circles. This question can not be answered definitely either one way or the other because success depends as in all operations of war upon various situations and circumstances. To-wit: The comparative strength in the air of the opposing forces, means of counter measures, quality of its personnel and materiel, geographical position of the country, density of population, economic structure,

* General Douhet in "The Great Problems of the National Defense."

** Wing-Commander C. H. K. Edmonds in "Air-Strategy."

and not the least the resisting power of the civil population.

However, the existence of the danger of utterly crushing the morale of the civil population by air attacks is not open to doubt. This effect of air attacks must be taken into account as much as the actual destruction of lives and property.

The German philosopher of war, Clausewitz, once said:

"The moral qualities are one of the most important factors of war. These are the spirits that permeate the whole element of war. The soul of war is mostly composed of part physical and part moral causes and effects, and one might say, the physical appear to be only the wooden scabbard while the moral ones are the pure metal, the real sharp and shining weapon."

General Conclusions.

When one comes to the point of wishing to interpret the development of the hostile air attacks and their effect on the German Home area, for present purposes, the difficult nature of such study can not be overlooked. Only an approximate basis can be established, and that by means of practical experiments. And, even then, such experiments are to be viewed with caution, as they have not taken place under actual war-time conditions. This view, unfortunately, is not always given enough consideration.

In spite of all this, I will make an attempt to draw a few final conclusions from the materiel on hand, which I have assembled for the purpose of this paper. This materiel, at least, offers some small foundation for the investigation of the problems of the so called "independent air warfare"; from which standpoint I may proceed without running the risk on the one hand, of fantastic exaggeration, and on the other, of an unconscious underestimation.

Conclusions that hold good and are of use with respect to existing conditions, can naturally only be arrived at by taking into account those technical improvements in aviation that have been achieved since the World War. From a consideration of these, there again appears in clear view, the close interdependence of air combat and antiaircraft defense, even when the problems of air warfare are only gone into theoretically. Neither one of the two arms can arrive at useful principles for its own activities, without taking into full account the activities of the other.

The improvements which have been made since the close of the World War, are of interest for antiaircraft defense, for reasons falling chiefly under four heads. These are the following:

1. The increase in speed of flight;
2. The increase in altitude attained;
3. The increase in load-carrying capacity;
4. The increase in radius of action.

To make the records of individual fliers a basis for study leads to an entirely erroneous picture. The special requirements upon which records are established are not met with by fliers under war conditions. Other demands are made upon a war plane and its occupants than a flier who starts after a careful prep-

aration and with a plane that has been specially built or equipped to gain a new record.

These records can only give us a point of departure for the possibilities of future developments, in so far as they are also applicable to war planes, without neglecting the problems that may have to be met in war. In general, however, we must consider the average capabilities of war planes now in use. In this respect Germany is dependent upon foreign professional information as it does not possess military planes. The following table shows a development of the bomber since the World War. These figures are only approximate.

Power of the Bomber.

Year	Speed km per hr.	Ascend in m.	Bomb. cap. kg.	Radius of action in km*	Remarks
1918	140	4500	250	250	
1932	250	8000	700	500	Day Bomber
	250	4500	1500	750	Night Bomber

*Radius of action is equal to one-half of the flying radius as the other half is required for the return after the bombs have been dropped.

The increased speed as shown in the above table raises the difficulties of defense for the Antiaircraft guns as well as for the Pursuit planes. In the meantime considerable improvements have also been made in the Antiaircraft guns. Firing upon planes rests upon advance calculation of the point in space where plane and point of explosion of shell should meet. The more rapid the advance calculation is and the faster the result of the calculation is transmitted to the guns, and the shorter the time of the trajectory in flight the more will increase the chances of hits. To reach this goal great advancement has been made since the World War. This is primarily due to the use of special calculation appliances. These give automatically the necessary data that are required for firing and in return are continually transmitted by electrical means to the guns and firing mechanisms. As a result of these means, the guns are constantly aimed with the proper allowance for the speed of the plane and point of impact, both horizontally and vertically, and the shell fuse always correctly placed for the correct range. Upon the command firing, all that is necessary is to insert the shell, so that no time is lost in aiming and fuse setting. Added to this, the improvement in range finders and guns as well as the shortening of time taken by the shell in flight, gives an increased accuracy to the modern Antiaircraft guns. They are far superior to the ones used in the World War.

The combat of the pursuit planes against bombing planes is, however, made more difficult by their increased speed. As already stated in Part I, the pursuit plane cannot remain constantly in the air to await the opponent. He may indeed only ascend when the attacking bombing planes approach the object to be protected. It is apparent at once, that the greater the speed of bombing planes the more difficult it becomes for even fast climbing pursuit planes to face them in combat. Furthermore the modern bomber has gained

tremendous fighting power through its stronger armament with machine guns and the mutual fire support of formation flying. The pursuit plane opposed by a closed flying bombing squadron finds himself in the same situation as an infantryman attacking across terrain devoid of cover a strongly fortified position. As the infantryman can not solve this problem without the assistance of the artillery, so must the pursuit flyer depend upon the assistance of the Antiaircraft guns. These must with their fire, separate the bombing squadron and create thereby favorable combat conditions for the pursuit planes, allowing them to attack the bombing planes while out of formation.

It may be expected that in the future the Antiaircraft guns will play a much greater role in warding off bombing attacks than they did in the World War. The prejudice still existing in some quarters against Antiaircraft guns, is due partly to the out-dated experiences of the war and partly to one-sided aerial maneuvers since the war. A great drawback to these aerial maneuvers is that one can not demonstrate with live ammunition the effect of the antiaircraft guns nor their cooperation with the pursuit planes. Therefore the aerial maneuvers do not present a correct estimate of the value of individual means of defense and air defense as a whole. Also, quite often, in the preparation of these maneuvers political tendencies or particular types of training objective, influence the military result one-sidedly.

The increased speed of airplanes has a profound influence upon the service of communication that must transmit information of approaching planes. These messages must keep far enough ahead of the approaching planes so that timely information of the impending attack reaches the Antiaircraft formations and the objects to be protected. The organization and efficiency of this communication service is greatly dependent upon the speed of the planes. The greater the speed, the greater must be the accuracy and rapidity of the work of this service. All this must be considered in its organization, the technical installations, and the training of its personnel.

The increased speed of planes demands greater activity from the Antiaircraft weapons as well as from the communication service.

The second point to be considered is the heightened flying ceiling; day bombers reaching a ceiling of 8000 m. It is not difficult to reach this height with shells from the Antiaircraft guns or the pursuit planes, but at such altitudes the planes are hard to hear and see.

The activity of air defense is dependent upon the timely discovery of planes. The important point, therefore, lies in the development of instruments able to determine the position of planes even at high altitudes, with such accuracy that the firing of the Antiaircraft guns can be conducted according to the data furnished by these instruments. Listening devices do not quite fulfill these demands because the slowly travelling sound waves (about 300 m. per second, render the instrument incapable of giving more than the approximate location of the planes. A better method

for accurate plane location is the use of the heat waves given off by the exhaust of the airplane engine. The article by Capt. W. Sackville and Lieut. J. E. Olivares in the *COAST ARTILLERY JOURNAL* of May, 1927, "A Suggestion for a New Method of Locating Aircraft at Night," discusses this question minutely. The heat waves have the advantage over the sound waves of travelling with the rapidity of light. The heat wave method eliminates the loss of time between the source of sound waves and their reception by the listening apparatus.

In solving this problem the technical difficulties are recognized, but a solution must be found if Antiaircraft defense is to keep up with Aircraft development.

It must not be overlooked that the higher a bomber is forced to operate the less chance there is for accurate hits. An important factor in the security of a country and its population is the existence of a potential military defense that can force the opponent to greater heights. States that are through the Treaties of Versailles, etc., without air defense such as Germany, Austria, Hungary and Bulgaria, are completely exposed to destruction by air attacks. The bombing planes can fly across these countries and drop their bombs just as they do in peace-time training without having to consider height nor the dangers of Antiaircraft defense.

The increased carrying capacity of planes does not hamper the effectiveness of defensive means as does the increased speed and altitudes. Rather the heavier and larger a bomber the more difficult it is to maneuver. It can not by sudden changes in direction escape the fire of Antiaircraft guns or the attack of pursuit planes as readily as a smaller and lighter craft.

But the increased capacity perfected since the World War means a greater danger to the land attacked. For example, with the present air armaments and the carrying capacity of planes, the bombing strength of the military powers that border on Germany could drop within 24 hours over the whole German territory pretty nearly the same amount of bombs that were dropped in the ten months of 1918 before the Armistice. This comparison is all that is needed to clearly show how greatly the power of air attacks has grown as a result of the increased carrying capacity. Also due to the added radius of action more States are being drawn into the danger zone. The U. S. is fortunately separated from other great military powers by wide oceans, so that the danger from the air has not as yet assumed an important role for her. Colonel Lindbergh, a citizen of the U. S., first crossed the North Atlantic in a non-stop flight in 1927; the American fliers Pangborn and Herndon made the first Pacific crossing in 1931 from Japan to North America. However these flights, as well as later crossings, including the squadron flight of the 12 Italian bombing planes in 1931 from Africa to South America do not mean that the U. S. can today be threatened by other continents. Whether it will remain so with the constant improvement in aviation only the future will tell.

There is no state in Europe today that can enjoy

the same security. The countries that lie in the heart of Europe are the ones most endangered as their whole territory is within the radius of action of modern bombers. For example, the capital and the important industrial centers of the German Reich can be reached by bombers of neighboring states in an hour. In the face of these conditions the demand made by the American Government at the Disarmament Conference for the abolishment of bombing planes is greeted with joy by the German people. The Treaty of Versailles has taken from Germany all means of military defense against air attacks; her only protection lies in civilian preventative measures.

To go at length into the details of these protective measures, would take up too much space. But, so as at least to form an idea of the large number of such details, the non-military measures may be enumerated briefly. Such are: alarm appliances for the purpose of warning the civilian population; educative measures concerning the conduct of the public during air attacks; the camouflage of important targets. This last measure includes the following points: devices to blend such targets with their surroundings; the effacing of outlines; the breaking-up of outlines; the use of camouflage nets; the planting of covering trees;

and above all, darkening measures to be taken after night-fall, which is the best protection against night attacks. Further there are: decoy and sham structures of all kinds; smoke screens; gas proof and splinter proof shelters and structures; fire protection in case of incendiary bombs; and last of all, that measure which is the basis and prerequisite for the functioning of all the air defenses as a whole, the preparation of the air observation and communications service (Flugmeldedienst). Laws capable of enforcement, are necessary in order to ensure the proper carrying out of the above mentioned measures. Also the organization of associated air defense services such as: gas defense, life saving, camouflage, bomb proof shelter and fire.

One may now see, how profoundly the necessity of air defense, even in peace-time, affects the life of the Nation, and the lives of the people and their existing economic state and also what an amount of work, on looking far into the future, this necessity entails.

As important as civilian preventative measures are they can not replace the military defense that alone is the best and most effective protection against air attacks.



The 61st Coast Artillery (AA) leaving Scott Field (October, 1932).

Convoy Operations

By Capt. J. T. de Camp and 1st. Lieut. L. M. Morton, C. A. C.

THE general principles for the employment of motor transportation in the Army are laid down in Field Service Regulations, amplified by our various Training Manuals and certain detailed instructions given in Army and Training Regulations. It is not the intention to cover herein the tactical principles which should guide the higher commander in issuing his instructions to a Convoy Commander. It is merely purposed to lay down certain essential principles of operation for the guidance of the Convoy Commander, though it often may be desirable to depart from these under exceptional circumstances.

As motor transportation is primarily furnished for the movement of troops and supplies in mass, it is evident that operations of any magnitude will be performed by organized groups or convoys rather than by vehicles operating independently. Although movement as a unit undoubtedly reduces the speed of some individual vehicles, the convoy formation is necessary for military purposes.

The employment of motor vehicles in our service has covered approximately the same period of time as that of the airplane. The rapid development of aviation is quite generally recognized but many fail to recognize the equally rapid development that is being made in the field of motor transportation. This is principally due to the fact that many of our vehicles still in service were procured during 1917-1918 and to the fact that their present use is largely restricted to routine garrison employment.

These vehicles must soon be entirely replaced. It may then be found that our present thought as to the control and use of motor transportation must be altered in many respects. Much knowledge can be obtained from the operators of large commercial bus fleets but the essential military problems will still remain. Some of these will be solved by the mechanized forces, but the principles for the handling of large scale movements of troops and supplies must still be largely predicated on our past experiences.

Besides the mechanical improvement in the vehicle, a second important factor which can be expected to alter our operations is the constantly increasing network of improved roads and bridges. Where an adequate network of roads exists, the usefulness of motor transportation is many times increased. For these reasons it is illogical to make any hard or fast statements as to limitations in mileage or when troops and supplies can be moved better by railroad or motor transportation. However when a choice can be made it is believed that distances that can be made in a day's run can usually be handled best by motor transportation and those over that distance by rail transportation.

The question naturally arises: What is a day's run? To answer this, not only the type of vehicles available and the road net must be considered, but also the terrain, state of weather, visibility, the hours of daylight available and whether the march can be accomplished in one day or is to continue for several days or more. In the latter case it has been found from practical experience that the normal day's run may be expressed in time as follows:

Preparation for start of convoy	—1 to 1½ hours
Running time	—8 hours
Noon halt	—1 hour
Inspection, servicing of vehicles	
Making camp and supper	—1½ to 2 hours

As to distances, it has been found that the average speed will be 80-90 per cent of designated speed in level country, 50-70 per cent in hilly country and may be as low as 35 per cent in mountain country. Each problem will be different, varying with the situation. Thus the day's run in distance may be anywhere from 30 miles to 300 miles. The average distance of 80 miles for truck trains, now considered a maximum, should be easily doubled in a few years. Our present prime movers are designed to move in convoy at an average speed of 25 miles per hour. There is no reason why such a convoy should not average 250 miles a day under favorable conditions or urgent necessity.

Road Reconnaissance: With so many variable factors to be considered it is important that a preliminary reconnaissance be made before coming to any final decision. It is advisable to keep motor transport columns on two-track roads whenever practicable. Long and steep hills, doubtful bridges, poor roads and congested centers should be avoided if possible. In this country U. S. highways and most State highways have already solved many of these problems in advance. Road maps are easily obtained and detailed information and co-operation can usually be secured by a mere request on the proper state authorities. Thus it is usually possible to map out a route well in advance so that an advance party will be able to make the detailed reconnaissance in addition to its other functions.

Basic Requirements in Convoy Operations: The basic requirements in successful convoy operations are:

- Serviceable equipment.
- A well thought out plan of operations.
- Trained and disciplined personnel.

With this foundation to build on, the factors to be considered in the technique of convoy operations are:

- a. Preliminary arrangements
- b. Control

- c. Road procedure
- d. Repair and upkeep
- e. Camps and messing
- f. Supply
- g. Plans and orders

Each of these will be briefly considered in turn.

Preliminary Arrangements: With well organized, well equipped and well trained units available to form the convoy, a large part of the convoy commander's problem is solved. But if the convoy consists of detailed drivers, or attached units with various and sundry types of vehicles, efficient organization becomes more important than ever.

In such cases it is well to follow as closely as practicable the Motor Transport Company organization. Such a company has 27 cargo trucks divided into three sections of nine vehicles, each under an assistant truckmaster. When two or more companies are operating together as a train, each company marches as a separate unit in the convoy, and its commander is responsible for the march discipline of the command and for the care, maintenance and operation of its own vehicles. In organizing trains, vehicles of the same general type and speed should be placed in the same column. It is generally better to organize light and heavy columns to run with a time interval between or over separate routes. This procedure of organizing separate columns should also be followed if the number of vehicles is excessive or if the column is unduly long. 100 vehicles is considered the maximum that can be controlled by a convoy commander, although many officers of experience feel that 40 vehicles should be the limiting size of convoys operating in an active area.

Next, the convoy commander should organize his staff. The important staff functions are performed by the following:

- a. Adjutant
- b. Operations Officer—who handles the details connected with the actual operation of the convoy such as preparing plans, march tables, march graphs, orders, etc.
- c. Supply Officer—who is responsible for supply, except that for which the mess officer is responsible. He is also responsible for the transportation of the cargo and should supervise and check the loading of vehicles.
- d. Mess Officer
- e. Advance Agent—who controls all advance arrangements for the passing of the convoy through towns, over toll bridges and ferries, advance arrangements for camp sites and in some instances for supplies. He should also make advance reconnaissance, locate detours and alternate routes, post markers, etc. He is also the billeting officer of the convoy. The duties of the advance agent are in general a function of operations, and he should be under the control of that officer. Some officer, generally the advance agent, should be appointed the agent finance officer.
- f. Maintenance Officer—who is the mechanical inspector and is charged with the larger problems of

maintenance and the mechanical condition of the equipment.

g. Medical Officer

When personnel is not sufficient for the assignment of individuals to separate staff duties, the convoy commander must decide how the above duties are to be combined. Some he may assume himself, as that of the operation officer, but the duties themselves are *necessary for efficient operation*.

The question of reconnaissance and routing have already been discussed as well as that of the day's run. In operations over known routes, or routes for which good maps are available, it will be possible to lay out schedules for several days in advance. No march should require continuous driving from daylight to dark. In making the schedule, provision should be made for having a slower rate of march during the first hour. It is during the first hour, the hour after lunch and the hour before camp, that trouble will most likely develop. Mechanical troubles are most likely in the early morning and late evenings; personal "failures" will most likely occur after lunch or late in the afternoon.

A convoy must maintain its schedule and no interruptions should be permitted, especially where troops are being transported or where the convoy is operating in the theatre of operations. The average speed must be so low in such cases to permit adherence to a time table schedule. Of course all elements of the convoy are subordinate to the traffic control that may be established in time of war. Convoys may be required to clear certain control points by a stated time. If failure to do so results in a traffic jam, the convoy commander will be held responsible.

Convoy Control: The convoy commander is responsible for the proper administration, operation and maintenance of his train. He may delegate many duties to staff officers. Certain duties, however, such as the provision for the security of his command, and contact with higher authority and other organizations, should be handled personally.

Ordinarily he will find it more satisfactory to ride in the rear of the convoy. From this position he can note vehicles that have been compelled to fall out, and also observe the progress of march of the entire column. The convoy commander should not endeavor to precede his convoy if competent personnel is available for this duty. It should be remembered that his most important function is to operate his convoy rather than act as an advance agent.

The operation officer, under the direction of the convoy commander, controls the actual running of the convoy. He is responsible for the uniform running speed, for making halts and for following the prescribed routes.

The maintenance officer, under the direction of the convoy commander, takes over the handling of the disabled vehicles which would unduly delay the rest of the column.

The prescribed convoy signals should be used on every occasion where orders are to be transmitted from

one end of the convoy to the other. This prompt transmission of signals particularly from rear to head of a long convoy, requires a high degree of training and is one of the hardest objectives of personnel training to secure. Because of this, many experienced officers feel that proper control can only be exercised by motorcycle. In the future radio control may be developed for use of large convoys, a method which is being experimented with by the mechanized forces.

Generally speaking, a well controlled convoy is an efficiently operated convoy. Violations of control regulations should be dealt with firmly. Control demands constant watchfulness and the enforcement of rules and regulations.

While speed control is usually under the control of the operations officer and the first vehicle sets the pace, the convoy commander must modify this speed if it appears suitable from his observation particularly for those vehicles in the rear of the column. In fast moving convoys, the tendency of the leading vehicle to pull away rapidly after slowing down for a curve or other reasons has the effect of encouraging the drivers in the rear to approach the same location at an excessive rate in order not to lose distance. This condition can be prevented by having fast moving convoys proceed at longer intervals between vehicles on the straight-away and by having the leading vehicle slowly pick up speed after a slow down.

Traffic control includes military traffic control in the theatre of operations, police control in civilian communities, the use of customary road signs, and the use of guides and guards. Guides should be stationed at critical points where there may be confusion in following the proper road. These guides are posted from the leading vehicles and are later picked up by the tail of the convoy. Guards must be likewise stationed at dangerous crossings and at the front and rear of the convoy when halted. It may also be advisable to post guides on bad hills, bridges, etc. to transmit special instructions to the drivers. If a motorcycleist is available he can be used to great advantage and can replace guides and guards. He can be posted by the operations officer at a particular spot until the convoy has passed, then report to the convoy commander before he rejoins the head of the column. In this manner he can also fulfill the duties of messenger between the convoy commander and the head of the column.

Road Procedure: Time is easy to waste and hard to make up. Small details cause most of the loss of time. Many delays will be prevented by frequent inspections, both before starting and on the road. Convoy and Organization commanders should make a habit of going to the head of their column from time to time where the convoy can be observed as it passes. Most of the mechanical breakdowns will occur shortly after leaving in the morning. Therefore it is advisable to make a halt about an hour after leaving camp. At this time the vehicles should be carefully checked for mechanical troubles. At halts always look at the ground under vehicles for signs of oil, gas or water leaks. Halts should not be made in congested areas,

on the crest of a hill or upon an ascending grade. On the other hand gentle descending grades will often facilitate the start after a halt. Vehicles of a convoy should come to a halt slowly, pulling well to the right and halt in a closed formation. Each driver at a halt should make a brief but thorough inspection of his vehicle, checking oil, water and gas and turning grease cups down and tightening loose parts. The time of the halt should be promptly announced in order that the driver will know how much time is available.

Night Movements: "In night marches when protection must be provided against the reconnaissance or attack of hostile airplanes, special precautions are necessary. The troops and vehicles should be provided with shaded lights. Daybreak should find the troops either in position or in concealed localities (woods, villages) and the trains under cover." (Extract from Field Service Regulations).

Undoubtedly in case of war, night movement can be expected to be routine, in maneuvers they will be required more and more frequently, particularly in anti-aircraft units. Night movements of searchlight batteries are essential to tactical employment. As in all night movements, particular care should be taken to see that the convoy does not go astray. It is highly important that the routes be well known, especially if moving without lights, while the speed must naturally be reduced, not only for safety but for proper control of the column.

Refueling: The problem of refueling the vehicles must be considered before the start of the convoy. The amount of fuel each gasoline tank holds together with the mileage per gallon of gasoline must be computed in order to determine when the vehicles should be refueled. Ordinary halts for the purpose of refueling should be made to conform with the regular halts thus allowing for the saving of time by having the halt serve a dual purpose. Vehicles can be refueled on short marches from containers carried in the column or from a tanker moving up or down the column servicing the vehicles. Where funds are available for the purchase of gasoline, a gasoline filling station permitting at least two vehicles to be serviced at the same time should be selected to conform to the periodic halt. At the night halt, arrangements should be made for a commercial gasoline truck to move into the parking place and completely refill the gasoline tank of each vehicle.

Vehicles must be refueled and serviced at night before the men are released. There must be no smoking around the tanks, or around the truck getting the gasoline. The engine must be stopped while refueling.

Accidents: A complete discussion of the subject of the causes of accidents is far beyond the scope of this paper. The method of preventing them is even more extensive. However it may be said that most accidents are caused by the failure of the driver to react instinctively, or react quickly enough, to an unforeseen event or series of events. Operators of large transportation pools have found that about 80 per cent of their accidents are caused by about 20 per cent of

their drivers. Some men seem to be reckless yet they make time and never have accidents. This is due to an instinctive reaction which causes them to do the right thing. There is no time to think. Consequently if a man has had several accidents, even though each time it has been shown that he was not at fault, he should not be allowed to drive. Obviously if a man has accidents due to carelessness or failure to obey the rules he should be relieved from duty as a driver.

Accidents will happen in the best convoys and the convoy commander should be prepared to deal with them on the spot. An investigating officer should be appointed before the march, and he should be with the convoy at all times. By being immediately available and obtaining signed statements at the moment, he will avoid a great deal of correspondence and delay in the final settlement of the claim.

Officers should insure themselves that each driver has an accident report form. The first officer on the scene should start the procurement of statements from all witnesses. Witnesses are generally much more willing to talk at this time than they will be later, particularly if the accident involves a friend of theirs. The procedure is fully covered in Regulations.

Repairs and Upkeep: There are many ideas and systems of vehicle repairs on the road. There seems to be no question but that repairs of anything like a serious nature should be turned over to a convoy unit which will trail the convoy as best as it can. However in a large convoy the utility of a "flying squad" has been clearly demonstrated. This section is provided with light, fast moving vehicles, and operates all along the convoy. The best trouble shooter and mechanic available should be on this work. He can catch a truck with a leaky carburetor float, for instance, make the change and send the truck on to rejoin its column at the next halt.

A single vehicle should not be allowed to delay the column. If it is a repair that can be quickly made it should be left for the flying squad or with the organization mechanic who will then bring it along at the next halt. If it is more serious, the battery or company maintenance force should leave the vehicle for the convoy maintenance section and proceed with the column to handle light repairs which may be necessary.

In operations near the front, frequently all that can be done will be to shove a disabled truck off the road so that it will not interfere with traffic, transfer the troops to other vehicles, or remove such supplies as is possible, and leave the truck for future salvage.

Sometimes a vehicle may be towed to the next halt and repaired there. Also at times it must be towed, for a vehicle cannot be left on a narrow bridge, in the city street, etc. If there remains but a short run to camp, or if the road is deep in mud or snow, it is usually better to tow it on to the night halt where repairs can be made more satisfactorily and with a greater degree of comfort.

These are all mere suggestions, the actual work in all cases will depend on many conditions, and problems will arise which can only be settled by applying com-

mon sense and good judgment to the principles enunciated above.

At times it is more satisfactory to improvise and make temporary repairs which will enable the vehicle to continue in the convoy until a suitable time for a complete repair is available. In general, however, a saving of time is realized and better results obtained by having a thorough and dependable repair job done by the mechanic.

Spare Parts: The number of spare parts carried along will depend on, the number of vehicles in the convoy, the distance it operates from the supply base, the known weakness of a particular type of vehicle, the type of the roads and the nature of the terrain, the experience of the personnel, and the condition and the age of the vehicles.

The parts that are taken should be carried by the maintenance section of the column and not by the units making up the convoy. Otherwise each unit feeling that it may need a certain article will take it along, with the result that the train as a whole will have a stock of the article greatly in excess of the probable needs.

It is manifestly impossible to foresee all the things that may happen, and, if it were, there is no way of carrying all of the replacement parts needed. Therefore a careful estimate must be made as to what essential parts will probably be needed and how many. The rest must be left to the ingenuity of the repair crew and their ability to improvise repairs until the supply officer is able to get the required part.

Mess and Camps: There is no reason why a hot substantial meal should not be served at breakfast and supper, whereas the noon meal is more difficult in preparation. If the convoy is moving in fair weather and for a few days only most men prefer to carry sandwiches rather than to prepare hot meals which would require them to use mess kits at noon. Hot coffee should be served. If the weather is cold, or if the march lasts several days, hot food is essential for dinner also. A hot meal at noon will raise the morale and will add immeasurably to the efficiency of the convoy. Supper should never be hurried. It will usually be ready before the men have finished servicing their vehicles, but mess call should never be sounded, nor should anyone be fed, until all men have been released from the park and had time to wash up.

In selecting a camp site, the availability of water and proper ground and space for parking of vehicles are of first importance. The rear, or driving wheels must always be left on hard surface and a surface that will give sufficient tire resistance if it should rain. If such a parking space cannot be reached without a considerable loss of time it is sometimes better to simply park along the road. In this event the column should be marked with red lights to warn traffic. Frequently however, it can be so arranged that the evening gasoline can be drawn from a filling station that has an open lot around it where either trucks can be parked or tents pitched. The station will usually have toilet facilities. In larger towns there will generally be

found a National Guard armory in which men can sleep, and outside of which vehicles can be parked. This also provides facilities for baths and toilets, but on account of the careful police work which will be required it will take longer to get out the next morning. If necessary, nearly all of the men in a motor drawn organization can find places to sleep on their vehicles, which obviates the necessity for much tentage.

Plan of Operation: Upon receipt of an order directing a convoy movement, the officer designated as convoy commander must carefully estimate the situation and prepare his plan of operation. He will then issue the necessary order based upon this plan. In making the estimate of the situation and in formulating the plan, consideration should be given to the following factors:

a. **Mission:** The mission will be stated in orders from higher authority and should include:

(1) The tactical requirements governing the movement.

(2) The tonnage to be moved, its nature, bulk, and amount; if troops are to be moved, the number and amount of equipment to be carried.

(3) Destination, including location and receiving agency.

(4) The time factors governing the movement, including time of reporting at assembly points for entrucking troops or loading cargo and time of arrival at destination.

b. **Available Transport:** With the tonnage requirement known to him, the convoy commander will be able to compute the number of vehicles required for the movement. The condition of the vehicles and the character of the load will indicate the number of spare vehicles and repair personnel which will be required for the convoy.

c. **Organization of the Column:** If the convoy consists of a single organized transport unit, company, battalion or regiment, this factor need not, of course, be considered. If such is not the case, the convoy then must be arranged in column, organized into convenient sized sub-divisions or units and a suitable staff provided.

d. **Routing:** Intelligent routing increases mileage of daily runs, and adds to the general operating efficiency of the convoy. In routing, convoy reconnaissance or map studies should be made and consideration should be given to avoiding steep grades, narrow roads, roads with frequent sharp turns and ferries. Length of routes, character of road beds and climatic conditions should also enter into the consideration of possible routes.

e. **The daily run:** In determining mileage estimates for daily runs of the convoy, consideration should be

given to: type of vehicles, mechanical condition of vehicles, condition of roads, terrain, weather conditions, and the state of training of personnel.

f. **Supply:** Prior to the departure of a convoy from its base, a systematic plan of supply should be arranged. The initial supplies and equipment for personnel and vehicles must be checked and deficiencies correct. Refilling points should be located and arrangements made for local purchases enroute.

g. **Camps and Bivouac Areas:** In so far as possible camp and bivouac areas should be selected and arrangements made relative thereto, before the arrival of the convoy at the area.

h. **Security:** If operating in hostile territory, an escort should be provided. The directing authority will decide whether or not an escort is necessary. However the convoy should take every reasonable precaution for the safety of his command under any condition.

Orders: Upon making an estimate of the situation a plan of operation should be formulated covering in general terms the what, when, where, how and why of the movement. The convoy commander then prepare the necessary field orders using the plan as a directive. These orders may be either oral or written and should follow the forms outlined in combat orders. When warning orders are necessary they should be issued in advance of the published order. In general the convoy commander's march orders should include in the body:

Paragraph 1. A statement of the tactical situation.

Paragraph 2-a. A general statement of the mission.

b. (1) Order of march.

(2) Time of departure.

(3) Route.

(4) Rate of march.

(5) The daily runs.

Paragraph 3-a. Instructions to various organizations of the convoy, where necessary. These instructions are given under separate lettered sub-paragraphs for each unit for which instructions are issued.

Sub-paragraph x contains instructions which are applicable to all or several elements of the convoy and which apply to the general conduct of the movement, such as distances to be maintained, traffic control, etc.

Paragraph 4. Administrative details, i.e., supply, messing, etc.

Paragraph 5. Information and instructions as to means and maintenance of communication.

Particular care should be exercised to see that all convoy field orders follow the forms published in combat orders. If the convoy is a large one or the movement covers more than one day, the order should be accompanied by a march table.

The Defence of Our Coastal Cities*

By Frederick Hung

CHINA has neglected her coastal defence since the close of the 19th Century. She has been relying on international law, and, later on, the Covenant of the League of Nations and the Kellogg-Briand Pact for her national security. The result of this blind confidence was the Japanese invasion of Manchuria, the bombardment of Shanghai and the complete destruction of Chapei and other populated quarters, and the massacre of some twenty thousand defenceless civilians by the Japanese invaders. For this national disaster, the Chinese press which has never or rarely drawn attention to this lacuna of Chinese defence, and the government leaders who have diverted funds for national defence to fight civil wars, are as much to blame as the soldiers of the invaders.

The Shanghai nightmare has opened the eyes of the Chinese public which has at last realized that neither the Covenant of the League of Nations, nor the Kellogg Pact, nor any number of such pacts and treaties can protect us from aggression. The protection of Chinese life, property and honor can be secured only through our ability to repulse invasion by force. That Chinese manhood has the "stuff" for such task is plainly proved by the military prowess of the 19th route Army in its glorious defence of Shanghai.

For years to come, pending the restoration of Manchuria to China, relations are likely to be devoid of amity between our country and Japan. In other words, our cities along or near the coast, especially the most populated ones, such as Shanghai, Nanking, Tientsin, Peiping, Tsingtao, Tsinan, Hangchow, Foochow, Amoy and Canton are liable to be menaced or attacked by the Japanese naval and military forces, or bombarded by her naval and air fleets. To leave these places without adequate defences would be to invite disaster. As to what these defences should be in each place it depended evidently upon local geographical and other conditions. Certain fundamental principles are, however, applicable to most cases, and these we shall presently study.

Military and naval experts generally recognize that it is impossible to defend the whole length of a coast line, even a short one like the Belgian Coast, against spasmodic raids. Prolonged attack or invasion can, however, be checked by a fleet. As to the relation of coastal defence to the navy it may be said that the only true defence of the coast is in its fleet, consisting of battleships, cruisers, destroyers, carriers, submarines and aircraft. That fleet must be free to move out into the open sea to give battle to the enemy, and must not remain attached to any locality, however important it may be. That seacoast batteries alone, however powerful and elaborate, are incapable of checking a concentrated attack is evidenced by the blocking

of Zeebrugge, German submarine base during the War, in 1916 by a surprise attack of the British fleet under the cover of a smoke screen. From this we may infer that the fortification of the whole of China's coast line would be a futile and wasteful effort. What we need is a powerful fleet and the fortification of the principal coastal cities.

A coastal city or naval port may be attacked from sea, air or land or the combination of all three. Its defence necessitates, consequently, the combination of land, sea and air forces, which must be adequate in themselves, or capable of holding on until the arrival of reinforcements. The introduction of new weapons into warfare has led to certain erroneous conceptions of coast defence. Some think that long range artillery would be able to keep enemy warships away from the coast, forgetting that their targets are far away, hard to hit and well protected by armor. Others imagine that the airplane can replace both the long range gun and the fleet, not knowing that the flying machine, dreadful as it is when its bombs hit the target, will not always be able to do so when flying at high speed and amid enemy bullets and pursuit planes. Neither can submarines alone keep away an enemy fleet as anti-submarine measures have made considerable progress since the Great War. Besides, the aircraft, submarines, minelayers, and other auxiliary surface warships, constituting the so-called mobile defences, may be paralyzed by fog or bad weather. Hence, the importance of conserving the immobile defences, i.e., the fortresses and batteries. Their usefulness is fully demonstrated by the part the Woosung Forts played in the Battle of Shanghai.

The fortification of our coastal cities were put up mostly during the latter half of the 19th Century through the efforts of Li Hung Chang. Since that time, naval artillery has made much progress. The range of modern heavy guns is 40,000 yards and upwards, and two new weapons of destruction have been introduced into warfare; aircraft and gas. Hence the need of enlarging, reinforcing and reconstructing the fortresses and shore batteries so as to give them the greatest possible security and the most effective destructive efficiency. Many fortifications, such as the Woosung Fortresses, have to be remodelled to form a system of fortified sea and land fronts instead of adventuring out into the coast as isolated batteries. Shanghai, Canton, Tsingtao, Weihaiwei, Foochow and Amoy, representing either very important centers of industry and commerce or naval bases, should be developed into fortified camps capable of sustaining a prolonged attack, and serving as operating bases in future naval battles. Other coastal cities which must be more or less fortified include Chefoo, Haichow, Hangchow, Ningpo, Santuao Hinghwa, Swatow, King-

* From *The China Critic*.

chow and lesser cities. Negotiations should be entered into with the Powers for the revision of the military clauses in the Boxer Protocol which limited our right of self defence in the Peiping and Tientsin area. Since, for a long time to come, railways connecting these cities with the interior and with each other would be insufficient for speedily dispatching reinforcements it follows that these local defences should be made capable of sustaining the attack by themselves for a period longer than is usually expected of similar cases in other countries. Special attention should therefore be accorded to the storage of abundant munitions, materials, fuel and food. Needless to say, strategic railways and roads should be built as soon as possible, without which the localities attacked are doomed sooner or later to collapse. As many aircraft bases as possible should be prepared near the locality to serve as operating bases against the invading fleet. A great number of expert gunners will have to be recruited and trained by the best instructors that we can secure. As for the building of the fortification works, it seems that this delicate mission can best be trusted to American or German military engineers who will have least interest to divulge our military secrets. They should be requested to instruct promising Chinese engineers to take charge of the repairs and maintenance of the works.

One may ask as to the number of guns necessary and as to how much the batteries and fortresses would cost. During the European War, German batteries on the 75 kilometers of the Belgian Coast counted no less than 300 guns, among which 136 were of 150 mm. calibre; 31,280 mm; 4,305 mm; 6,400 mm.¹ If the whole of the Chinese coast is to be defended by batteries in the same proportion of guns to the kilometer of coast line we would need 300,000 guns, i.e., six times the total number of cannon possessed by the Germans at the end of the War. This wasteful and unnecessary luxury is of course beyond our financial means. We would only need, speaking in round numbers, say 1000 cannon of all calibres from 18 inches downward, but excluding the machine guns for anti-aircraft defence. Of course it is preferable to have these guns made locally and secretly under the supervision of competent officers and advisors. If the cannon and munitions can be manufactured in China their cost would not be beyond the financial means of China.

The mobile defences are of even greater importance than the fortifications. They should consist of submarines, minelayers, aircraft and other auxiliary surface warships. The submarines and other naval units are used for observation and for attacking the invading fleet at points beyond the striking distances of the shore batteries. They can also be used to lay mines and nets in the possible tracks of the enemy fleet. For these operations the submarine is of especially great value because of its small cost of construction, its relative invisibility in the sea and its great independence of operations. The aircrafts cooperate in distant air observations, in assisting in directing the

firing of long range guns, and in attacking enemy naval and air forces.

To render coastal cities safe from the enemy's naval and air bombardment it would be necessary in the former case to keep the invading fleet away from the 50-kilometer radius, and in the latter case, the host aircraft carriers outside of the 500-kilometer radius, considering the radius of action of actual naval artillery and aircraft. For this we would need a substantial navy and a powerful air fleet. The latter of course less costly and more easily built. A few weeks are sufficient to make a military pilot where years are necessary to instruct a naval officer. As a matter of fact, in France an intelligent and healthy boy can learn to fly as a tourist in some 60 lessons of 15 minutes each. To make a military pilot more instruction is necessary. During the War the first American pilots were trained in French camps after only a few week's instruction. Evidently, pilots for single-seat pursuit planes would need much more fighting experience which can be obtained only by hard training and real air duels.

One may inquire as to how many airplanes would be necessary to defend a big industrial center, such as Shanghai, or a naval base, such as Foochow. This would depend of course upon the maximum scale of the attack, i. e., whether the enemy attacks from a land base or from aircraft carriers. The objective of the defending air forces being to annihilate altogether the enemy air fleet, the former must necessarily be superior in skill and in number to the latter. Take the example of a Japanese attack on Shanghai from a fleet including aircraft carriers. The capacity of Japanese carriers is as follows: Kaya and Akagi, 66 hydroplanes each; Wakamiya, 6 machines; Hosho, 28 machines; Matora, 12 machines—a total of 178 machines.² In addition to this, each Japanese battleship or cruiser carries 2 to 3 planes, making at total for the invading fleet of over 200 bombarding or fighting machines. Excluding the possibility of the Japanese occupying a nearby island or part of International Settlement as an air base whereby additional planes could be launched, this armada is quite sufficient to reduce Shanghai to ashes in several hours time. The job of the defence air forces is therefore not only to drive them to their floating bases—they are sure to come back again, especially in the night—but to destroy them altogether, for which work from 400 to 600 pursuit planes piloted by experienced air warriors are necessary. Add to this the number of bombarding planes necessary to attack and destroy the floating bases and the number of machines necessary to defend the most important cities in the 500-kilometer radius, such as Hangchow, Wusih, Nanking, etc., we would need from 700 to 900 planes. If Japan attacks the Peiping-Tientsin zone from a land base, say Chingchow or Port Arthur or both, and with a total of the 1639 planes at her disposal,³ we'll have to oppose to this air armada at least 2500 machines. Our need

¹ Major General Sir George Aston, *Secret Service*, p. 231.

² *L'Armée Moderne*, Feb. 1, 1932, Paris; and *Annuaire Militaire de la S. D. N.*, 1931.

³ Report to the Disarmament Conference, Geneva, Feb. 1932, quoted in *L'Illustration*, Feb. 20, 1932, p. 221.

sity of superiority lies in that our aim must be to destroy the enemy air fleet, while theirs is only to bombard our cities and to massacre our civil population, a much easier job from a military point of view.

In the opinion of French and British military writers the best means of air defence is to retaliate against bombardment by bombardment. As we cannot revenge Shanghai on Tokyo or any other Japanese city until we have a powerful navy, our only weapon would be to develop a superior air force. We would need for our air fleet at least 3000 planes, mostly single-seat pursuit planes, and a personnel of 30,000 the same as for Great Britain, including officers, men, mechanics, and workers. In peace time these men, or a considerable part of them, can be engaged in air transportation, air surveys and air police, all of which China needs badly. Besides, with this powerful air fleet at the disposal of the Central Government rebellions would be wiped out in no time and civil wars made impossible. It may also be pointed out that defensive aviation is very much cheaper than offensive aviation because pursuit planes cost much less than the bombers.

For our national defence in general and the coast defence in particular we need a substantial fleet of battleships, cruisers, destroyers, submarines, and aircraft carriers. The object of our naval development is of course to build a fleet as strong as that of Japan, and this, within ten or fifteen years if possible. To start with, we should work out say a quinquennial naval programme where emphasis is laid on the defensive arms, i.e., the submarines, destroyers and aircraft carriers. Our programme might comprise:

	<i>Total tonnage</i>
Battleships: 2 of 35,000 tons each	70,000
First-class Cruisers: 2 of 10,000 tons, 2 of 7,100 tons	34,200
Second-class Cruisers: 4 of 5,950 tons	23,800
Aircraft carriers: 2 of 13,800 tons	27,600
Submarines: 8 first-class (1,970 tons)	15,760
16 second-class (1,400 tons)	22,400
30 third-class (998 tons)	29,940
10 fourth-class (480 tons)	4,800
2 flotilla leaders (8,500 tons)	17,000
First-class Destroyers: 12 of 1,400 tons	16,800
Second-class Destroyers: 12 of 900 tons....	10,800
Total tonnage	273,100

The realization of this programme would probably cost pounds (Sterling) 46,000,000, a little less than one-fourth of the total cost spent in Japan for the construction of her present fleet of a total tonnage of 871,222. As this programme is to be progressively realized in 5 years time, each Chinese need contribute no more than 6 pence or 35 cents silver a year, in other words, the cost of 20 cigarettes.

In coastal defence the army should cooperate with sea and air forces in preventing the landing of enemy troops. The Battle of Shanghai has definitely proved the military value of Chinese manhood, and there is little doubt that hereafter the Chinese Army would be called upon to play a more and more glorious part in nation defense. Their efficiency can be increased many fold by the incorporation of modern weapons, especially aircraft, tanks and heavy artillery. During the Great War, heavy artillery of 305 mm and 400 mm were mounted on railway mounts and used on the Belgian coast, and two such guns, though perhaps of smaller calibre, were reported used in the Battle of Shanghai by the Chinese Army. The use of heavy railway guns has also been adopted by the United States Coast Artillery which recognizes its ability to reinforce coast batteries rapidly and in great numbers.

For many years to come railway communications may not be sufficient for military needs, consequently every isolated vulnerable point in our territory should train up a local militia to help the defending troops to hold on until reinforcements come. The local militia can be used specially for anti-aircraft and anti-gas defence, which in France are partially assigned to civilians led by reserve officers.

There is little doubt that the efficiency of the Chinese Army can be increased many times by the improvement of its equipment and the reduction of its numbers. Among the present troops, estimated at 2,500,000 men, say one million may be kept as an active army and the rest classed as reserves and used to construct military roads, irrigation and drainage canals, aviation fields, and some other public works which require massive labor. If this be carried out and at the same time the army secure unified command with a good General Staff, the Chinese Army will become one of the best in the world in a few years. The General Staff would take care that enough munitions, fuel and other vital materials are stored in each fortified camp so that there would be no more disagreeable surprises in the future.

From the above notes on the coastal defence it is readily seen that the security of our maritime ports is inseparable from the programme of national armament, including the reorganization and re-equipment of our Army, the building up of a fleet, the formation of powerful air forces, the construction of strategic railways and roads, the enhancement of our vital resources, and in general, the recovery of our national prosperity. The shortest time that we need to realize our programme of national security would naturally depend upon the "savoir faire" of the government and the money that we can secure for our armaments. If all goes well as expected, in three years time incidents like the last Shanghai bombardment will be made an impossibility, and in ten years time China will become a great power which will be in position to ask Japan to evacuate all former Chinese territories.

The Third Line of Defense

By Major Hollis LeR. Muller, Coast Artillery Corps

ON the twelfth day of September, 1924, the President ordered a test mobilization of the organized military forces of the nation. Accordingly, between dawn and sunset of that day, some 90,000 reservists, about 75,000 National Guardsmen, and the full strength of the Regular Army, were mustered before the colors. The news of that day records that everywhere under our flag, expressions of approval marked these peaceful concentrations.

Of course, this was no extraordinary event for the Regular Army; nor yet for the National Guard, which is kept in a continual state of readiness. But, for the Organized Reserves, these demonstrations fixed the end of the first phase in its existence. The third line of defense had taken its place—a working element of the constituted land forces.

The Organized Reserves thus became a going concern; the culmination of a century's effort on the part of our military leaders to make the people of this country realize the necessity and value of a citizens' reserve component in the scheme of national defense. What kind of weapon the Government would forge from this raw material of security, remained to be seen.

In evaluating the Reserve today, it would first be well to recall certain reasons back of its adoption in this country.

History discloses that when a nation becomes softened by success and prosperity, its citizens gradually neglect and eventually disdain their military duties. They thus become easy victims of warlike rivals. After Tamerlane conquered Herat, it was said: "Timur's dominion became so secure that luxury was its only enemy." When Darius, last of the grand Persian monarchs and overlord of the civilized world, entrusted his country's security to foreign hirelings, Alexander knew that the time was ripe for his disciplined Macedonian shepherds. The case of Carthage is epochal. And mighty Rome which men said would endure forever....

With such lessons in mind, the War Department considered any scheme which assured the permanence of a citizen army of uniform representation from all sections, the most important measure of security in this nation's life. General Pershing chose with good purpose, the test mobilization of 1924 as the final act of his administration. He warned the American people to regard the Reserve component as the backbone of security, since it must furnish the bulk of their troops in war. He urged that none but the most skillful leaders be assigned to Organized Reserve duty, in order that this body could be quickly brought to a high state of efficiency. Lastly, he cautioned the nation to continually observe the utility of the Reserves, from which the country would derive its chief protection in future wars. Such is the importance of an organized reserve.

A brief glance at our own military history will call to mind the fickle leadership which harassed General Washington throughout the Revolutionary War; the helpless misdirection by leaders of all grades, in 1811, when in consequence, the brave pioneer was more apt to run than face the enemy; the pitiful troop leadership at Bull Run and Shiloh; the incompetence at Santiago. Experience has thus taught us that it takes months to train good troops; years to develop capable leaders. Therefore, the first essential in any program of preparedness is a corps of trained leaders. Of these our chief concern is with the numerous leaders of front-line troops, who in this day of far-flung battle formations, have the final issue of combat in their hands. But, if good and sufficient leaders of all grades are not ready on M-day, it will practically always be too late to provide them. Futile it is, and probably disastrous, to attempt the training of troops and the education of their leaders at the same time. Such a course would defeat the objectives of the Organized Reserves.

Let us see to what extent these aims have been realized with the citizen component which will furnish three-sixths of our army, in war.

In the original set-up of the Organized Reserves, the framers of the National Defense act of 1920, first sought to apply the lessons of the World War. The War Department had to bring tactical doctrine up to date, and determine organization on a war basis according to the Missions had to be assigned anew to Regulars and Militia and prescribed for the third line of defense, the Organized Reserves. Arms and services once balanced, it was next necessary to compute the various quotas of units required for the field forces and the Zone of the Interior; a total of 5000 independent units for the Organized Reserves alone. Allocations of personnel and units were then made to corps areas on a population basis which distributed the burden of defense equally throughout the nation. Finally, from the field army down to the company, mobilization plans were drawn. Then only, could the Officers' Reserve Corps begin to function, with its nucleus of World War officers; expanded with selected enlisted veterans; augmented by annual increments of R. O. T. C. and C. M. T. C. graduates. All these steps had been satisfactorily taken when the War Department conducted the first test of the Reserves—their capacity to assemble rapidly.

The Reserves were then ready for the detailed task of developing leaders indoctrinated with the American theory of making war. This was substantially the tactical doctrine we had taken to France; and which the American army had put into swift and decisive execution. The power of the offensive; open warfare; the superiority of the human element over the machine.

tor; the discipline of cooperation (rather than of force); roles of the primary and supporting arms; functions of the tactical teams—the division, corps, and army; team-work and mutual support; and other factors conformable with sound principles of war. In short, this typically American doctrine of making war had to displace the piecemeal ideas that had inevitably sprung up, due to the makeshift methods of 1917-18.

From experience, we learn that each assignment an officer receives, calls for special study. Command exercised over veteran troops differs from method of leadership applied to untrained levies. Militia, C. M. T. C., R. O. T. C.; each require intelligent understanding. Manifestly, the leader must keep in mind the character, experience, previous condition and environment of individuals, and the "class mind" making up his command. With Reserves, we are dealing with officer-cadres, virtually without troops because the three per cent enlisted reservists are candidates for commissions. In consequence, each member must be handled as a separate entity, to a degree that does not apply in other components. Accordingly, one factor stands out in getting results with Reserve personnel. This is the individual attention of commanders and instructors to each Reserve officer's problems; the matter of personal touch. We might properly label this: Rule "A," and keep it uppermost in mind, to better understand the discussion which follows.

The Reserve Officer's Problem

Nothing can alter the fundamental fact that it takes considerable time and hard seasoning to make a soldier. Still more time and care are required in making leaders. In time of war, this training process may be speeded up slightly by means of intensive methods. However, on the field of battle, lessons are learned—not taught. And, at what a staggering cost! On the other hand, it takes no lives, no pensions, no vast outlay of munitions to make mistakes on the drill-ground.

There is consequently no substitute for handling men at practice on the drill and maneuver field; no short cuts to battle efficiency. How then, without sufficient troops to give the Reserve officer occasional practice in troop leading and managing men, can we teach practical leadership; develop an army in which the human factor outweighs the mechanical; and thereby avoid the dangerous regimen of a straight diet of theory?

To that end, provision was early made to send reservists periodically to active duty. But the best we have been able to do, up to the present, is two weeks active duty in three years, on the average. At this rate, it will take many years to give all the Reserves a fair degree of facility in handling troops.

Without troops to lead, active duty takes the form of *group training*. Officers form in ranks, man the guns or other materiel, and attend drills, conferences, and terrain exercises. The schedule is varied with problems of decision in the field, demonstrations furnished by Regular Army troops, and participation in ceremonies of these units. As basic training, group instruction is invaluable. For technical purposes it cannot be surpassed. Yet, at a certain stage in an of-

ficer's training, no further benefit will be derived from the manual operation of driving a tank or manipulating a breechblock. After grounding in theory and practical work, progress is checked for want of the working tools of soldiering. Only a negligible number of Reserve officers can be accommodated with tours of duty in Regular Army or National Guard units. Were it not therefore for the Citizens' Military Training Camps, we would have no means of giving our Reserve officers that indispensable practice in troop leading which alone saves casualties and prevents disaster on the battlefield.

Since only a fraction of the Officers' Reserve Corps can be sent to training camp each year, and a still smaller fraction to officer C. M. T. camps, the War Department has always attached great importance to *inactive duty* training. The extension schools were founded and correspondence courses prepared as the basis of such training. Concerning their development, a volume might be written. Suffice it here to say that the involved experimental courses have now been replaced with short lessons and concise subcourses well suited to the average needs. When one considers that the Reserve student must pick up his studies in odd moments, is often interrupted, and nearly always works under adverse conditions; texts and references ought to excite zeal—not dread; interest—not fatigue. The increase of extension school work during the current year is ample proof that the new courses meet these requirements. And what is more, that the extension lessons are as adaptable to class work as to individual study. This is an important consideration for the reason that in the larger communities, the first demand is for class-room instruction.

This brings up the important subject of contact; synonymous with getting results in Reserve work. The principal means of bringing reserves together, are the Reserve Officers' Association branch chapters; regimental meetings and unit conferences. Social relations are thus established and official business transacted. During the Fall, Winter, and Spring months conferences are held on a fixed schedule. Here the student is grounded in rudiments, so that his Summer training may be entirely devoted to practical work.

Last year, nearly 200,000 officers' class-attendance was recorded. About the same number of extension lessons were submitted. The actual cost to the government was approximately eight cents per hour of instruction. The value to the service was in any case very high. Locally however, results are gauged by the number of subcourses completed, and by the per cent of members attending meetings. The average of these items, gives a fairly good index of the quality of work being done. Interesting conferences naturally induce students to enroll in the extension school. The speed and value of extension study are enhanced by preliminary class instruction. In this way, one promotes the other. Thus, while extension work is the means of qualifying for promotion to the next higher grade, unit conferences breathe life into what otherwise tends to become rather staid procedure.

A certain number of meetings should be spaced

throughout the year, dealing with technical and tactical subjects of general professional interest. These will include moving pictures, map problems, illustrated lectures, and such other departures from a stereotyped program as best meet varying tastes and needs. During the Spring months, saber drill, pistol practice, infantry drill affording actual command, and the rules of leadership; should anticipate active training. In other words, the *inactive* program should lead progressively up to *active* duty.

Meanwhile, every series of meetings should have such continuity as to draw students regularly to class. Although instruction is the main object, it is desirable to alternate work with diversion. Meetings should be conducted with the least amount of formality, and some opportunity afforded for visiting. This is a feature that attracts members to gatherings. Accordingly, it will be found that an occasional lunch, dinner, or dance will increase regimental esprit and interest; all very essential in the making of good soldiers.

The Citizen Soldier

In any estimate of the Organized Reserves, a study of the psychology of the citizen soldier forms an important part. An insight into this subject will explain many policies and customs that have grown up with the Reserves, simply because they favored methods which proved uniformly successful.

Categorically, the Officers' Reserve Corps may be divided into three rather well-defined groups. To illustrate, let us take a typical officer from each.

Quite the smallest group is represented by a man of more or less means; successful in his community; a natural leader, conscious of his ability and influence in both civil and reserve affairs. Generally such a man has time, energy, and the wherewithal to perform his military duties in a big way. It is but natural for him to stick with the Reserves. Thus, the more prominent of our older officers have become the leaders of the Reserve movement.

Such a man as described belongs to the manager or superintendent class. In the Reserves, he is a field officer. He will respond to any call for assistance in putting across Reserve missions. To him the authorities look for leadership, especially for that inestimable quality in Reserve work—example. He is the intermediary, the booster, the disciplinarian. In peacetime we will seldom find this type of officer becoming inactive until age takes him out of the picture. In war he will command important Reserve elements. This type is the keystone of the scheme.

The next larger group is represented by a first lieutenant. In civil life he is somewhere between the clerical and managerial classes. This man is fighting his way up, both as a soldier and civilian. Hence he must give time, outlay, and effort sparingly. Limited means and domestic responsibility interfere with his spare hours; affect his choice of uniforms and equipment; jeopardize his two weeks in camp. Yet strangely, the hardest working officers come from this group. Significantly, the men who are headed upwards in their occupations.

Unfortunately, however, the least active officers are also included in this group. Nine times out of ten, it will be found that the Reserve officer who is slowly fading out, is struggling to hold his own in civil life. Thus, losses from this middle group of reservists represent actually the least valuable classification from a military standpoint, where leadership qualities set the standard.

Between these two extremes of the middle group, the typical officer is plodding along. Not brilliant, but safe and sure. The man who will command our batteries and battalions in war. As a man values training in leadership, this is the class of citizen officer who most needs the organizing influence of command experience. To work past the bottle-neck of competition, as civilian; soldiering has a capital worth he is usually able to recognize. Experience proves that this is the hardest officer to reach. Certainly he is the most difficult to teach. Therefore, the main effort of Reserve instruction should be aimed in his direction.

Lastly comes the bulk of the Reserves—second lieutenants; replacements out of the R. O. T. C. and C. M. T. C.; men without war experience, and for the most part unfamiliar with the art of handling men.

Of these, a small per cent is either finding the Reserve work too much to handle on the side, or having trouble getting started in the business world. In some cases early employment carries them from one job to another. Others take traveling positions which keep them from establishing in one locality. In consequence this type of reservist is headed for the *inactive* status. Five years thereafter, they cease to belong to the Reserves. The only consolation is, that our better grade officer material is rarely lost through a lack of energy or through sheer indifference.

On the contrary, the mass of young Reserve officers is seriously interested from the start and easily induced to become active. Hence, the typical man in this largest and most important group of Reserve officers is awakened without much effort, to the professional value of disciplinary training. Early in his experience he grasps the fact that discipline of thought and habit impress his business superiors and associates. Consequently, in the great majority of cases, missionary work with the new Reserve officer brings quick pay both to the individual and to the service.

From all this it seems that the beginner is in the Reserve service for what he can derive from it intrinsically; which is as it should be. When the officer approaches his captaincy, he has gotten safely past the doldrums of discouragement that beset the younger reservist at some time in his career. The attachment of the middle group has become adventitious. They can nearly always be counted upon to go ahead under their own initiative. With rank, the somewhat older officer is actuated by two motives; a sense of responsibility, and a love of the service.

It is encouraging to note, after twelve years of Reserve progress, that the citizen officers who are wedded to the service are those in whom qualities of leadership are strong. Consider the infinite pains these men have put into their preparation for a war they well know

may never come in their days of service. There is no professional reward, as with the Regular; no armories, troops and equipment, as with the Guardsman. Through lean years and prosperity—each of these conditions a trial in itself—they have worked for the Army when their business needed them most, or when other men in like positions were playing. Nothing short of a patriotic sense of duty and total lack of self-interest can account for the professional zeal of the most active element in the Corps.

The utility of recognizing the state and temper of the Reserve officer lies in giving the kind of administration and guidance he expects. This does not mean a compromise with the quality of leadership, but rather to methods adopted. For, only when the Reserve officer finds in the military game what he craves, may he be developed into a useful leader.

Regular Army Cadres

Any estimate of the Organized Reserves, is incomplete without the role played by the military authorities, through unit instructors, chiefs of staff, and liaison officers who come into contact with Reserve personnel. The enlisted force that composes the permanent administrative cadre must also be considered, and Regular Army personnel of all grades at stations where the reservists report for the annual training period. What is now said of the unit instructor may be taken as a fair guide by all the above classes in their relations with Reserve personnel.

The unit instructor is the balance wheel in the organization. On one hand he represents the War Department; on the other, his unit officers expect him to guard their interests. This dual status in no wise conflicts; nor does it impair the Reserve commander's authority. The unit instructor must work harmoniously with the commander, as executive, adjutant, personal representative, according to the arrangement between them. Naturally, success with the unit depends upon the good feeling between these individuals. In every detail these two officers must work in closest harmony and cooperation, if either expects to succeed. Under the regimental commander, battalion and subordinate commanders should be held responsible for their assigned officers. The chain of command is the secret of multiplying Reserve activities. The most active officers are used to stimulate the least active. Unless the unit is widely scattered, the temptation to habitually use direct methods should be resisted. Likewise, a spirit of comradeship permits appeal on a personal basis between officers that would only arouse friction if couched in official terms.

This does not mean that Reserve officers want to be coddled; that they resent official action; that they object to soldiering. Quite the contrary. It merely means that we must enforce with them a discipline based on cooperation and suasion; and sedulously void the discipline of force or fear.

Instructors of reserves ought to be very carefully selected, when one considers that these men have the power of influencing three-sixths of our war forces. They must be capable of implanting sound technical

and tactical knowledge, of instilling high ideals, and inspiring these war-time leaders with a fighting heart. To do this, they must win the Reserve officers both professionally and personally.

No matter how large his unit, the instructor must recognize each of his Reserve officers at sight and by name. He should know each individual's general situation in civil life and all details of his military status. It is advisable to know something personal about each officer, and to take an interest in private matters that the officer is pleased to discuss with him as a friend. So, an instructor detailed with the Organized Reserves must first of all be a student of human nature; and secondly, a good mixer.

Officers who have served long tours with the Organized Reserves say that these simple rules guarantee success. Violate them and you fail. Furthermore, what has been said in general, represents the composite opinion of scores of Reserve officers consulted on the subject.

Reserve Policies

When the Reserve movement began in this country, we could draw but slightly from the experience of other nations. So essentially American were our reserves that we had to depend entirely upon developments to bring about improvement and refinement.

From time to time, as was to be expected, changes of policy had to be made—as the War Department expresses it—"to strengthen the organization; to increase the responsibilities of unit commanders, and to demand more in the way of demonstrated military capacity for promotion, while increasing the opportunity for promotion." These have generally been cheerfully accepted by the Reserves, notwithstanding they often worked an individual hardship, or loss. Indeed, the loyalty and cooperation of officers in placing the good of the cause, and the betterment of the majority, before individual interest, is one of the most impressive developments we have seen in our service.

But now, as the experimental period draws to a close, the Reserve scheme is becoming more settled, and changes should be fewer. However, the War Department points out, that "any mobilization plan is rather fluid, varying with every change in organization. Should it ever stabilize, it will probably indicate that the Army has ceased to develop."

Although it is not so much the purpose of this article to point out possible improvements, as to outline proved features of the present scheme, certain developments seem so clearly forecasted that we cannot entirely dissociate them from the *modus operandi* which regulates Reserve affairs.

Some of these changes may come only after the next war, or in the next generation; depending upon a quirk of history. But by looking forward, without thought of local interest, and free from prejudice, we will now consider what the future possibly holds for the Reserves.

Consolidated Reserve Activities

In time, the principles of unified control and coordination would appear to demand the creation of a Bureau of Reserve Affairs, which will consolidate all ele-

ments of the Organized Reserves, together with the R. O. T. C. and the C. M. T. C. To what extent such an organization would resemble the present Militia Bureau is beside the question. A Reserve Bureau would seem to fit into the existing scheme. While the idea has many advocates, it is opposed by many who have the welfare of the Reserves at heart.

In time of war, the special machinery for turning out many thousand officers to bring the Army to strength, will become overnight one of our most important projects. This organization might well be incorporated into the Reserve scheme. During peace it could profitably operate in the exact form to be used in war. Summer training camps by using this machinery for the active duty training of Reserve officers would pass to a war basis without so much as a jar.

Refresher schools for Reserve officers, contemplated after M-Day, if likewise united to Reserve activities, will keep the instruction of Reserve officers in the hands of experts acquainted with the best methods of handling their training. This does not refer to the matter of control, which for all components, is now decentralized in the hands of corps area commanders. We refer rather to the more vital matter of doctrine and methods used; of instructors drilled in the processes that are peculiarly adapted to Reserve training; of leaders familiar with the psychology of the citizen soldier.

A decade of experience has now given us a corps of these trained instructors. Additional instructors developed at leisure during time of peace to meet the needs of war, will have much confusion of M-Day. Out of a school designed for this purpose, sufficient reserve officers should be developed to form a pool of qualified specialists, available for training centers, schools, and courses that must be promptly instituted upon mobilization. These reservists should be selected on a basis of annual efficiency reports over a period of several years; with special attention to results accomplished in *inactive duty training*, where instructor ability is best determined.

In another generation, the Army as a whole will be acquainted with the Reserve problem; and the three components will understand one another better, hence the necessity of concentrating the various Reserve activities may never materialize. In fact, the Regular Army and Organized Reserves belong essentially to each other. But, as specialists are developed, and the Officers' Reserve Corps gains a better balance in grades and proficiency in grade; as agencies and scope of Reserve affairs multiply, and coordination becomes increasingly difficult; it would seem that the time will gradually ripen for the consolidation of all Reserve functions under one head. Whether as a section, division, bureau or corps is immaterial. The main point is to insure cooperation and teamwork.

War Strength of Reserves

Against the requirements of a major war, more senior officers will have to be developed during the next few years. That this affects the Organized Reserves,

may easily be seen. For example, suppose we should decide upon a war procurement objective of 225,000 officers. This works out to be about 155,000 Reserve officers, with some 35,000 added as replacements in 300 days. These figures do not include permanent casualties of 25,000 in round numbers, during the first year of war. Without going into detail we will need, say, 20,000 officers of the grade of major and higher; some 70,000 captains; and roughly, 135,000 lieutenants.

All our present officers—Regulars, Militia, and Reserves—would barely fill the requirement for officers in grades of captain to general officer, inclusive. It must be remembered that a considerable number of all classes of officers, will be found professionally and physically unfit for extended field service. Some say as much as twenty per cent. And, if we consider that less than 50% of our Reserve are "real active," this percentage may be increased. Recognizing this situation, Reserve commanders and unit instructors should begin at once to qualify as many officers as possible in the duties of the grade of captain.

Another consideration offers food for thought. During the past ten years, the Command and General Staff School at Fort Leavenworth has graduated approximately 2200 officers. These are expertly qualified to lead regiments and higher units, and to serve as general staff officers of divisions and higher commands. However, a rather considerable number of these will have to be used in high administrative positions. Numerous older graduates are being lost continually by retirement. Then deduct the physically unfit for war service. Altogether, we can foresee that our higher commanders and general staff will be many hundred short of the requirements for field armies, not to mention the Zone of the Interior, and the unforeseeable demands that new methods of warfare always bring.

This indicates that unit instructors should without delay qualify more Reserve field officers in the Fifty-Series extension course, with a view to Leavenworth training.

Each officer must bear in mind that professional and physical fitness, and capacity to fill any job assigned in war—and not mere rank—are the tests for extended field service. Otherwise he is jeopardizing all the hard work of his Reserve career.

Junior Leaders

Qualified leadership for the larger forces—generalship, tactical direction, staff control—will always be of paramount importance. But, after all, the battalion is the fighting body of an army; the combat platoon its strong right arm. In the hands of these junior commanders is entrusted the front line situation in battle. Is it not therefore clear, that the careful and systematic development of junior leaders is the first and most important business of the Organized Reserves?

Granting that, any scheme which gives these junior officers practice and facility in handling men, is of outstanding importance in the military policy of the United States. Many commanders at the heads of regiments and divisions in our next war, will pause to think upon this matter. Why not now?

Reserve Troops

We have emphasized the value of the Citizens' Military Training Camps as a training force for the Officers' Reserve Corps. These candidates are the only soldiery which the Reserve officer has a chance to handle prior to M-Day. Any scheme adopted to increase the number of these trainees, or to lengthen their tours of duty, will enable more Reserve officers to receive this invaluable practice on the drill-ground rather than on the battlefield. The enlistment of C. M. T. C. candidates as key-men in the Enlisted Reserve Corps would immeasurably speed up the processes of mobilization and concentration for war. Special inducements should be offered these young men in addition to the present opportunity to earn a commission. These might include: designation as officer-candidate, effective on M-Day; liberal promotion in noncommissioned grades; possibly industrial and academic scholarships; a small quota of competitive appointments to the United States Military Academy. Provisions for the periodic active duty training of enlisted reservists (say at Citizens' Military Training Camps) will further raise the efficiency of unit-cadres upon which the Organized Reserve troops are to be superimposed. The cost of these innovations is small in comparison with the returns promised.

When we contemplate our past wars, we realize that the Organized Reserve as now constituted, is an instrument of military security which should enable us to overcome the chief weakness displayed in our past battle experience—namely, the lack of a force of trained junior officers. The War Department estimates the present *potential* value of the Reserves in national de-

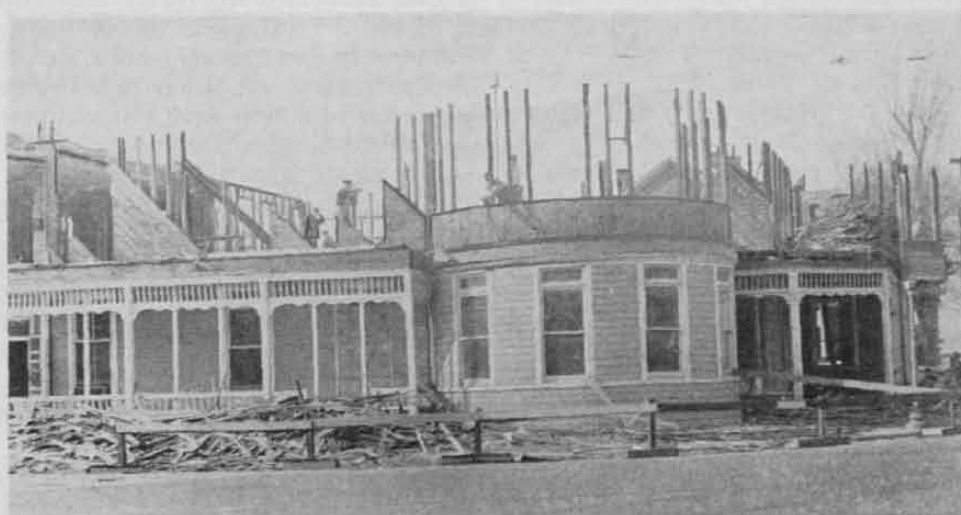
fense, to represent a saving of nine months in officer procurement. The *actual* value of the Organized Reserves, however, depends upon its professional fitness; a condition that is progressing satisfactorily.

In any event, considering the small size of our Regular Army and National Guard, the Reserve has become in reality, the *second* line of defense. Therefore, the importance of the Reserve element of the military service is increasing in every respect, and must be given renewed attention by the entire Army, in the light of its performance.

History—infallible text-book of the great teacher, Experience—tells us that numbers do not make any army. Alexander's conquering host was in fact a puny little force. At the start, little larger than one of our World War divisions. Europe was saved from the Hun only because "Attila became infatuated with the power of numbers." Ghengis Khan won the most decisive victories in history, judged by speed, magnitude, and uniformity of success. And yet his *Golden Horde* was nearly always numerically inferior to its opponents. Tamerlane said: "Take no more men than can be subsisted on the way . . . It is better to be at the right place with ten men than absent with a thousand." At Alesia, Caesar was not dismayed by the barbarian hosts surrounding him on all sides; nor Lee, by the formidable Union forces at Antietam.

Certainly History teaches us, it is quality that makes an army. Discipline. Technical skill. Heart. And—above all—leadership.

It is conceivable that with a small but efficient Regular Army, supplemented by an effective National Guard, the Organized Reserves may some day stand between this nation and defeat.



A PASSING LANDMARK.

The Sherwood Inn at Fort Monroe during its demolition.

Bacterial Warfare

The Use of Biologic Agents in Warfare

By Major Leon A. Fox, Medical Corps

BACTERIAL warfare is one of the recent scare-heads that we are being served by the pseudo-scientists who contribute to the flaming pages of the Sunday annexes syndicated over the nation's press. This question of bacterial warfare has been brought forward from time to time since the World War. The use of the organisms that cause communicable diseases as an instrument of warfare was considered by the Conference on the Limitation of Armaments held in Washington in 1922. An international commission consisting of Professor Pfeiffer (Breslau), Bordet (Pasteur Institute), Madsen (Copenhagen) and Cannon (Harvard) appointed at the time, reported to the League of Nations essentially as follows:

a. The effects of bacterial injury cannot be limited or localized.

b. Modern water purification methods protect against the organisms of typhoid and cholera.

c. Plague is a disease that would be as dangerous for the force using the organisms as for the attacked.

d. The danger from typhus has been exaggerated.

e. Modern sanitary methods are effective in controlling communicable diseases.

Following this pronouncement by these eminent scientists, the question of bacterial warfare suffered a lapse of interest; but during the past year, as an incident of the preparation for the Geneva Convention, there has been a marked revival of interest in this supposed bugbear, bacterial warfare. Possibly this is only a part of the effort of professional pacifists to add all the imaginary frightfulness they can picture to the known real horrors of war.

The space and thought that have been given to this question by feature writers have not been without effect, and many people now believe that bacterial warfare represents a real threat and problem for future generations. Many are now associating chemical warfare and bacterial warfare with the result that in the resolution of adjournment, voted by the General Commission of the Disarmament Conference on July 23, 1932 at Geneva, we find chemical, bacteriological and incendiary warfare grouped for consideration. The mere fact that this great body of peace workers considers bacterial warfare seriously enough to prohibit its use justifies military men in considering this agency of warfare. We know how little treaties protect, so we should study the question to see if the use of biologic weapons is a real problem for the military minds of the future.

Under biologies we include all those organisms that

may invade the body of man or animal to produce disease, so while we use the term bacterial warfare we do not limit this paper to a consideration of bacterial diseases. We will also consider the filterable viruses, protozoa, and other pathogenic forms as well as their toxic products.

With the powers of the world in session at Geneva discussing the future of warfare, and with some of the great nations of the world recommending the complete abolition of chemical warfare, it may appear strange to have one consider biologic warfare. I believe all will agree that while it is a mistake to live in the past it is equally undesirable to ignore the lessons of the past in prognosticating regarding the future. It is therefore well, before we consider the possible use of biologies in warfare, to discuss briefly the question, Will the nations of the world abandon the use of chemicals as an instrument of warfare?

Every advance in thought or design meets reaction and antagonism from the minds of the previous generation. It does not take some radical departure from the accepted views of the day such as marked the revolutionary concept of Copernicus or Darwin to start all "as is" conservatives on a tirade of opposition with the usual tenor of their remarks as follows: "It is against the law of nature," "It is against religion," "It conflicts with all known law," "Even if true, it does not fit into the existing order of things." A man of middle age today may remember the old mossback who refused to ride on the train of the 19th century. In fact the train and street car had not completely overcome all the pooh poohs of the backward ignoramus until they were involved in a fight for their very existence with a newer means of transportation—the motor. The motor vehicle had just had time to have a proper road net constructed when this engine, becoming "air-minded," needs no roads. Have they been generally accepted? Certainly; however, remarks such as, "If God wished man to fly he would have given him wings," were made in the pulpits of this country during the present century.

It takes more than the harpings of the minds of yesterday to scotch the wheels of progress. It may startle many to talk of world progress in connection with implements of warfare. However, it is not believed that any fair-minded individual can deny the place in world advancement that is due to the spirit of conquest. The peaceful shepherd, content to watch his flocks, has added little to the world's knowledge. The trader and warrior have discovered and spread knowledge. Trader and warrior are almost inseparably associated throughout history, and slowly as they may

have progressed, they usually lead the thought of the day. The spirit of adventure and discovery has always marched with the warrior. The discoveries of the warrior are not limited to implements of war; however, these are the factors we wish to consider. In this field again we meet the same antagonism at every advance that the fighting man has made, an antagonism that has affected all minds of the "as is" type, including conservative and reactionary individuals. Every advance, every discovery of a new weapon by the fighting man, has had to overcome two groups of opponents:

1. The fixed and established military group who are always sure the new weapon "won't work," "Is not as good as older weapons," "Not practical," etc.

2. The pacifist group—the shepherd group that considers each new weapon more terrible than the former and cries out against it.

Primitive man in his combats certainly had no weapons. Are there any today that believe that this early creature did not fight over "food and females?" It may be added that all combat ultimately resolves itself in the final analysis to a strife for one of these basic biologic requirements—nourishment or sex. Fighting over gods was a later development; and these fights over gods were over a personal God, a God of the land or tribe, a God to favor their own special country, a benevolent God who would make their country a more bountiful place to live.

In the early combats man could only bite and claw and choke an adversary. This was the day of brute strength. Cleverness had relatively little value. The first man to use a weapon was the man with the best mind of his day. The first weapon used must have been very simple and elementary—possibly a hard object held in the hand with which he brained his opponent. This weapon possibly did not create much comment. This was not an age of comment; however, the descendants of the type that could not learn to use this weapon are not numerous. Has this weapon been abandoned? Certainly not; it is an excellent weapon, and no good weapon has ever been discarded. Its use today is very limited due to discovery of other weapons of greater range and effectiveness.

Development of weapons has always been for the purpose of using intelligence to overcome mere physical force.

The factor of range, killing an opponent before he can close with you, is a most important factor when the man of intelligence must meet superior physical force or number.

Probably the first weapon to provide range was a club, possibly a sharp stick, the forerunner of the iron-tipped spear. The club may have had a stone head attached. These weapons not only advanced the clever man over the mere strong man; they aided man in his fight with the man-eating animals of the time. However, if we can make deductions from the early cave records of the men of this period, advance was slow because the intelligence was of such low order that they were slow to understand and accept these new weapons.

The race improved because the thinker, the successful warrior lived and won the females and left descendants, the slow and reactionary type did not live to reproduce. With every advance in weapons man is giving evidence of a desire to overcome brute strength by means of a weapon with range and effectiveness.

We can picture the introduction of the early propelled instruments, such as the arrow, causing a storm of opposition. Some youngster designed some form of propelling instrument for a sharp stick and possibly suffered the jeers of the snagged tooth elders as he shot the sticks into inanimate targets, and only received the reward of complete recognition when he shot a sharp stick through the belly of an old pack leader to take over a band of cowed females. The progeny of this genius were of a higher order of mentality and possibly soon learned the value of organization, with the result that a tribe of arrow users developed.

This seemed like the final advance, and who can doubt their ability to inflict their will on the men of the time?

The fact that the conquered men, possibly of superior physical development, considered the weapon a cruel and brutal implement that God had not endowed man with did not cause it to fall into disuse. The only thing that caused this weapon to fall into disuse and finally be practically abandoned was the development of such protection as caused the implement to cease to be effective or because other instruments were designed of greater range and effectiveness. These factors are the only things that have ever caused a weapon used successfully to be abandoned.

The outcry against the use of chemicals seems to people of this day to be quite a serious factor, and some wonder if their use will be curtailed by this influence. The following factors should be considered before we make a decision:

- a. No effective weapon once introduced has ever been abandoned until it was displaced by a more effective weapon or protection developed that rendered the instrument useless.

- b. The hue and cry that attended the introduction of chemicals is not unusual on the introduction of a new weapon. The early use of gunpowder produced a reaction in every respect similar to the cry of the present day pacifist against gas.

Will the use of chemicals in warfare be abandoned? Probably not. Will the use of chemicals be curtailed? Certainly; just as certain as the race progresses, just as certain as new and more effective weapons are designed—not before this advance is made.

Will the next advance in warfare see the use of biologics? Will the next agent used be the living organisms, bacterial warfare, the scourge of armies from the most ancient times—the communicable diseases?

The question of biologic warfare will be considered in more detail because here again we run into the most elaborate and fanciful statements.

A review of military history will reveal the great influence that disease has played in past wars. Results have been decisively influenced in many campaigns by epidemics of communicable disease. In some campaigns communicable diseases have caused such tremendous losses and such great numbers of non-effectives that the combat has reached a stalemate. However, in certain instances, for unknown reasons, there has been a great difference in the degree to which combatants have reacted to the epidemic conditions. In a few cases we are able to understand why the communicable diseases appeared to have greater invasive power toward one of the armies; in other instances we do not understand clearly why there was a difference in the degree of involvement of the forces.

Volumes have been written on the epidemic diseases that have attacked the military forces. We will not attempt to review this extensive literature, but the doctor, especially the epidemiologist, knows that the student of history who only reads of tactics and strategy, the victories and defeats of a campaign, without familiarity with the medical history of the war, is likely to give some commander credit for success or failure that all too often has been caused by some epidemic of communicable disease. This is not meant to depreciate military success, for the great general is often a great sanitarian, and even Alexander may owe a part of his success to his Doctor—Philosopher—Teacher, Aristotle's advice to "Boil his water and bury his dung."

We must remember that we can march through the pages of military history all the way to the Twentieth Century before we come to a campaign where the missiles of the enemy produce more casualties than epidemic disease. In most of the ancient campaigns of any duration some one of the great military plagues did more to decimate the military forces than all the man-made munitions. I say one advisedly, although often many infections raged and famine and scurvy accompanied the communicable diseases.

What was the nature of these ancient pests? Were they diseases of that age now no longer known? No—the military pests that existed then are still with us. The Big Six of all time (war times) are:

1. The Enteric fevers, typhoid and the paratyphoids.
2. The Dysenteries.
3. Cholera.
4. Typhus.
5. The Plague, Bubonic plague, the Black Death.
6. Smallpox.

Do not consider for a moment that the above diseases had any monopoly on the right to destroy armies. It is probable that at times influenza and the epidemic pneumonias took such heavy toll that but little fuel was left to be consumed by the Big Six. Again, under conditions where malaria is endemic, this disease is second to none in the production of non-effectives in military ranks. In fact measles and epidemic meningitis may well be added to the list of military scourges.

This paper is not for the purpose of considering the epidemic conditions of the armies of the past, but it is realized that many individuals will naturally consider that if these infectious agents were able to produce such frightful outbreaks of disease by the simple process of chance infection under natural conditions, then in the hands of man, as a military weapon, they may well prove even more destructive. They may fail to consider the fact that the same measures that are now so efficacious against the chance infections occurring in nature may prove of equal value in combating the same agency of destruction when used by man.

We have presented biologic warfare in all its horrors; now let us analyze the problem in detail. What agents can be used to produce death and disease? How can these agents be introduced into the bodies of the enemy? We will discuss these questions in the order stated.

The biologic agents available for warfare are:

1. The communicable diseases.
2. Other infective processes (such as wound infections).
3. Toxic products of bacteria.

The communicable diseases are well known. They are the so-called transmissible diseases that produce epidemics. They are caused by a living contagion and are spread from man to man or animal to man by various channels of transmission. All of the Big Six and the other diseases mentioned above belong to this group.

The second group, the other infective processes that are available, include such infective materials as the agents that infect wounds, gas gangrene, tetanus, anthrax and other wound contaminations that are infective but not communicable.

The last group of dangerous agents are the toxic products of bacterial growth. We will mention but a single terror-inspiring example—Botulinus toxin. A portion of this toxin almost inconceivably small, when introduced into the body by any channel, is lethal. We will give details later.

No one will question the effectiveness of all of these agents in producing casualties when introduced into the bodies of unprotected and non-immunized individuals. The important question then is "How"? How are these agents to be introduced into the bodies of the enemy to produce casualties?

Any consideration of the deliberate use of pathogenic organisms as a means of warfare will have to consider the question of how to produce a destructive epidemic in the forces of an opponent and at the same time protect one's own forces from invasion by the virulent organisms in question. Certainly at the present time we know of no disease-producing microorganisms that will respect uniform or insignia, and the use of bacteria in warfare for the destruction of opposing forces will have to be predicated upon the successful prior immunization or the complete isolation of the forces employing the disease-producing organisms through some system of quarantine.

Any intelligent discussion of bacterial warfare must certainly give detailed consideration to the question of

how the living contagion is to be introduced into the individuals that are to be infected. We can well begin this investigation by a study of the channels of infection. The communicable diseases may be classified on the basis of their "Routes of Transmission." By this is meant the path that the living contagion follows when it leaves the body of the sick man or animal, or in some cases the carrier, to enter the body of the susceptible host to produce disease. On this basis we may classify the communicable diseases into intestinal diseases, respiratory diseases, direct contact diseases and insect-transmitted diseases.

The intestinal diseases are produced when some small portion, usually a microscopic portion, of the material from the intestinal canal of the sick man with its living micro-organism, is introduced into the alimentary canal of the susceptible individual. Typhoid, cholera, and dysentery are well known examples of this type of disease.

The respiratory diseases, sometimes known as "sputa borne" or even "air borne" diseases, are the communicable diseases spread by the transmission of living micro-organisms from the respiratory tract of the sick to the respiratory tract of the invaded. This group of diseases is of tremendous importance and embraces such conditions as the common cold, influenza, pneumonia, diphtheria, epidemic meningitis, smallpox, and possibly of special importance for war purposes, the pneumonic form of bubonic plague.

The group of diseases that we refer to as "insect-transmitted" are those where the invasion of the new host is effected by the bites of insects which have previously fed on an individual—man or animal—infected with the disease in question. A period of incubation on the part of the insect between feedings on sick and feedings on individuals to be infected is necessary in certain instances; with other diseases such interval is not required. Examples of insect-transmitted diseases that require an interval for the development of the contagion within the body of the insect after feeding on the infected individual are malaria and yellow fever, both transmitted by mosquitoes.

Bubonic plague, a disease of rats that is transmitted to man by the bite of the rat flea, does not require an incubation period for the rat flea to develop ineffectiveness.

The venereal diseases are direct contact diseases. They are of profound military importance and have proved decisive factors in certain past wars; notably influencing the European campaigns of the 15th and 16th centuries. The deliberate use, however, of this means of injury is fraught with difficulties when we plan a method of securing personnel to effect the necessary exposure. The soldier's danger from the venereal diseases will not come from the open avowed wartime enemy who loves him least, but from the money loving or uniform worshipping ladies who profess to love him most. Therefore, while these diseases may at times exceed all other causes of military non-effectiveness, we can dismiss them without further discussion while we are considering bacterial warfare.

It follows, then, that the communicable diseases that

constitute an epidemic or pandemic threat to the military forces are the intestinal, respiratory and insect transmitted diseases.

The Intestinal Diseases

Mankind is all too familiar with the terrible epidemics of typhoid, cholera, dysentery, and the diarrheal conditions that have destroyed military forces in the past. However, it is highly questionable if this group of diseases will ever in the future cause any such terrible catastrophies for the reason that the epidemiology of these infections is so thoroughly understood, that modern sanitary methods and immunization processes have rendered comparatively innocuous these hazards of earlier armies.

The deliberate use in warfare of these agents, however, we shall consider. While occasional small outbreaks of these diseases may be due to food infections, real epidemics of this group of diseases are only traceable to infected water and milk supplies, or to such a complete sanitary breakdown that general fecal contamination of food supplies occurs. The possibility of contaminating a milk supply presents practically insurmountable difficulties, although it is theoretically possible that spies might use such a means to discommodate and harass civil populations. It, of course, has no practical application to the military forces themselves.

Contamination of water supplies of civilian communities by means of infection of large reservoirs and storage basins where the water is held awaiting consumption, is a possibility. Contamination, to be effective, would have to be subsequent to treatment by the modern water purification plant consisting of filtration and chlorination, or of course it would be valueless; but this is within the range of possibilities, and it is possible that future wars will reveal that spies will make an effort to contaminate municipal water supplies.

The use of the intestinal group of diseases against forces in the field would probably prove entirely ineffective because modern water purification methods and the close supervision of the water supply that is accepted as a necessary incident of military service will absolutely preclude the successful employment of this means of combat.

In considering the intestinal group it may be well to stress the fact that the reason modern armies, and for that matter all civilized communities, do not have serious epidemics of these diseases is not because the infective agents that cause these diseases are not present or available, but because modern sanitation protects the personnel.

Let us take a typical example, typhoid fever. The incidence of typhoid in our civil population has been greatly reduced during the present century. Let no one think, however, that this is due to any scarcity of the typhoid bacillus, and it must also be remembered that the civil population has not had any general immunization such as helps to protect the Army. Typhoid has not retreated to the outskirts of civilization; it is all about us. Every state, yes every county in the union, is infected. Typhoid carriers in the United

states possibly number 100,000 and are generally without supervision. The reason we only have about 5,000 deaths per year in the U. S. A. instead of about 100,000 deaths from typhoid fever is because the great mass of our people now use water that has been rendered safe by filtration and chlorination. They consume milk that has been pasteurized and other foods that have been protected.

The same statement may be made concerning the low incidence of the dysenteries in our country. The infection is present, but epidemics do not occur because our sanitary measures are effective. We need not fear infection from without with this group of diseases; we are already grossly contaminated.

The die-hards will say that cholera is not so easily handled and is not at present a problem in America. Granted. We do not have cholera in the States; but our Army and our people do live in the presence of cholera without having epidemics of the disease. The Philippine Islands, where our Army maintains an effective fighting force entirely free from this terrible scourge, has a carrier incidence of the vibrio that causes cholera that is always high.

The intestinal group of diseases will certainly not prove destructive against any civilized nation that cares to pay the price of the protection that modern sanitary methods provide.

The Respiratory Diseases

In leaving the intestinal group of diseases we proceed from the problem that represents the greatest triumph in preventive medicine to the group of diseases that baffles the best efforts of all health workers.

In the control of the intestinal diseases we have so much to be proud of. In preventing the respiratory diseases we have accomplished so little. This is stated with a full knowledge of the wonderful results that have been obtained with smallpox vaccination, and the immunization to diphtheria by the use of toxin products, as well as with a full realization of the fact that we are on the threshold of equally great accomplishments in controlling scarlet fever.

It should be noted that these great accomplishments are not sanitary triumphs such as glorify our work with the intestinal group of diseases, but immunization processes. Not being able to prevent the infection reaching mankind, we take advantage of the fact that familiarity with the organism, while not breeding contempt, does produce immunity. Therefore we use the only method that appears to offer any great protection against the respiratory diseases in nature, namely, immunization. It must be admitted that health workers can accomplish practically nothing in the way of protecting peoples from infection with the great host of respiratory invaders, and such protection as we have is due to either the natural or artificial exposure to these organisms.

In this group of diseases we find a number of maladies that are serious enough to be effective war weapons if ways of using them can be devised. However, before proceeding we should call attention to the fact that in this group are also a large number of diseases that are not suited for military purposes.

For instance, smallpox, while a very serious epidemic disease, must be dismissed immediately. All military forces are immunized to this dreadful scourge, and we can therefore dismiss it from further consideration.

Many of the diseases of childhood, while constituting a military problem at time of mobilizing rural recruits, are not suitable for military purposes for the reason that the factor of age susceptibility plays so much importance when we consider the entire group that comprises our population. As an example we may mention diphtheria. While in childhood a very high percentage of the population is susceptible to this disease, the great majority of these same individuals develop considerable natural immunity to the organism that causes diphtheria without further interference than the normal aging. Therefore, while we see epidemics of diphtheria in schools and orphanages, we do not encounter serious outbreaks involving large numbers of any adult population. This disease is cited only as an example wherein the factor of age susceptibility is important; there are a number of diseases that show this phenomenon and would therefore be unsuited as offensive military weapons.

Certain conditions such as influenza, pneumonia, and the common cold, do not show a marked tendency to limit their injury to any one age group and would be efficacious if they could be used against military personnel. Mankind is as helpless today as at any period in history in the control of these diseases; also they are very serious conditions that produce great numbers of non-effectives, and in the instance of the epidemic pneumonia they result in a tremendous mortality.

Before we surrender to the individuals who threaten such frightful havoc with this group, we may well ask how are they going to start an epidemic of influenza, pneumonia or the common cold. If they answer that they will introduce the germs that cause these diseases we can well laugh at them. The process is not so simple. The factors that make respiratory epidemics are not so elementary. They include not only the infection of the individual, but the question of the resistance of the infected animal. The organisms that cause these diseases are all about us. They are always with us. Epidemics mean more than simply infection; they mean the rapid transfer from individual to individual of these infective agents. They mean a lapse in the immunity of the invaded, and possibly something else.

I do not know of a bacteriologist or an epidemiologist who can tell you how to start a respiratory epidemic unless the stage is especially set. I know many who are certain that whenever you place a large group of individuals, man or beast, under poor hygienic conditions, with *over-crowding*, poor ventilation, and exposure to unfavorable climatic conditions, or other factors that decrease resistance, respiratory outbreaks will occur in spite of any precautions that can be taken, and that if large numbers of highly susceptible individuals (rural populations) are present the outbreak can be expected to assume epidemic proportions.

It is also worthy of note that when epidemic conditions prevail certain organisms may possibly have greater invasive power, for then apparently populations that were not so susceptible or readily invaded may be attacked when they previously escaped injury. It will be noted that as in the case of the intestinal diseases, so with the respiratory diseases it is not a simple case of introducing infection that constitutes a menace. The organisms that produce most of these diseases are always with us, and epidemics mean more than infection. While we cannot understand exactly how epidemics start, and we question the ability of a military agency to deliberately produce an epidemic of one of these diseases, we feel certain that if bacterial warfare is ever contemplated they will not think of using the respiratory group of invaders for the reason that quarantine, isolation, and all other methods to control diseases such as influenza, are practically valueless. The torch once set off might destroy friend and foe alike, and would therefore prove of no value as a military weapon.

The two diseases in this group that are most frequently mentioned are influenza and epidemic meningitis (cerebrospinal fever), possibly because of their importance during the World War. All that has been stated above applies with especial force to influenza, where in addition to the fact that no one knows how to control this disease, we must add that we are not even positive about the actual organism that causes the condition. Epidemic meningitis, on the other hand, is a very definite, specific disease due to a very well known organism. We must admit at the outset that this is a very serious disease, and that it often assumes epidemic proportions in military organizations. However, if we stop to consider the nature of the organism and the epidemiology we see how entirely unsuited epidemic meningitis is for use as a military weapon. The organism, the micrococcus of Weichselbaum, is so delicate that even on the most favorable culture media it rapidly dies when exposed for even a few hours to temperatures much below that of blood heat. This disease is spread by carriers, and the organism must be introduced almost directly from the nasal pharynx of the carrier to the respiratory mucous membrane of the individual invaded or it will be destroyed by the unfavorable temperature conditions while en route.

Those individuals who think this disease may be used for military purposes will answer that carriers in the form of prisoners, etc., would be introduced into the opposing forces. To those who know anything about epidemic meningitis this suggestion is ridiculous. Any military aggregation of any great size already has so many carriers present (anywhere from 2 to 30%) that the introduction of a few more or less is of no moment. Epidemics of meningitis only occur when *over-crowding* is associated with conditions that lower the general resistance as exposure, unfavorable climatic conditions, and fatigue. Meningitis is, and probably always will be, a military problem; but the individual's friends and associates, not the enemy, are the great problem with this disease.

We will not take up in detail all of the various respiratory diseases. The tabulation would prove tiresome, for the story would always be not so much a question of the great danger of the introduction of the infective agent, but the creation of epidemic conditions, a soil in which the organism could produce an epidemic, over-crowding and lessened resistance.

The Insect-transmitted Diseases

These diseases will probably most certainly influence wars of the future as they have in the past. An invasion of such a country as Mexico, at the present time, would constitute more of a sanitary than a military problem. With malaria, dengue, and possibly even yellow fever along the seaboards, and typhus endemic in the plateau district, our main problems would be sanitary. Bubonic plague might also be encountered here as well as in any other place. This disease—bubonic plague—is the disease entity that many consider best suited for military purposes. To begin with, it is a frightfully serious malady—a decimating disease that has most profoundly influenced warfare in the past. It is possible that the rise of the Mohammedan world was due to a great extent to the fact that Europe was in the throes of the greatest scourge mankind has known, the plague, at the time that Mohammed's followers were ready to organize and extend the influence of the crescent until the horns were about to encircle the Mediterranean. Certainly these Arabian tribesmen had never shown any signs of military greatness or valor prior to this period, and it is probable that their religious ardor would have met with small success against the well organized nations of the time if these nations had not been practically exsanguinated by the "Black Death".

The use of bubonic plague today against a field force, when the forces are actually in contact, is unthinkable for the simple reason that the epidemic could not be controlled. Infected personnel captured would provide the spark to set off possible outbreaks of pneumonic plague in the ranks of the captors. Infected rats would also visit and spread the condition. An advance over terrain infected with plague-bearing rats would be dangerous. Therefore, except as a last desperate, despairing hope of a rapidly retreating army, the use of plague by forces in the field is not to be considered.

The use of plague to harass civil populations presents less difficulty than the use of the organisms against a field force. Those who think that plague will be used as an offensive weapon consider that civil communities may be infected by introducing plague infected rats. Of course this is easier to state than to accomplish, but it may be possible for airplanes flying low to drop recently infected rats. At least this is the statement that the individuals make who consider the use of this weapon feasible. Even with so terrible a pandemic disease as plague, however, there is a great deal more to the question of epidemics than mere infection. For instance, to cite an example, one that Gill so forcibly states, "Not half a dozen cases of plague occurred amongst Europeans (including British troops) stationed in the Punjab during the year 1924,

when about 500,000, or one-fortieth of the indigenous population suffered from the disease.”* If these intelligent people were able to avoid the infection when residing in an environment that was literally infiltrated with the infection, it certainly should be possible to control bubonic plague in a population such as we have.

For that matter, the question of plague is not a condition that takes us to the outskirts of civilization. Our own Pacific Seaboard became infected in 1900, and following the San Francisco earthquake the infection extended and is now more or less endemic as a rodent disease involving not only rats but ground squirrels. Here again it is not a question of can we control the infection; we are controlling it, and have not had an outbreak of human plague of sufficient size to designate as an epidemic.

The other insect-transmitted disease that is most frequently assigned a place of importance as an agent suited for warfare is typhus. This disease is certainly terrible enough to satisfy even those individuals who are anxious to preach the gospel of frightfulness. The military and civil populations that have been destroyed by typhus bear witness to how effective this agent of destruction can be. However, again we have a condition that is easily controlled. Complete solution of the problem of endemic typhus is not yet in print, although it is probable that the work of such men as Dyer, Maxcy, and Zinsser will soon offer a complete explanation of how this scourge simmers along during the inter-epidemic periods. Epidemic typhus is thoroughly understood. The epidemiology is so simple that it can be embraced in the name of the transmitting insect, the body louse. The control of epidemic typhus is the simple question of the control of louse infestation. Of course quarantine will help to prevent the introduction of the infection, but quarantine is futile if the Army is allowed to become lousy. The lousy Army may become the victim of typhus, even in America, without the introduction of infection from extraneous sources. The weight of opinion in the best epidemiological minds is that, as Maxcy suggested, endemic typhus is probably carried over between epidemics in a rodent reservoir. Endemic cases occasionally occur when transmitted to man by an insect, and when the infection is passed from man to man by the body louse, with the resulting enhancement of virulence, epidemics may be expected to result.

The difficulty of starting an epidemic of malaria-yellow fever, or trypanosomiasis (sleeping sickness) appears to be obvious, for no one has suggested the use of these agents. Those who understand the epidemiology of these diseases know they are not suited for war purposes even though they realize the problem they present to military forces in endemic areas.

This completes consideration of the communicable diseases. We have discussed in some detail practically all except the direct contact group. The only diseases

of this group of great military importance are venereal, and we have given our reasons for dismissing this group from consideration.

The Infective Processes

Certain disease processes that affect the tissues are caused by living organisms and are therefore designated as infective, even though they are not considered communicable in the sense that they tend to be transmitted from man to man. These disease processes include such infections as tetanus, gas gangrene, anthrax, and the ordinary pyogenic (pus formers) invaders. The agents that produce these infections have all been mentioned as possible war weapons, and it must be admitted that so far as the first three are concerned, with some scientific judgment on the part of their sponsors.

The agents that cause tetanus, gas gangrene and anthrax are not delicate organisms such as the relatively short lived, easily destroyed pathogens that cause most of the communicable diseases. They are very resistant, spore forming organisms, generally capable of a prolonged period of viability without loss of virulence, even when separated from the animal tissues. It is not surprising, therefore, to find one of this group (anthrax) selected as the infectious agent best suited for military purposes by a science student preparing an undergraduate thesis on “Bacteriologic Warfare”.**

The selection of anthrax does credit to his training: in fact the entire study shows more intelligent thought than any article that has come to the attention of the writer. His description of the characteristics of the proposed bacterial invader are worth quoting:

“What shall we say are the requirements for a perfect military pathogen? It attacks preferably both man and animals. It must be quick acting, highly virulent, and capable of causing disease in small quantities. It must be highly resistant, capable of surviving outside the body under the most adverse conditions, and even resisting partial cooking or a careless attempt at sterilization (a spore former). The causative organism should be able to force its entrance through all the avenues of infection; respiratory tract, alimentary tract, and breaks in the skin. The disease should not be too actively contagious, and it must be very well understood,—for pathogens should never be used without contemplating the possibility of their getting out of control. Finally, and perhaps most importantly, it should be possible to obtain large quantities of the pathogen in virulent strain and spore form with the least possible manipulation and delay.”

After this excellent description of the perfect hypothetical agent, he selects anthrax as the agent best suited to meet the requirements of a bacterial weapon. I cannot agree with Pentler that “Anthrax satisfies the requirements almost perfectly”; but I believe all bacteriologists will agree that he has selected the agent that most nearly meets the requirements he has so well outlined.

These spore forming invaders are a real problem. Tetanus and gas gangrene are pathogenic processes that have always been associated with gunshot wounds

*Gill, C. A.—*The Genesis of Epidemics*, Bailliere, Tindall & Cox, London, 1928.

***Some Thoughts on Bacteriologic Warfare*, C. F. Pentler, Mass. Institute of Technology; Department of Biology and Public Health.

and are therefore of special interest to the military surgeon. They do not produce epidemic diseases, however, and they are not communicable. They have to have a portal of entry made for them, a wound, and while the use of these organisms to contaminate battlefields might cause an increase in the number of cases of tetanus and gas gangrene, they would not increase the number of casualties. They would only complicate the treatment of those already disabled. It might be added that we have an entirely satisfactory serologic prophylactic agent for tetanus, and that as a result of the surgical advances of the last fifty years, gas gangrene is less frequent than in the pre-bacteriologic days.

We cannot dismiss anthrax so readily; however, it is worthy of note that although anthrax is almost a world wide disease nevertheless anthrax infection of gunshot wounds is practically unknown. If gross contamination of battlefields with the organism of anthrax is effected it is granted that cases of anthrax infection of wounds will occur, and possibly some few cases of infection in individuals who have not been wounded; but when we consider that human epidemic anthrax is unknown during the bacteriologic era, I question if we need fear greater danger from this organism than contamination of wounds.

It will be noted that up to this point we have not discussed the technical difficulties that a military force would have in contaminating a hostile force. The difficulties in the case of the communicable diseases are so obvious that they need not be mentioned. The epidemiologic factors make the communicable diseases unsuited for offensive military use. The causative organisms are all either short lived when separated from the living tissues or else readily destroyed by ordinary routine sanitary precautions.

We cannot make this statement concerning the highly resistant infections such as tetanus, gas gangrene and anthrax. These agents are admittedly the most dangerous; but it must be remembered that to be dangerous they must be alive, and that many technical difficulties present themselves when living agents are to be used that are not present when missiles and chemicals are used. Shells can be used to project missiles and chemicals on to an enemy many miles distant; but bacteria cannot be used in this way. No living organism will withstand the temperature generated by an exploding artillery shell. Airplanes may contaminate terrain, but their effect would be quite local and probably less dangerous and less certain than high explosives used in the same way.

It is not maintained that bacterial contamination is impossible. A retreating enemy may hurriedly contaminate the terrain that is to be evacuated. However, it is believed that the use of living organisms in offensive warfare presents technical difficulties that are not generally considered. The contamination that spies and other individuals could effect, using the only really effective agents we have mentioned—the highly resistant, spore forming organisms that are so dangerous to wounds—would prove too local to be of any value whatsoever.

Toxic Products

The forms of bacterial warfare include not only the possible distribution of living organisms in the force of an enemy, but the possible use of toxic products derived from bacteria. Certain of our bacterial toxins are the most deadly poisons known. The toxin of the bacillus botulinus is so powerful that instances have been recorded where toxins have been produced so toxic that .005 milligram would kill a 250 gram guinea pig. This material, botulinus toxin, is poison for man. It is possibly the most toxic agent known, and will produce the lethal effect in any way that the material is introduced into the animal. If consumed with food, injected into the tissues, or even dropped on to the mucous membrane or conjunctiva, it is equally deadly.

This must be the material referred to when we read such dramatic statements as the following: "An airplane can carry sufficient toxins to destroy an entire city". Such statements have an element of truth in them. In fact they are conservative. An airplane could carry enough of the botulinus toxin to destroy every living man in the world if administration of the toxin was as simple a process as production and transportation.

There were over 100 billion bullets manufactured during the World War—enough to kill the entire world population 50 times; but a few of us are still alive. It is easy to calculate the lethal (fatal) dose of a toxic agent; but do not think it is so easy to figure on the casualty producing power of a military weapon.

The hostile aviator will not be received with a welcome, nor can he expect to land at an air field near any large city and find the entire population lined up ready to accept the carefully measured lethal dose of botulinus toxin.

The release of tremendous quantities of botulinus toxin over a large city may produce human casualties; however, the extent of the damage might be only the wholesale destruction of rodents, sparrows, and possibly numerous cats and dogs—not such a serious loss in time of war. It is difficult to evaluate properly the possible effects of the bacterial toxins. Certainly such statements as an airplane destroying an entire city with toxins is ridiculous; but they may have a value comparable to chemical agents, with this great disadvantage, however, bacterial toxins are readily destroyed by heat; therefore, like bacteria, they are unsuited for use in shells.

Animal Diseases

The use of living organisms to produce disease in live stock, such as horses and mules needed for transportation of Army equipment and supplies, has been mentioned as a possible form of bacterial warfare. It is believed that the difficulties here are quite similar to those mentioned for diseases attacking man, with this great advantage to the defense that the veterinary officer will have in controlling epidemics. The veterinary officer can destroy any animal or group that he considers a menace to the health of the animals in

the Army. The Medical Officer cannot take such steps to control epidemics that threaten human populations.

If we expand the term bacterial warfare to embrace such phases of biologic warfare as will include the agricultural pests, then, an additional factor to consider is the fact that spies and possibly hostile aviators might inoculate growing crops with such pests as the boll weevil, the corn borer, the Mediterranean fruit fly, and like destructive agents. These agents in most instances, however, take so long to invade sufficient terrain to be effective in destroying crops that their value in actually overcoming the resistance of a foe is questionable. They take several years to advance over a large area, and might prove an economic problem years after the war has been completed; therefore, they violate one of the fundamental ideas in warfare, since they would interfere with the ability of the conquered nation to pay the victors for the beating they had received.

Conclusions

It is believed that it has been shown that the development of implements of warfare represents an evolution based on the gradual application of the improving mind of man. The one factor of importance in this development has been effectiveness. It has been a question of the good mind versus the strong back; of the thinker versus the lifter. It is believed that the future of warfare will be based on the same principles. It is therefore apparent that the question of whether chemical munitions will be used or not, and whether bacterial warfare will be used or not, will depend on their practicability rather than on the sentimental reactions of pacifists.

I consider that it is highly questionable if biologic agents are suited for warfare. Certainly at the present time practically insurmountable technical difficulties prevent the use of biologic agents as effective weapons of warfare.

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Efficiency Reports

By Lieutenant Colonel Bernard Lentz, Infantry

AN efficiency report is a yard stick intended to measure, what?

For an answer to this question I quote from General von Seeckt's *Thoughts of a Soldier*: "Man is the most difficult, the most recalcitrant and the most grateful, the most faithful and the most treacherous of all materials and the soldier, like all rulers, works first and foremost with men".

If it is correct to assume that an efficiency report is a yard stick with which to measure man and General von Seeckt's description of man is reasonable then we see at once that we have quite a job on our hands.

To me the difficulty appears something like an attempt to produce a single yard stick with which to measure gasoline for the motor car, coal in the bin, hay in the mow, alcohol in beer, and then some.

When we try to measure man, in the sense under discussion, we are attempting to measure genius, talent, industry, et cetera, all residing more or less in a single human being. Joseph Hergesheimer, the well known novelist in his recent biography on General Sheridan says: "Genius is a term possible to recognize but not to describe. It does not reside in the capacity for taking pains. Genius has an elaborate and often commonplace patience and industry of its own; its essence, its spirit is far different."

If genius, as Mr. Hergesheimer says, cannot even be described, how much more difficult is it to measure genius accurately. And what holds for genius is also true, in my opinion, for many other attributes which the human being does or does not possess.

I have purposely dwelt somewhat on the difficulties of the problem for this is of first importance if we expect to arrive at any reasonably satisfactory solution.

John Dewey, American philosopher, says: "We generally begin with some vague anticipation of a conclusion and then look around for principles and data which will substantiate it." My mind, in spite of attempts to muster, first of all the facts bearing on the subject, is working along the lines suggested by Dewey so I might as well at once state my conclusion—there is no accurate solution—and then give some "principles and data", for thinking so.

Let us discuss some of the terms which are used in rating the human being:

We shall begin with, "tact." This is a perfectly good word but how often its real meaning is misconstrued when applied to the human being!

From time to time, while reading the stories of famous military leaders, I have amused myself by giving them hypothetical ratings in, "tact". This same thing can be done for other qualifications. The chances are, the average rater, would have given Napoleon not much on "tact" and his worthy opponent, Well-

ington, still less. Mr. Hergesheimer in his biography mentioned above tells an incident about General Sheridan that illustrates the point. When Sheridan joined the army in Virginia he was placed under Meade. Meade continued to issue instructions to the commanders of cavalry divisions without letting Sheridan know, though Sheridan was in command of the cavalry. After considerable confusion had been caused, Sheridan told Meade if he insisted on giving the cavalry instructions without consulting, or even notifying him, Meade himself could command it. He (Sheridan) would not give another order. Sheridan added that if given a chance he could whip Stuart. Meade at once reported the interview to Grant repeating also Sheridan's remark about whipping Stuart. "Did he say so", Grant commented, "then let him go out and do it". Sheridan soon had his orders and we all know what he did to Stuart.

What rating would Meade probably have given Sheridan in "tact" after Sheridan had told him to command the cavalry himself? And aren't we compelled to recognize in this incident, the genius of Grant, genius which cannot be described or measured but which is there nevertheless; genius which, in the light of events, outweighed all the faults that have been ascribed to Grant.

It seems to me that "tact" in the sense that it is frequently interpreted operates to defeat the quality of "force"—the faculty of carrying out with energy and resolution that which on examination is believed reasonable, right, or duty.

In a similar way "activity" may be opposed to "intelligence" for have not all of us seen officers engaging in tremendous simulated activity unduly supervising, and perhaps annoying and harassing perfectly competent subordinates when the *intelligent* thing to have done would have been to let the subordinates alone.

Activity can be most pernicious, so in any rating scheme if "activity" is mentioned at all, there should be a blank space for describing the pernicious kind of activity as well as the good kind.

The story of the lieutenant, in the front line in France where the bullets were flying, is appropriate in this connection. This lieutenant off the battle-field and in posts, camps and stations, had had such consistent activity displayed over him in everything that he was called upon to do that from sheer habit when a special situation came up, in the front line where the bullets flew, he went to the 'phone and asked his superior what to do and the reply, over the 'phone, from rear to front, was—"use your own judgment". If we are going to teach officers to use their own judgment on the battle-field we must begin in posts, camps and stations and not postpone it until officers are learn-

ing grand tactics in our higher schools. In other words we must eliminate pernicious activity on the part of supervising officers who may be working for a high "activity" rating while they are forgetting that there are also such words as "intelligence" and "judgment and common sense".

There is a danger that people who know that they are going to be rated on a multitude of items, may retain all those items in the back of their heads; items which are at once transferred to the front of their heads when the rating officer comes around. Like boy scouts reciting "trustworthy, loyal, helpful, friendly, courteous, etc." there will flash through their minds "activity, military bearing, tact, intelligence, force, leadership" and what not. This is likely to cause them to forget their job. The means for measuring efficiency may crowd the thing to be measured,—efficiency—out of the picture. It is much like the old trustworthy employee in a big factory who was told by the manager: "Jones I hear you don't think much of our new efficiency system." And Jones replied, "Well, sir you know there must be some one around here to see that the work gets done". Like too many cooks spoiling the broth, too many terms spoil any rating scheme.

It has sometimes been difficult for me—and others have told me the same thing—to write a brief general estimate of an officer in my own words.

One friend of mine had a rather practical solution to this item. He searched through a necrology pamphlet and made up a number of citations for the good officers to be reported upon. Similarly he made up some negative citations (the speech of Sergeant Buzfuz denouncing Mr. Pickwick in *Bardwell vs. Pickwick* might be used as source material). All these, positive and negative, citations he numbered. Then all he had to do was to indicate the number and the sergeant-major would enter same under the brief general estimate.

Sometimes efficiency reports have to be rendered on officers when the reporting officer knows little or nothing about the officer reported on, and this is liable to make one feel like the new British Consul who was sent to the interior of Africa and who presently had to render a long report on the natives in his district. When he came to the item "Manners and Customs", he filled in the blank: "Manners—None; Customs—Nasty". It seems to me that the more we go into multiplicity of detail in trying to rate the human being the more we get involved in obscurity and contradiction. If this is true then the principle of simplicity, an important principle of war, could also be used to great advantage in any rating scheme for human beings.

Let us stop to consider for a moment the various situations under which efficiency reports are rendered.

In these days when many are called upon to preach soldiering over long periods of time and perhaps not so many are practicing soldiering over shorter periods, how is it possible to establish a worth-while comparison? A prominent minister once told me that a good preacher, preaches better than he practices and if this

should be true in the army it is bound to show up on efficiency reports.

Then we have heard of the reporting officer who won't rate any officer under him higher than he himself is rated. Such a rater is doing something that is not intended but is, after all, rather human. It supports General Von Seeckt's observations on "man".

If we are going to consider all the varying situations under which reports are rendered I think we should again conclude that our job is a difficult one.

At this point, I am going to inject some thoughts which I have gleaned from a number of sources and which I believe have a bearing on the matter at hand.

Dr. Dewey says: "No one can foresee all consequences because no one can be aware of all the conditions that enter into their production. Every person builds better or worse than he knows. Good fortune or the favorable cooperation of environment is still necessary. Even with his best thought, a man's proposed course of action may be defeated. But in as far as his act is truly a manifestation of intelligent choice, he learns something. One may learn quite as much or even more from a failure than from a success. He finds out at least a little as to what was the matter with his prior choice. He can choose better and do better next time. Luck or fortune not foreseeable is always involved. But at least such a person forms the habit of choosing and acting with conscious regard to the run of affairs. And what is more, such a man becomes able to turn frustration and failure to account in his further choices and purposes. Even a thing insofar serves his purpose to be an intelligent human being."

The just quoted, rather philosophical thought means, without in any way compromising with discipline or other soldierly attributes, that it would be well to be indulgent when it comes to mistakes. The Duke of Wellington had the idea.

Mr. Philip Guedalla in a recent biography of Wellington quotes the Duke as saying in 1809: "If I am to be hanged for it, I cannot accuse a man who I believe has meant well. Although my errors, and those of others also are visited heavily upon me, that is not the way in which any, much less a British Army can be commanded."

These being the Duke's sentiments no wonder he could say after he had conquered the French in the Peninsula and Napoleon was about to proceed to Elba: "I could have done anything with that army."

Ludwig tells us that before his first encounter at Mollwitz, Frederick the Great had fled and did not appear again until sixteen hours later when all was over and won. And Frederick became one of history's greatest captains. So it seems to me that we may well bear in mind the idea of tolerance towards honest mistakes when dealing with efficiency.

An efficiency report should mean something after it has been rendered. The officer's efficiency report with other documents that form a part of the report should be the sole record to which we turn in judging the man. This means that special reports from school indicating whether or not an officer is fitted to go to

other schools, are out of place and when schooling is coupled with general staff eligibility we run into special difficulties for we thereby decidedly limit the value of efficiency reports.

Unless our efficiency report is the sole repository of all merits and demerits how can we, for example, strike a just balance between earning a distinguished service cross in the thick of battle and barring the same officer from further education when further schooling alone leads to a place on a special eligibility list?

More than ten years ago, I pointed out in some articles, the flaws in any scheme that uses what in labor parlance is called the closed shop principle, for eligibility for anything. What about the morale of many hundreds of very capable officers who on account of conditions that may exist, will never get to the schools? Would it not be better to leave the door open for the "self-made" eligible school or no school?

In this connection, the law exempts the Chief of Staff from the provision that to become eligible for the General Staff, officers must go through the schools.

Is it not significant that since the law was passed none of the five chiefs of staffs have been through any of the schools through which the Chief of Staff's assistants must go before they can be eligible? If the "self-made" man is good enough to be Chief of Staff

it seems to me "self-made" assistants should also be acceptable.

I am all in favor of our schools, and expressed myself that way in a recent article in the JOURNAL, but I repeat that general staff eligibility should be divorced from our schools. The efficiency report will not be the worthy document that it should be until we make it the one and only report to which we turn whether we are trying to determine Class "B", or are considering a fine detail, even one to the General Staff.

I stated one conclusion early in this discussion, to the effect that our problem is one of great difficulty and cannot be solved accurately as long as man is man. This being the case the simpler we make our yardstick the more we are likely to arrive at something that is practical even though it does not measure everything through the alphabet from Activity to Zeal.

That the efficiency report is absolutely essential needs no discussion but it will attain full importance and value only when it becomes the *sole* debit and credit sheet for the man reported on. This means the elimination of special reports and special eligibilities.

And the final thought is that a reasonable solution for this complex problem calls for the employment of that well known but often overlooked, principle of war—Simplicity.



Camp of Battery G, 4th C. A., at Fort Randolph, C. Z. (Capt. P. W. Lewis, Comdg.)

"Towers Along the Steep"

By Fletcher Pratt

"Britannia needs no bulwarks,
No towers along the steep;
Her march is on the mountain wave,
Her home is on the deep."

WHEN Tom Campbell wrote the lines that make every true Briton's heart vibrate with emotion for king, country and the roast beef of old England, he was not indulging in a flight of literary fancy, but taking sides in a hot little military controversy then convulsing parliament, the army and the country. The question of whether or not to build actual, physical "towers along the steep" was a burning issue. Specifically, it was a question of Martello towers for coast defence, for the shadow of revolutionary France was looming huge across Europe, and in the south a General Bonaparte was shivering the armies of England's allies to bits while in the north the Dutch navy had been added to the list of England's enemies, and no man knew when a revolutionary army might be landed on the shores of England.

Hence Martello towers were a burning issue. Obviously some form of coast defence was needed and these towers were being enthusiastically guaranteed by various politico-military gentlemen in Parliament as a sure preventative against invasion, raids, sudden death and all the other evils that might afflict an island kingdom. The term has altogether sunk out of existence today, along with the object, but in 1798 everybody knew what they were and what they were for. And their history forms on an interesting exhibition of what happens when politicians neglect national defence for a term of years, to be suddenly awakened by the terrific reality of war.

The beginnings of this most curious form of coast defence can be traced directly to the inspiration of a philosophical engineer and Louis XV's penchant for economizing on governmental expenses to give tasteful fetes at the Oeil-de-Boeuf. It all started in the Seven Years' War which, as the text-books will tell you, opened in 1756. France was exceedingly ill-prepared for a fight of any kind, and the navy in particular was in a state of decay. Now nothing was more certain than that the English would make war with a series of raids on French seaports. It was an old English habit in French wars. In the great conflicts of Louis XIV, three-quarters of a century before, Brest, Cherbourg, Dieppe, Dunkerque, Havre and Rochefort had all received these unpleasant visitations, with resulting profit to the English side and damage to the French.

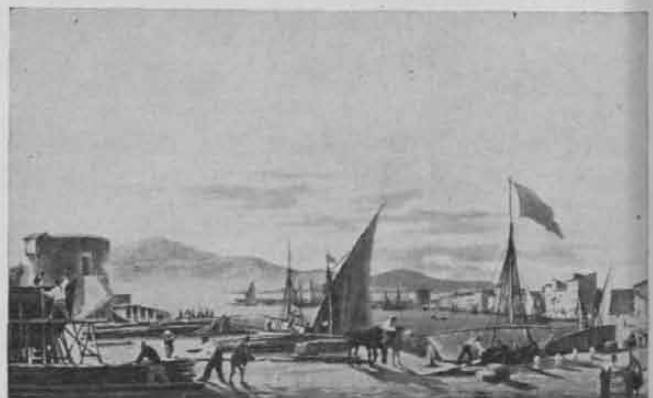
Louis XIV had had all these places fortified by Vauban, but in 1756 the fortifications were becoming slightly moth-eaten. Moreover, Vauban took harbor defence seriously, and had erected a series of really

formidable works that would take a good many trained soldiers to man. When the royal easter-up-of-account came to figure how much it would cost to man all these forts, Louis XV was appalled to discover that he would have to do without fetes for six whole months. Not to be thought of!

But about this time appeared a pamphlet by a philosophical engineer (who signed himself cryptically, *Vicomte de B...*) who had discovered the proper way to run a benevolent monarchy in all its departments, including reform of the marriage laws and coast defence. The chapter on coast defence was brought to the Royal Louis' attention. Among other oddments it contained the following passage:

"The maritime frontier of an energetic and bellicose nation has no need for fortifications to give security to the state or even to itself: for no serious attack can really menace or even compromise it; but it may need small works to afford its interesting parts protection from the ravages of an enemy come not with projects of conquest impossible to realize but with the design of ravaging and destroying, and reassembling after having performed his unappetizing task." The very thing!—thought the Royal Louis, and continued.

"What should these 'small works' be?" the author asked, and answered himself that they should be towers in the roadsteads of vulnerable ports. These towers should be sufficiently tall to prevent their embrasures being raked by the musketry from the topmasts of a ship, more than fifty feet above the water. As they would be attacked suddenly, and will probably be



Port of St. Tropez, France, about 1830. Martello tower is visible at the left. This tower, of which a model is still in existence, was designed for three guns, and did not originally have the stairs shown in the picture.

weakly manned, they must be made proof against escalade from the water level. Now the only way of bringing this about is to make the towers impossible of entrance from the water level and as the works of the tower must necessarily be at the top, the lower

parts of it are useless except to hold up the upper parts. Therefore let the towers be practically solid all the way up. The only way to get into them should be by climbing a ladder to a small door near the top. After the defenders get in, the ladder can be thrown away or something—(presumably leaving the defenders to fly down).

The top of the tower should consist of nothing more elaborate than emplacements for three or four guns and beneath them, in a kind of well in the solid masonry, a storehouse for ammunition and provisions. Roosting up there in comfort the garrison, immune from all attack, can pepper approaching ships at their will. As they will hardly be under fire, there is no need even for trained troops to man the towers; one gun-pointer for each cannon would do.

That is the whole idea; beautiful, ingenious and above all—cheap. The Royal Louis was charmed. He



Port of Havre, about 1830. A Martello Tower is visible at the left center. At this period the tower was no longer in use.

hung a decoration on the philosophical engineer, made plans for a super-fete and ordered towers of this description to be built in every seaport of the kingdom.

A few of them did actually get built; one or two in Corsica, one at Toulon, another at St. Tropez, one on the island of Aix and a couple at Cherbourg. As might be expected, they were somewhat modified from the Spartan simplicity of the original plan. Most of them had a large casemated chamber for the stores, and few of them were as high above the water as originally planned, except where they stood on projecting headlands.

They accomplished exactly nothing. Except in one case the English descents on the coast arrived before the towers got built; and that one case was the tower on the island of Aix, which surrendered after half an hour's bombardment by the British fleet which attacked the place. After the war, the sage Montalembert reached the conclusion that all coastal fortifications were useless. "It is evident," he says, "that a ship can be sunk to the bottom before a solidly constructed fort is razed. The combat of a fort against a ship should be the encounter of an iron pot with an earthenware one. Nevertheless, the ship usually wins, which proves that the ship is the iron pot. This was the case with the tower on the island of Aix. The musketry of the topmasts commanded the batteries and rendered

the service of the cannon impossible." He concluded that the only cure would be to run the towers up to 110 feet in height, which was absurd.

Apparently, everyone in authority agreed with him. At all events no more of the Vicomte de B's wonderful towers were built and those already in operation fast fell into decay.

Until the French Revolution, when any kind of defence, no matter how silly, was put into action. Now in 1794 the Corsican patriot Paoli raised a separatist movement in his island. The English sent some troops and a fleet to help him out. Now the only good anchorage in Corsica is the gulf of San Fiorenzo. It was defended by nothing more serious than one of the philosophical engineer's towers, mounted on the headland of Cape Mortella, and armed with two 18-pounder guns and one 6-pounder.

The English transports landed their men on the coast, and the warships *Fortitude*, 74 and *Juno*, 38, anchored off the tower to reduce it. They caught a tartar; the tower was full of revolutionary soldiers who were full of enthusiasm for the sacred cause provided with plenty of ammunition. After two and a half hours of cannonading, the *Fortitude* slipped her cable and ran for the sea. She was on fire in two places, had 62 men killed and wounded and her spars were a wreck. The *Juno* followed with several feet of water in her hold and a heavy injured list. The tower was undamaged and did not fall till the next day when the guns of a battery set up on shore set fire to the "bass junk" (whatever that is) with which its upper platform was lined.

Sensation.

Particularly among the army officers who had seen the defence, and who drew the obvious conclusion that three little guns on top of a stone tower were worth 112 big ones on ships. Now it happened that one of these officers was also an amateur politician of some talent and a member of Parliament. He did not get a chance to transmit his great discovery to England at once as the expeditionary force stayed on in Corsica till 1796, and he did not get home till the next year. When he did, he took the matter up at once, slightly mispronouncing the name of the cape where the battle had taken place so that from Mortella it became Martello.

He arrived at a particularly opportune (or inopportune) moment. Parliament was thoroughly scared by a series of thundering events. General Bonaparte was beating the Austrians in Italy, General Moreau the Germans in Bavaria. Thurot was landing French troops to aid the insurrection in Ireland. British fleets faced superior forces off the coast of Spain, where Jervis was taking 18 ships into action against 37 and off the coast of Holland. And worst of all, at that precise moment the great series of mutinies known as the Mutinies at the Nore broke out, as though to demonstrate that Britain's naval defences were a broken reed. Why, an invasion might come at any moment.

It was quite useless to point out to the parliamentary

politicians that the inferiority of the British fleets and the mutinies themselves were due to their own cheese-paring economies, or that Thurot's raid was a singularly pointless and futile venture. They wanted action right away.

And the soldier-politician demonstrated that with arithmetical accuracy that if one Martello tower with three guns could knock out two ships, twenty or thirty of them would extinguish the whole French navy, with all its allies. While a horrified finance minister pleaded in vain and military authorities looked on aghast, Parliament voted some hundred thousands of pounds for the construction of Martello towers all around the coasts of England. All the stone-masons in the cuntry began to inquire about the price of carriages, and the Vicomte de B's bright idea, exploded forty years before, leaped into a startling renaissance.

About forty of them were actually run up, wholly or partly, and apart from a few in the great ports, they were planted in the most unlikely places imaginable, on the theory that the French were apt to make a descent almost anywhere. None of them ever fired a gun at a Frenchman, though in the piping days of Napoleon's camp of Boulogne, in 1805, the local "fencibles" were wont to march to them in great state, and mounting to the tops of the towers, then demonstrate their valor by giving three ringing British cheers.

After the invasion threat was ended, they were forgotten, like their French predecessors, though a few of them came in handy to builders along the coasts who were in need of a supply of ready-cut stone. And a few of them are still in existence, serving a useful purpose as landmarks for the skippers of yachts and motor-boats.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF COAST ARTILLERY
Washington

December 5, 1932.

Brig. General John J. Byrne,
Hq. Coast Artillery, N.Y.N.G.,
160 West 62nd Street,
New York City.

My dear General Byrne:

I am taking advantage of this first opportunity to write you and to again thank you and the officers and enlisted men of your brigade for the splendid review on the evening of December 2, 1932.

I was very much impressed with the soldiery and military bearing of all of the officers and enlisted men and the smartness with which your review was carried out. I was also highly impressed with the high standard of the enlisted personnel of your command. The review in fact indicated a very high state of training and efficiency.

As I stated to the assembled officers, the Coast Artillery Brigade of the New York National Guard is a most important element in our system of national defense and it has a definite mission. I know that all of the organizations comprising the brigade are seriously preparing themselves for accomplishing this mission. I repeat what I have said before, I am proud to know that the Coast Artillery Brigade of the New York National Guard embracing the 212th, 244th and the 245th Coast Artillery is a part of the Coast Artillery of the Army of the United States.

I will be very glad if you will communicate the foregoing to the officers and enlisted men of your command.

With the best of good wishes,

Sincerely yours,

(Signed) JOHN W. GULICK,

Major General,
Chief of Coast Artillery.

A Trip to New York—1885

By Colonel F. A. Yorke, O.B.E., late Royal Artillery

Editor's Note: The following from the diary of Colonel Yorke is believed of interest. It was submitted by Colonel Yorke's son, Major F. A. Yorke, M. C., Royal Artillery. Major Yorke is serving with the famous Heugh Battery, Harlepool, England, which acquitted itself against a German raiding squadron during the War, as all Coast Artillery should.

I WAS the Major commanding the battery stationed in Jamaica and had a detachment in Nassau, due for inspection.

As our Fleet was going in that direction, and the Flagship "Northampton" was to call in at the latter place and then proceed to Bermuda, I took this chance of combining duty and leave of absence. I intended to go on to New York from Bermuda by mail-steamer.

I came aboard "Northampton" 3 p.m. 26th February, as the guest of Sir Edmund Commerell, V. C., our naval Commander-in-Chief.

The Fleet weighed at once, but we had to wait to pick up another guest, Lord Cranbrook. As it was getting dark, and he had not arrived, the Admiral steamed out, leaving his Lordship to catch us up in the dockyard launch. We swept the sea with the new electric arc-light projector, found him, and took him aboard.

I had a swing cot on the main deck, slung close to the breech of a big gun; I dressed in the chaplain's cabin.

Next morning, all the ship's company assembled for prayers, and then the Fleet went to "Steam Tactics." A very pretty sight.

In the afternoon we anchored off Ocho Rios and I went ashore with some of the officers. The water is a lovely emerald green against a coral bottom. The shore is plentifully supplied with large maiden-hair ferns and cotton trees with fantastic looking roots. The road skirting the high cliffs had its telegraph wires covered with enormous spider webs with gigantic spiders to match.

Dined the same evening with the Admiral, and after dinner, smoked and chatted with him on his stern-walk. We had let the Fleet get ahead again, and at 11 pm. caught it up and passed through it to take station ahead ourselves. It was a lovely sight: full moon; dead calm; and all ships with lights burning as we steamed through the two columns.

Our next port of call was Montego Bay. Here we saw a large church, over one hundred years old, which contained a fine specimen of what was known as a "three-decker" pulpit. The negro clerk was walking about in the church, smoking and hat on head.

There is also a barrack and barrack-square. This, the church, and some fine old houses are all falling to pieces. The batteries, still mounted as they were in Piracy days, are buried in luxuriant creeper.

We came upon an old negro, preaching. Concealed from him, we sat down, lit our pipes and listened. The discourse was a string of disconnected sentences punctuated by another man with the most inappropriate "Amen's."

A hymn was next given out consisting of eight verses. Each was read through by the preacher, who then repeated the first verse. He then cleared his throat and began a most awful howl. This electrified the congregation who commenced to join in, among whom were several very ancient negro ladies smoking pipes.

We returned to the ship to find her full of coloured gentlemen attired in the height of fashion. One buck was so pleased with himself that he kept passing and repassing the officers, taking off his hat and bowing in the most exaggerated manner.

We spent two days in this spot and fixed up a cricket match and regatta.

The Fleet now dispersed. Some of the ships to Bermuda—my own included—others to Port Royal, Colon (Panama), and other places. Poor "Bullfrog" being very small, had burnt nearly all her coal in keeping up with the big ships, so she had to be taken in tow by the flagship which was now bound for Nassau.

We were able to get a glimpse of far distant Santiago de Cuba. Next, we called in at the island of Great Maqua—a very dreary spot.

March 10th, cast off "Bullfrog" off Rum Cay. She spread her canvas and gaily sailed away. Warships still utilized both wind and steam in 1885. Yard and Mast Drill aboard the flagship—setting and shortening sail.

Came into Nassau 10:30 p. m. March 11th, and next morning inspected my detachment. My duties had ceased and I was now "on leave" for New York, Bermuda being my starting-point.

I must now crave indulgence before I return to my diary and explain that I portray the American exactly as I met him forty-seven years ago—no more, and no less.

After my inspection I lunched at the hotel in Nassau, a very fine one and on the American system. All courses, served in little dishes, are put down at the same time: a kind of gigantic *hors d'oeuvres*.

An American, next me, was completely surrounded by soup, fish, lamb outlets, beef, pudding, ice-cream, and fruit. He seemed to be able to attack all and sundry at the same time.

The American drinks nothing but iced water at his meals, keeps silence the whole time, and eats at railroad speed. If he wants anything stronger than water he drinks that at the bar either before or after meals. It is certainly a most sober Nation, for I only saw one drunken man the whole time I was in the States.

The same evening I was introduced to General Perkins and Lieutenant Pinkney late of the United States Army, who invited two or three of us to breakfast next morning.

It was a breakfast! It commenced with a glass of neat gin, followed by champagne and other luxuries. Twelve courses, topped off by cigars and coffee. We

sat down at 10:45 a. m. and rose 1:45 p. m. A three hour breakfast—not bad!

My hosts were clever men, and had a quaint and downright common-sense way of expressing themselves.

We worked off the breakfast by playing Lawn Tennis all that afternoon, and in the evening sailed for Bermuda.

On reaching Bermuda, I bade farewell to the Admiral, and with a brother officer, Hamilton of the Rifle Brigade, embarked on the 29th of March in the S.S. Orinoco, bound for New York.

Bermuda abounding in onions, the cargo was composed entirely of this vegetable which permeated the whole ship.

We arrived at New York after a voyage of three-and-a-half days. During the whole of that time, four Americans established themselves in the saloon, and, as far as I could judge, never left it, being engrossed in what appeared to be one continuous game of "Euchre" between the two ports.

We anchored off Fort Hamilton at about 7:30 a. m. the whole place covered in snow. A curious two-decker craft came alongside propelled by a beam-engine. To this odd-looking tender we were transferred, and steamed for New York, past Long Island, to the Customs Docks.

After the examination of our luggage, we took a buggy and drove to a hotel in Fifth Avenue. The delight of getting out of the cold and sleet into a nice warm building, with an immediate bath and change, was most gratifying. Then a splendid late breakfast, one course of which was hot gingerbread. We spent the rest of the day sight-seeing.

Next, I went down to the General Post office in a horse-drawn tram. There is one fare—five cents, or 2d in our money. You get off when and where you like.

The conductor was somewhat "short" with me because I was uncertain where to alight; whereupon an old gentleman, wearing a large black sombrero, and whose face was adorned with a most perfect "Van Dyck" beard and moustache, jumped to his feet and addressed himself to that conductor in no uncertain language. He then swept off his hat and asked me to accept—through him—an apology on behalf of his countrymen.

The elevated railroad is a grand institution. The permanent way is supported on pillars, stairs leading to a small station. Here again is an universal fare—10 cents to anywhere. You just buy your ticket and place it in a pillar-box near the entrance to the platform. Trains run every two minutes. You jump into the long cars and alight where you please.

Streets are extremely easy to find. Avenues run North and South, streets, East and West. This network is broken by public squares and the Great Broadway in which a great deal of business is done.

Central Park is a very pretty wooded locality at the North end of the Town, and corresponds to our Hyde Park and Rotten Row.

The Americans ride a great deal and we saw a good many ladies very well turned out and mounted.

Plenty of extremely smart carriages, driven almost entirely by English coachmen, together with the general trend of English fashions, made me feel quite at home.

That evening, we were interviewed by a reporter of the *New York Tribune* and asked what we thought the chances of war were (the Russian menace to India). We replied we had plenty of men and would be ready for it when the time came.

Was Mr. Gladstone popular with the English Army?

Our answer was a decided negative which included all that gentleman's following.

The next few days we wandered about New York gazing at the sights. We went over the wonderful Brooklyn Bridge. This carried a central foot-way, two carriage tracks, and two tram-lines; the motive power for the latter being a cable and engine each end.

A short time before, and during a public holiday, some pick-pockets spread a false alarm the bridge was breaking, hoping, of course, to reap a rich harvest in the ensuing confusion. In the crush a gentleman lost a gold watch. At the bottom of a heap of dead, a thief, killed in the struggle which he had helped to originate, was found with the watch smashed flat.

As Barnum's Wild Beast Show was then the thing to see, we duly paid it a visit and saw the famous "Jumbo."

I was now to meet Lieutenant Zalinski of the United States Artillery, the famous inventor of the pneumatic gun which threw a dynamite shell. We bought a weapon to test in this country and I happened to be the Battery Commander. It was mounted as a Coast Defence Gun, and we shot at a towed hulk. When we did hit her, she just disappeared in dust.

I think this gun was only once used in anger—at the bombardment of Santiago during the Spanish-American War in Admiral Sampson's squadron. I hope I may be corrected if wrong.

Zalinski was cordiality itself, showing me round everything that was permitted, and putting me up for the club where *all* the members present in the smoking-room made a point of shaking hands with me. I am glad I was privileged to return the compliment some years later, when another American officer was our guest in London.

The principle of the gun was propulsion without initial shock. This was obtained by admitting air into the gun-chamber and gradually increasing the pressure from a reservoir whose contents were kept at enormous compression by the use of hydraulic machinery.

The shell was detonated by a small and very simple electric battery sliding forward on impact and thereby connecting two terminals in the head of the projectile. The charge was, of course, well forward.

Zalinski told me he was a darned nuisance to the inhabitants round Fort Hamilton; he was always bringing down their ceilings with his "dynamical" experiments.

He took me over a field battery. The teams had their tails touching the ground and the guns appeared to be of different calibres. The harness differed some-

what from ours. The men are fine, well set up, fellows, and extremely intelligent. On the 2nd April we went by river steamer to Falls River.

These vessels are nothing else than large floating hotels, complete with sitting, dining, and smoking rooms. The sleeping apartments are fitted like cabins, holding two berths each.

Electric light throughout. You just turn the switch one way and the lamp lights—the other way and it goes out. Please excuse this elementary thrill of pleasure at what was, in 1885, something which had about it all the fascination of black magic!

Before turning in I had a long chat with an old fellow smoking a cigar held between absolutely toothless gums. The lack of teeth appeared to have no deterrent effect on the enjoyment of the weed.

He informed me he had a presentiment there would be an accident to the old boat—"The Pilgrim." In the middle of the night we did indeed strike another vessel, some of the passengers being badly hurt.

Landing at Newport, we took our seats in the train for Boston. This consisted of long coaches or "cars" with a gangway down the middle.

Through the fog we could only see thick woods and wooden villages. This was New England, and we seemed to miss the "go-ahead" methods of New York but felt more in touch with the old Puritan Settlers.

On arriving in Boston we drove to the Brunswick Hotel. I wonder if it is still in existence?

Boston is not like New York. The houses are very well built, but the streets are not of that regular formation the other city presents.

There is much ice-boat sailing during the season.

I was taken round the Educational Institute—a wonderful piece of organization. There is also a fine Art Gallery and Free Library.

Next day we visited Harvard University. It is a wonderful place and modelled on Cambridge. Its appearance is very like Eton. There is a very fine dining hall hung with oil paintings of college celebrities.

I have to thank Dr. Williams of the New York Artillery Barracks for showing me Boston.

Back in New York for Easter. I just missed hearing the famous Dr. Talmage.

On Easter Monday we left New York at 6 p. m. and reached Niagara 7 a. m. the following morning.

After breakfast—at the little German hotel the "Kaltenbach"—we drove in a buggy to the Falls. We crossed the suspension bridge and saw the ice bridge over the rapids. Next day this had melted. The eternal thunder and beautiful green of the Falls is an unforgettable combination.

Back to New York, and after a few more days in that very pleasant city—back to duty!



View from Post Office Building Looking Down Broadway.

"Herald Building" "Evening Post" Building

Trinity Church

W. U. Telegraph Co's Building

St. Paul's Church

Astor House

Things Haven't Changed Much

Editor's Note: The following was sent us by our correspondent, Lieut. W. A. Dunton, Jr., Adjutant of the 626th (Los Angeles). He thinks it is amusing, and so do we, and we hope you will.

HEADQUARTERS DEPARTMENT OF
SOUTHERN LUZON

Manila, P. I., July 6th, 1900.

To the Depot Quartermaster
Manila, P. I.

Sir:

I have the honor to invite your attention to the fact that though application was made some weeks ago for a suitable conveyance for the use of the Inspector General of this Department and myself, the only result thus far has been the "hope deferred" which "maketh the heart sick" and which, at the same time makes the rest of one's individuality extremely tired.

The fact that the conveyance now issued to Major Beach and myself is an unattractive combination of a hearse and a chicken-coop is one that I can endure in a becoming spirit of humility though it might seem proper that there should be some visible evidence that in the matter of transportation, the senior staff officer of an important department is given more consideration than is habitually extended to a company slop barrel; but it may be well doubted whether it accords with the best interests of the service to provide such rickety and jolting conveyance for a staff officer that upon his arrival at his office, he finds his inner man churned into an unlovely omelet composed of the wrecks of his viscerae, his conscience and his professional attainments.

This request is neither inspired by pride nor prompted by the spirit of a sybarite, I do not aspire to an iron chariot such as baffled the Almighty in his campaign against the Caananites of the Valley (Judges 1, 19) nor even to a buckboard of the pattern rendered famous in the more recent military operations. Nay, more, I do not aspire even to participation in the wheeled glory of my juniors in rank on duty at Division Headquarters, nor to the vehicular grandeur of a newly created Quartermaster, but I would like to have a conveyance which I could leave standing with a reasonable degree of assurance that it would not be removed by a police party, as an offense against the landscape or a menace to sanitation.

The vehicle which I am now provided with offers an appearance of impending disintegration not unlike that presented by a man with his suspenders broken and ten Mexican dollars in his trousers pocket; and its imitation of the "one horse Shay" is doubtless delayed only by a Castillian spirit of procrastination acquired from its makers.

To be sure, there remains the alternative of walking through the burning rays of a tropical sun, which would be perfectly feasible if one could escape a Cabessa Caliente or consider his liver with the same indifference that the late Mr. Vanderbilt entertained for the public, but the alternative of my melting away in perspiration, or of fading away in an atmosphere of humiliation is not attractive to me although it may not be devoid of hopeful features for the junior members of my Corps.

Trusting that this delay in the matter of providing me with a conveyance is due merely to a climatic spirit of "manana" and is not an evidence of original sin on the part of the Quartermaster's Department.

Very respectfully,

(Signed) ARTHUR L. WAGNER

Lieut. Col. Asst.

Adjutant General, U. S. A.

First Endorsement

Office of Depot Quartermaster, Manila, P. I., July 7th. 1900.

Respectfully referred to Lieut. Kossman, 35th Infantry, Asst. to Depot Quartermaster, in charge of land transportation, with the hope that he can repair, rejuvenate or even substitute a good Quilez for this cross between a "hearse and a chicken-coop" now used by Colonel Wagner.

This paper to be returned with report of action.

(Signed) JNO. T. KNIGHT

Major and Q. M. U. S. V. Depot Q. M.

Second Endorsement

Office of Land Transportation, Manila, P. I., July 11th. 1900.

Respectfully returned to the Depot Quartermaster, Manila, P. I., with the information that the "one horse shay" has been replaced by a new "Quilez", thus providing a more suitable vehicle for such portions of the staff officers of the Department of Southern Luzon as may still remain intact and susceptible of conveyance. Regretting the inability of this branch of the service in the matter of restoration of wrecked viscerae and individual consciences, it is respectfully suggested that this part of the communication be referred to the Medical Department of the Army and some reputable Chaplain, respectively, for such repairs and restoration as they may be able to make.

(Signed) B. KOSSMAN

2nd Lieut. 35th U. S. Vol. Infy.

In charge of Land Transportation.

The Soldier Dreams of War's Alarms

By Major F. M. Green, C. A. C.

(Showing the cross-section of an organization commander's mind, especially about the target practice season, when well fortified by study of TR 435-55 and TR 435-280.)

"I had a dream, which was not all a dream. . . ."—Byron

The captain went to sleep one night
And dreamed a hideous dream,
In which his most abstract ideas
Great living forms did seem.
(Perhaps he'd supped too freely on
Shrimp wiggle and ice cream.)

Probable error was a fiend
Elastic in his size;
At times he'd almost shrink away,
Then shoot up to the skies
And tower o'er the captain's bed
With hatred in his eyes.

The Center of Impact was a dwarf
Of most elusive ways;
One sees him here, one thinks him there,
But nowhere long he stays;
The way he skipped about the place
Would certainly amaze!

But, worse than either one of these,—
The Error Systematic
Would swell and shrink as though his hide
Were somehow made pneumatic;
He'd change his size (and eke his sign)
In manner most erratic.

The slugging A-term lurched about
The Captain's QM bunk;
He'd hit at anything in sight
Like any common drunk;
(Yet in a wink he'd help you out
If the proper wink were wunk.)

A veiled, mysterious, awful ghost
The B-term proved to be;
A speed-cop was the C-term's shape;
And as for dreaded D,
He kept a book of One's mistakes,
As careful as could be.

The B-term bore a Ladder long
And, trailed by M and N,
Each of whom had a monstrous Fork,
He'd climb the Ladder; then
They'd run the Ladder out and out—
Then run it in again.

The Captain dreamed "der Tag" had come—
His record practice day;
He rose betimes and set to work
In his accustomed way,
To shoot his best and try his luck.—
(You know old sailors say

That Judas burns in hell-fire pit
Till the annual time draws near,
When he's turned loose for just one day
To cool his fevered rear
By sitting on the Polar ice;
Then—back for another year!

Thus doth the artful Cosmoline
Quit shining brass anon,
And shoot his guns one day each year
Till the ammunition's gone;
And then reports for months and months
On all that he has done.)

The Captain dreamed; and in his dream
He stood in his C. P.,
Prepared to fire his record string
In hopes of a red "E".
He squinted through his telescope,
Ye gods! what did he see!

Proberror and the Centrimpact
Were walking down the shore,
And well the Captain knew their hope
That they could get him sore.
Proberror's belt was hung with scalps;
Centrimpact's hands dripped gore!

"Now to my aid, Saint Barbara",
The Captain dreamed he cried;
"Stand close beside me in this hour;
And, on my other side,
Come Lady Luck and hold my hand!"
But thus the fiends deride:—

"The shell game's old," cried Centrimpact,
"With walnut shells and peas,
But if you hope to win from us
Just tell us of it, please,
For I can slip around the bay
With every passing breeze;

"And shell games with cast-iron shell
Are just my middle name."
Proberror leered in wicked wise
And said, "Make mine the same;
Your chance of hits is almost nil
For we're wise to your game;

"The bore is cold, the powder's old
And also water-dried;
E'en its stability's in doubt,"
Proberror loudly cried;
"It's fairly certain your first round
Is going to fall quite wide."

The Captain fired a ranging shot
And looked to see the splash;
The time of flight was forty year....
Then, with an awful crash,
The QM tug blew up and sunk.
That browned the Captain's hash!

"Oh shot so wild, Oh error huge!"
The Centrimpact did cry.
"I've just revoked the Law of Chance—
Your hour of doom is nigh!"
Just then an airplane drifted down
Across the summer sky.

And lo, the Captain's battery
Was firing at that plane;
Machine gun tracers,—shrapnel bursts,—
They shot with might and main!
Directors fizzed and threw out sparks,
And whistles blew in vain!

He tried to telephone the guns
To bid the firing cease;
But all the answer he received
Was, "I ain't got no grease;
Dat oil-house feller's gone to sleep,—
Go on—leave me in peace!"

Yet in his dream the Captain thought
 He trod an M. P. deck;
 The D. B.'d lost the cable-end,
 The yawl-boat was a wreck;
 "If anyone finds out all this,"
 He thought, "They'll have my neck."

Within the casemate once again
 The Captain dreamed he stood;
 A gong rang loud alarms to him,
 The crimson light dripped blood,
 As mille-volts and mille-amps
 Swirled round him in a flood.

The sergeant-major, bald and fat,
 Came rushing into sight;
 "The training schedule for next week
 Should have been in last night.
 If you can come across at once,
 I'll fix it up all right."

A camouflaged comparator
 With a breath that smelled of "Spiff"
 Said, "You'd better Section VIII that man,
 You'll find him worthless if
 The crossing of those contours
 Means an overhanging cliff.

"A state of war's existed
 Since December twenty-two
 'Tween a naval power, Missouri (Red),
 And Pennsylvania (Blue);
 The Orange fleet controls all fords
 Of the Big Stranger, too.

"If you don't place smoke on ST. LUKE'S CHURCH,
 You'll see its very clear
 You can't envelop Iwilei
 And penetrate their rear.
 On M-day send a side-car
 For the war-reserve of beer."

Again he was about to fire
 But, ere the round was loosed,
 A Varley Loop dropped down from heaven
 And quickly had him noosed;
 The Captain shouted in despair,
 "I guess my cook is goosed."

Then for a time the Captain tried
 His shovels to allot;
 For some of them were plain QM
 And some of them were not,
 Some Ordnance and some Engineer—
 And Signal Corps, God wot!

And wrenches came from every side
 Each clamoring for a name;
 For some of them clear piece-marks bore,
 But most were lost to shame
 And hid in anonymity
 As though it were a game.

The sick-book lay before his eyes;
 The doctor had marked "No"
 Across from forty soldiers' names.
 The Captain said, "I'll go
 And take a jump into the bay
 For my morale is low."

Then someone asking questions sharp—
 Lord God—! 'twas the I. G.!
 "I want to see all clothing slips
 And all your Forms 3-3;
 Send your Fund book and your check book,
 With all cancelled checks, to me."

"Coming down Beretania Street,"
 A plaintive voice then spoke,
 "A cop came rushing up to me
 And framed me with some oke."
 But it changed to the Escolta
 And a slant-eyed gook with coke.

He went into the Stranger's Club
 To buy himself a drink;
 But beans were all they had to serve
 Dished up with drawing ink....
 In situations such as this
 A feller's got to *think!*

"If seven I. G.'s with seven J. A.'s
 Investigate a year,
 Do you suppose," the Captain asked,
 "That they could make this clear?"
 "I doubt it," said the bar-keep, and
 He shed a bitter tear.

The Captain went to sign a chit,
 But written on the bill
 It said that "Serial No. 7
 Will have to clear Red Hill
 And reach Malinta-Bruja Point
 Or they'll put you in the mill"

His watch said "H plus 32",
 But stipulated that
 If he were too dispersed in depth
 The doctor'd call him fat.
 A challenge most peremptory
 Like a lei lay round his hat.

A challenge most peremptory
 Was coiled around outside,
 (Like Cleopatra's well-known asp
 That took her for a ride),
 But it shouted, "Git up on the line,
 Hey! Dress up there to that guide!"

Then a G. P. F. command he had,
 And he'd got to make a show,—
 But the target swarmed with sampans;
 And twelve bancas in a row
 Were stretched along the tow-line's length
 And simply *wouldn't* go!

Then a K. P. worked a slide-rule
 That would change the wind's direction,
 But the line-of-metal checker said,
 "I don't see the connection
 Between carbohydrates in the slum
 And a physical inspection."

He looked around to find his men,
 He hunted very hard;
 Data was flowing smoothly,
 He had ranges to a yard....
 Then he suddenly remembers
 That his battery's on old guard;

And a solemn voice was asking him
 If he could show the class
 On the Graphical Analysis
 The place for shining brass;
 "The third cook's symbol isn't right,
 So you cannot hope to pass."

Then a duckweed stadium he built
 And a golf-course fair and wide;
 He took a course in cookery
 And painted trucks beside.
 And he slaughtered all the woodchucks
 That defaced the Colonel's pride.

He "caretook" thirteen batteries,
 And filled their grease-cups full;
 As trial J. A. before the court
 He spilled a lot of bull;
 He verified by hundreds
 All the "blankets, O. D., wool."

Then he went to fire the railroad guns
 In place along the spur;
 But he had to make a tractor march
 And the tractors wouldn't stir,
 So he answered by indorsement,
 "I have shipped effects to her."

He had to fire the railroad guns
 But the data-phone had quit;
 And every time that he relayed
 The target shrunk a bit.
 "If this keeps on," the Colonel said,
 "I'm going to have a fit."

And when at last the data came
 He sliced or hooked each shot,
 And misfires came both thick and fast,
 And he never got a "spot!"
 "To burn up powder in this way,"
 The Colonel said, "is rot."

Then came an urgent message;
 "The Commanding General's near;
 A guard of honor must be formed
 To meet him at the pier.
 All uniforms must be the best—
 Hurry—he's getting here!"

The Captain ran, and as he ran
 He counted all the times
 He'd been inspected in that month;
 But I can't tell in these rhymes
 What the Captain said when he'd added up—
 But we all speak thus sometimes!

Faster and yet more fast he ran
 For his saber, blouse and cap;
 But his feet caught in the contours
 On a very large scale map,
 And suddenly it came to him
 That he'd got to take a nap.*

He fled through Requisition Woods
 Pursued by Audit forms;
 Huge Mess Accounts flew overhead
 In inventory swarms;
 Reports of Accidents swooped down
 In blue dress uniforms!

In Survey Swamp his feet bogged down;
 Vouchers twined round his knees;
 And tangled Personnel Reports
 Waved in the sickening breeze;
 O. S. & D. gnats buzzed around
 And Blitz Bugs, hard to please.

*Parlor version

He colored cartridge belts pea-green
 And buffed the catches brass;
 He stood inspections in between
 And watered all the grass;
 In the Interbattery Baseball League
 He ran a Wire Chief's class.

He refereed at boxing bouts
 (Ran convoys to them, too!)
 Installments on the radio set
 He thought were overdue,
 So he nicked all his forks and spoons
 And painted the day-room blue.

A B-board like a vulture
 Soared and circled overhead;
 A deposition on his desk
 Demanded why he said
 That a methyl-violet loading-tray
 Had its oil-holes painted red;

And why the regimental crest
 Upon the diet chart
 Showed corrections on the salvo
 That was in the garbage cart
 When the second mine was fired;
 And he murmured, "Have a heart!"

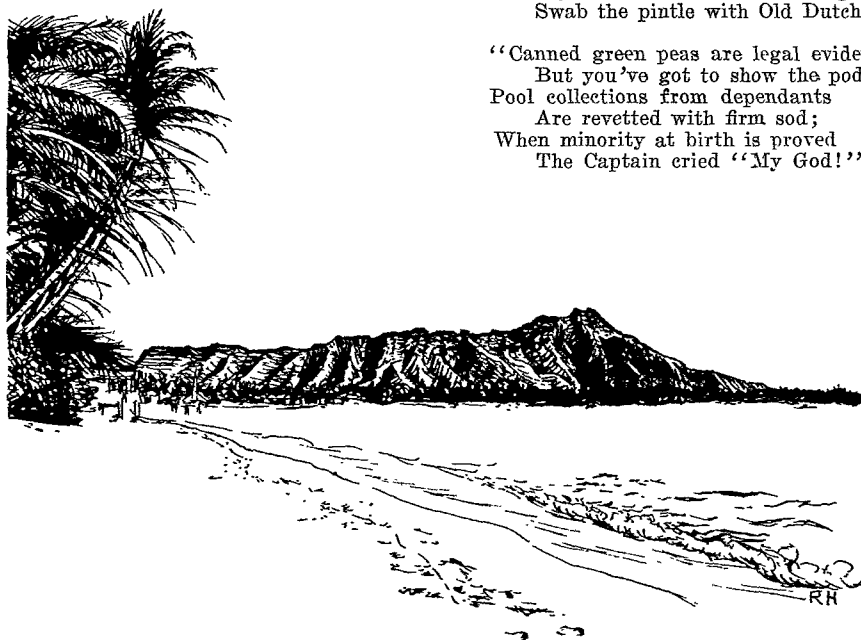
He got a letter from his wife
 Which opened, "Dearest Ted:—
 A R three five dash seven eight nine
 Requires you use red lead
 On your narrative report of why
 You're not already dead.

"You will answer by indorsement
 When wind strata of your wire
 Show resistance of ten megohms.
 You will draw an extra tire
 For your seacoast mortar compound plugs
 To be used in case of fire.

"Your altimeter hub-caps
 Should be padded with lamb's fleece,
 But the main line of resistance
 Of the Milit'ry Police
 Shows the azimuth of forgery
 Is flooded with hard grease.

"If the safety officer clears a course
 For vitamins and such,
 You will take such further action
 As will not amount to much.
 When you miss the broadside target
 Swab the pintle with Old Dutch!

"Canned green peas are legal evidence
 But you've got to show the pod;
 Pool collections from dependants
 Are revetted with firm sod;
 When minority at birth is proved . . .
 The Captain cried "My God!"



The Foreign Military Press

Reviewed by Major Alexander L. P. Johnson, Infantry

MEXICO—*Revista del Ejercito y de la Marina*—June, 1932.

"The Infantry of the United States," by Captain Cammas.

In a series of articles of which this is the first instalment, the author undertakes to acquaint his countrymen with the military system of the United States and more particularly with the organization, training, personnel and materiel of the United States Infantry. The article is well written, and discloses a thorough knowledge of the subject. It is an interesting and highly informative discussion, and it will unquestionably go a long way in spreading a better understanding of the American Army and its background among our comrades-in-arms south of the Rio Bravo del Norte.

URUGUAY—*Revista Militar y Naval*—May-June, 1932.
"Cavalry in South America," by Major Jose M. Silveira.

The vast expanse of land, long frontiers, scarcity or the total lack of good roads the author writes, will ever make for dependence upon the horse and mule. Large cavalry units will remain indispensable for reconnaissance and security before and during battle. In pursuit or in retreat, the role of cavalry will remain equally important. The difficulty of keeping up the normal flow of supplies will in the author's opinion, frequently necessitate the employment of the cavalry in small bodies not exceeding a regiment.

Mounted manoeuvre, combination of fire and movement, exploitation of surprise will continue to be the normal tactical action of the cavalry. Success will be decisive in proportion to the rapidity and care in the execution of its mission. Cavalry, in the author's opinion, must depend far more upon these, than upon its fire power in contrast with World War experience. This, in South America, the author states, is largely due to poor road conditions and the difficulty in maintaining the supply of ammunition.

AUSTRIA — *Militärwissenschaftliche Mitteilungen* — July-August, 1932.

"Planning of an Attack," by Lieut. Col. Dr. Lothar Rendulic.

In planning an attack, the author writes, it is of decisive importance whether the action is to be a meeting engagement or an attack against a defended position. The method of procedure will necessarily differ in each situation. He notes the difficulties encountered by the Austro-Hungarian Army in the first year of the World War on the Russian front. The Russians were masters in the rapid preparation of a defense. Al-

though the Austro-Hungarian Commanders were quite frequently aware of the enemy's plan to defend, they failed to rearrange their plans of attack based upon an anticipated meeting engagement to conform to the changed situation. Naturally these attacks usually failed, and where success crowned the effort, it always proved to be very costly. In the author's opinion, it will ordinarily be necessary to modify the plan of an attack even in course of a meeting engagement should hostile resistance stiffen. He believes that modern weapons will materially increase the time factor in the development of a meeting engagement over what it was during the World War. This added time, he believes, will enable the enemy to bring up reinforcements and to organize his defence.

The advanced elements of a column on the march will contact with the enemy's security and covering detachments while the main body still continues in route column at a considerable distance from the hostile position. The column commander must so conduct the march that it will favor rapid development and deployment of his command. His mission and the nature of the terrain will materially influence the formation adopted during the march, while information concerning the enemy and his probable intentions is still lacking. The author believes, that the commander should be able to decide upon his plan of action for a meeting engagement even though he may not possess detailed information concerning the enemy. In the author's opinion, it is essential that the basic elements of his plan of action be indicated in his orders for the development of the command, otherwise the commander may run the risk of losing the initiative.

As a rule, the development of the command will precede the actual attack. Seldom will there be an opportunity to launch an attack directly from the route column. In general, an attack cannot be initiated until the artillery is ready to render support. It follows that in order to launch an attack directly from the route column, an early forward displacement of a considerable portion of the artillery becomes imperative. Batteries will have to go into suitable firing positions under the protection of the advance guard in order to be ready to support the attack at the earliest moment. War experience shows that the actual time required by the artillery to prepare for action has generally been underestimated. Whenever the disposition of the command during the advance is unfavorable for an attack or when the information concerning the enemy is inadequate for the making of proper dispositions, then the development of the command in suitable assembly areas is indispensable. This, however, requires time and will seriously delay the commitment to action of the main body of a command. It is, therefore, important, the author holds, that the advance guard be suf-

ficiently strong to sustain its action independently for the amount of time required.

The attack against an enemy occupying a defensive position requires altogether different planning. First, it is necessary to drive in hostile covering and security detachments and to occupy the hostile outpost area. This is, of course, the mission of the advance guard which, for this reason, must be strong in artillery. In situations of this type it is invariably necessary to develop the command preparatory to an attack. The author holds that the most advanced portions of the assembly areas should be within the zone held by the advance guard. As a rule, hostile fire will demand that these positions be occupied under cover of darkness, or artificial blinding of hostile observation. Normally there should be sufficient time available to permit a thorough understanding of the plan of action by all subordinate commanders, and a thorough coordination of all arms.

FRANCE—*La Revue d'Infanterie*—November, 1932.

"The Russian Cavalry," by Commander Loustannau-Lacau.

The largest body of cavalry in the world today is that maintained by Soviet Russia. It comprises 13 cavalry divisions and eight independent cavalry brigades. Practically this entire force is stationed along the Polish and Roumanian frontiers.

The military authorities of Soviet Russia differentiate between tactical or divisional cavalry and strategic or army cavalry. Each infantry division includes a reconnaissance detachment armed with carbines and the "Dzegaroff" machine-rifle weighing about 15 pounds. Lances were discarded by all Russian cavalry units in 1927.

The separate cavalry brigades consist of three regiments each. Six of the cavalry divisions contain three brigades of two regiments each, and seven consist of two brigades of three regiments each. The regiments consist of headquarters, a communications platoon, four rifle troops of four platoons each, and one machine gun troop of four platoons with four Maxim guns each. In addition, the cavalry division includes two battalions of horse artillery of four to six batteries each, an artillery headquarters, communications troop, pioneer troop and chemical warfare platoon. It is planned to add to each cavalry division one regiment of horse artillery, one mechanized regiment of infantry and one of tanks.

Nine divisions of cavalry and one of the independent brigades are constituted into four cavalry corps, three of which are stationed along the western frontier, and one in the Caucasus. Each cavalry corps is provided with heavy artillery.

Cavalry regulations date from 1929. They are thoroughly modern, but like all Russian regulations, they are schematic and crush initiative. Dismounted action seems to be gaining in favor. The author believes, that these large masses of cavalry, if properly led, should possess great possibilities especially in the early stages of a war. It remains, however, to be seen, the author adds, whether Soviet Russia developed com-

petent leaders and general staffs to lead them and to control them in action.

GERMANY—*Deutsche Wehr*—October 28, 1932.

"Japanese Thoughts of Seapower," by G.

Since the military assumed control of Japanese politics, the author writes, a craving for action and national expansion seems to have overcome the entire populace. The occupation of Manchuria has become the focal point of the political aspirations of the masses. The author believes that Manchuria is to Japan, what the Rhineland is to France and Iraq to Great Britain. Japan looks upon Manchuria not only as an important source of raw materials, but as an equally important market for her products. In his opinion, the Japanese desire to secure a trade monopoly in that troubled province will inevitably bring the island empire into conflict with the United States and Europe.

The risk of a protracted struggle with the awakening masses of China, the danger of a conflict with the United States and the League of Nations do not, in the author's opinion, deter the Japanese in the least. They took that chance at a favorable opportunity and they are fully prepared to defend their action against any challenge. The author believes that in view of the present internal situation in Russia, action against the Japanese must inevitably come from overseas, meaning thereby the United States. The Washington Naval Disarmament Conference in 1922, he states, fully appreciated the possibilities of a Pacific war, but at that time the consensus of opinion held that the means then available did not promise success to the aggressor, either Japan or the United States. The fact that more recently the United States decided to leave the Atlantic fleet in the Pacific, justifying that action by reasons of economy, has, the author states, produced a strong reaction in Japan. He quotes the well known Japanese naval expert and writer, Seitoku Ito (*Daily Telegraph*, September 13) as follows:

"The Japanese submarine fleet is today the most powerful and the most effective in the world—British and American submarines have an incomparably lower military value. The best American submarines can at best be compared only with Japan's poorest. Their radius of action, notwithstanding the Hawaiian base, is hardly sufficient to reach Japanese waters. They have essentially but a defensive value. In marked contrast, Hawaii is within the radius of action of all Japanese submarines, while the best of them may operate against San Francisco and even Panama—Japan has 30 submarines of 1150-1955 tons, most of them being capable of a speed of 19 knots. In addition, Japan has 40 (the list shows 45!) smaller submarines with a radius of action of 7000 nautical miles. The 1700 ton destroyers, with a speed capacity of 35 knots, carry six 13 cm guns in twin-turrets in addition to nine torpedo tubes. They are the most powerful of their kind afloat, excepting the Italian and French flotilla leaders. The 13 cm guns were especially designed for the physical stature of the Japanese—it has a range of 16,000 meters and can fire 10 rounds per minute. Cruisers mount the same type gun; the newest ones as

many as fifteen of them. Japan has 33 cruisers including those still under construction. They are of the 8500 ton class and have a speed of 33 knots."

In conclusion, the author mentions the rumors, though officially denied, that the Japanese Government recently purchased the Portuguese colony of Timor, 700 miles off the Australian coast. As a consequence of this acquisition, the Commonwealth of Australia now proposes to fortify the Port Darwin area.

GREAT BRITAIN—*The Royal Engineers Journal*—June, 1932.

"This Tank Business—In Fact and Fancy," by Colonel M. N. MacLeod, D. S. O., M. C.

It is natural that new arms and armaments should arouse ardent enthusiasm and acquire staunch supporters. It was ever thus, notwithstanding the fact that in the crucial tests they usually have fallen short of expectations. With this thought in mind, the author undertakes to disprove some of the claims advanced by tank enthusiasts in favor of this important contribution to world armaments by the late war. He seeks to show, that in most cases success was really attributable to effective and improved methods of artillery fire, and that was, in the final analysis, the result of the highly efficient work of the Field Service Battalion, R. E., which made possible the rapid and accurate computation of firing data, and the elimination of the customary tell-tale ranging fire of batteries. Quoting General Fuller's statement to the effect that "on November 20th, at the battle of Cambrai, tradition received such a blow between the eyes, that even the most pessimistic asserted that the tank had at last come into its own" (*The Reformation of War*, by Col. J. F. C. Fuller, p. 115), the author retorts that "the novel feature about that remarkable attack was not that it was led by 350 tanks, but that a new method of handling the artillery was tried out for the first time." The author points out that the tank, as is well known, had actually delivered its first blow to tradition at the battle of the Somme in September, 1916, but had made so little impression that Earl Haig recommended work on them be discontinued. Citing other historic examples, the author points out that at Arras the tanks failed to arrive, but the Canadians, nevertheless, took Vimy Ridge almost at a rush. At Bullecourt, with the terrain favorable to tanks, they failed. At Messines, 76 tanks participated in the successful attack, yet the author quotes General Fuller to the effect that "Messines was in no sense a tank battle." Tanks were a complete failure at Ypres. On the other hand, a few days after the successful British attack at Cambrai, on November 20, 1917, the Germans, without tank support counterattacked with almost as much success as the British. These, and other similar incidents of the World War lead the author to the conclusion that "whatever opinions may be held on the performances of 'General Tank,' the value of the system of bombardment initiated at Cambrai is not in doubt. The mere fact that it was repeated with success on every subsequent offensive establishes its value beyond peradventure of doubt."

HUNGARY—*Magyar Katonai Szemle*—November, 1932. "The Modern Infantry Company," by First Lieutenant Stephen Milassin.

The rifle company being the smallest tactical unit which may be given a separate mission makes it necessary, the author believes, that it possess the necessary means to carry out successfully the assigned task. The fact that in all phases of an action, the infantry company is actually reinforced by machine guns and other heavy infantry weapons indicates the desirability of assigning to each rifle company an organic machine gun platoon. Close cooperation between riflemen and machine gunners is essential to success. In the author's opinion, normal peace time training hardly offers adequate opportunity for developing teamwork between these combat elements. The situation would materially change, the author states, if rifle companies were provided with organic machine gun elements. It would tend to emphasize their interdependence and correspondingly help to correlate their combat training.

The author rejects as untenable the argument against such a plan that the presence of pack animals would considerably impede the mobility of the infantry company, or that machine guns would complicate the ammunition supply. He advocates an infantry company which, in his opinion, would possess the necessary fire power and shock-ability to meet all requirements of modern warfare. He visualizes a company of two rifle platoons and one machine gun platoon. The author recommends omission of platoon headquarters, which by its size would, in his opinion, actually handicap the platoon leader and would tend to disclose to the enemy his location. The rifle platoon proposed by the author consists of three combat groups or squads of fourteen men each. These squads are: the rifle squad, the automatic rifle squad and the hand grenade squad. The automatic rifle squad includes one sniper and one rifle-grenadier, while the rifle squad would have two of each. In the author's opinion, the automatic rifle squad will supply the fire power, the hand grenade squad is to provide the movement. The rifle squad being capable of both, should, in the author's opinion properly constitute the platoon support, and be used as the situation requires.

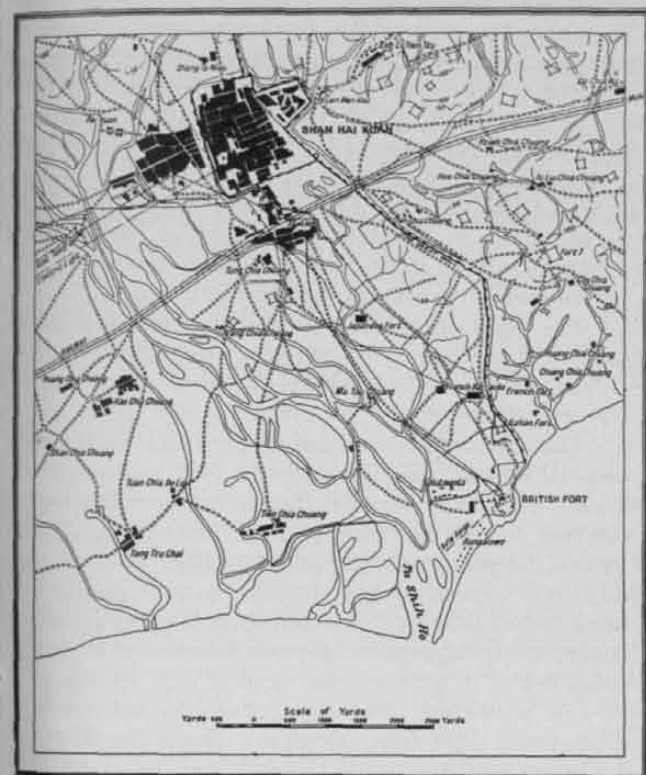
INDIA—*The Journal of the United Service Institution of India*—July, 1932.

"Shan Hai Kuan," by Major E. W. N. Wade, M. C., the East Yorkshire Regiment.

"Shan Hai Kuan", the author writes, "is the seaside resort to which the Tientsin garrison moves for the summer." The name of that delightful place literally means "between mountains and sea." Situated at the extreme eastern corner of Chih-Li, four miles from the Manchurian frontier, it stands on the Peking-Mukden railway. Shan Hai Kuan is a walled city with its eastern face forming part of the Great Wall of China. Strategically, Shan Hai Kuan blocks the Mandarin road and the railway from Peking and Tientsin to Mukden. Tactically, the walls and the series of ridges lying astride the main line of communications, form an exceptionally strong zone of

defense against an enemy advancing either from east or west. The main mountain range, which more or less parallels the road and the railway, assists materially in the defense of the plain. With one flank resting on the sea, and the other secured in the mountains, the Shan Hai Kuan position is the key to the defense of the bottle-neck entrance to Manchuria against any attack from the west along the railway.

The British garrison of Tientsin utilizes this interesting terrain for its field training. The British camp is situated in close proximity of the city and includes the old Chinese Fort No. 1. Italian, French and Japanese troops occupy similar Chinese forts along the western side of the wall.



"The Next War Medal," by B. Arless.

The post-war fashion of multiplication or decorations arouses the author's ire. He notes, "a man may wear a brave array starting with a couple of decorations, and running through four or five war medals, via the coronation medal, to the Ruritanian Order of St. Bibulous with Palms without ever having braved any danger." This situation, he writes, induced a Commandant of the Staff College to propose that all young officers (on receiving their first commission) be given about half a dozen artistic medals, and that for every four or five years of satisfactory behavior they should be permitted to discard one until "with high rank they would attain the quiet dignity of unadorned chests." The author is not, however, opposed to medals altogether. He merely advocates a return to the old ideals in this respect, that a medal is and should be an acknowledgment of danger encountered or risk accepted. The author believes that the World War practice of giving a medal to everyone who happened

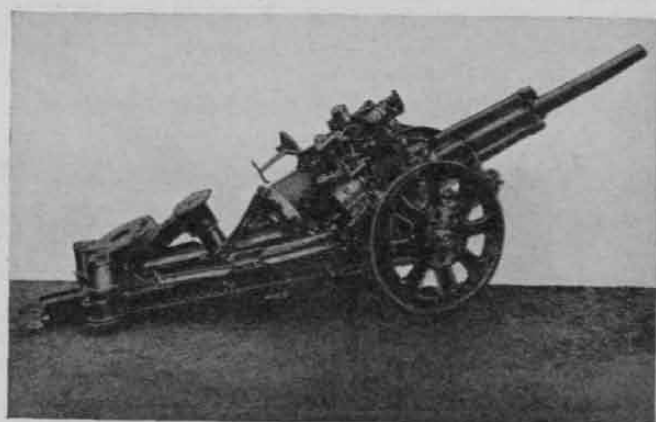


Fig. 1

to be in a theatre of war, should be discontinued. He believes, that the value of a medal as a morale raiser would be enhanced if it really meant something to the wearer and to those who saw him wear it.

PORTUGAL—*Revista de Artilharia*—September, 1942. "Antiaircraft Materiel," by Lieutenant Campos Andrada.

The author describes three anti-aircraft weapons produced by the Swedish firm "Bofors". The first of these is a tractor-drawn anti-aircraft gun, calibre 75 mm (Fig 1 and 2) and two anti-aircraft machine guns of 40 mm (Fig 3) and 25 mm calibre, respectively.

The 75 mm gun fires a projectile weighing 6.5 kg. The weight of shell, cartridge case and powder charge complete is 10.3 kg. The initial velocity of this ammunition is 750 m/sec. The maximum vertical range is 9,400 meters, and the maximum horizontal range about 14,500 meters. Total weight of gun and limber in route order is 3,500 kg. The gun can fire 25 rounds per minute. Drawn by tractor, the gun can travel at a rate of 25 km per hour. Two minutes are required to put the gun from route order into battery and vice versa.

The cal. 40 mm machine gun can fire 100 rounds per minute with an initial velocity of 900 m/sec. The cal. 25 mm machine gun fires 150 rounds per minute,

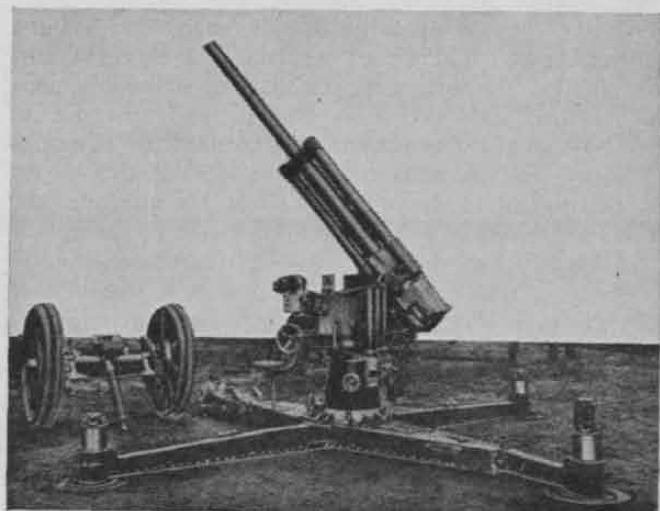


Fig. 2



Fig. 3

and has an initial muzzle velocity identical with that of the larger model. Weight of the 40 mm cartridge complete is 2.035 kg, while the cal. 25 mm ammunition weighs 0.65 kg. The maximum range of the former is 5000 meters, of the latter 3000 meters. The vertical field of fire extends from -15° to $+85^{\circ}$ and -10° to $+85^{\circ}$, respectively. Both guns have an all-around horizontal field of fire.

SPAIN—*Revista de Estudios Militares*—May, 1932.

"German and French Infantry," by Lieutenant Colonel Juan Beigbeder, G. S.

The author, who had the opportunity of serving both with French and the German armies, presents an interesting comparison of the infantry arms of these, pointing out the essential differences in organization and tactical employment of the basic tactical units. The French Infantry platoon, the author states, normally consists of three squads, each with a light machine gun. The squad consists of a sergeant and eleven men. Its tactics are simple. The squad advances its machine gun as far as possible and sustains its fire without interruption. In order to triumph, infantry must push its weapons as close to the enemy as possible in order to bring about his annihilation. The light machine gun is the vital factor of the squad. The whole squad depends upon it; therefore, it must be kept in action as long as there is a single man left to operate it. For this reason losses among ammunition carriers are replaced from among the riflemen. Surplus personnel is, for the same reason, used to carry ammunition rather than to reinforce or to make up casualties among riflemen. Only five members of the squad are armed with the rifle, one of these being equipped for rifle-grenades. This, however, does not make of them individual cogs in the fighting

machine. On the contrary, their sole mission is to protect the machine gun, and they employ rifle fire only when the machine gun goes out of action. French regulations deny initiative to riflemen. They are not even trained for individual combat. The stereotyped organization and absolute prohibition of manoeuvre with any part of the squad vastly simplify the squad leader's mission. The French lieutenant has only three subordinates to deal with. Since he invariably will be near one of his squads, he will in reality have to give his orders to the other two only. This simplicity of organization enables the platoon leader to keep his command well in hand, to control its action and to direct its fire. All in all, the French platoon is led today more or less as it was in 1914.

In marked contrast, the Germans have created a combat unit that is well adapted to the different forms of modern action. Their regulations prescribe but few rules of execution. The German platoon contains a varying number of squads; 2 or 3 rifle squads and 2 or 3 light machine gun squads. The idea, that the attack consists of two factors, fire and movement, brought about a complete separation of fire power and shock action. The two factors are represented in the German organization by different squads:

1. The light machine gun squad consisting of a gunner and ammunition carriers, two riflemen, one equipped with telescopic sights; total strength: 1 N. C. O. and 7 men.

2. The rifle squad consisting of 1 N. C. O. and 7 men all armed with the rifle.

These two squads compose the German combat team. According to the German point of view, the object of fire is to permit the attacker to close in with the enemy and to enable him to secure the decision in a hand-to-hand fight. This requires the development of an intensely aggressive spirit and initiative in every soldier, hence it imposes the necessity of careful selection of personnel, exaltation of individual combat, and above all thorough training. While the French insist upon uninterrupted fire action, the Germans seek to preserve intact the striking power of their combat team. For this reason, whenever the platoon consists of less than four squads, the two riflemen are taken from the machine gun squads and used to reinforce the rifle squads.

The Germans do not centralize the command of the platoon as do the French. On the contrary, they allow a great deal of freedom of action to the squad leaders. The Germans, in marked contrast to French practice, attach great importance to manoeuvre. The squad leaders must solve their own tactical problems and carry out their respective missions in mutual cooperation. In keeping with this concept, special situations permit the formation of special "combat groups", small columns consisting of rifle squad, light machine gun squad and attached heavy infantry weapons. As soon as the special mission is accomplished, this "combat group" dissolves and its elements revert to their normal status and function. Thus, in reality, the author writes, the German companies and platoon are essentially administrative and not tactical units.

Their elasticity permits ready regrouping as the constantly varying situation may demand.

The author notes the following objections to the German plan:

1. Difficulty of control in platoons of five or six squads. This, the author holds, requires exceptional leadership on the part of the platoon commander.

2. It requires exceptionally fine, well trained squad leaders. Without such the German regulations cannot be applied.

3. Creation of temporary "combat groups" for special missions, and leaving complete freedom of action and initiative to its leaders, in the author's opinion, is the weakest point of the German system, or rather its most difficult aspect. Without selected troops, squad leaders, and exceptional junior officers, the author thinks, it will surely invite defeat. In his opinion, it is wholly inconceivable of application in the case of raw levies suddenly called to the colors for active service receiving but a rudimentary training.

The author believes, that the French plan is based upon a simple and clear concept. It facilitates training under all circumstances, and this is of paramount importance when only a limited time is available to prepare recruits for field service.

—July 1932.

"The Soviet Army", by Major Jose Ungria, G. S.

The "Red Army" came into existence by decree of the Soviet authorities issued on January 28, 1918. At first based upon the principle of voluntary service, the results proved so far from satisfactory, that the system of universal and compulsory service was reintroduced in Russia two months later. Soviet authorities justify this reversion to the former system, which is diametrically opposed to the pre-revolutionary creed and propaganda of the communists, on the ground of necessary defense of the proletarian institutions against counter-revolution. After the elimination of counter-revolutionary activities, the Red Army, which at first numbered four million men, was gradually reduced to 562,000 effectives. This is the actual strength of the Soviet Army today according to figures submitted to the Disarmament Conference through the League of Nations. Since these figures do not include territorial militia, specialist organizations, training cadres or reserves, it is estimated that the number of Soviet citizens actually under arms is not less than one million.

The Soviet military system is a combination of a standing army and territorial militia. The latter consists of two categories: permanent units consisting of instructors and nuclei of specialists, and mobile units assembled only for periods of instruction.

The annual contingent of recruits numbers about 1,200,000 of whom 260,000 are allotted to the standing army: 200,000 go to the territorial militia, 3 to 400,000 are rejected for various causes of disability, while the remainder receive military instruction outside of the ranks. Service becomes obligatory at the age of 21, and covers a period of two to three years. Pre-military training is obligatory between 19 and

21. The completion of a nine months' course of pre-military training is required of those who desire to become subaltern commanders in the Soviet Army.

Special formations include the Frontier Guards, about 28,150 men; the G. P. U. or political police of about 17,240 men, and Prison Guards of about 13,200 men. The Soviet Air Force had at the end of 1931 a total of 2000 airplanes with an expected increment of 1000 planes of all types for 1932.

The general organization, command, and administration of the Soviet Army conform largely to that of other armies. The peculiarity of the situation, in the author's opinion, rests in the fact that while Soviet propaganda the world over is directed against the principle of universal and obligatory military service, there is no indication whatever that the Soviet authorities contemplate modification, far less abandonment, of that system within the U. S. S. R. On the contrary, the active training period in Soviet Russia actually exceeds that of Italy, Turkey, Yugoslavia and Czechoslovakia, being actually the double of that in France, Belgium and Spain. While the Swiss militiamen are released from their military obligation at the age of 48, having completed a total of seven months of active training, the Soviet militiamen, though released at 40, must actually complete 13 months of active training.

Training, though it conforms to the practice of other armies, is actually far more intensive. From May to October all active divisions undergo a strenuous program of field training. Gas masks are frequently used in connection with these exercises and marches. Large scale manoeuvres were held in 1931 in the vicinity of Moscow, Leningrad, Minsk and Baku with the participation of about 100,000 troops. During the same year extensive motorization has been effected. Training continues with undiminished intensity throughout the winter at the regular home stations of units. Combat exercises and marches involving the use of skis receive particular attention at this time. Instruction is suspended only while the temperature registers 30 degrees below zero.

General Military Information

RUSSIA—*Krasnaya Svezda (Red Star)*, the organ of the Soviet Army (No. 141) calls attention to the interesting fact, that the five Succession States of the former Austro-Hungarian Monarchy (Austria, Hungary, Roumania, Yugoslavia and Czechoslovakia) actually spend 60% more on national defense than did the old dual empire. The total active military establishment of these countries amounts to 628,000 effectives compared to 400,000 in the Monarchy. The present budget of these countries amounts to 50 million pounds sterling as compared to 15 million spent by Austria-Hungary. The total population of the Monarchy was 55 million compared to 60 million of the Succession States. In addition, the article points out that Poland has a military establishment of 256,000 men. Bulgaria, Greece and Albania spend annually about 8 million pounds sterling for national defense. (*Militar-Wochenblatt*, August 25, 1932)

NATIONAL GUARD NOTES

Cost of the National Guard

THE tabulation which accompanies this paragraph shows the cost of the National Guard, both to the Federal Government and the States of the Union during the fiscal year which ended on June 30, 1932.

Including the \$2,000,000 derived by organizations from the rental of armories and funds received from other private sources, the total cost is \$49,733,567.07. This sum divided by the population of the United States, which is approximately 124,000,000 shows that the per capita cost of the National Guard is only about 40 cents. In other words it costs the people of this country only 40 cents each to maintain this component of the national defense consisting of 190,000 officers and enlisted men. Allowing an average five persons

per family, the national insurance costs afforded by the National Guard is only \$2.00 per year for each family.

The tabulation contains some interesting information and if comparisons are indulged in one may find them here which indicate the extent of the support derived from the several states. The Federal funds are distributed on an equitable basis but those states which have organizations with high maintenance cost naturally require more funds and as a consequence, the per capita cost of the National Guardsman is higher than in those States which have a preponderance of low cost maintenance organizations and units.

The tabulation was prepared in the Militia Bureau and contains the latest and best information available on the subject.

Federal and State Appropriations for the Support of the National Guard, Fiscal Year, 1932

State	Enlisted Strength of National Guard, June 30, 1932, (including W.O's)	Amount of Federal aid apportioned	State Appropriations	Appropriated by Federal and State Governments	Amount per capita per National Guardsman		Total Amount per capita per National Guardsman
					Federal	State	
Alabama	2566	\$ 608,971.72	\$ 79,988.10	\$ 688,909.82	\$ 234.67	\$ 30.80	\$ 265.48
Arizona	1190	173,869.94	71,770.00	245,639.94	145.70	60.31	206.00
Arkansas	2078	456,530.04	86,860.00	543,390.04	219.70	41.80	261.50
California	6086	1,127,499.01	538,433.60	1,665,932.61	185.29	88.49	273.78
Colorado	1771	358,464.99	101,592.03	459,057.02	199.58	57.36	256.94
Connecticut	4067	731,456.14	506,937.16	1,240,393.30	178.97	124.53	303.50
Delaware	901	122,455.98	44,650.00	167,105.98	162.36	55.74	218.10
District of Columbia	964	149,154.88	61,100.00	210,254.88	151.53	62.09	213.67
Florida	2339	438,397.12	115,029.60	553,426.72	206.66	49.18	255.85
Georgia	3512	586,410.25	37,000.00	623,410.25	166.97	10.54	177.51
Hawaii	1619	210,865.70	41,619.14	252,484.84	130.24	25.71	155.95
Idaho	1196	286,734.31	25,182.50	310,916.81	238.51	20.98	259.49
Illinois	8905	1,525,763.99	1,073,983.00	2,599,701.99	171.34	120.60	291.94
Indiana	4546	888,163.36	349,500.00	1,237,663.36	190.97	76.88	267.85
Iowa	3517	603,240.07	218,492.86	821,732.93	171.52	62.12	233.65
Kansas	3031	664,716.41	178,706.68	843,423.09	216.01	58.96	274.97
Kentucky	2739	476,607.72	172,157.38	648,765.10	174.01	62.86	236.86
Louisiana	1903	357,234.94	69,320.00	426,554.94	187.72	36.43	224.15
Maine	2313	414,437.90	197,917.54	612,355.44	179.18	85.37	264.74
Maryland	3216	580,514.59	221,000.00	801,514.59	180.51	68.71	249.23
Massachusetts	9065	1,594,318.59	774,982.00	2,369,300.59	176.13	85.56	261.71
Michigan	4287	845,232.27	249,033.17	1,094,265.44	196.56	58.50	255.06
Minnesota	4735	893,531.20	662,931.09	1,556,462.29	188.71	140.00	328.71
Mississippi	1652	285,815.26	37,900.00	323,715.26	173.01	22.70	195.71
Missouri	4313	789,488.00	117,049.21	906,537.21	188.06	27.14	215.20
Montana	1133	175,042.97	23,124.29	203,167.26	154.50	24.82	179.32
Nebraska	1663	252,127.20	78,046.23	330,173.43	151.61	43.62	195.50
Nevada	152	21,121.64	1,700.00	22,821.64	133.96	11.18	145.14
New Hampshire	1009	175,035.44	123,373.30	308,408.74	173.47	127.23	300.70
New Jersey	4677	881,080.14	679,004.35	1,560,084.49	183.88	145.18	329.06
New Mexico	961	234,777.01	108,755.00	343,532.01	244.80	113.17	357.97
New York	19061	3,663,689.73	3,473,652.89	7,137,342.62	133.63	174.10	307.74
North Carolina	3236	596,879.51	78,456.78	675,336.29	185.02	24.32	209.34
North Dakota	1120	155,935.96	36,867.97	192,803.93	139.23	33.92	173.15
Ohio	8182	1,435,759.24	451,022.90	1,886,782.14	182.03	55.28	237.29
Oklahoma	4944	960,619.55	196,050.04	1,156,669.59	196.35	39.05	235.40
Oregon	2870	513,768.61	116,471.68	630,240.29	179.01	40.56	219.56
Pennsylvania	11347	2,275,301.91	*1,690,000.89	3,965,302.80	200.52	148.94	349.46
Puerto Rico	1430	191,180.71	40,903.71	232,084.42	133.69	23.63	157.32
Rhode Island	1335	371,973.23	137,962.63	509,935.86	202.71	75.18	277.89
South Carolina	2076	361,332.25	49,195.65	410,527.90	174.06	23.70	197.77
South Dakota	1262	254,543.46	24,400.00	278,943.46	201.70	19.88	221.04
Tennessee	2394	540,147.88	132,000.00	672,147.88	225.63	55.14	280.76
Texas	7779	1,587,481.37	376,670.00	1,964,151.37	204.07	48.42	252.49
Utah	1820	523,011.66	57,886.01	580,897.67	396.49	43.85	440.34
Vermont	1145	162,736.50	64,304.00	227,040.50	142.17	56.16	198.33
Virginia	3717	655,397.04	123,541.07	778,938.11	176.33	33.24	209.56
Washington	2493	593,390.03	165,221.43	758,611.46	225.99	66.27	292.26
West Virginia	1870	243,120.32	97,851.47	340,971.79	182.63	52.32	234.95
Wisconsin	4477	863,546.98	230,000.00	1,093,546.98	192.39	51.37	243.76
Wyoming	608	149,939.39	71,800.00	221,739.39	246.61	113.09	359.70
Totals	176,062	\$33,065,369.70	\$14,667,697.37	\$47,733,567.07	(2)	(3)	(4)

No information furnished; estimated. Distribution among items estimated by Militia Bureau.

(1) Does not include approximately \$2,000,000 derived by organizations from rental of armories and other private sources.

(2) Average per capita from Federal appropriations based on enlisted strength as of June 30, 1932, —\$187.51.

(3) Average per capita from State appropriations, —\$33.31.

(4) Average per capita from Federal and State appropriations, —\$271.12.

Curtailment of Training

THERE are those who contend that the curtailment of training in the National Guard would have no detrimental effect on that component of the Army. In this connection it is well to note the experience of the British Territorial Army over the past year.

In order to help balance their budget, the British authorities dispensed with the normal program of military field training last summer. In isolated cases organizations managed to have a part of their training which was made possible by funds supplied by public-spirited citizens.

During the year the territorial army lost more than 12,000 men. It is now more than 50,000 below authorized strength and interest has lagged to the extent that it is estimated that with the omission of another field training period, the establishment will suffer a further reduction of 15,000 men.

America may expect to face just such a situation. If the training of the civilian components is curtailed to the extent contemplated by the budget as it came from the Bureau of the Budget, we may expect to see interest lag in exact proportion to the curtailment.



The Trench Mortar section of the Howitzer Company, 105th Infantry, New York National Guard at Target Practice at Camp Smith, N. Y.

Medical Treatment

IN the course of his address at the Convention of the National Guard Association at Norfolk, Major General George E. Leach, Chief of the Militia Bureau, discussed the matter of the medical treatment of the National Guard for injuries or sickness incurred during the field training period. He said:

In looking back over the files of the Bureau, I find that when these regulations were promulgated in 1929, an officer of the Bureau said—"In time this will sink the Guard." Well it looks to me that the time has arrived and so rapidly that the situation must have immediate attention.

I think it sufficient to capture the interest of this convention to state that in 1929 it was \$50,000 and in 1932 \$70,000, with practically the same number of personnel, a gain in four years of \$20,000. Let the Veterans' Bureau be a lesson to you.

The expenditures for this purpose vary widely. In some of the states the per capita cost runs more than

one dollar, while in others it is less than twenty-five cents. It has been found that "not in line of duty, not due to own misconduct" cases account for much of the expenditures in those states where the per capita cost is high. These cases include piles, hernia, appendicitis, old dislocations, chronic ear troubles, etc. Men afflicted with them are taken to camp and early in the period report for medical treatment. They get into hospitals where they run up bills that are out of all reason.

In those states which have kept the costs down to the lower brackets, the state authorities have adopted the plan of having every member of the organization physically examined immediately on arrival at camp. All old chronic cases and complaints which are likely to develop during the period of the camp are forthwith sent back home and steps taken to eliminate them from the National Guard. This process has solved many problems.

In other camps handling of trivial cases by medical officers account for much of the high costs. These include bruises, sprains, contusions and minor accidents which would ordinarily be treated in quarters. They are sent out to nearby civil hospitals where excessive bills for laboratory and x-ray examinations are made and where drugs, dressings and hospital charges are piled up.

This is a problem that the National Guard will have to solve and it is incumbent on every organization and unit commander to do his part.

Pistol Accidents

A LARGE percentage of the accidents with the automatic pistol in the hands of the National Guard are due to the failure of the bullet to leave the barrel of the weapon, due to a too light or an improperly ignited charge, followed by the firing of another cartridge.

In all instances of failures of the pistol to fire or to reload automatically, and in the case of registered miss on the target, the pistol should be examined to insure that the bullet from the preceding round is not stuck in the barrel.

In the case of obstruction in the barrel an attempt to reload and fire the pistol without examination will cause the barrel to bulge and split and may cause possible injury to the firer.

Reduction of Sergeant-Instructors on Duty with the National Guard

IN his talk before the National Guard Convention at Norfolk, Virginia, General Leach, Chief of the Militia Bureau, discussed the matter of sergeant-instructors on duty with the National Guard as follows:

Under Item No. 29 of the Militia Bureau Budget there is set up for the expenses of sergeant-instructors \$480,000.00. As a result of conferences this summer the Bureau took \$10,000.00 from this amount and set out upon a plan whereby there would be no replace-

ments among these sergeant-instructors until they had been reduced to one per regiment or separate unit.

There are 505 sergeant-instructors at present, and this would reduce them in the course of time to about one-half, at a saving of \$240,000.00. It is not thought desirable with the limited time now to go into a lengthy discussion of this situation. There is no question as to their value. When the Guard was being reorganized under the National Defense Act, they were absolutely indispensable. Since that time many members of the Guard have had the privilege of going through the various service schools and correspondence courses; many valuable instructors have been provided in the Guard's own ranks. If this was the proper number of regular sergeant-instructors in the beginning, and you are out of your swaddling clothes, as everyone is convinced you are, then a start should be made in reducing this very considerable proportion of our entire budget. It is not so much a question as to whether they are of great value or not. The question is—is it a justifiable expenditure of our limited means?

The Militia Bureau asked the War Department not to assign or fill any vacancies among the sergeant-instructors through retirements or other casualties, until they had reached the number of one per regiment or separate unit. This request has been returned to the Bureau with the statement that in view of the fact that the War Department has just adopted the policy of allocating all of the D.E.M.L. men to the Corps Area in one lump group that they did not desire to make any changes or to specify to the Corps Area Commander how he should use these D.E.M.L. men. This therefore is the situation at present with regards to any definite solution, but unless there is serious objection on the part of the convention, the Bureau will continue to reduce the money set up for the payment of these men with a hope that in the end the Bureau will be able to control the number of sergeant-instructors whom they think it desirable or able to pay.

The Bureau hopes that the convention will give this matter its careful consideration and that a definite policy with regard to this item of instruction can be worked out.

May I inject one personal thought which is uppermost in my mind. Would it be of greater advantage to the National Guard to take this saving of a quarter of a million and apply it to schools where a greater number of our own ranks could attend, or to continue paying it to the sergeant-instructors?

The matter was the subject of extended discussion on the floor of the convention, and at the sessions of the Resolutions Committee, which body framed a resolution which was adopted by the Association as follows:

RESOLUTION No. 6.

BE IT RESOLVED by the National Guard Association of the United States in Convention assembled in the City of Norfolk, Va., on October 21, 1932, that

it recommend to the Chief of the Militia Bureau the adoption of a policy whereby the number of sergeant-instructors now on duty with the National Guard be reduced over a period of years until the allotment shall consist of one (1) sergeant-instructor per regiment or separate organization.

PROVIDED, That nothing in this policy shall operate to bar promotions of sergeant-instructors of the 1st, 2nd and 3rd grades now on duty with the National Guard, and that all vacancies occurring in accordance with this policy shall occur in the 4th grade.

It will be noted that this reduction in the number of sergeant-instructors with the National Guard is to be worked out over a period of years and in such way that it will not be a hardship on those deserving men who are now on duty with the National Guard. The reduction will be effected in grade four by the process of simply not taking on additional men to fill vacancies due to retirements and other natural casualties in the D.E.M.L. personnel on duty with the National Guard.

Distribution of Documents

DUE to the reduction in funds available to the Militia Bureau for printing and binding, it has been necessary to curtail the distribution of official publications during the remainder of the fiscal year.

The distribution of training publications will be limited to one copy for each officer and one for each unit for the arm or service concerned. Replacement of publications now in print will have to be limited to the stocks now on hand in the Militia Bureau. It will not be practicable to publish another edition of any manual. It is therefore necessary for individuals and organizations to take care of what they now have on hand.

The distribution of the Army Regulations pamphlets will be reduced in the case of the State Staff from 10 to 5 copies; The Division Headquarters, from 25 to 10 copies; and brigade headquarters from 5 to 2 copies. Except for those directly affecting the National Guard, the distribution of War Department General Orders is to be discontinued entirely.

The issue of the Army List and Directory to the National Guard must be discontinued and from now on none of these documents will be sent out, as heretofore. Those who desire a copy of this publication can get it from the Superintendent of Documents, Government Printing Office, Washington, D. C. The cost of same is \$1.50 per year by subscription, or 40 cents per separate copy. Federal funds cannot be spent for the purpose of this subscription or purchase.

All of these measures have been made necessary due to the limitations placed upon all of the departments of the Government by the Economy Act, which provided that the public printer can produce only so many dollar's worth of printed material during the fiscal year.

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.

COLONEL J. C. OHNSTAD, C.A.C.
MAJOR J. D. MCCAIN, C.A.C.
CAPTAIN J. T. LEWIS, C.A.C.

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

Projects Completed During November-December, 1932

No. 814. Illuminating Device for 12-inch Barbette Carriage, M1917.—An Experimental lighting system for 12-inch barbette carriage had been installed at Fort Hancock, New Jersey, but did not prove satisfactory. The Coast Artillery Board recommended that a new lighting system be designed for test. The Board recommends that an experimental lighting system be tested, consisting of a small shielded light supported from the non-recoiling parts of the carriage, at a point above and to the rear of the breech of the gun in the loading position. The light should be supported through a ball and socket joint which will permit its being directed as desired. A clamp should be provided to hold it in any given position. The shield for the light should be opaque, and should be small and cylindrical in shape to prevent material spreading of the beam. It is estimated that about an 8 c. p. globe will furnish sufficient illumination. It is probable that a blue globe will afford a light least visible from the air.

No. 871. Azimuth Pointer for 12-inch Barbette Carriage, M1917.—An azimuth pointer was installed on the upper working platform of the 12-inch barbette carriage. It was on the outer edge of the working platform on a radial line making an angle of thirty degrees measured counter-clockwise from the axis of the gun at the muzzle. This location was recommended as the most suitable position for this pointer.

No. 901. Modified Shot Truck and Guide for 12-inch Barbette Carriages, M1917.—The shape of the center slot of the shot truck guides of the 12-inch barbette carriage at Fort Hancock was changed and a slight modification made on the shot truck. The modifications were tested and as a result the Coast Artillery Board recommended that (a) no effort be made to modify additional shot truck guides now in the hands of the using service; (b) instructions be issued that all unmodified shot truck guides be removed and stored; (c) that the matter of whether the modified shot truck guides at Fort Hancock are used or not, be left to the choice of the battery commander; (d) the Chief of Ordnance be requested to investigate the mechanical

feasibility of incorporating, as a part of the shot truck, a projectile stop which will prevent the premature forward motion of the projectile along the tray of the truck. Provision should be made to release the stop as the truck buffer strikes the face of the breech.

No. 915. Test of NH Power Charges (D. P. Lot X-3701) for 12-inch Mortar M1890-08.—Twenty-four rounds of powder charges were fired by a battery of railway mortars at Fort Monroe, Virginia, in the current target practice season. N. H. powder was used. The test was too limited to permit the drawing of definite conclusions and it was accordingly recommended that a more extensive service test be made of this type of powder for 12-inch railway mortars.

No. 920. Test of Fire Control Tower for Tractor Drawn Artillery.—The tower formerly adopted as standard for railway artillery was tested to determine its value for use with tractor drawn artillery. The Coast Artillery Board recommended that this tower not be adopted as standard, but that a new tower be designed for use with tractor drawn artillery. (This recommendation for the design of a new tower was disapproved by the Chief of Coast Artillery.)

No. 932. Diaphragm Gas Masks E3R111-IV-III.—These masks were equipped with universal facepieces and were tested at Fort Monroe, Virginia, during November. It was recommended that the principle of universal facepieces for the diaphragm gas mask be adopted; with diaphragm assembly modified to provide a more leak-proof joint with the canister hose, the diaphragm mask E3R111-IV-III be adopted as standard for replacement of the present standard diaphragm gas mask with facepiece M1A1.

No. 934. Test of .50 Caliber Machine Gun Equipment.—Numerous accessories for caliber .50 machine guns were tested at Fort Monroe, Virginia, during the month of November. As a result of this test it was recommended that (a) the new cooling system be adopted as standard and placed on all new guns to be manufactured; (b) the new flash hider be adopted as standard and issued to the service; (c) new guns to be manufactured be equipped with brackets on both the right and left sides so that the shoulder stock may be placed on the side the gunner prefers; (d) new guns

equipped with new accessories be balanced so that the muzzle preponderance does not exceed five pounds; (e) authority be given local Ordnance Officers to install new equipment, when received, on guns now in service; (f) guns now in service not be shipped great distances for modification; (g) an effort be made to obtain a better charging device than the charging slide T-5; (h) pending the development of a better device, the charging slide T-5 be used on caliber .50 guns (i) the 50 cm Bausch and Lomb Range Finder not be accepted as a suitable machine gun range finder; (j) instructions be given the service to mark bullets with printer's ink when the target cannot be dropped after each course in target practice; (k) the method of fire adjustment by observing the intersection of two streams of tracers be further investigated; (l) the cover catches be adopted as standard and installed on all guns in service and all new guns to be supplied; (m) the anti-aircraft machine gun mount and all other types, such as multiple mounts, be considered only as special devices of limited use; (n) the individual mount for machine guns be redesigned to produce a mount that shall have the characteristics given in the report on this test; (o) the development of a small detachable two-wheeled chassis for individual machine gun mounts be undertaken; and (p) the development of the individual machine gun mount be given first priority in machine gun projects.

No. 936. Test of Binocular Comparator-Controller (Searchlights).—A new type of Binocular Comparator-Controller, which contained an oscillating device and upon which was mounted a night glass, was tested at Fort Humphreys, Virginia. As a result of this test the Coast Artillery Board recommended that (a) the feature permitting separate oscillation in azimuth and elevation be eliminated; (b) the gear ratio of the oscillating handwheel be increased; (c) an effort be made to oscillate only the night glass and its supporting column rather than the whole comparator; (d) the check back between searchlight and comparator be eliminated in future models; (e) the rotary converter be made portable; (f) all comparators to be issued be equipped with night glasses; (g) the Binocular Comparator-Controller be standardized and issued to the service with the searchlights to be supplied during the current fiscal year; and (h) the commanding officers to whom the new Binocular Comparator-Controller is issued be required to submit a report of the functioning of the materiel.

No. 940. Revision of Training Regulations 435-55.—The Coast Artillery Board completed a draft of a proposed revision of TR 435-55. A new method of determining deviations in seacoast practices was included in this revision. The section dealing with anti-aircraft guns was completely rewritten, a new method

of computing hits was incorporated and the forms for and method for analyzing practices completely changed. There were some other changes of a minor nature. The publication of the revised regulation awaits the action of the Chief of Coast Artillery. The short time available may make such publication impossible before the next target practice year.

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—report in preparation.

No. 874. Service Test of Seacoast Data Computer T-3.—Test completed—report in preparation.

No. 886. Comparative Test of AA Directors (T-8; M-2; and M1A1, uncoupled).—Reports from Aberdeen Proving Ground received and under study.

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 (CAB).—Under test.

No. 929. Experimental Field Chornograph (Jackson).—Awaiting monthly progress report from Capt. Jackson.

No. 931. Test of Roller Bearing, 3-inch Antiaircraft Gun Truck Mount T1.—To complete the tests as scheduled it is necessary to fire at least 50 more rounds from this gun. The first firing that will occur, as far as is known, is the firing by the Battery Officers' Class, C.A. School, on April 17, 1933.

No. 936. Test of Firing Dynamo T1.—Report in preparation.

No. 937. Test of Submarine Mine Equipment.—Under test. See attached report from Commanding Officer, Submarine Mine Depot.

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. Awaiting receipt of reports.

No. 942. Test Firings of Antiaircraft Director T-8.—Tests completed—report in preparation.

No. 943. Service Test of Reel Unit, Type RL-26-T1.—Wire and reels received—awaiting receipt of remainder of equipment.

No. 944. Water-Proofing of Battery DeRussy, Fort Monroe, Virginia (CAB).—Under study.

PROFESSIONAL NOTES

An Antiaircraft Plotting Board

*Designed and built by the 198th Coast Artillery (AA)
(Del. N. G.)*

THE plotting board consists of a table 36" x 48", made of well seasoned soft white pine. The legs are hinged so that by removing a longitudinal brace the table may be folded for traveling. A heavy felt-lined canvas cover is provided to protect the board when traveling.

The base line is set flush with the surface of the table, the protractors rest on the surface of the table, and arms "A" and "B" are bent so that they rest on the surface of the table.

The O_2 protractor or azimuth scale is moveable, being maintained in correct relation to the base line by means of two slides N-N, and the clamping screws M-M, only the screw at "F" need be clamped to fix the scale to the base line. An index and reading

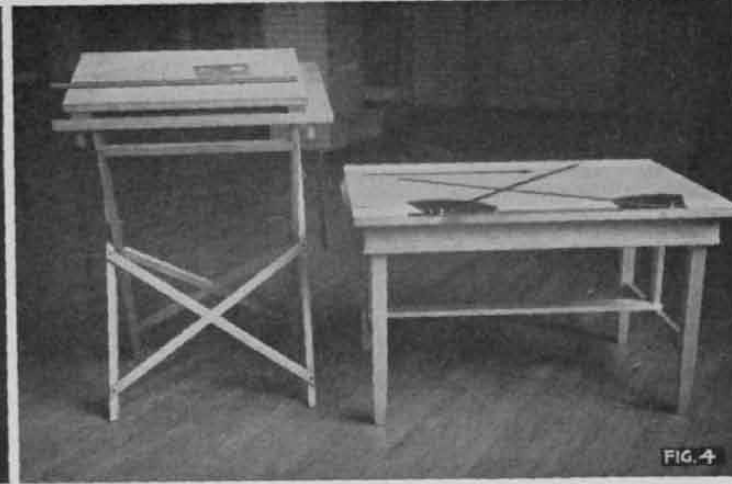
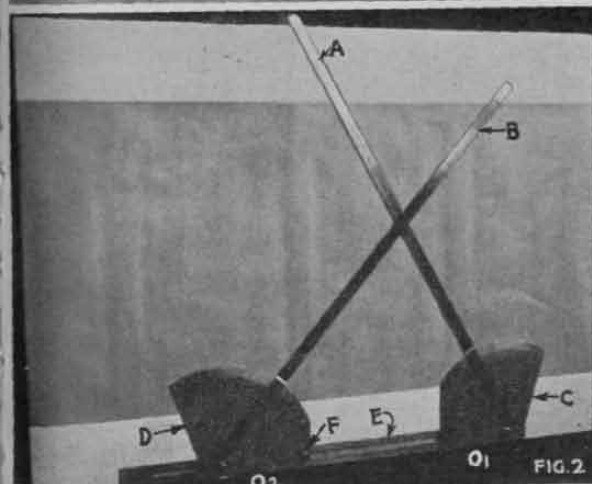
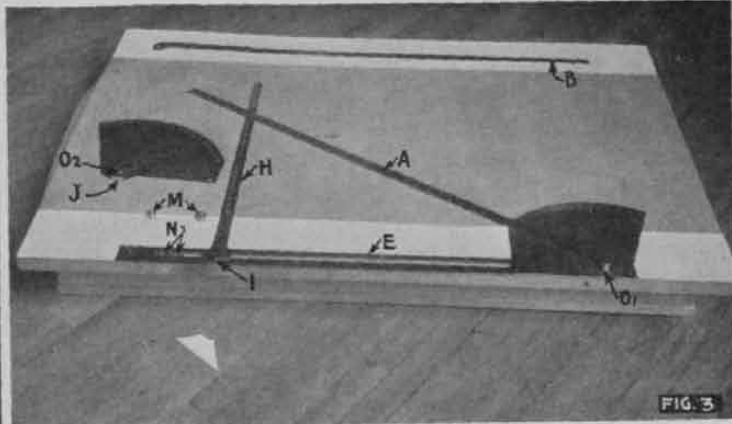


Fig. 1. General view of board. Fig. 2. Board set up for horizontal plot of course. Fig. 3. Board with legs folded, set up for determining horizontal or slant ranges. Fig. 4. View of complete plotting equipment.

The board consists of:

- (1) A slotted base line "E" graduated from right to left, from 1400 to 6000 yards with a least reading of 20 yards: scale 200 yards to the inch.
- (2) Two protractors or azimuth circles O_1 and O_2 graduated clockwise in mils, least reading 10 mils.
- (3) Two arms "A" and "B" graduated in yards to the same scale as the base line from 2000 to 8000 yards.
- (4) An auxiliary or altitude arm "H" graduated to same scale as base line.

window for setting off the length of the base line is provided at "J".

The O_1 protractor is fixed and is graduated so that the direction O_1-O_2 is zero. This requires that observing instruments or cameras be oriented so that the reading O_1-O_2 is zero or that true azimuth be corrected to make this reading zero. The advantage claimed for this method is that O_1 protractor may be used for setting angular heights without change.

The auxiliary or altitude arm "H" slides in the slot in the base line and is at right angles to it. An

index is provided at "I" so that horizontal ranges may be set or read from the scale on the base line.

Protractors and base line are made of polished stainless steel, while arms are of polished monel metal. All scales stand out sharply and clearly, making the task of reading very easy.

The use of the altitude arm "H" obviates the necessity for an altitude and horizontal range quadrillage which was read with difficulty; and does not require the removal of the paper on which horizontal plot is made in order to convert horizontal to slant ranges. It is not necessary to remove the O_2 protractor from the board in order to read horizontal ranges as it can be moved to right or left a sufficient distance to make the entire length of the base line available.

The description of the board has been given for a left hand base line. The board is of course equally adapted to use with a right hand base line, in which case the azimuth O_2-O_1 must be made equal to 3,200 mils.

While this board does not contain any notable or novel features, it is believed that it represents a forward step in construction and that a board of this type might be manufactured for issue to the service. The size of the board, length of scales, etc., is believed to be suitable for almost any condition which might be encountered in service.

Full credit for the construction of this board with the working out of the practical design must be given to Captain James L. Whaley, 198th Coast Artillery (A.A.) (Delaware National Guard). The workmanship is of a very high order and the board is of a far greater degree of accuracy than that of even a well trained visual spotting section.

To complete the plotting equipment a "Nelson Board" was constructed. The use of this modern equipment made possible for the first time the actual analysis of the target practices by officers of the Delaware National Guard.

Suggestions for Training for Searchlight Target Practices (AA Searchlights) Using Sound Locators M-1

By First Lieutenant J. L. Goff, 69th C.A. (AA)

AFTER a consideration of the "Proposed Scoring Formulae for Searchlight Practices" we may note that the following features are desirable and essential to attain a good score; and are suggested as necessary steps to conduct good searchlight target practices.

(They are listed in the order of their performance in the field and not in order of their mathematical importance in the scoring formulae.)

First, arrange for the type of plane, if possible, that can give high speed and heavy bombardment maneuvering. The penalty imposed in the score for using multi-motored ships is not great. Make the pilot

thoroughly familiar with what you wish to have as minimum altitude, and for as high a plane speed as it is practicable to attain. Designate to the pilot well defined and logical point as the objective (with prominent night lighting). Altitude should be at least nine thousand feet.

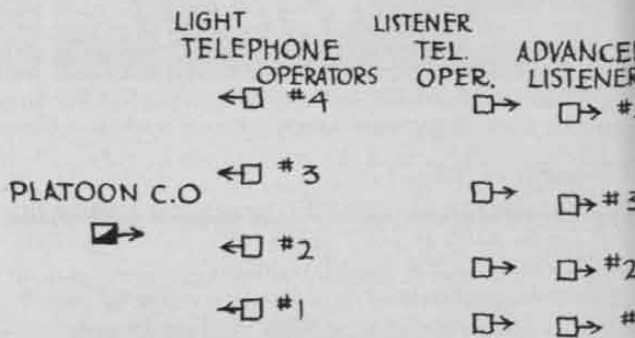
Second, place the outer circle of lights about *ten thousand yards* from the bombing objective. This insures ample carry time (two minutes and forty seconds) to attain the maximum score, assuming bombing speed of *one hundred and fifty miles per hour* altitude of *ten thousand feet* and pick-ups at *least three thousand yards* ahead of the *circle of pilot lights*. Place advanced listeners 7000 yards ahead of corresponding lights, if possible.

Third, hold enough preliminary practices to train sound locator-comparator teams to function smoothly and promptly and communication personnel to transmit commands and intelligence instantly and concisely. The number of these preliminary practices depends upon the previous experience of the present members of the light and locator sections and the communication—advanced listener teams. With half old men and half new men, at least two preliminary practices are necessary. With an entirely green organization, six or eight practices will not be too many.

Fourth, place orientation stakes around lights and locators close enough to be distinguishable at night and indicating direction to the other lights on the outer ring, to all the advanced listeners and to the north star.

Fifth, conduct drill in such a manner that all lights will go in action as nearly simultaneously as possible with all personnel impressed with the importance of getting on the plane immediately. The azimuths and elevations corresponding to the distant positions and expected altitudes should be furnished to and used by section leaders and light commanders.

Sixth, conduct a communication drill in barracks by word of mouth to teach personnel the terminology and to impress them with the need for suppressing all unnecessary data over communication lines. A suggested formation for this drill would appear as follows;



Seventh, equip all lights and the platoon C. O. with night binoculars and assign men with keen distant sight to use them and if possible, also operate the distant electric controllers.

An Antiaircraft Check Sight

AN ANTIAIRCRAFT check sight suggested by Captain J. R. Townsend, C.A.C., and designed and built at the Hawaiian Ordnance Depot, has been attached to a three-inch antiaircraft mount M-2 and is in use by the 64th C. A. (A. A.) at Fort Shafter. The purpose of the check sight is to provide means for checking the output of the director prediction mechanism, director operating personnel and follow-the-pointer operators at the guns.

The sight utilizes one of the standard elbow telescopes M-1 A-1 furnished with the director M-2 (see photographs). Both a vertical and lateral mil scale are incorporated in the telescope which is supported on a special sight mount attached to the gun cradle and moves with the gun in elevation and azimuth. The mount is located as near the trunnion axis as



possible so as to minimize the displacement of the eye piece when the gun is elevated. The sight mount is provided with a means for adjusting the line of collimation of the telescope parallel to the axis of the bore. When adjusted, gun and telescope will always point toward the same object regardless of elevation while the eye piece will remain in a position convenient to the observer.

A check sight is operated as follows: Strip out the super elevation and all ballistic quantities (except drift which cannot be eliminated) by appropriate settings at the director. Station an observer at the check sight and another man directly in rear of the observer with a stop watch. This latter individual should wear a telephone headset communicating with another man stationed at the time of flight dial at the director. Operate the director in a normal manner (except for super elevation which remains at zero) and follow the pointer in elevation and azimuth at the gun.

At a given signal the following operations must be performed simultaneously:

a. Transmit the time of flight reading to the stop watch operator who will start his watch at the same time.

b. Cease following the pointer at the gun. The end of the time of flight will be announced to the observer who will read, at the same instant, the targets vertical and lateral deviations in mils from the center of the telescope. The amount of drift can then be deducted from the apparent lateral deviations leaving a very close approximation of the prediction errors. The difficulty in reading both vertical and lateral deviations instantaneously may be overcome by requiring the follow-the-pointer operators to note the displacement between the electrical and mechanical pointers at the end of a time of flight, then resume tracking, maintaining this same displacement until the observer has had time to read the deviations.

By direction of the department commander the check sight was given an exhaustive test to determine its suitability and the desirability of its addition to the standard equipment of an antiaircraft battery. The test resolved itself into two parts—an orientation test and a prediction test.

a. Orientation Test.

Ballistic conditions were set at normal, super elevation was set at zero during the test. Rates both N-S and E-W were set at zero during the test. A target was tracked with the director operating normally except for super elevation and rates. When pointers were matched on the gun the observer at the check sight on the gun would expect to find the target at the intersection of the cross wires in the sight except for the divergences due to drift. Unexplained divergences could be accounted for in one of several ways.

1. Lack of orientation of the gun.
2. Failure of the observer on the direction to follow the target properly.
3. Failure of the azimuth and elevation setters on the gun to match pointers properly.
4. Failure of director to turn out correct data.

By substitution of personnel and by close supervision it was easy to determine exactly where errors were being made. It will be noted that this test is independent of any maneuvers that the target may make since director sights and gun sights should be constantly on the target.

b. Prediction Test.

This test was conducted as described above in the operation of the check sight except that a target having been tracked for a short time a whistle was blown, whereupon tracking ceased. At the end of the time of flight the whistle was again blown and divergences indicated by the check sight noted. In order for this test to be complete it is necessary that the target should maintain a straight course during the time of flight.

Upon completion of the tests it was recommended that the sight be adopted as standard equipment. It

permits an excellent determination of the prediction errors resulting from personnel errors and mechanical inaccuracies in direction. By process of elimination it is possible to separate the two classes of errors. It was believed that an eight-power telescope would be better than the telescope taken from the director. Furthermore, the director spotting telescope would be needed on the director at about the time when the check sight would be most in use, i.e., just prior to target practice.

The check sight was brought to the attention of the Coast Artillery Board which approved its installation when desired by the battery commander but did not recommend its adoption as standard because it did not believe it advisable to standardize any type of sighting system incapable of use for emergency fire control.

Defending Southern California from an Attack by Air

By Lt. Gordon S. Mitchell, Coast Artillery Reserve

SOUTHERN California residents as they go to bed these nights may do so with the added assurance,—as a result of the test of the Antiaircraft defense of this territory recently conducted by the Coast Artillery Reserve forces,—that should the state be attacked by an enemy air force they will be adequately protected and the enemy repulsed in an efficient and expeditious manner.

This test took the form of a field problem centering at Hawthorne and participated in by units of Regular Army troops from Fort MacArthur, Reserve Officers from the Air Corps, Field Artillery, Engineer Corps, Signal Corps, Infantry, the Organized Reserve regiments of the 975th and 977th Coast Artillery, as well as detached units from the 160th Infantry, California National Guard. In order to understand the significance of the test, it becomes necessary to understand exactly how the maneuver was conducted.

An area twenty miles on a side, approximately centered at Hawthorne was considered as being attacked by an enemy air force from the south and west (for the specific purposes of the problem, a fleet of enemy bombers was reported as coming from the south by way of Riverside and Santa Ana for the purpose of bombing both Harbor shipping and rail terminals at San Pedro as well as the machine shops at Torrance.)

All of the officers participating in the test were ordered to report at the headquarters of the 9th Coast Artillery Brigade which had been temporarily set up in the City Hall at Hawthorne, while the enlisted men of the Regular Army and the National Guard assigned to it were put into a temporary but complete camp on the hills just west of Hawthorne.

At 2 p.m. on the afternoon of the first day of the problem, a Brigade staff conference was called and the officers were given all details of the problem, which had heretofore not been revealed. These, in brief, were that all personnel, equipment, armament and

ammunition was to be moved from the temporary headquarters at Hawthorne to the area which was to be attacked, and that this entire area, approximately four hundred square miles, had to be adequately prepared by 8:30 a.m. the next morning against a possible attack from the air.

For the purposes of the problem the Brigade was divided into three regiments, each of which was assigned a definite portion of the territory to defend. The normal organization of Antiaircraft defense includes not only the emplacement and operation of the defense weapons but also the organization of all communications and the emplacement and operation of the search light equipment needed in conjunction with these weapons.

In this particular problem the area lying between a line drawn from Redondo Beach on the west to Harbor Boulevard on the east, and the coast, was assigned to the 975th Coast Artillery regiment, commanded by Lieutenant Colonel F. H. Holden, while a territory of approximately the same width from Harbor Boulevard on the west to Seal Beach on the east was given to the 977th Coast Artillery regiment commanded by Lieutenant Colonel E. A. Evans. The Brigade, during this problem, was commanded by Colonel M. S. Crissey, normally Commanding Officer of the 63rd Coast Artillery stationed at Fort MacArthur.

The afternoon was spent in conference, reconnaissance and inspection of equipment, and all details of plans for procedure in moving out and occupying the area to be defended were carefully worked out. Although the organizations were of course working at reduced strength, officers were assigned to their various positions in the command, and with the assistance of their superiors and brother officers who had had previous experience in combat and combat problems, performed their duties efficiently and expeditiously.

At daybreak the next morning there was great activity in Hawthorne, as the activities connected with moving a great body of troops with the guns and protecting armament necessary to defend an area of the extent under consideration, commenced.

Command posts and communications stations were set up in their previously determined emplacements. Wire telephone and short wave radio were both used, and a complete system consisting of fourteen two-way radio stations (transmitter and receiver) and sixteen telephone stations, was set up and operating by 10 a.m. This system was used for communication between the various units during all subsequent activities of the problem.

During the period from 11:00 a.m. till 12:00 noon, a comprehensive communications exercise, apart from the problem as a whole, was conducted in order to familiarize the communications officers of the various units with their respective duties during combat. This consisted of telephoned and radio transmitted reports of the course of a fleet of planes which was theoretically approaching the area, which gave details of the type of plane, the observed course, height of flight, and

approximate speed. As these reports come in over the system, the data, including the location of the reporting station, was noted on a map, from which the approximate time of arrival and strength of the attacking force could be determined and an adequate as well as a timely reception prepared for it.

All of the necessary equipment for this defense problem, which is normally stationed at Fort MacArthur in San Pedro, was taken to Hawthorne, where it was given a thorough inspection by the officers participating in the problem.

The War Department has been, during the past few years, assigning new anti-aircraft defense equipment to the Los Angeles area, and the defense agencies in this district are receiving this equipment as it is issued.

The problem ended with a critique, held in the Community Hall at Hawthorne, and participated in by all officers attending. During this conference, which was conducted by Lieutenant Colonel Evans, all orders issued by Brigade Headquarters as well as by all unit commanders were examined and a general discussion of the details and significance of this type problem to the city and the defense forces was conducted.

The success of the Hawthorne problem has encouraged those in charge of Reserve Corps activities in this district to plan a similar future problem, to be participated in by the Coast Artillery and Air Service Reserve, and which as now contemplated will include the actual sighting, location, and defense against a fleet of planes which will move in and attempt to theoretically attack the city and Harbor of Los Angeles.



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

Changes in Chief's Office

TWO new faces have appeared in the Chief's office since the last number of the JOURNAL. Major E. E. Bennett, who is well known to all National Guard and Reserve officers of the Third Corps Area, arrived from the Philippines before Xmas and sat down at the desk formerly occupied by Major J. B. (Jimmy) Crawford. Major Bennett will be remembered as on duty with the Third Coast Artillery District and the Editor of the "Bulletin" (A darned good job he did, too). Major F. P. Hardaway is the other new arrival—from Panama. He has been assigned to the Organization and Training Section, also, Captain J. H. Wilson left on the February transport for Hawaii. Good luck John—and here's hoping you got Ruger.

ing and the spirit of aggressiveness on the part of our officers.

"The above are applicable to all of our activities: Materiel, Organization, Training and Personnel."

The instructions quoted above were brought about by the feeling on my part that in our enthusiasm for technical development and refinements we were not giving full consideration to the tactical and training conditions. I hope that the application of these principles will bring about a further simplification of our fire control, the elimination of equipment not entirely suitable for field service, the development of real mobility and the establishment of methods for conducting fire with less elaborate equipment and under emergency conditions.

* * * *

Extracts from the Address of the Chief of Coast Artillery at the Coast Artillery School, January 25, 1933

BEFORE outlining briefly the more important objectives for 1933, I desire to stress the importance of giving full consideration to tactical, as well as technical features in the development of materiel and in the conduct of training. No matter how perfect mechanically, materiel that is not adaptable to the tactical requirements of the organization with which it is to be used will be useless in many situations. We must not lose sight of the fact that the time and space factors now available for training and the establishment of ideal fire control installations may not be present under war conditions.

"The tendency of the Coast Artillery to rely too much upon mechanical aids in the conduct of fire is well known. This emphasizes the necessity of cultivating and encouraging quick thinking and quick act-

Previously I have discussed the educational system of the Army at some length and the requirements for attending the Command and General Staff School and the Army War College as well as my responsibilities in recommending officers to attend these schools. I pointed out that I could recommend no officer to attend the Command and General Staff School or the Army War College whose general rating was less than "Excellent." Since that date the standards have been raised. Now I cannot recommend any officer to attend the Command and General Staff School or the Army War College whose general rating is less than "Superior" or near "Superior." I believe that these new restrictions are in the right direction and are entirely proper. They should not have the effect of discouraging any ambitious officer. During the past year, I have personally supervised the general rating of our officers and I am glad to inform you that we are in a much more favorable status than has heretofore been the case. Based upon the June 30, 1932, efficiency reports and previous records, 123 of our officers are

rated "Superior"; 603 are rated "Excellent," 247 are rated "Satisfactory" and 6 are rated "Unsatisfactory." The percentages of the officers rated "Superior" in the different grades at the present time are as follows—Colonels, 25 per cent; Lieutenant Colonels, 33 per cent; Majors, 18 per cent; Captains, 10 per cent; First Lieutenants, 8 per cent; Second Lieutenants, 5 per cent. The percentages of those rated "Excellent" in the different grades are; Colonels, 50 per cent; Lieutenant Colonels, 57 per cent; Majors, 69 per cent; Captains, 67 per cent; First Lieutenants, 66 per cent; Second Lieutenants, 41 per cent. When it is taken into account that many of the officers rated "Excellent" are near "Superior" the figures just given you are most encouraging. The situation justifies my advice to the classes of 1930-31 and 1931-32—and to you—to seek appropriate duty and to safeguard your records.

* * *

It is useless to inform you that the so-called economic depression continues. You have felt it and you know that it continues. It is inevitable that economic measures to meet the situation of the government demand continued restrictions and some curtailment of military activities. I do not believe that any damage will be done to our military establishment or that our people will countenance any weakening of our national defense. However, we must realize the necessity for real economy and the fact that many worthy projects must be suspended or postponed until more normal conditions are restored. We have been fortunate in making so much progress since 1929, the beginning of the world wide depression.

* * *

The Coast Artillery with its broad mission and varied activities offers a varied and interesting field of endeavor for any ambitious officer. The officers of the Coast Artillery of the Regular Army must be proficient in all of our activities. They are not and should not be allowed to specialize in any one activity. By study and by service with organizations, they must acquire a comprehensive working knowledge of all of our activities.

I have emphasized the necessity for every officer to prepare himself for his opportunity. I believe that here at the Coast Artillery School you have the time and means to improve your professional usefulness to the Coast Artillery and to the Army of the United States.

It is our duty to prepare ourselves for the future. Do not be misled by what occurred in the World War. The progress and the development in materiel and means for its employment during the past ten years far exceeds the developments preceding and during the World War. I believe that developments during the next ten years will be even more marked and far reaching. It is our duty to prepare ourselves for the future. While keeping in mind the fine traditions of the past you must be progressive and look forward to the future with confidence, enthusiasm and aggressive-

ness. If you do this, I have no doubts about the future of the Coast Artillery.

The Air Corps-Antiaircraft Exercises at Fort Knox

THE Air Corps-Antiaircraft exercises to be held at Fort Knox, Kentucky, during the period May 15-27, 1933, will be more elaborate than any combined exercise of this nature ever conducted in this country. In principle the exercises will be similar to those conducted at Aberdeen Proving Ground in the spring of 1930 but will be more extensive in three main features. First, the ground defense system will be much more elaborate and will require many more troops to operate it; second, the attacking aircraft will be greater in number and a great variety of planes capable of developing much higher speeds. They will also employ a greater variety of methods of attack. Third, the attacking aircraft will operate from a base at such a great distance from the defended area that the observers at the listening posts in the warning net surrounding the defended area will not be able to hear the attacking planes when they start from their bases to their places of rendezvous preparatory to an attack.

The problem of the defending force will be to defend the important regulating station at Fort Knox against air attacks by planes to be based near Dayton, Ohio. The layout at Knox consisting of cantonment buildings, warehouses, and railroad tracks, is peculiarly adapted to represent a large regulating station. Its location with respect to the assumed front line and to the enemy air fields in the vicinity of Dayton corresponds closely to the location of some regulating stations in France which were the objectives of German bombardment missions.

The Commanding General, Fifth Corps Area, is charged with the preparation and conduct of the exercises. He will be assisted by a Director, Brig-Gen. George H. Jamerson, who will control the exercises and act as chief umpire. Brig-Gen. Henry C. Pratt will command the attacking air forces while Brig-Gen. Julian R. Lindsey will command the air defense forces.

The attacking force will have its headquarters at Wright or Patterson Field. The aircraft to be used will consist of pursuit, attack, bombardment and observation planes, some of which are of the latest types capable of developing very high speeds. The Air Corps personnel will be drawn from stations in all parts of the country.

The commanding general of the air defenses will have at his disposal:

- a. A defending air force consisting of pursuit and observation planes.
- b. One complete antiaircraft regiment.
- c. An intelligence or warning net.

The defending air force will be based at Bowman Field about 30 miles from Knox. It will be able to use, to a limited extent, a small landing field at Knox.

The antiaircraft regiment to be organized from the 61st, (Lt. Col. Joseph A. Green, Commanding) 62nd, (Col. Arthur S. Conklin, Commanding) and 69th, (Lt. Col. F. H. Smith, Commanding) Coast Artillery will have its various elements, guns, machine guns, searchlights and sound locators disposed in tactical positions.

The intelligence net will consist of a series of observation posts located on bands at distances of 50, 75 and 100 miles from the defended objective, each band being approximately on the arc of a circle with center at Knox. The net will cover approximately 110 degrees to the northwest of Knox. Practically all communications in the net will be by telephone. The existing commercial telephone system will be used as far as practicable, supplemented by field lines to be laid by the First Signal Company. A very limited amount of radio communication will be maintained between key points in the net and defense headquarters. The observation posts and the communication system of the net will be manned by troops of the First Signal Company, the composite antiaircraft regiment and infantry units of the Fifth Corps Area. (The intelligence net in war time would be manned mostly by civilians and would employ existing commercial communication systems almost entirely.)

All troops to participate in the exercises will arrive in the Fifth Corps Area between April 25 and May 1.

The maneuvers will be conducted in day and night phases. Each phase will consist of an attack or series of attacks against the defended objective by enemy aircraft. It will adopt various formations involving the use of the three types—pursuit, attack, and bombardment—singly or in combination. The various methods of attack which have been studied at the Air Corps Tactical School will be tried out. A very important feature of these methods at night will be the employment of attack and pursuit planes against the searchlights. They will have the double purpose of putting the searchlights out of action by fire effect and at the same time to render the sound locator ineffective due to the confusing noises set up by the different types of planes employed. The attacking air force will be free to conduct attacks at any time during the day or night periods and may employ such methods as it desires so long as service conditions are simulated. Practically the only limitation placed on the attacking air force is that it must approach the objective in the arc of approximately 110 degrees northwest of Knox. This restriction is necessary due to insufficient personnel and materiel to man a larger intelligence net.

The function of the defenses in any phase will consist of three features. Considered in their order of occurrence these are:

a. Discovery and identification of attacking aircraft by the observation posts in the warning net and the transmitting to the rear of this information.

b. Dispatch of the defending pursuit aviation to intercept approaching hostile aircraft (This means of defense is employed in the judgment of the defense commander and may not be used in all phases).

c. The employment of the various weapons in the antiaircraft regiment to deliver fire on hostile aircraft. At night this involves the use of sound locators and searchlights to locate the enemy before opening fire.

There will be no ammunition fired during the exercises except blank ammunition by the attacking aircraft.

The exercise will be witnessed by observers from the Coast Artillery School, the Air Corps Tactical School and Chief of Air Corps. Major O. L. Spiller will attend as the representative of the Chief of Coast Artillery.

Research Studies at the Coast Artillery School

THE Research Studies, commonly called General Conferences conducted at The Coast Artillery School are the result of the evolution of the course in Public Speaking.

The purpose of this course is threefold.

"First—To afford an opportunity for practice in public speaking.

"Second—To provide a means of stimulating interest in the cultural side of an officer's education.

"Third—To cover various special subjects in which instruction is required."

The course is divided into two phases. The first half covers political and economic conditions of the United States and other great powers. The second half covers, in general, problems of purely military interest.

At the present time, due to the great civilian components of the United States Army, it is very unlikely that any officer of the Regular establishment can escape the duty of public speaking. With orators of the radical, pacifist and communist elements attempting to undermine our National Defense, it is absolutely necessary that each officer be prepared to take the stand and make an intelligent, clear, and interesting presentation of facts. Under the present policy of generalization, where every officer must be prepared to handle all types of Coast Artillery armament, we are apt to spend too little time on this essential part of an Army officer's education, spending all of our time on technical and tactical subjects.

Each officer in the Advanced class is assigned a subject under supervision of an instructor as adviser. The student, making use of the library to a great extent, assembles the available material on his subject. It then becomes necessary for him to "study, sift, and evaluate it." This is especially necessary in view of the mass of contradictory material published on the World War. We are too apt to accept as the truth any statements made as a statement of fact that is read in a printed book. A study of the Harbor Defense actions in the World War on the Belgian coast is a glaring example of non-reliability of authors. If one were to believe these authors one would find that the blocking of the Zeebrugge was a complete success;

that it was a complete failure; that it practically stopped submarine activity in the North Sea; and that it had no effect on submarine warfare.

The result of this research study is presented by two methods. An epitome is prepared by the student using not more than 2000 words to express his ideas on the subject. The manuscript of this paper is proofread by the author and the officer in charge of the conference for correctness in syntax, grammar and spelling. Statement of facts must be supported by citing the authority from which they were obtained. This is done by listing the authors consulted at the end of the synopsis under the heading "Bibliography." This epitome is placed into the hands of the faculty and student body early enough to enable them to familiarize themselves with the subject prior to the conference. The officer in charge conducts a rehearsal with the student who is to present the research study before the date set for the conference. At this rehearsal, a check is made on the time, bad habits are corrected, and faulty parts of the speech are ironed out. The student then presents his subject at a general conference using notes, and such slides and graphs as will increase interest in the subject.

The officers of the Battery class are assigned "minor research studies" covering some phase of one of the "major research subjects." The presentation of these subjects is confined to a period of time not to exceed four (4) minutes, and is given together with the main research study on the subjects.

The conference is conducted by the instructor who introduces the speakers, questions other battery officers without previous warning in order to cause discussion of the study and opens the conference for general discussion.

Research Studies, 1932-33 Subject

- No. 1. a. Orientation.
b. Forms of Government—Ancient and Modern and their bearing on military strength.
2. Economic Bases of War.
3. Economic characteristics bearing on war making ability of more important states.
4. Important economic, political and military problems created by the distribution of the mineral resources of the world.
5. The economic and military interests of the United States in the Carribean area.
6. Industrial preparedness in the United States for war.
7. The more important elements of military strength and weakness of Japan.
8. The more important elements of military strength and weakness of Russia.
9. Political and economic issues between Russia and Japan.
10. Present political and economic conditions in Germany.
11. The German-French War Plans of August 1914, and the Mobilization based on same.
12. Operation of the British Expeditionary Forces, August 21—Sept. 2, 1914.

13. The Battle of Jutland.
14. The Principal Problems in Organizing and Conducting Joint Army and Navy Operations with illustrations from history.
15. Joint Army and Navy Organization for Coast Defense.
16. Grand Joint Exercises No. 4, Hawaiian Department, 1932.
17. Harbor Defenses Actions in the Russo-Japanese War—Port Arthur.
18. Harbor Defenses Actions in the World War—The Belgian Coast.
19. Defense of the Dardanelles—The Naval Attack.
20. Defense of the Dardanelles—Land Operations.
21. The relation of Harbor Defenses to Military and Naval Strategy.
22. Development of Aviation since the World War and its effect on aerial tactics.
23. Military role of antiaircraft artillery with particular reference to its relation to aviation.

School Notes

ALTHOUGH retrenchment has necessarily been the order of the day, Old Man Depression did not detract from the Holiday Spirit at Fort Monroe. The usual number of parties and dances were well attended. The New Year and the Old Year arrived in automobile at the stroke of 12 midnight. Nineteen hundred thirty-two was promptly felled by a well aimed blow from 1933, and was dragged out by the heels together with his depression banner.

General and Mrs. Tracy entertained the officers and ladies of the garrison at their quarters on New Year's day.

The holiday period was used to absorb legislative furloughs to a great extent.

The Fort Monroe Golf course has been quite popular this winter to the detriment of the local country clubs. Although only six holes have been completed, the other three are under construction and the work is progressing rapidly. The high tides last month threatened to turn the fourth hole into a duck pond but the damage was not great. It is hoped that next fall Fort Monroe will be the proud possessor of a nine hole golf course.

The National Guard classes of the Enlisted Specialists Division graduated on December 16, 1932. The graduates were:

Radio Course

Sergeant Willie M. Hagins, Jr., Hq. Det, 264th CA GA NG
Pvt. Wallace F. Howlett, Hq. Btry., 197th CA NH NG
Pvt. Chester H. Klovstad, Hq. Btry. & Combat Tn 260th CA DC NG
Corporal Dale C. Prior, Hq. Btry. Combat TN 250th CA CALIF NG
Corporal David L. Stephen, Hq. Btry. 242d CA CONN NG
Staff Sgt. Sylvester Stolzenberger, 245th CA NY NG

Staff Sgt. Thomas C. Tinlin, Hq. Btry. 241st CA
MASS NG

Electrical Course

Sergeant James F. Blanz, Btry. A. 260th CA ARK
NG

Master Sgt. John C. Booth, Hq. Btry. 246th CA
VA NG

Sergeant Oliver W. Dobson, Btry. B, 211th CA
MASS NG

Sergeant Gordon H. Evans, Btry. C, 213th CA
PENN NG

Pvt. 1 cl. Oleg Pantuhoff, 244th CA NY NG

Staff Sgt. Lothar A. Stehle, Hq. Det. & C. Tn 202d
CA ILL NG

On February 1, 1933, twelve students graduated from the Special Clerical Course of the Department of Enlisted Specialists, with two brothers, H. J. and F. W. Stevens of the Air Corps, Langley Field, leading the class.

The Advanced Engineering students will not be able to make the usual trip this year due to lack of funds. The Advanced Gunnery class will probably leave for Aberdeen about the middle of March for a five week stay.

The equipment and personnel of The C. A. School Machine Shop have been turned over to the C. A. Board for the purpose of constructing the second Lewis Seacoast Data Computer. The first computer was also constructed in this shop. The highest type of mechanical precision and skill are required in the manufacture of the parts for this machine.

Knox Trophy Presented to Battery C, 91st C. A. (PS)

THE 42nd annual dinner of the Society of the Sons of the Revolution in the Commonwealth of Massachusetts was held January 17 at the Hotel Somerset, in Boston.

The feature of the evening was the presentation of the Knox Trophies and Medals for proficiency in gunnery to Regular Army and Mass. National Guard Field and Coast Artillery Units, and to representatives of the Navy.

Captain H. P. Hennessy, C.A.C. and Lt. Paul A. Leahy, C.A.C., battery commander and range officer, respectively, of Battery C, 91st C. A. (PS) stationed at Fort Mills, P. I. were presented the Knox Trophy for superior gunnery in the Coast Artillery for the year 1932. Captain Hennessy is at present stationed at the University of Cincinnati. Lt. Leahy is stationed at Fort Totten, New York.

Maj.-Gen. John V. Bouvier, general president of the national society, brought the greetings of that organization. Maj.-Gen. Fox Conner, commanding the corps area, and Brig.-Gen. Alston Hamilton, commanding the first coast artillery district, were guests.

War College List

WAR Department orders have been issued assigning the following Coast Artillery officers to the War College as students in the 1933-34 course.

Lt. Col. John S. Pratt

Lt. Col. Sanderford Jarman

Lt. Col. Allen Kimberly

Major George F. Moore

Major Charles W. Bundy

Major Dale D. Hinman

Major John H. Lindt

The Coast Artillery Association Trophy Is Presented to the 243d

THE trophy, awarded by the Coast Artillery Association for outstanding performance during the past training year, was presented to the 243d Coast Artillery, Rhode Island National Guard, at its annual banquet in the Narragansett Hotel, Providence, R. I., January 28, 1933. Approximately 100 officers and



General Alston Hamilton, commanding the 1st Coast Artillery District, congratulating Colonel John J. Collins, upon the winning of the Coast Artillery Association trophy by his regiment the 243d C. A. (R. I. N. G.)

guests celebrated the occasion, among them being Governor Theodore F. Green of Rhode Island, General Alston Hamilton, Commanding 1st C. A. District, General H. R. Dean, Adjutant General of R. I., Colonel G. E. Fogg, commanding the 240th C. A., of Maine, Lt. Colonel C. K. Wing, representing the Chief of Militia Bureau, Maj. E. E. Bennett, representing the Coast Artillery Association, Colonel H. Z. Landon, former commander of the 211th C. A., and Major R. D. Fales, representing the 211th C. A. of Mass., and Representative R. E. Rawlings of the State Legislature.

A delicious dinner was enjoyed to the accompaniment of music from the balcony by the 243d orchestra, and the more subdued music of tinkling glasses of ice water.

Theodore F. Green, newly elected Governor of Rhode Island, and a descendant of the famous Nathaniel Green, opened the speaking with references to the past history of the regiment dating back to 1775 with Battery "E" of Westerly, its participation in every war and nearly every battle in which troops of this country have participated since then, and voicing pride in its past and present history. He concluded with a very humorous sketch of the duties of a governor.

General Alston Hamilton presented the trophy, on behalf of the Coast Artillery Association. He described the all around excellence of the work done by the 243d as observed by him, especially during the summer camp, saying in part: "I know that this trophy is well earned. I stayed at your camp and saw your searchlights, antiaircraft guns and harbor defense guns in action. I did not find a single thing to criticize in the work or with the camp—I wasn't looking for faults—but if anything had been wrong I'd have seen it." Colonel John J. Collins, commanding the 243d C. A., responded to the trophy presentation with a graceful speech distributing due credit to all who had contributed to the happy results.

Colonel C. K. Wing, representing the Chief of Militia Bureau, congratulated the regiment and told them about National Guard affairs as the Militia Bureau sees them, and how closer cooperation and better results may be obtained. Major E. E. Bennett opened his remarks by reading a letter from General Gulick expressing his regret at being unable to attend personally, expressing his pleasure at the high degree of training and general efficiency attained, his belief that this regiment was prepared to carry out its mission without delay or confusion, and that the results attained were attributable in a large measure to the unusually close cooperation and understanding existing between Colonel Collins and his officers and the Regular Army Instructors Major A. E. Rowland and Captain M. G. Armstrong.

Major R. D. Fales presented a pictorial history of the 211th and Colonel H. Z. Landon an enlarged photograph of Colonel Collins "watching a direct hit" at camp last summer. Colonel G. E. Fogg, toastmaster traced the continuous growth of efficiency in the 243d during the past four years as represented by the increase in average artillery scores from 34.8 in 1929 to 96.7 in 1933. He concluded the speaking with a stirring account of attacks now being made upon the National Defense, and the folly of economy by petty reduction in such items as sergeant instructors, reduced hours of training and cutting essential defense activities and personnel, when foresight discloses the future enormous cost that may result from present crippling of defense in guise of economy.

The party broke up at a late hour amid happy rejoicing and good wishes for another successful year. For those who are interested in actual figures, the per-

centages and scores for the year ending October 31, 1932, are here given, as used in determining the trophy award:

Average attendance for the year (percent)		91.2	
Percent gunners (Excl. of M. D. and Band)		34	
All armory inspection ratings		8	
All field inspection ratings		8	
Artillery practice:		Score	
	Armament	New System	Old System
Btry. A	12-inch Fixed Mortars	90.7	110.2
" B	10-inch D. C. Rifles	104.2	118.1
" C	10-inch D. C. Rifles	92.8	74.9
" D	12-inch D. C. Rifles	91.2	91.0
" E	6-inch D. C. Rifles	98.9	107.8
" F	12-inch D. C. Rifles	107.7	112.1
" G	30-cal. A.A. Machine Guns	78.6	78.6
" H	3-inch A.A. Guns	100.6	100.6
" I	60-inch A.A. Searchlights	77.0	77.0
Average		93.5	96.7

San Francisco Chapter United States Coast Artillery Association

THE San Francisco Chapter of the Coast Artillery Association under the able leadership of Colonel R. E. Mittelstaedt, Commanding the 250th C.A. (Cal. N.G.) and former Adjutant General of the State of California, has been very active during the past six months. Colonel Mittelstaedt has been aided and abetted by the energetic Secretary-Treasurer of the Chapter, Major W. R. Miller, also the 250th C.A. The officers of the Chapter in addition to the above are members of the Regular Army or the Reserve. Major J. D. MacMullen, Regular Army Instructor with the 250th, is Vice-President of the Chapter. Lt. Col. L. L. Pendleton, C.A.C. is the director, as is Colonel C. J. Mund of the Reserve.

The Chapter has adopted a policy of holding three meetings annually to be sponsored respectively by the National Guard, Regular Army and Reserve members. The Regular Army meeting to be held in March is in charge of Colonel Pendleton who has made arrangements for the reception of the members at Fort Scott. The Organized Reserve meeting will be held later in the spring under plans formulated by Colonel Mund.

Coast Artillery Reserves, 2d Corps Area

Colonel F. W. Stopford, CAC (DOL) Executive

Metropolitan District

BRIGADIER General William E. Cole, who has been in command of the Hawaiian Coast Artillery District for the last two years, assumed command of the Second Coast Artillery District on November 4, and is making an intensive study of all matters affecting the Reserves. His interest is having a marked effect upon the general good feeling and esprit of the Coast Artillery Reserves, Second Coast Artillery District.

On November 21, the 533rd Coast Artillery, Colonel Francis R. Stoddard, commanding, entertained General Cole for dinner and on December 19, the 619th Coast Artillery, Colonel George W. Johnston, commanding, acted as host to the General. Both dinners

were well attended by the members of the regiments and a hearty welcome given the General.

A social club, to be known as Coast Artillery Reserve Officers Club, has been formed for handling all social activities in the Metropolitan District with the following officers:

Chairman: Major Charles I. Clark, CA-Res.

Treasurer: Major Herbert Ridgway, CA-Res.

Secretary: Lt. D. A. Hopper, Jr., CA-Res.

The object of the club will be to organize and direct all social activities of the Reserves in this district, such as dances, dinners, beach activities at various posts, golf, target practice, equitation and other similar entertainment. All Coast Artillery officers of the Regular Army, National Guard and Reserve Corps will be eligible for membership. The enlisted cadres of Reserve Regiments will be eligible as junior members.

Upstate New York Coast Artillery Reserves

Major Joseph C. Haw, CAC (DOL), Unit Instructor

All three regiments have settled down to a brisk routine of inactive training. Meetings are held monthly in Schenectady. In the latter city, an unusual number of Coast Artillerymen are turning out for small bore target practice held in conjunction with the Infantry.

Members of the 514th are much gratified at the selection of the regiment for active duty with the C. M. T. C. at Fort Hancock next summer and plans are being formulated for intensive drills and instruction in preparation for that duty. As there is no Coast Artillery armament available in Schenectady, wooden models of the 6-inch gun, plotting board, etc., are to be constructed. These will be approximately life size so as to enable regular drills to be held.

621st Coast Artillery, Wilmington, Delaware

Major W. M. Cravens, C.A.C.; Unit Instr.

Eighteen applications for certificate of capacity with proceedings of a board of officers have been submitted to the 2nd CA District for officers of this regiment who have completed all their military knowledge requirements and have had a 14 day period of active duty. They will be eligible for promotion as soon as they have had the necessary time in grade.

This regiment is scheduled to train CMTC at Fort Hancock, N. J. next summer, and is looking forward to its active duty encampment. 30 applications have been received to attend this camp, although only 20 officers are authorized to attend. The regiment will hold a special school for those officers selected to go as well as alternates.

A number of officers of this regiment enjoyed the showing of Signal Corps training films at the meeting of the Reserve Officers' Association, Department of Delaware, on December 13. The subject of the films were the Combat Engineer Company, its organization, equipment and employment in combat; and Flashes of Action, a film made by the Signal Corps showing action in the World War in France.

The 621st Coast Artillery has enjoyed the honor of being first in hours of credit for completed subcourses

in the 2nd Coast Artillery District during the months of September, October and November.

The First Defenders Chapter

At a meeting held in the Armory of the 213th Coast Artillery at Reading, Pa., on November 30, 1932, the First Defenders Chapter of the United States Coast Artillery Association was formally organized with the following officers elected:

President, Col. C. J. Smith, 213th C.A., Allentown, Pa. 1st Vice-President, Major C. B. Meyer, C.A.C., Allentown, Pa. 2nd Vice-President, Lt. Col. F. M. Godley, 213th C.A., Easton, Pa. 3rd Vice-President, Major L. B. Herr, C.A. Reserve, Lancaster, Pa. Secretary, Capt. Harry C. Blank, 213th C.A., Allentown, Pa. Treasurer, Major J. D. Eisenbrown, 213th C.A., Reading, Pa. Executive Council Members: Major W. J. Smith, Reading, Pa.; Capt. Geo. Tucker, Lebanon, Pa.; Capt. H. D. Schwenk, Schuylkill Haven, Pa.; Capt. Russell Hahn, Easton, Pa.; Lt. Joseph L. Siessmayer, Allentown, Pa.

The Chapter gets their name from the 213th C.A. (AA) known in Pennsylvania National Guard traditions as "The First Defenders." Since the membership of the Chapter is largely made up of officers of the 213th it is appropriate that the name of the Chapter be allied with that regiment. Forty-four members attended the meeting when the constitution of the Chapter was adopted and members formally enrolled. The constitution has been presented to the Executive Council, United States Coast Artillery Association, and the First Defenders Chapter has been formally recognized as a branch chapter of the Association.

The 251st Coast Artillery (Cal. N.G.)

An Antiaircraft regiment in the south-west corner of the United States made its bid for recognition during the 1932 Field Training period and attained a percentage rating of 86.01, second only to the 243d Coast Artillery of Rhode Island.

The 251st Coast Artillery, commanded by Colonel H. H. Morehead, is one of the most enthusiastic National Guard units in the country. They accepted the challenge of antiaircraft and its attendant motorization problems some six years ago and have devoted much time and attention to the job of perfecting their ability. With numerous week-end marches and bivouacs to test mobility they prepared for camp each year. With the same attention to details of gunners instruction and drill they have always made an excellent showing with the guns.

In addition to their record of enthusiastic training one may find part of the reason for success in the reports of attendance. The data for eight years is at hand and shows the 251st Coast Artillery at the head of the regiments in this State seven of those years. During 1932 their average attendance for the year was 97.22 per cent with a State average of 92.40. Counting the active reserves it is not unusual to find batteries drilling with way over 100 per cent attendance.

COAST ARTILLERY ORDERS

Colonel John T. Geary, 6th, Ft. Winfield Scott to 9th C. A. District, Ft. Winfield Scott.

Colonel Charles H. Hilton, 9th C. A. District, Presidio of San Francisco, to 3d, Ft. MacArthur, January 1.

Colonel Harrison S. Kerrick relieved Coordinator Sixth Area, Kansas City, Mo., to Manila, sailing San Francisco, February 10.

Colonel Francis H. Lincoln, 13th, Ft. Barrancas, to General Staff Corps, War Department General Staff, Washington, June 30.

Colonel Frederick W. Phisterer, 14th, Fort Worden, to Recruiting, Indianapolis, sailing San Francisco, February 28.

Colonel Robert F. Woods, 9th C. A. District, Presidio of San Francisco, retired, December 31.

Lt. Col. George Ruhlen, jr., from Panama to 3d, Fort Rosecrans.

Major Joseph R. Cygon, retired account of disability, January 31.

Major Olin H. Longino, promoted Lt. Col., December 1.

Major Hollis LeR. Muller, Org. Res., Pittsburgh to 11th, Ft. H. G. Wright.

Major Peter H. Ottosen, promoted Lt. Col., December 1.

Major Edgar H. Thompson, promoted Lt. Col., December 1.

Major Francis J. Toohey, from Hawaii to 5th, Ft. Wadsworth.

Major Robert H. VanVolkenburgh, student, Army War College, to General Staff Corps, War Department General Staff, Washington, June 30.

Major Richard B. Webb, retired account of disability, January 31.

Captain Arnold D. Amoroso, Hawaii, orders to 11th, Ft. H. G. Wright, revoked.

Captain Elvin L. Barr, from the Philippines to student, Quartermaster Corps School, Philadelphia.

Captain Thomas J. Betts, from office Chief of Staff, Washington, to Historical Section, Army War College, Washington.

Captain Ephraim P. Jolls, from Panama to 62d, Ft. Totten.

Captain Percy S. Lowe, from Hawaii, to 6th, Ft. Winfield Scott.

Captain Ernest R. Percy, Recruiting, New York, to Walter Reed General Hospital, Washington, for treatment.

Captain Don R. Norris, 61st, Ft. Sheridan, to Panama, sailing New York, February 28.

Captain Philip B. Taliaferro, from R.O.T.C., Georgia School of Technology, Atlanta to Panama sailing New York, May 4, instead of as previously ordered.

Captain Henry W. Ulmo, 11th, Ft. H. G. Wright to 13th, Ft. Moultrie.

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

1st Lt. James B. Carroll, Fort Hancock to Manila sailing New York, May 9, instead of as previously ordered.

1st Lt. Clifton C. Carter, 62d, Ft. Totten, to duty with Gold Star Pilgrimage, Paris, sailing New York, April 12.

1st Lt. Wilbur R. Ellis, 2d, Ft. Story, to Hawaii, sailing New York, May 9.

1st Lt. E. Carl Engelhart, student, Coast Artillery School, Ft. Monroe to 2d, Ft. Monroe, upon completion of the course.

1st Lt. Porter T. Gregory, 62d, Ft. Totten, to duty with Gold Star Pilgrimage, New York, May 1.

1st Lt. Frederick R. Keeler, 13th, Ft. Moultrie, orders to Hawaii revoked.

1st Lt. Ernest B. Thompson, student, Coast Artillery School, Ft. Monroe to 52d, Ft. Monroe, upon completion of the course.

1st Lt. Everett C. Wallace, 61st, Ft. Sheridan to Hawaii, sailing New York, February 28.

1st Lt. Arthur E. Watson, jr., retired account of disability, December 31.

1st Lt. John A. Weeks, from Hawaii to 9th, Ft. Banks.

1st Lt. Walter J. Wolfe, from Hawaii, to Coast Artillery Board, Ft. Monroe.

2d Lt. Gilbert N. Adams, 14th, Ft.

Worden, to Hawaii, sailing San Francisco, March 24.

2d Lt. Charles G. Calloway, from Hawaii to 61st, Ft. Sheridan.

2d Lt. John B. F. Dice, from Hawaii to 52d, Ft. Monroe.

2d Lt. Carl H. Fernstrom, from Hawaii to 6th, Ft. Winfield Scott.

2d Lt. Robert D. Glassburn, relieved from Air Corps, Randolph Field, to Panama, sailing New York, December 22.

2d Lt. Stephen M. Mellnik, relieved from Air Corps, Randolph Field, to Hawaii, sailing San Francisco, January 14.

2d Lt. Byron L. Paige, to Hawaii, sailing San Francisco, February 8, instead of January 14.

2d Lt. Charles E. Wheatley, jr., 51st Ft. Monroe, orders to Hawaii, revoked.

Warrant Officer John A. Paterson, Coast Artillery School, Fort Monroe, retired, January 31.

Master Sgt. Jones C. Harton, 52d, Ft. Hancock, retired, December 31.

Master Sgt. White L. Roberson, 15th, Ft. DeRussy, retired, December 31.

1st Sgt. Thomas E. Beaudry, 7th, Ft. Hancock, retired, December 31.

1st Sgt. John F. Christopher, 59th, Ft. Mills, retired, December 31.

1st Sgt. Claud A. Frazier, 61st, Ft. Sheridan, retired, January 31.

1st Sgt. George L. Heter, 14th, Ft. Worden, retired, December 31.

1st Sgt. David L. Merrell, 51st, Ft. Monroe, retired, December 31.

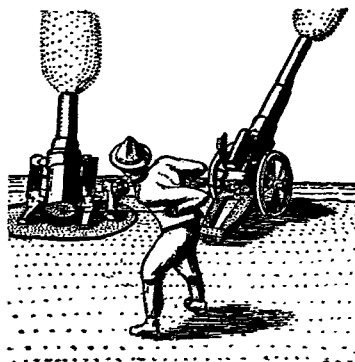
1st Sgt. Edward F. Reilly, 6th, Ft. Winfield Scott, retired, December 31.

1st Sgt. Peter C. Tatro, 4th, Ft. Amador, retired, January 31.

1st Sgt. Harrison Williams, 61st, Ft. Sheridan, retired, December 31.

1st Sgt. Emery G. Wilson, 60th, Ft. Mills, retired, January 31.

Staff Sgt. Richard Geary, 10th, Ft. Rodman, retired, December 31.



BOOK REVIEWS

THE NATION AT WAR, by General Peyton C. March, 407 pages. Doubleday & Co., New York, 1932. Price \$3.00.

General March, wartime chief of staff of the United States Army, is the last of America's principal military leaders of the World War to release his war memoirs. It is an interesting story, told in terse military language that fairly bristles with vigorous, and at times scathing criticism. Yet, in the end, it leaves the reader with a slight sense of disappointment. General March unquestionably is a brilliant soldier. His achievements, the importance of his services to the cause of America at war cannot be overestimated. An objective, calm retrospect of so eminent an authority and participant in his nation's greatest war effort, would unquestionably be a military document of tremendous value and importance. It is only to be regretted that General March preferred the polemical, subjective method of the advocate to the objective, judicial treatment of the historian. The reason, of course, must be sought in the purpose of the author.

General March's book is in the nature of a retort to General Pershing's memoirs. Perhaps, General March has a grievance though the cause and nature of the same is not quite apparent. Two things, however, are manifest: (1) the evidence of a certain hostility against General Pershing, and (2) the emphasis upon General March's own part in the conduct of the war. This he carries to the point of asserting—for the benefit of the non-military reader—that as Chief of Staff, he actually was General Pershing's military superior. One is almost inclined to suspect, that General March was displeased with the insufficiency of credit accorded to him by General Pershing in his memoirs.

Aside from its controversial nature, General March's literary contribution to World War history contains data and information invaluable to the student of that great conflict.

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STORM OVER ASIA, by Paul Hutchinson. Published by Henry Holt and Company. New York, 1932. 301 pages. Price \$3.00.

The greater portion of "Storm over Asia" deals with Japan and her Asiatic policies. To a lesser extent the social and political situation existing at the present in India, Asiatic Russia, and China, is discussed. The entire book constitutes a very outspoken and candid review of the whole state of affairs in the Far East. The writer's opinion is that the restlessness of the peoples of the various Asiatic countries, both large and small, is caused in general, by the "imperialism" of the white nations. In his opinion, also, a more acute factor in the situation, is the "mili-

tarism" of Japan. Taken as a whole, the book strikes one as being primarily, a scolding of Japan and the European Powers interested in Asia, with no solution advanced other, apparently, than that of merely withdrawing from that part of the world and letting disorder, and the consequent ruin have full sway. By inference, the United States comes in for its share of the general scolding through references made to our actions in the Caribbean Sea area, Central America, and the Nanking trouble in 1927.

In the concluding part of the book the author states, "I come to the end of the writing of this book deeply conscious of its manifest shortcomings," and therefore, there can be no complaint if this reviewer agrees with him. In the opinion of the reviewer, "Storm over Asia" could have been a valuable contribution to the current mass of literature dealing with Asia, but fails on account of the extremely strong bias shown against Japan, and the constant belittling of all of Japan's actions. So much scolding destroys interest in the book and is apt to cause the reader to overlook some of the very salient facts which it contains. A more careful checking of statements, and a greater willingness to present both sides of what is considered one of the most intricate world problems of today, would have made this a far more readable and worthwhile book.

Not particularly recommended for officers to read unless they are well enough informed on the Far Eastern situation to be able to discriminate between "panicky" statements and facts.

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A POLITICAL AND CULTURAL HISTORY OF MODERN EUROPE, by Carleton J. H. Hayes, Vol. I. 1500-1830. 863 pages. The MacMillan Co., New York. Price \$3.50.

An elaborate compilation of information tracing the political and cultural development of modern Europe prepared for the use of the college student and the general reader. Obviously based upon secondary sources, the accuracy of the text diminishes progressively as the author leaves the well known centers of civilization of Western Europe and ventures among people more or less removed from the beaten track. The barrier of language and paucity of dependable secondary source material pertaining to the history of those regions are apparent throughout the text. Moreover, the author takes liberties in the use of terminology which cannot be justified on any ground whatever. Thus, at the very outset of the text, noting the gradual expansion of Christianity among the nations of Europe, the author refers to "Czechoslovaks" in the ninth century. Surely, Professor Hayes knows better than that. This ethnic amalgam was utterly

unknown to history until the hectic days of the World War whose product it is. Even so, it first appeared in hyphenated form only, but the hyphen eventually went the way of its foster-mother, the fictitious right of self-determination. Again, when the author writes, that ".....the Holy Roman Emperor, and the King of Poland too, made repeated and protracted attempts to drive the Turks out of Hungary and Roumania," he discloses a surprising unfamiliarity with the history of Central Europe during the period 1526-1687, aside from the fact that Roumania as such did not exist during that period. But when Professor Hayes writes that ".....the Magyar nobles, by conquering neighboring alien peoples—Slavic Croats and Slovaks and Latin Roumanians,—made Hungary less and less homogeneous," one is almost inclined to suspect that he drew upon Dr. Seton-Watson's propaganda literature for his information.

The author devotes an interesting chapter to the religious upheaval which rent asunder the Christian Church. While he endeavors to remain objective, his presentation, nevertheless, has something of a Roman flavor. Theologians of the Orthodox Church no doubt could challenge some of his assertions, as for example, that the ancient patriarchates were "almost wholly honorary." As a matter of fact, these three words harbor the gist of the conflict between Eastern and Western Christianity regarding the primacy of the Pope.

This volume may serve the purpose for which it was produced, but it is far from being an history worthy of the author's prestige and reputation. The book is profusely illustrated, thoroughly indexed, and it is dedicated to Captain Leon Dessez, U. S. Army.

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CAN AMERICA STAY AT HOME, by Frank H. Simonds.

Published by Harper & Brothers, New York, 1932. 361 pages.

A columnist in a New York newspaper, who is well known for his liberal ideas, had this to say in his paper the day after the French Deputies voted not to pay the December 15th installment of the French debt to the United States:

"However, there is one grain of comfort. Even though the situation has come about prematurely, we are faced with a condition and not a theory. It is a condition which should not surprise any man with an ounce of information about foreign affairs. The American public is both startled and angry, but I beg Americans not to vent all their wrath on our European neighbors. Save a little for the liars at home who have been going up and down the land spreading a story which is now shown up in all its falsity."

There will be no excuse in the future for the ignorance mentioned in the foregoing paragraph if every one in America will read Mr. Simonds' new book—"Can America Stay at Home." At this particular moment it is peculiarly appropriate that a publicist of Mr. Simonds' broad experience and wide acquaintanceship with European affairs, and European statesmen, should offer to the American public

such a readable and erudite exposition of the affairs of the United States vis-à-vis Europe. Every thoughtful American should read this volume. It is a masterpiece of clarity.

The author starts out with a brief discussion of the idealism and "missionary spirit" of the people of the United States and of the factors that gave birth to them. He then takes up in detail the policy of Woodrow Wilson, which finally carried the United States into war with Germany, and later how his internationalism made us partly responsible for the present boundary troubles of Europe. However, the American people repudiated Mr. Wilson's European agreements, and the succeeding Presidents, accepting the mandate of the American people as demonstrated in the 1920 election, attempted to preserve complete isolation for the United States. This of course, was a factual impossibility, but nevertheless the fiction was maintained officially, and the "unofficial observer method" was used in an attempt to keep abreast of the realities. Mr. Simonds is rather severe in passing judgment upon the present administration for its methods in "interfering" with European affairs without being willing to assume corresponding responsibilities.

In general, according to the author, the conflict of opinion between the United States and Europe is caused by the almost universal ignorance of the American people concerning European history and present day political conditions. Situated as the United States is, without danger of invasion, and with a long history of freedom from invasion, we simply do not understand the psychology of peoples whose entire history has mainly been one of fighting off the invader. Therefore, our ideas of finance, disarmament and peace, so continually and everlastingly preached to the nations of Europe, together with our consistent refusal to be responsible for any results which might occur if our advice were followed, has resulted in the long record of failures in international conferences. The causes of many of the international situations that exist at the present day are thoroughly discussed.

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THE TINDER BOX OF ASIA, by George E. Sokolosky.

Published by Doubleday, Doran and Company, Inc., 1932. 347 pages.

Many books are being published at this time with China and Japan as their subject. It is not exaggerating to say that a great number of these more or less hastily written books are published for the purpose of influencing sympathy for or against one of the two rival Asiatic Powers. It is therefore refreshing to read at least one book that is not a plea for either side, but on the contrary is so impartial that when finished, the reader lays it down with the mental query—"Which side does the author favor?" Fact after fact is submitted for the reader's consumption, and withal, in so entertaining and fascinating a manner that it is hard to put the book down once one starts reading it. Certainly, at least in the opinion of this reviewer, it is the clearest and most authoritative volume yet published, not only dealing with the causes of the present Sino-Japanese situation in Man-