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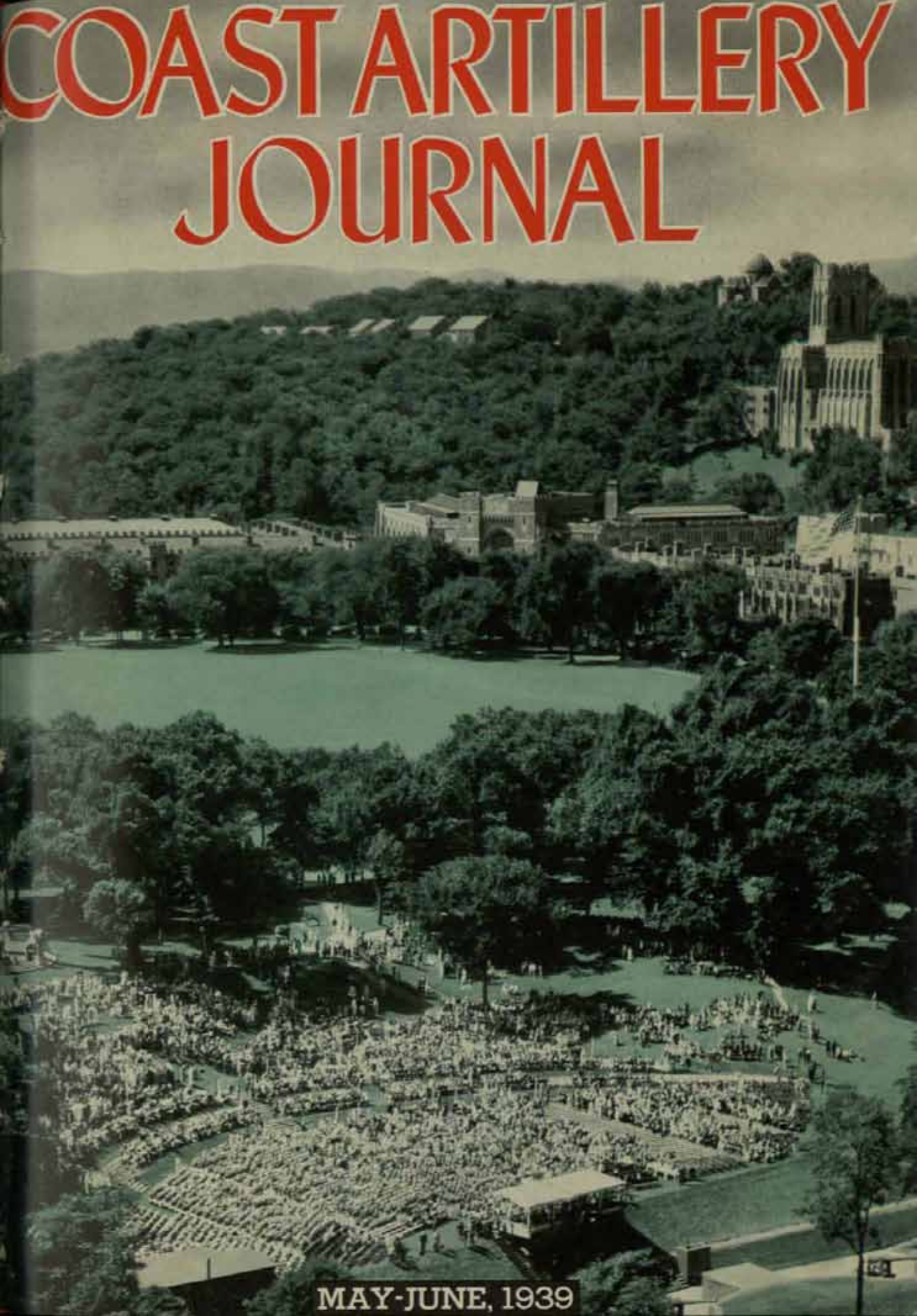

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THE GLORY OF THE SOLDIER

☆

A DISCIPLINE OF CHARACTER IS THE ONLY DISCIPLINE THAT WILL STAND THE STRAIN OF WAR.

☆

"It is military discipline which constitutes the glory of the soldier and the principal force of armies." Thus wrote Carnot in 1811. But the celebrated Marshal Saxe, who had rediscovered cadenced marching—lost since the time of the Romans—and had changed his armies from straggling mobs into orderly forces, had proclaimed fifty years previously that: "All the mystery of military discipline is to be found in the legs and he who thinks otherwise is a fool." Even at this time "discipline" was used with widely different meanings.

An early drill regulations for artillery published in

By
Major Thomas R. Phillips
COAST ARTILLERY CORPS

Illustrated by Hobart Britton

United States in 1797 was entitled: *A System of Discipline of the Artillery of the United States of America, or the Young Artilleryman's Pocket Companion*. Duane's drill regulations for the Infantry, adopted officially by the Adjutant General of the Army, March 19, 1813, was entitled: *Regulations to be Received and Observed for the Discipline of the Infantry*. In spite of its title, this was purely a manual of infantry drill. But Duane remarks in it: "The principle of discipline most prevalent is terror, cruelty and degradation. . . . The soldier is treated as the outcast of the earth, and however different he may be when he enters the ranks, the manner of his treatment too often transforms him into the miserable slave which he is presupposed to be." So Duane, too, used "discipline" in two different senses.

Wellington, in one of his dispatches, wrote: "The fact is, that if discipline means obedience to orders, as well as military instruction, we have but little of it in the army." And here again is a double meaning.

In our present Army Regulations the same confusion of meaning is retained, although an effort is made to assimilate the two senses into one. "Military discipline," it reads, "is that mental attitude and state of training

which render obedience and proper conduct instinctive under all conditions." It is to be doubted whether any amount of training will give birth to an instinct, but that can be skipped as unimportant. The discipline of today has descended from the hoary past of armies when "passive" obedience was *de rigueur*. However, a sentence farther on we find that: "it (discipline) is developed primarily by military drill," thus returning to Saxe's conception that "discipline is to be found in the legs."

"Discipline" derives from disciple. Originally it referred to the instruction imparted to disciples and hence, a particular course of instruction. From this the word evolved to mean "instruction having for its aim to form the pupil to proper conduct or action, or the training of scholars or subordinates to proper or orderly action by instructing or exercising them in the same." At this stage in its evolution the word proper was used to signify "training in the practice of arms and military evolutions" and as such was used by Duane. But soldiers were punished when they broke ranks or got out of step, hence punishment given for infractions of discipline (drill) became known as disciplinary punishments. And likewise, when an organization drilled well, it was said to be well disciplined, that is, obedience was prompt and simultaneous. So finally discipline became associated with obedience and control.

Today Webster defines discipline as "control gained by enforcing obedience or order." But a prominent soldier, in a lecture delivered a few years ago, said: "A man is physically well disciplined when he may be trusted to perform efficiently all the varied duties of his branch in moments of stress *without thought*," presumably by command. A robot, in other words. But an automaton is useless in war today. In the Russian army, in the World War, the peasant, not long released from serfdom was disciplined in the ancient mode. And what was the result? "If the Russian army was found wanting in Eastern Asia," wrote Baron von Freytag-Loringhoven, "this was due above all to the fact that it proved incapable of adapting itself to the conditions of modern war. It afforded no opportunity for the training of the individual soldier in self-reliance in war." The Russians could perform their duties "without thought." They could not perform them without commands; their "discipline" was one cause of disaster.

Since before our Civil War, new conditions of battle had demanded a changed discipline. But military institutions and traditions have an appalling permanence. Changes are always at least a generation behind realities. The high command loses touch with the soldier, with the front line, with the basic element of armies. The second lieutenant of today, when he becomes a general, will make the changes that now are due. But by then a whole new set of conditions will demand, and may not receive, new treatment.

In no respect is this illustrated better than in the history of our own regulations on discipline. Disciplinary regulations first appeared in Army Regulations of 1821. These were copied from the French. The deadly parallel shows their kinship:

U. S. Army Regulations, 1821.	*French Regulations, 1792.*
It is the intention of the Government, that there be established in every regiment or corps, and throughout the army, as one corps, a gradual and universal subordination or authority, which, without loss of force, shall be even, mild and paternal; and which, founded in justice and firmness, shall maintain all subordinates in the strictest observance of duty. It requires that all enlisted soldiers shall be treated with particular kindness and humanity; that punishments, sometimes unavoidable, shall be strictly conformable to martial law; and that all in commission shall conduct, direct, and protect, inferiors of every rank, with the care due to men from whose patriotism, valour, and obedience, they are to expect a part of their own reputation and glory.	It is the intention of the Government, that there be established in all regiments a gradual subordination, which without losing any of its force, shall be mild and paternal, and which, founded on justice and firmness, avoiding all arbitrariness and oppression, shall maintain all subordinates in the observance of duty. It is desired that soldiers shall be treated with the greatest humanity and kindness and that they shall never be wronged; that they shall find kind guides in their superiors; that the punishments that some may merit shall conform to the law, and that the officers shall conduct, direct and protect them with the care due to the men from whose valor and obedience they are to expect a part of their glory.

This paragraph was omitted in the 1835 regulations, but in 1841 it reappears with the following paragraph added:

U. S. Army Regulations, 1841.	*French Regulations, 1792.*
In all that concerns the good of the service, the Government requires that the superior shall always find in the inferior a strict obedience; and that all orders shall be executed with alacrity and good faith; but in prescribing this kind of obedience, it is understood that orders shall not be manifestly against law or reason; and that every superior is strictly enjoined not to injure those under him by abusive or unbecoming language, or by capricious or tyrannical conduct.	In all that concerns the good of the service and public decorum, the Government desires that the superior shall always find in the inferior a passive obedience; and that all orders shall be executed literally and without delay. But in prescribing this kind of obedience, it is understood that all orders shall be conformable to law or founded on reason; and it forbids any superior of whatever grade, to allow himself any abusive language toward his subordinates.

The French regulations of 1792 were slightly rewritten from those of 1788. These had been prescribed by the King to correct abuses in the army that were leading to wholesale deterioration of discipline. They were corrective of the conditions of that time and that country. In the United States they should have had no application. We already had the fine regulations of von Steuben, used at Valley Forge, and afterwards published in 1799, under authority of Congress. Their nature can be judged from the following extract:[1]

INSTRUCTIONS FOR THE CAPTAIN

His first object should be to gain the love of his men by treating them with every possible kindness and humanity, inquiring into their complaints, and when well founded, seeing them redressed. He should know every man of his company, by name and character. He should often visit those who are sick, speak tenderly to them, see that the public provision, whether of medicine or diet, is duly administered, and procure them besides such comforts and conveniences as are in his power. The attachment that arises from this kind of attention to the sick and wounded is almost inconceivable; it will, moreover, be the means of preserving the lives of many valuable men.

It is probable that the high reputation of the French Army under Napoleon led to the slavish copying of their regulations. Drill, too, was adapted from the French. But it is curious that these prescriptions should have been retained for almost a hundred years, with minor revisions, until some additional American material was added in 1915.

In the century and a quarter that had passed since the original regulations had been written, citizen armies had replaced mercenary armies, shoulder-to-shoulder fighting had given way to independent action by the smallest units, and the soldiers themselves had more education and higher ideals than the officers of the old armies. But conceptions of discipline had changed little more than had the regulations. Officers of our war army were as kindly and democratic as the nation, but many thought there was some military magic in a domineering manner, a loud voice, and hours daily of formal drill. Little men, exercising authority for the first time, made discipline an excuse for personal tyranny. It was realized that discipline is the cement that holds armies together, but it was striven for on the model of Frederick the Great, although reforms had commenced in Germany in 1857, in France about 1875. Moreover, our Civil War had given us a model far better than any furnished by Europe.

ALONE UNDER THE EYES OF GOD

The nature of discipline is not unchangeable, although its objective remains always the same—"uniformity in cooperating for the attainment of a common goal." (Ludendorff.) The methods of attaining it must vary with armament, tactics, education and social ideals.

When men fought in ranks, each feeling the touch of his neighbor, with the eyes of the captain on him, discipline consisted in holding ranks. Drill was the means to attain such discipline. Men were drilled to perform the evolutions of battle "without thought." They were drilled for years on end to march in line and to load and fire, in the hope that these actions would still be performed with perfect regularity when under fire. The line advancing like an irresistible machine, "a walking fortress," if it did not falter, was certain to chase the enemy from his position. The ancient discipline, or drill, was perfectly suited to the tactics of the day.

Ranks were three or four deep. Muskets could be fired but once every quarter of a minute to two minutes depending upon the firearm of the time. "Troops that have fired are undone," said Marshal Saxe, "if those opposed to them have reserved fire." Men who had fired and did not have time to reload were lost when the attackers fired their volley at close quarters and closed on them with bayonets under the cover of smoke. Movement had to continue into the face of the enemy volley, hence the importance of solid ranks. So that ranks should not waver, old soldiers were placed as file closers behind, to make the rear more terrifying than the front. From the French term for file closer, *serre gens*, comes our word sergeant.

The Prussian army of Frederick the Great developed the soldier automaton to the highest degree and his successes led to universal imitation of his methods. The American Civil War first showed the futility of drill maneuvers on the battlefields, but European military men, with their usual blindness to facts that conflicted with tradition, explained this away by characterizing it as a war of armed mobs. They thought the Americans lacked the courage to advance in close order. In Europe they still attempted to discipline men in formations adapted for the slow-firing muskets of the past, not realizing that rifles with a rate of fire of six or eight rounds a minute and the new tactics they entailed had made the old discipline useless.

In the Franco-Prussian War of 1870, the great Moltke attempted to keep his armies from massing on the battlefields, to no avail. His generals closed into enormous huddles in spite of orders. Soldiers were mowed down as they advanced in mass formations. They spread out instinctively, while officers belabored them to attempt to keep them massed. Von Schlieffen wrote with bitter sarcasm: "The simple men with narrow minds could not understand that they somehow served King and Country by letting themselves be killed in the second or third line. It surely could not harm Germany if, before being stricken with a soldier's death of honor on the field, they should strike down a few of the hereditary enemies. They did not want to die in vain and rushed forward to form a single line of skirmishers."

The initiative of the subordinate leaders multiplied the strength of the army. To the intelligent, hardy, and even sometimes somewhat reckless initiative of the German subordinate leaders the French had nothing to oppose, in the grand as in the minor operations, but a deliberate inactivity, always waiting for the impulse from above. No well organized army can afford to dispense with the

[1] Ganoe, *History of the United States Army.*

initiative of subordinate leaders, for it is the determining factor in war. So wrote Colonel G. F. R. Henderson of the Franco-Prussian War.

In the World War the greater number of French officers had gone ahead of existing regulations in treatment of their men. Their comprehension of the character and morale of their soldiers was the result of the citizen army and had prepared them for passing from the discipline of peace to that of war. Yet there were some failures that required understanding and patience to overcome.

Ludendorff realized early the need of independent action of small units and German training by 1917 contemplated reinstruction to encourage the initiative of noncommissioned officers. The great offensives of the spring of 1918 were based on infiltration methods by small units. German officers, however, were inclined to continue their traditional attitude toward the men. This resulted, in the latter half of 1918, in extensive agitation against officers, both in the army and at home. To this, partially at least, can be attributed the breakdown in morale when the military decision commenced to go against them. The officers were not close enough to the men to inspire them with their own tenacity.

The acute military students of Germany did not fail to draw true conclusions. In the German army today, all officer candidates serve a year and one half in the ranks, one year as a private and six months or more as a noncommissioned officer. Discipline is as meticulous as ever, but to it is joined a very real comradeship. The private who clicks his heels and snaps into an immobile salute to his captain, may be his host at dinner that evening. In no army in the world today does there exist a finer relationship between officer and man combined with outstanding discipline. The spirit of German regulations, which prescribes "Real comradeship is just as important between officers and men as between the men themselves" is followed.

The Americans had not learned when the war ended; their excessive and needless casualties resulted as much from undue massing on the battlefield as from ignorance of staff and commanders. We can take the evidence of General Charteris, a friendly Briton, who wrote: "A distinguished American staff officer who visited the battleground immediately after the fight brought back word that on this front the American dead lay in long orderly lines, a tribute to the high spirit and splendid courage with which they advanced to certain death." A sacrifice, rather than a tribute, to the god of drill on the battlefield. Anyone with an ear to the ground could discover the undercurrent of dissatisfaction during the last months of the AEF. What its volume and result might have been by spring, no one knows. The War ended before we, too, had to learn the lesson the French and Germans digested.

The old discipline of drill has been useless in battle for a hundred years. Overemphasis on it today is only another evidence of the force of tradition and custom in armies. Tactics requires independent action of the most modest units. Drill, which aims at suppression of individuality, unfits men for independent action. Ludendorff realized this and wrote after the war: "Young men, strong in their free development and rooted in the nation and state, will in most cases be more suitable for the tasks of military service than youths formerly drilled in mass and deprived of personality. These young men are more fitted to perform the necessary deeds independently than are members of drilled youth. If here and there they have more difficulty in mastering technical proficiency, it will not matter. Their spiritual strength will enable them in good time to achieve even better results."

The squad executes its mission on the battlefield alone under the eyes of God. Decentralization is the characteristic of battle today. It demands a corresponding discipline. Independent action of men and small detachments, which is the basis of tactical collaboration, is a technical necessity and can only be met by a form of intellectual discipline. It requires a force of character that no longer is the property only of the higher leaders. It must be cultivated in the modest grades. Unless morally controlled, execution escapes control. A discipline of honor, responsibility, duty, devotion, is the only discipline that meets tactical needs and will stand the strain of war.

Citizen or Serf?

At the same time that dispersion on the battlefield was making a new discipline mandatory to establish control, social changes in democratic countries were producing citizens who could be made to conform to the old discipline with difficulty. Tactics demanded a new and more difficult discipline and so did democracy. Military institutions displayed their well-proved vitality by resisting both tendencies. Today, if independence and education had not supplied young men with natural initiative and responsibility, the army would be forced to develop these qualities, just as they always have developed courage, pride, obedience and self-sacrifice. The tendency remains even today to destroy the foremost virtues of our soldiers by trying to mold them to a pattern of war and society that long since has disappeared.

No longer do noble officers command their peasant followers by divine right. Field Marshal Count Schwerin once declared that Fear and Love were the two instruments by which the soldier must be governed, and then added that unfortunately Fear had to perform the lion's share. Frederick the Great's soldiers were the lowest of his citizens. Large numbers (tall men, especially) had been kidnapped by his recruiting officers. To keep them from deserting, he prescribed in his instructions to his generals, that camps should not be made near woods, since woods made escape easy; that night marches should not be undertaken; on the march through woods, that mounted guards should patrol the flanks of the columns, and so on. Frederick's army was a jail on the march.

"All that can be done with a soldier," he wrote in his Military Testament, "is to give him esprit de corps, i.e. a higher opinion of his own regiment than of all the other troops in the country, and since his officers some-

times have to lead him into the greatest dangers (and he cannot be influenced by a sense of honor) he must be more afraid of his officers than of the dangers to which he is exposed." That was just the argument of Xerxes, Herodotus tells us, but the democracy on the march that was Greece in war, defeated the driven hordes of Persia.

Not many years after the great Frederick's death, the revolutionary mobs of France, fighting under the banner of "Liberty, Equality, Fraternity" defeated the drilled Austrian and German armies. Incredible, but true. True discipline had been developed in the place of formal discipline and patriotism took the place of the cudgel. The lesson was not lost on Germany. While the rest of the world continued to imitate Frederick the Great and Prussian discipline, Scharnhorst first, and then Prince William of Prussia in the 1840's and fifties, carried through reforms that encouraged a high degree of initiative in the officer ranks, at least. But in England the Duke of Wellington was deeply mortified when British soldiers were permitted to have reading rooms and educational instruction. "Such centers," he said, "will eventually only prove themselves to be foci of mutinies."

Discipline has not discarded all the remnants of these traditions. Not infrequently the citizen soldier of today is as well educated as his officers. He has an equal endowment of patriotism, an equal understanding of the cause for which he serves, an equal devotion to duty and country. He may be inferior to the officer only in military knowledge and he seeks to remedy this with an eagerness that needs no driving. And perhaps he has been accustomed to greater independence of thought and action than is permitted to professional army officers.

The citizen of today is not suited to the ancient discipline, and fortunately so, for the ancient discipline is not suited to war. He will resent it and hate it. He will accept it from patriotism, as the worst of the horrors of war. When he realizes its futility, his dislike will turn against the men who enforce it—his officers. Too frequently, he is not analytical enough to distinguish between the system and the helpless products of it.

The young American is disciplined, although not drilled. He has gone to school and arrived there promptly in time for classes five days a week, nine months a year, for eight, twelve, or sixteen years. He has been given study assignments to do at home and does them without a preceptor looking over his shoulder. He has learned leadership and coöperation in group games. He has driven a motor and has learned the discipline of traffic. He comes to the army with the elements of just the kind of discipline the army needs, that is, submission to necessary authority and independent action within its limits. He

"The great Moltke attempted to keep his armies from massing on the battlefield, to no avail. His generals closed into enormous huddles. Soldiers were mowed down as they advanced in mass formations."

obeys willingly and intelligently when he knows the need for obedience.

Obedience is the foundation of discipline, but obedience can no longer be blind. At one time it was literal and formal. It tends to be so in peace. In war, with superiors invisible, with conditions often different from those assumed when orders were issued, the combatant is the sole judge of how best to obey. His formidable duties will only be performed if his own initiative takes control. The back-seat driver cannot be heard in the roar of battle.

General Cordonnier relates in his book, *Obedience in Armies*, an example of literal (or passive, or instinctive) obedience. The advanced elements of the French 3d Division occupied a salient along the south bank of the Aisne in September, 1914. The retreat was still on. The roads were filled with convoys of fleeing peasants, women and children. A German battery in plain sight was firing on the helpless mass. It then shifted its fire and adjusted on the advanced elements of the 3d Division. A battalion of French 75's, occupying the heights to the northeast, continued to remain in surveillance to the north without replying to the German fire, although the German battery was within range. Its commander turned his field glasses on the German battery and limited himself to that. It was not in the sector assigned to him, so he did not take it under fire; he allowed it to massacre his comrades of the 51st Infantry. He was obeying orders without argument or reclamation. Such obedience may do for an army in peace but it is worthless in war. Obedience in war is a means of collaboration and is not an end in itself.

That evening, General Cordonnier was ordered by his corps commander, General Gerard, to withdraw his artillery along certain routes at a specified time and to assemble it at prescribed points. Mist drifted over the field in the dusk. The advanced elements along the Aisne were weak. There was danger of a German advance in the mist and growing darkness and this might cut off the withdrawal of the artillery if it were not pulled out immediately. But the orders had prescribed a later hour for the withdrawal. General Cordonnier ordered all eighty-four guns out at once by all available roads. As he had feared, one of the bridges over the Aisne had not been destroyed completely when it was blown up and the Germans came across on his flank and rear in force. Had he complied with his orders much of his artillery would have been captured.

"Cordonnier," barked General Gerard, the next morning, "when I give orders, I expect them to be executed. I fixed an itinerary, the assembly points for guns, you did something else; I do not permit that." Cordonnier had not obeyed orders literally and in consequence had saved the division artillery and part of the corps artillery from capture. General Gerard, later in the day, recognized the virtue of General Cordonnier's disobedience and praised him for it.

An incident a week later showed that the corps commander was gaining a new conception of obedience. The retreat had been halted. Joffre was starting his counter-offensive. The 3d Division was holding the enemy a half-day's march north of the Marne. Bridgeheads had been prepared north of the Marne so that an offensive return could be launched from there. But Joffre's orders were to hold in place at all costs.

A general staff officer came with a message from the corps commander ordering the 3d Division to withdraw to the Marne. The order explained the dangerous situation of both flanks of the division. Cordonnier thought he could hold and continue to hold. The longer he thought about withdrawing, the madder he got. He started to complain violently to the staff officer, damned General Gerard and all the wooden heads at corps command post. Captain Schweisgut, the staff officer, looked pleased and said: "Give me back the order and act as if you never had received it." General Cordonnier expressed his astonishment. General Gerard had instructed Captain Schweisgut: "I am afraid that Cordonnier will insist on resisting beyond the capacity of his troops. Give him this order which will show him the situation as it is. If after the authorization for withdrawal has been given, after he has been informed of the dangers he runs, he kicks about it, take the order back and bring it to me." General Cordonnier kicked, held, and the next day started in pursuit of the retreating Germans.

This astounding evolution in the corps commander's ideas of obedience took place in only a week of war. But how far he had traveled from the conceptions of obedience and orders in peace! It involved complete recognition of the right of the man on the ground to obey according to the situation with which he was confronted.

As armies have become larger and fronts solid, a curious reversal in the echelons in which independence must be granted has taken place. Formerly, the generals properly were allowed a great degree of independence of action. Now the actions of divisions, corps and armies take place slowly, over days and weeks; the radio, telephone and motor transportation between higher headquarters keeps the superior staffs informed of the larger situation. Orders to large units are based on accurate and timely information. But in squads, platoons and companies, although their action may take place within a mile or two from their superiors, information and orders cannot be sent or received; they have to act independently. The corporal, the sergeant and the lieutenant have to be given greater freedom of action in their spheres than the general in his.

Initiative or Disobedience?

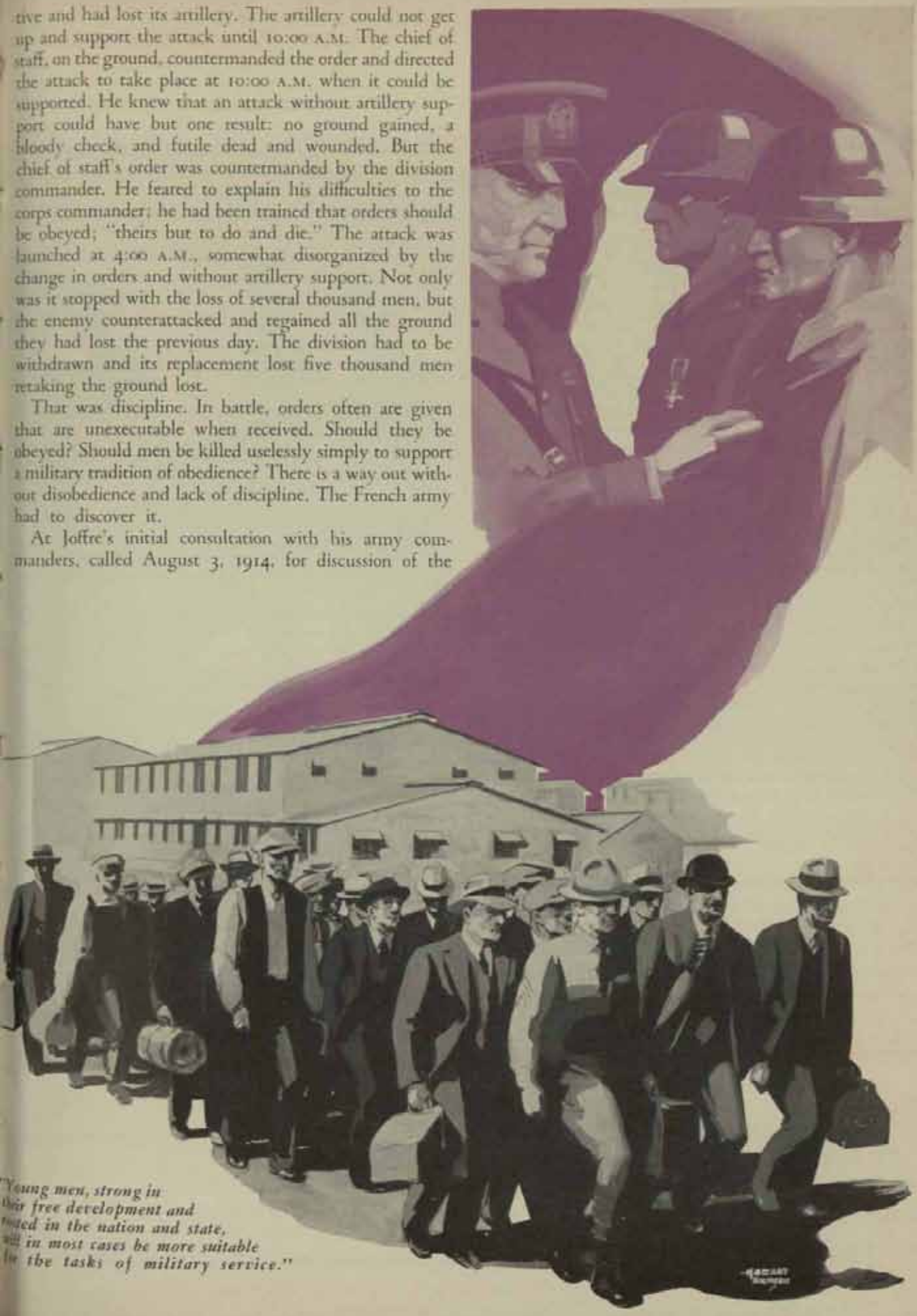
Initiative, like liberty, has limitations. It is essential that initiative does not become disobedience. Orders do not execute themselves nor debate their execution. True initiative consists in the adaptation of the order received to the circumstances of the moment at which it must be executed. In the German army modification of an order that no longer fits the conditions that existed when it was issued, is a duty and is not considered as disobedience. Is that lack of discipline?

A division was ordered to attack at 4:00 A.M. In its assault the previous day, it had gone far beyond its objec-

tive and had lost its artillery. The artillery could not get up and support the attack until 10:00 A.M. The chief of staff, on the ground, countermanded the order and directed the attack to take place at 10:00 A.M. when it could be supported. He knew that an attack without artillery support could have but one result: no ground gained, a bloody check, and futile dead and wounded. But the chief of staff's order was countermanded by the division commander. He feared to explain his difficulties to the corps commander; he had been trained that orders should be obeyed; "theirs but to do and die." The attack was launched at 4:00 A.M., somewhat disorganized by the change in orders and without artillery support. Not only was it stopped with the loss of several thousand men, but the enemy counterattacked and regained all the ground they had lost the previous day. The division had to be withdrawn and its replacement lost five thousand men retaking the ground lost.

That was discipline. In battle, orders often are given that are unexecutable when received. Should they be obeyed? Should men be killed uselessly simply to support a military tradition of obedience? There is a way out without disobedience and lack of discipline. The French army had to discover it.

At Joffre's initial consultation with his army commanders, called August 3, 1914, for discussion of the



"Young men, strong in their free development and rooted in the nation and state, will in most cases be more suitable for the tasks of military service."

French plan of attack, the high commanders anxiously waited for decisive words which were to be pronounced. They heard only banalities. Finally General Dubail asked a question: What should be done in case of such or such an eventuality? Joffre replied: "This plan is your plan, it is not mine." Meaning—you have your orders, execute them. On a later occasion, General Franchet d'Esperey, who knew conditions on the ground, objected to certain orders and feared that they could not be obeyed. Joffre replied that it was d'Esperey's business to issue the orders and the soldiers' to obey them.

Before the Nivelle offensive in April, 1917, the entire army, except the General himself, knew there was little chance of success. They knew of the insufficiency of artillery support and that the plan to form reserves from assaulting units on the field of battle, for exploitation, was only a dream. Nivelle would listen to no objection to his plans, either from his staff or from his army commanders. His great offensive was a bloody and futile disaster and led to mutiny in the French army. This was discipline. Nivelle issued orders and they were obeyed. Result: mutiny—indiscipline complete.

Pétain's first order when he succeeded Nivelle in command of the French armies in May, 1917, was the following:

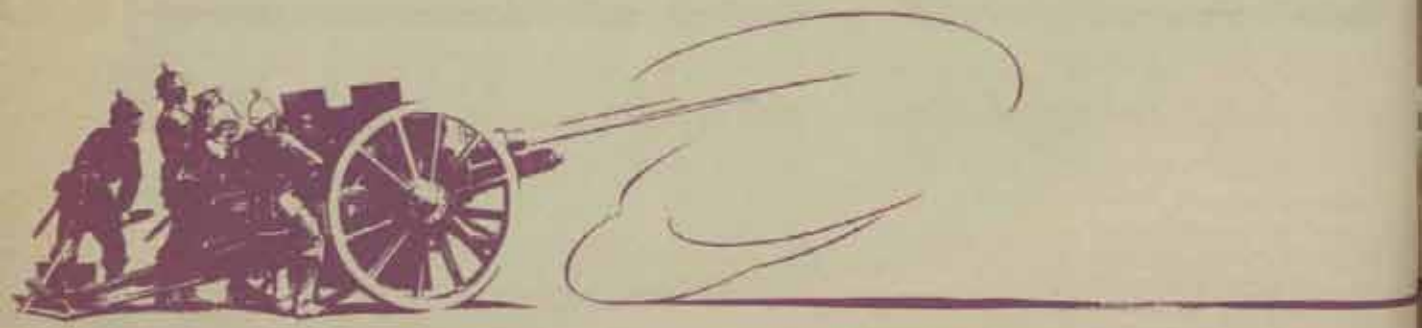
> NOTE RELATIVE TO THE ATTITUDE OF COMMANDERS
>
> Our officers for three years have given the most heroic proofs of courage and nevertheless they hesitate to inform their superiors of the difficulties that confront them from fear of being taxed as of timorous spirit. It is the duty of commanders, by their attitude, to resist this tendency. The superior should give his subordinate a friendly welcome and show his desire to aid him to triumph over the difficulties which stop him, ask for useful information, and even provoke it. The kindly attitude of the commander conforms to the most noble traditions of the French Army. It does not exclude firmness. The professional confidant of the officer is his superior. The superior should justify this confidence which reposes on reciprocal esteem and common devotion to the country.

Here was precisely the opposite of the previous attitude: "You have your orders, obey them." Petain's attitude is practicable with officers. To what extent can it be carried into the ranks? Should every soldier be encouraged to come to his officer and complain of the difficulties he finds in carrying out the order he has received? Obviously not. The solution lies in provoking the reaction of the soldier.

Napoleon kept perfect account of the state of mind of his men, in spite of appearances to the contrary. After the half-victory and fearful butchery of Eylau, when he passed among his troops, in the middle of cries: "Live the Emperor," many soldiers were heard to call: "Long live peace," or "Give us bread and peace." At such times Napoleon rebuked his men, but in actuality he took account of their humor. At other times he walked among their bivouacs at night, sat down with a group and shared their bread and cheese, and learned their state of mind. He could not admit that he was influenced by such considerations, for that would have injured his authority. But he sought these evidences and took them into account, correcting both the morale and getting at the source.

General Debeney relates that in March, 1918, he had received the mission to form the First Army and close the gap the German offensive had driven between the French and British. There were days of desperate fighting. During the night of March 27th, he visited the 12th Division in a village they had just retaken. With the regimental commander he circulated among the groups of men and stopped by a strong light used to care for the wounded, so as to show himself clearly. He was quickly surrounded by a considerable circle. He explained the situation, told the men they would have to hold for two days before reinforcements would arrive. As he spoke he examined their faces and found again the determination of Verdun. He was sure they would hold.

During the second battle of Guise, at the end of October, 1918, the preparation for the attack on the Sambre canal did not go well. The troops complained of incessant bombardment with gas shell. The Army Commander knew that the action of German artillery had diminished greatly, so he went to the front lines and quickly saw that the troops had no confidence in the



success of the attack because the preparatory measures seemed incomplete to them. They were right. A phrase of his instructions had been ambiguous and had been incorrectly interpreted. He rectified the fault and "the enthusiasm of these brave men was restored immediately."

The soldier becomes a first-rate tactician in war. He knows when artillery support is lacking, when he should have aerial support, how much tanks help. The same man,

"Its commander turned his field glasses on the German battery and limited himself to that. It was not in the sector assigned to him, so he did not take it under fire; he allowed it to massacre his comrades."

who without complaint will stay with his machine gun until he is killed to protect the withdrawal of the main force, knowing it to be necessary, will be mutinous if required to risk his life in a poorly planned and unsupported operation. As Liddell Hart remarked so justly: "The mutinies of 1917 were to show that the incapacity of generals and their waste of human lives are the most potent factors in disturbing the spirit of discipline."

August 8, 1918, was declared the "black day of the history of the German Army in this war" by Ludendorff, because of the breakdown of discipline. On that day "whole bodies of our men surrendered to single troopers or isolated squadrons. I became convinced that we were now without that safe foundation for the plans of General Headquarters, on which I had hitherto been able to build." Unfulfilled promises had destroyed the confidence of the German Army. At that time their inferiority of numbers was not greater than allied inferiority had been in March and May. With discipline, they could have continued the war for a long period. Without it, the German armies melted twice as fast as could be accounted for by casualties.

Commissar or Commander?

The commissar system of the Russian Army is an original disciplinary development of recent times. Initially, commissars were installed as co-commanders in the Red Army during the Revolution because the proletariat had no trained military commanders and were forced to depend upon Czarist officers whose loyalty they distrusted. The lack of education of the Russian soldier made political and educational training necessary to give him enthusiasm to fight. This duty devolved upon the commissar. Hence he became an educational and morale officer, independent of the commander, as well as a reporter on the loyalty of the military chief.

The disadvantage of the commissar system lies in divided authority. Discipline and moral leadership, the most important function of command, was taken from the commander's control. The commissar has a separate chain of command, independent of the military hierarchy. The commander must please the commissar as well as his own chief. Divided authority makes coöperation difficult and divided loyalty on the part of the men leads to disunion.

The system was adopted by the Spanish Government army in the Civil War. It must be given credit for maintenance of a morale that survived two and one half years of unparalleled hardship and almost uninterrupted defeat. But it must be charged with the destruction of initiative and authority of Government commanders and with the resulting military incompetence. From the western point of view, it would be more suitable to make the commissar the commander and supply him with a competent military staff.

"At other times he (Napoleon) walked among their bivouacs at night, sat down with a group and shared their bread and cheese, and learned their state of mind."

From the two armies supplied with commissars can be learned the tremendous importance of morale and patriotic training. In western armies it is largely neglected. In the German and Italian armies it is given in the pre-military training. Soldiers, in the democracies, are assumed to come to the army with patriotism and enthusiasm for the cause. Their initial endowment is insufficient. They need further education. To support the discipline of war, they must be given an overmastering faith in their cause that will survive all the hardships and disintegrating influences of modern battle and hostile propaganda. A minor staff officer, called the "morale officer," who supervises athletics and the like, is merely an avoidance of the problem. The maintenance of the discipline of morale is as important as the planning of military operations. It requires the primary attention of the commander. Patriotic and morale training must be organized with as much attention as is devoted to food and munitions. It is the basis of the will to fight.

The Parade of the Wooden Soldiers

"Disciplinary drill" seems to have been left far behind. But it is difficult to find an experienced officer who does not believe in the disciplinary value of drill. Originally devised for battle, it has been retained in armies for elementary disciplinary training. It appears to be the best means yet devised of developing group unity and the expectancy of obedience in the early stages of training. In armies where drill has been made an end in itself, it has defeated its purpose. Too much of it develops either resentment or boredom, or an automatism that destroys initiative.

In the German Army there is little drill after the recruit stage of training. Drill is exceedingly simple. The parade step—the mis-called goose step—of the German Army is a true disciplinary drill. Its patent inappropriateness to battle has prevented giving disciplinary drill in Germany the over-emphasis that has characterized training in the British and American armies. In Germany, the nation that Americans like to think of as regimented and drilled out of all semblance of initiative, the "mechanical heads," as Scharnhorst called them, did not triumph. They did in our democratic army.

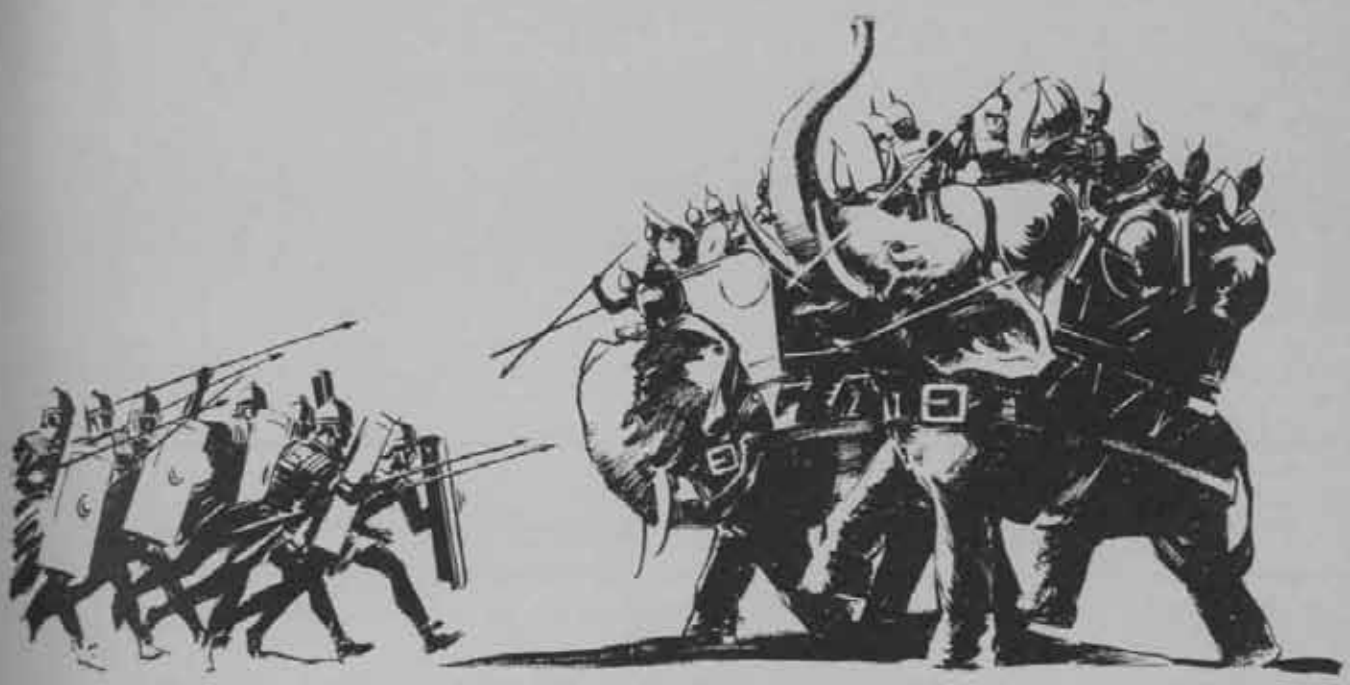
Perhaps a new day has arrived with the recent adoption of simplified drill. Many will miss the clean-cut artificial evolutions of drill. The stubbornness of the "mechanical heads" may yet destroy a reform one hundred years overdue.

* * *

Literal obedience, like formal drill, has no application to discipline in war. It is necessary to cultivate the habit of reasoning about orders received. The tradition that an order shall not be discussed or argued until after it has been obeyed is as absurd in war as battalion parade on the battlefield.

The foundations of discipline are the sentiment of duty that must be fulfilled, cost what it may; the will to sacrifice; the possibility of fulfilling the duty required; and a competent hierarchy of leadership.

"The only lasting discipline is that which comes from free and voluntary acceptance of the obligations of those who have part in collective action." (General McGlachlin.) Discipline is the means of bringing the moral forces into play; to the strength of each is added the force of all. "After inspiration, that which is most beautiful is devotion; after the poet, comes the soldier." It is of voluntary submission, abnegation and sacrifice that discipline is composed and it is these that make it truly the glory of the soldier and the principal force of armies.



HARBOR DEFENSES AND NAVAL STRATEGY

By MAJOR BRYAN L. MILBURN

Coast Artillery Corps

A striking feature of the discussion that has been aroused by the current interest and concern in our problem of national defense is the misconception, or rather lack of conception, even among military men, as to the true rôle of harbor defenses.

Before drawing any conclusions as to what extent harbor defenses are necessary, it is well that we first consider what they are, their powers, limitations, and relationship to our naval and military forces.

What are Harbor Defenses?

Harbor defenses are administrative and tactical commands organized to provide an effective seaward defense of important strategic areas of our coastal frontiers. It is well to bear in mind the distinction between the terms *harbor defense* and *coast defense*. *Coast defense* is the term applied to *operations*, military or naval, in defense of the coast.

In general, the strategic coastal areas which harbor defenses are organized to protect derive their importance from the fact that they, or the installations they contain, are:

(1) Vital to naval operations.

(2) Vital to army operations, in defense of the coast.

(3) Of great importance though not necessarily vital to naval or military operations (such areas would include important industrial, population, or political centers).

Coastal areas may fall into one or more of these categories. It should also be noted that the importance of a harbor or coastal area in the second category will probably depend primarily upon its probable value to the invader. For example, the harbors of Portland, Portsmouth, or even Boston, may not be vital to the Navy, but would nevertheless provide excellent preliminary objectives for an expeditionary force bent upon capturing Narragansett Bay, which *is* vital to the Navy. In other words, the Narragansett Bay area must not only be provided with a seaward defense to prevent *direct* capture but a similar defense of one or more of the other harbors mentioned may become a vital factor in army operations, to prevent the *ultimate* capture of Narragansett Bay.

In considering probable initial objectives of a hostile expeditionary force, it should be borne in mind that one or more good harbors, with adequate facilities to permit landing tanks, artillery, motor transportation, and other impedimenta, are indispensable to an invading force of any consequence.

Each harbor defense consists of one or more forts, normally provided in time of peace with certain permanent means of defense which may include: fixed and mobile seacoast guns of various types and caliber, fixed and mobile searchlights, fixed and mobile antiaircraft artillery, submarine mines, and the necessary installations and equipment required for the control and conduct of fire. The fixed armament and accessories of a harbor defense may be considered as its basic armament about which is grouped such railway, tractor-drawn, and antiaircraft artillery, aviation and other mobile elements as the situation may require.

The *primary* armament of a harbor defense must be so located with respect to the installations or facilities it defends as to prevent damage to them by naval bombardment and in the case of a harbor employed, or likely to be employed, by the fleet, to protect it when within, entering, or debouching from the harbor. Only long-range, large-caliber armament can accomplish such a mission. *Secondary* armament, comprising rapid-fire batteries of various caliber, including any 155-mm. mobile guns available, is normally emplaced so that fire may be brought to bear on fast, lightly armored or unarmed vessels and landing boats and to protect any submarine mines which have been installed. Harbor defense troops normally install and operate the controlled type of mine, which can be planted in suitable locations and exploded when desired. On the other hand, the Navy installs the *contact* type, which is normally installed in channels or areas where friendly vessels do not operate. Both controlled and contact mines can be swept and are of limited value unless covered by gunfire. This fact was conclusively demonstrated in the Russo-Japanese War, the World War, and again during the recent Japanese invasion of China.

Instant readiness for action makes harbor defenses the strongest support of the field forces

Five of the nineteen permanent harbor defenses within the continental United States have been designated as training centers and contain the bulk of troops now assigned to the nineteen harbor defenses. Most of the other harbor defenses are provided with small caretaking detachments. By this arrangement the training of both regular and civilian components is facilitated, the maximum economy is effected, the more important harbor defenses are given a basic strength which may be readily expanded and the armament of the others is maintained in serviceable condition so that manning personnel may be assigned in case of emergency.

Powers and Limitations

The primary target of harbor defense armament is hostile naval craft. Admiral Mahan, the father of American naval strategy, once said that "a ship can no more stand up against a fort costing the same money than the fort could run a race with the ship." The ability of modern harbor defenses to repel a purely naval attack is universally recognized and is based upon the following considerations:

(1) Harbor defense guns have more stable platforms and better facilities for fire control; hence, are inherently more accurate than naval guns.

A RAILWAY BATTERY READY FOR ACTION

Railway guns are important actors in the drama of coast defense of our nation

(2) They have better and more accurate spotting facilities.

(3) They generally have a more abundant ammunition supply. Ships can carry only a limited amount of ammunition.

(4) They, and the ammunition they use, are designated primarily for defense against naval targets. On the other hand, ships and their ammunition are designed primarily for attack of other ships—not *land* targets.

(5) They can normally be reinforced by mobile guns and additional equipment more readily than ships attacking a fort; certainly in the usual case where the ships are removed from their home base.

(6) They, together with their fire control instruments, installations, and ammunition supply, can be given greater concealment and security. While the guns ashore may be subjected to aerial attack, the ship will also encounter this and additional annoyances, including attacks by submarines and other naval craft and mines, which were so effective at the Dardanelles.

The *advantages* of fixed armament in general can be summed up as follows:

(1) It is ready for use on short notice; and this is particularly important in coast defense.

(2) A large and suitable ammunition supply can be provided and adequately protected.

(3) Bomb and gas-proof shelters may be provided for personnel, guns, ammunition, powder, command and fire-control stations.

(4) Communications and fire-control equipment, including extensive baselines required for accurate long-range fire at naval vessels, may be permanently installed.

(5) Gun mounts can be made stable enough to permit accurate long-range fire.

But the installation of fixed armament in harbor defenses has several recognized *disadvantages*.

(1) It is expensive. However, as in other cases the controlling consideration is whether it is necessary to an adequate national defense and such a decision *cannot be postponed until war breaks*. Some of our harbor defenses are now being strengthened and improved in accordance with an approved Five-Year Program.

(2) Once installed, fixed armament is decidedly immobile. Guns can be removed, as they were during the World War, but otherwise fixed armament and its accessory installations are definitely committed to a single locality. Yet many feel that this is a decided advantage, for the harbor or utility requiring protection cannot move out and, as Admiral Mahan indicated, the permanent emplacement of armament prevents its hasty and indiscriminate transfer for political reasons. This does not, however, satisfy the possible contingency of having armament permanently installed in one place when a greater *military* need of it arises in another.

(3) Another disadvantage is that harbor defenses cannot, or at least *do not*, cover all harbors or areas which require protection against naval, even *major*, naval attack. The construction of permanent harbor defenses has not kept pace with changes in the strategic importance of coastal areas, particularly in the south and on the Pacific coast. This, of course, is a question primarily of insufficiency rather than inherent unsuitability and can be solved to some extent by the establishment of temporary harbor defenses consisting of mobile 155-mm. gun and railway units and other available armament. Owing to considerations of economy, permanent harbor defenses are necessarily limited to those harbors and areas of greatest strategic importance.

(4) Modern harbor defenses are intended to "prevent ingress by water, land or air" into the areas they are organized to cover. To accomplish this multiple mission provision has been made to reinforce them to the extent necessary with air, antiaircraft and other mobile units.

Harbor defenses have not always been successful in resisting combined land and naval attacks: Sebastopol (1855), Charleston (1865), Port Arthur (1904), Tsing-

tao (1915) and the harbor defenses at the entrance to the Gulf of Riga (1917), most of which were vital objectives, fell in this manner. In each instance, the harbor defense repelled the purely naval attack only to fall, after varying periods of delay, from the land side. While provision has been made for reinforcing harbor defenses with armament and units capable of providing an all-around defense, their fixed armament is necessarily designed for primary employment against naval targets.

The German seacoast batteries on the Belgian coast accomplished their mission in spite of frequent naval and aerial attacks, but will harbor defenses be able to withstand the aerial attacks of the future? Considerable progress has been made in providing structural and other passive protection for magazines, fire-control and other installations of more modern batteries and provision has been made for increasing the active means of antiaircraft defense in important harbor defenses, but protection of the guns themselves, and their manning details, is a problem which has not been satisfactorily solved in many cases.

It is generally agreed that some sort of structural protection for guns and manning details will be necessary to withstand the aerial attacks that will inevitably accompany major operations against fortified areas. Some of the guns emplaced by the Germans at Heligoland and Tsingtao were mounted in protective turrets. Some guns at Heligoland were mounted in cupolas; others had circular shields to provide overhead protection. Shields such as these may provide the only suitable protection for guns delivering high angle fire such as mortars and antiaircraft guns. A still different type of construction employs a "casemate," built around the gun but not revolving with it, with wall openings reduced to the minimum required for the traverse and service of the piece and the elimination of excessive pressure and gases within the structure.

With these powers and limitations of harbor defenses in mind, let us consider their particular relationship to the Navy and our mobile forces in coast defense.

Relation to the Navy

In any problem of national defense, our immediate interests are those at sea. With a few negligible exceptions, troops cannot penetrate our continental frontiers nor invade our overseas possessions unless they are transported or conducted by hostile fleets. The hostile fleet, then, is initially our most important threat. It is our Navy's principal job to meet and defeat or, at least, contain the hostile fleet. How shall that mission be accomplished? Naval authority is agreed that such a mission requires:

(1) Concentration of forces.
(2) Strategic freedom.
(3) Relief from direct defense of the coast.
(4) Protected bases and lines of communication.

Let us briefly consider each of these requirements. The principle of *mass* applies equally to naval and military warfare. To divide the fleet or to parcel it out into small detachments denies it the driving and fighting power that

BRITISH ANTIAIRCRAFT DEFENSES AT HONGKONG

These fixed AA guns guard the Empire's choicest far-eastern city from air attack.

"SOMEWHERE ON THE BRITISH COAST"

This is a sample of late-type British coast defense armament. The personnel manning this barbette-mount seacoast gun are afforded partial splinter protection by a steel "apron."

alone can bring decisive results. In fact, such strategy invites disaster, for even a smaller force which remains concentrated can defeat separate detachments of a larger fleet in detail. This was demonstrated in the Russo-Japanese War.

But concentration alone does not bring naval victory. It is essential that the fleet first gain and maintain strategic freedom. It must be able to move toward the enemy fleet or to a locality from which it can operate against that fleet. "Mobility," said Schofield, "is the soul of naval warfare." There is only one reason for placing guns on ships and that is to give them mobile fire power. A fleet that has lost its mobility has lost its power. In 1904 Russia specifically assigned one fleet to St. Petersburg, the other to Port Arthur; and there they stayed as "floating fortresses" until too late to perform their proper rôle.

It being agreed that the fleet must concentrate its forces and gain and maintain strategic freedom for successful action, the corollary is that it must be relieved from responsibility for the *direct* defense of the coast. If a fleet is to be parceled out to perform a floating defense of the coast line, it obviously has dissipated its fighting strength and lost its strategic freedom. "Of what use," asked Mahan, "is a fleet, if it is to be thus whittled away?"

Here it is that harbor defenses lend valuable support to the Navy. By furnishing an effective seaward defense for important harbors, they help make it possible for the fleet to concentrate and gain the necessary strategic freedom for offensive action. In transmitting the report of the National Coast Defense Board, President Theodore Roosevelt said, "It was due to the thoroughly defended position of the Japanese forts that the Japanese fleet was free to seek out and watch its proper objective—the Russian fleet—without fear of interruption or recall to guard its home ports." "Strategic freedom," said Admiral Schofield, "is largely a matter of coastal fortifications at home."

But a navy at sea is concerned not alone with relief from coast defense. To operate effectively, the fleet must have defended harbors within range where vessels may anchor, make repairs, and obtain the necessary fuel and supplies. "Bases," said Mahan, "are the indispensable super-structures upon which naval offense is raised."

The influence of advanced bases on the various conferences for limitation of armament has been apparent. Japan successfully protested the further extension of improvement of naval bases in the Far East. It is significant, however, that this agreement did not extend to the strategic position of Great Britain at Singapore which dominates the passage between the Indian Ocean and the China Sea and completes an almost world-wide system of bases which have long been a vital factor in British naval supremacy. Gibraltar in particular has been an important factor in British naval successes in the past, for it permits the fleet to be shifted between the Atlantic and the Mediterranean, in operations along British trade routes to the East. With reference to the American Navy the Panama Canal occupies a similar position. In fact, an essential element of our naval strategy is the ability to concentrate our fleet in either ocean by means of the Canal. The Canal is in effect a *double* base which must be protected. Pearl Harbor, our most important advanced base in the Pacific, if properly protected, denies an enemy a necessary base in operating against the Panama Canal and our western coastal frontiers, and affords our fleet a base 2,000 miles from our coast from which to operate against the enemy fleet.

The rôle of harbor defenses with respect to naval bases is obvious: any base is of limited value unless protected. It is one of the prescribed functions of the Army to defend permanent naval bases, and harbor defenses are an

important element of that defense. The Panama Canal, for example, must be protected by armament of range and caliber sufficient not only to prevent damage to the locks, power plants and elements within and along the canal but to permit the orderly debouchment of naval forces and other friendly vessels at either end of the canal; it provides what we might call a naval bridgehead.

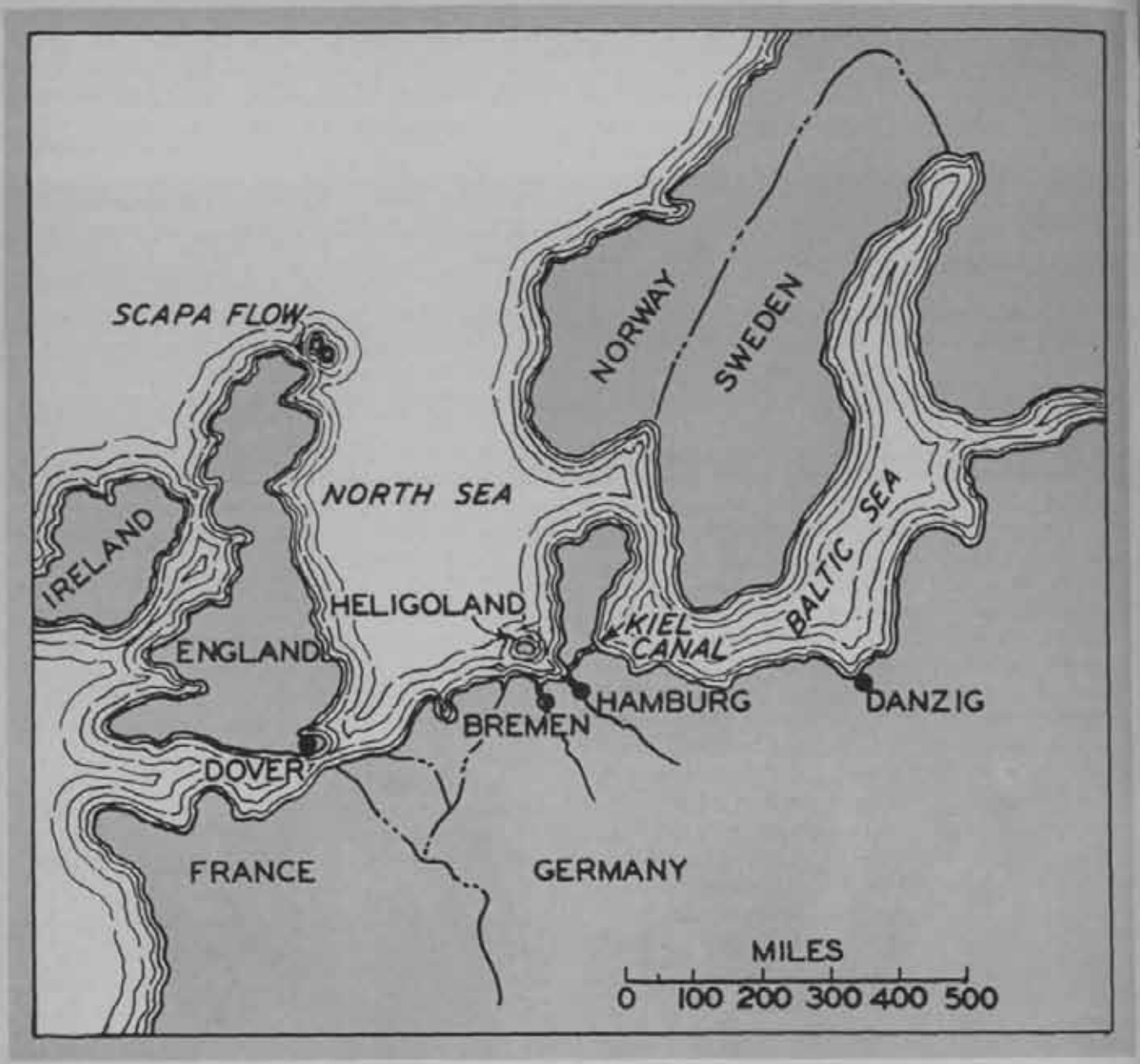
We have assumed that the Navy will take the offensive. But what if the fleet, because inferior strength or other circumstances, is forced into a defensive mission? In such an event, suitable harbors in which the fleet can reorganize and gain time are essential and proper protection of these harbors becomes even more vitally important. However, it should be noted that such protection can easily injure the defense as a whole should it encourage protracted immobility of the fleet. The general principle still holds that a fleet cannot accomplish its mission without offensive action.

The naval strategy employed by both forces during the World War plainly indicates the influence and rôle of harbor defenses in coast defense. (See Map 1). The primary mission of the Grand Fleet, as expressed by its commander, Admiral Jellicoe, was to defeat the German High Seas Fleet. As in our Spanish-American War, strong political pressure was exerted to parcel out the navy into floating coast defenses. Sounder strategy prevailed, however, and the Grand Fleet concentrated and gained the necessary freedom to engage the High Seas Fleet. But the German fleet preferred to remain, at least temporarily, under protection of its harbor defenses—"hid under their protection," as one British naval officer expressed it. An important element of these defenses was the heavily fortified artificial harbor at Heligoland, fifty miles off the coast, which, strangely enough had been ceded to Germany by England in 1890. The Germans retained a small fleet in the Baltic and a concentration of forces through the strongly fortified Kiel Canal was always possible. Admiral von Tirpitz, father of the German Navy, claims he urged the offensive from the beginning but says in his memoirs "having regard for our numerical inferiority, we must strive to give battle within a reasonable distance, at the most, not over 100 knots from Heligoland."

At any rate, the German ships remained near their defenses for the time being and there the Grand Fleet was unwilling to venture. So it did the next best thing. It based on Scapa Flow to prevent the escape of the German fleet through the northern exit of the North Sea. This long distance blockade continued until the German fleet ventured out to the indecisive Battle of Jutland, after which it withdrew to its bases. There it remained, except for unimportant operations, until revolution wrought what the British fleet had been unable to accomplish. The fact that German harbor defense troops were a part of the German Navy and accordingly engulfed in the same undermining influences did not help the situation any.

In the meantime, however, Germany had secured almost decisive results with her submarine campaign. Important factors in that campaign were the advanced bases established on the Belgian Coast. The harbors of Zee-

This 14-inch coast defense gun is one of the links in the chain that guards us from seaward assault.



Map 1: Naval strategy during the World War

brugge and Ostend were connected by canal to Bruges and the latter to Ghent and other points by rail or canal. Parts of submarines and other craft could thus be transported by rail from Germany, assembled and sent to sea. In this manner, Germany was provided a base about three hundred miles nearer the English Channel. To protect this valuable base, as well as the exposed right flank of the German Army near Nieuport, there grew up along the Belgian coast one of the most modern and complete systems of seacoast fortifications that the world has known. That in spite of frequent aerial and naval attacks they fully accomplished the purpose for which they were intended has never been questioned.

And so, harbor defenses placed an indelible impression on the World War naval strategy employed by both Great Britain and Germany.

Relation to Mobile Forces

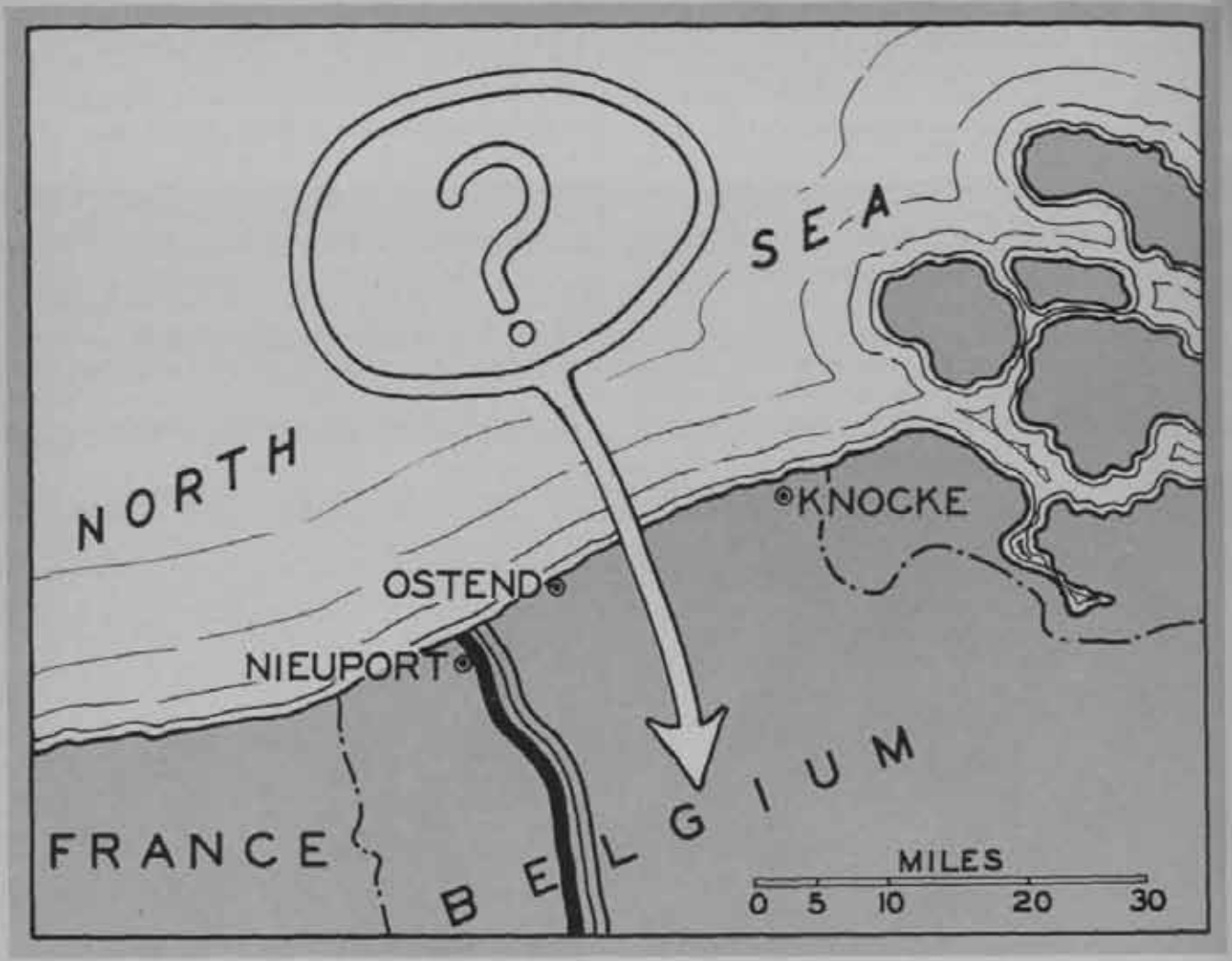
There is a common conception that the *main* strategy of coast defense is built around the idea of permitting—almost inviting—the enemy to invade our coastal areas and then waging offensive war against him. But, the fundamental strategy of coast defense is to defeat the enemy *before* he reaches the coast or at the water's edge. The counter-offensive is the last but not the fondest hope we have in coast defense. True strategy does not mean men held back as much as it means ships, aircraft, obstacles and fire power pushed forward. The best and safest security against invasion is a fleet strong enough and mobile enough to gain control of the sea. Unless our fleet and its aviation is defeated or contained in distant waters, invasion is out of the question. If the enemy overcomes the fleet, he must deal with any naval *local* defense forces, in-

cluding submarines and mines, and a land based air force. These successive obstacles overcome or out of the picture, the invader is now faced with the extreme difficulty of establishing himself ashore. That picture—the *entire* picture—staring a possible invader in the face, is the strongest coast defense we have and it is and must be the basis of our national strategy.

But let us suppose that successive obstacles at sea are overcome and that the Army's task of preventing invasion is at hand. While definite steps have been taken to insure the prompt concentration and employment of our military strength, the fact remains that only limited field forces will be available on the outbreak of war. This condition demands that strategically important points on our coastal frontiers be secured from direct attack and that any frontier defense as a whole must gain the maximum time for the mobilization of our full military strength with a minimum allotment of troops.

Permanent harbor defenses are a direct application of the principle of Economy of Force. They furnish a type of defense which is strong in the essential elements of position, obstacles and fire power. Thus they require only a minimum allotment of forces, as do any properly organized strong points in other defensive operations. They have been called "the policemen at the main gates" but this analogy should be amplified to include the suggestion that only if these policemen have the proper guns and equipment can they hold the gates for the necessary time.

Map 2: The San Francisco Bay strategic area



Map 3: Situation on Belgian coast during the World War

while a larger number of policemen not so armed and equipped would be ineffective.

Could any number of troops, lacking proper fire power and equipment provide a seaward defense of the whole Chesapeake Bay area, which includes Hampton Roads and important naval, military, or commercial facilities at Norfolk, Newport News, Portsmouth, Langley Field, Washington, and Baltimore? And yet the Harbor Defenses of Chesapeake Bay provides such a defense from a single area and with a force that is but a fraction of our military strength. The same holds true for other strategically located harbor defenses.

The forces employed so effectively in German harbor defenses during the World War certainly did not seriously drain her manpower. In spite of Russian mistakes and poor leadership, the Japanese at all times employed more forces at Port Arthur, and for five months preceding its surrender the defenses diverted four of the Japanese line divisions from field operations.

But it is in their instant readiness for action that permanent harbor defenses lend their strongest support to the field forces in coast defense. By such immediate readiness for action, harbor defenses prevent the direct seizure of important harbors and compel the enemy to resort to difficult landing operations elsewhere and to time-consuming processes of reaching the objective by circuitous routes ashore.

Assume, for example, that the harbor defenses of San Francisco furnish an effective seaward defense for that harbor. An invader, in order to take this important objective must establish a large beachhead, say, at Monterey Bay or farther south, and must then fight his way northward over difficult terrain. (See Map 2). If our mobile forces, including those establishing temporary harbor defenses, are unable to prevent the enemy from gaining a foothold ashore, they will at least have time to intervene between the beachhead and the objective.

Had not Tsingtao, the principal objective, been strongly held by harbor defenses, the Allied troops in 1915 would certainly not have landed at Hangkow, 100 miles away, and permitted 5,000 German troops to hold up a force of 30,000 for three months. While the fatal delay at the Dardanelles which ensued between the naval attack on the 18th of March and the first landings on the 25th of April, 1915, can be charged largely to faulty preparation, the fact remains that the antequated defenses guarding

the direct approach to Constantinople made the difficult landing operations necessary and afforded the Turkish field forces the time and opportunity for a successful defense. In fact, General von Saunders, hailed as the savior of Turkey, did not arrive on the scene until after the initial naval attacks had been thrown back.

But let us return to the scene of major operations in the World War for examples of the manner in which harbor defenses fit into the scheme of a nation's coast defense as a whole. The Schlieffen plan was a brilliant conception, but why did not the Germans make a *real* envelopment —striking Paris from the sea, or at least cutting the Allied line of communications across the Channel? British seapower, of course, is the answer. But consider now the Allies. Why did they waste time and manpower in a stabilized situation where decisive results appeared hopeless? The German north flank rested near Nieuport, exposed to a sea which the Allies controlled. (See Map 3). Since a protected area from which to launch a flank attack had already been secured, why not strike German bases and lines of communication directly from the sea? A plan to this very end was proposed in 1915 and discussed at length by the Allies. A still more elaborate plan, referred to as the Great Landing, was proposed and discussed in 1917. Neither plan was translated into action. Bad weather and lack of troops were mentioned as prohibitive features, but the strong German defenses on the Belgian coast were really the important consideration. "It is interesting to note," says Admiral Bacon, writing of the 1915 plan, "how the installation of a single battery of 12-inch guns at Knoche, fifteen miles from the proposed plan of landing (Ostend) changed the whole aspect of the operation."

But there was a possibility of a still wider envelopment. President Wilson asked Admiral Sims, American naval representative, why the Allies did not invade the German homeland direct from the sea and thus bring the war to a quick and decisive termination. Admiral Sims replied, "A sea attack alone upon German forts could not succeed against the concealed guns of modern defenses."

It was specifically provided in the Treaty of Versailles that Heligoland be dismantled, a sufficient tribute to its strategic importance—as indeed also is the fact that it is being rebuilt. In so far as known it was not necessary for Heligoland to fire a single shot at hostile ships.

This instance of Heligoland being so effective without the necessity of becoming actively engaged suggests the similar rôle performed by Fort Monroe during the Civil War. As so well expressed by Major General Embick in an article in the COAST ARTILLERY JOURNAL several years ago, "here was a Federal outpost thrust well forward in the heart of the Confederacy, held by a small force at no time a serious drain on the strength of the Federal armies, which closed to the Confederacy throughout the war the entrance to Hampton Roads and the James River; made it possible for the Federal government to maintain complete control of the invaluable communications of the Chesapeake; afforded an advanced base for joint expeditions against the Carolina coast and for operations of the army of the Potomac against the capital of the Confederacy; and yet Monroe was not attacked, the Confederates deeming it too strong. *These momentous results were a consequence of its mere existence.*"

Such instances as these reaffirm Admiral Mahan's statement that "coastal fortifications earn fully, in the battles they may never fight, the cost of their construction and maintenance."

SUMMARY

In any problem of national defense, our first concern is the hostile fleet. Our Navy's principal mission is to defeat or contain that fleet. To do so, it must concentrate and gain and maintain strategic freedom. Neither can be accomplished unless the fleet is relieved from responsibility for the direct defense of the coast. Any operations of a fleet are also limited by its bases. Harbor defenses, by furnishing an effective seaward defense of important harbors and bases, furnish essential support in each of these respects.

The best coast defense we have is an invader's realization of the many difficulties that beset an overseas expedition—resistance at sea, in the air and along the coast. If this picture fails to deter a prospective invader, harbor defenses will secure important bases against direct attack and compel him to resort to difficult and time-consuming operations ashore. Harbor defenses thus hold where holding is important. They thereby release other forces—naval and military—for a test of strength at sea, in the air, or ashore.

It is reasonable to conclude with Admiral Schofield, who said: "Ordinarily we think of coastal fortifications as defending positions and of their effects as limited by the range of their guns. Their effect on national strategy is of far greater importance than this conception of their function would indicate."

☆ ☆ ☆

TAKE IT AWAY

By

Captain Francis S. Drath

Military Intelligence Reserve

The technique of dealing with the press has been worked out in such fine detail that hardly any military organization is without its press officer, no matter how amateurish he may be. Since newspapers usually coöperate willingly, the press officer always manages to get something into print. Even a bare schedule of post activities or a roster of prominent persons attending some function ordinarily results in newspaper publicity. But getting on the air is another story.

The radio usually finds a publicity officer as awkward as a recruit at his first inspection. If he is at all alert, he may manage to get the post or organization he represents some mention on a news broadcast—just as he gets an item into the paper. But that is not a complete use of the radio, as he well knows, and he will then want to do a better job of radio publicity. Here the regulations are of little help to him, for the instructions for a camp intelligence officer in one of the Army Extension Courses say, in part, ". . . radio facilities of the area will all be of use to him if he knows how and when to use these agenies. . . ."

True enough! But how?

Yet for those few who know how to work with it, radio is no more formidable than the press. Station managers are as anxious to do their part as newspaper editors, but they require something different from a publicity handout or a tip-off. The spot-news coverage newspapers relish gets only scant attention from the radio; a brief bulletin on a newscast is the best that can be hoped for. A publicity officer merely wastes his time if he calls up the local station to report that the boys are doing some sensational firing out on the range and demands coverage. Rifle fire doesn't make good program material, except perhaps on gang-busting skits, and the radio people cannot drag broadcasting apparatus out to the target range on a moment's notice. Moreover, the hour the boys are doing their shooting may have been contracted for by a paying program.

Radio sells time just as newspapers sell advertising space. The schedules are arranged in advance. In order to get time for Army publicity, it is necessary to arrange—perhaps a considerable time in advance—for a military program. Therefore a public relations officer who is going to put the Army on the air is a man who is going to start early. And he is going to deliver more or less definitely *scheduled* events.

He must also realize that commercial radio in general doesn't know much about the Army. A member of a radio-station staff knows what can be broadcast; but unless he happens to be a Guardsman or a Reserve officer, he won't know just what the Army does that might be suitable material for a broadcast. The soldier knows what the Army has and does but doesn't know what part of it can be put on the air. That puts it up to the Army, through a "radio officer"—who may also handle press relations—to bring the Army and commercial radio together.

When the radio officer sees a newsworthy or entertaining event coming up he should let the radio station know about it. He should talk it over with the manager; try to interest him in it. And he should be sure to do this far enough ahead of time so that the station manager doesn't schedule every period of the day on which the event is to take place. With such notice, the station will at least mention the event on a news broadcast and perhaps a program can be arranged.

In the case of encampments, maneuvers, and other special activities, the radio officer who appears at the local station manager's office a month or more in advance of the event stands a fair chance of getting some time on the air.

A program offered in complete form—ready for production—is easier to sell than an unadorned idea, with production left to the station. The radio officer can ex-

ARMY!

pect coöperation from the management and much help, but the job is a big one. A daily, or even a weekly, program is a large undertaking.

Not only must a program be planned far in advance; there must also be a substitute ready for every detail in any program. This means that the officer in charge of a program must be prepared for any emergency. A station can fill in time on short notice, but it does not like to do so. When it schedules a broadcast from Camp Blank it naturally likes to have a broadcast from Camp Blank.

A radio officer can follow one of two general courses of action, or he can follow a course that comprises elements of both. He can (1) find and suggest subjects for coverage to the local station or stations; or (2) he can prepare complete programs, possibly a series of them.

The first course of action is fairly easy and simple. From his own experience as a listener the radio officer knows some of the qualities needed to make a broadcast "broadcastable." Band music, of course, is the old standby. Ceremonies can be put across with the help of good narration, for they are in themselves colorful. Interviews also have a well-defined place. But best of all is the program in which the Army does something.

Instead of bringing the station manager a bald idea, if you are the radio officer, elaborate on it. Do not merely suggest a program to deal with gas masks and chemical warfare. Work out a skit, say an air raid plus sound effects—chemical bombs dropping while gas-mask drill goes on in the background. A broadcast dealing with this subject at the 1938 Nebraska National Guard camp featured a soldier talking to the audience in the normal fashion and then donning a gas mask and speaking through it. The horror element was not stressed. It was a businesslike explanation and made an effective program.

A program featuring infantry weapons should not be confined, for example, to a simple description of the 37-mm. gun. On the contrary, a problem should be worked out. Tell what the gun crew sees in the foreground, depict the approach of a tank, and have the crew run through the process of firing a problem. A tank program should be replete with rumblings, with the tank crew telling what it sees ahead, and might well include the drama of a gun jammed at a crucial moment.

Routine activities—as well as special events—at every Army post offer opportunities for series of programs. Such a series could cover doings all the way from the mess hall to guardhouse and from rifle range to parade ground.

All this takes imagination. But a little originality combined with full knowledge of the Army should make for interesting and informative radio programs.

In any case, a radio officer must make early contact with the local radio-station manager to undertake the most important step—selling the idea. If the radio officer has an attractive list of suggested programs, and if he can convince the station manager that the event will be of wide general interest, he won't find the selling very difficult.

If there is likelihood of other stations having an interest in the program, a group presentation may be arranged. It is possible that arrangements can be made to originate the program on the local station and to rebroadcast from others. For this chain stations will use their own facilities. A program might even be produced and broadcast over Army short-wave for rebroadcast by radio stations within its range, but here Federal Communications Commission approval is necessary.

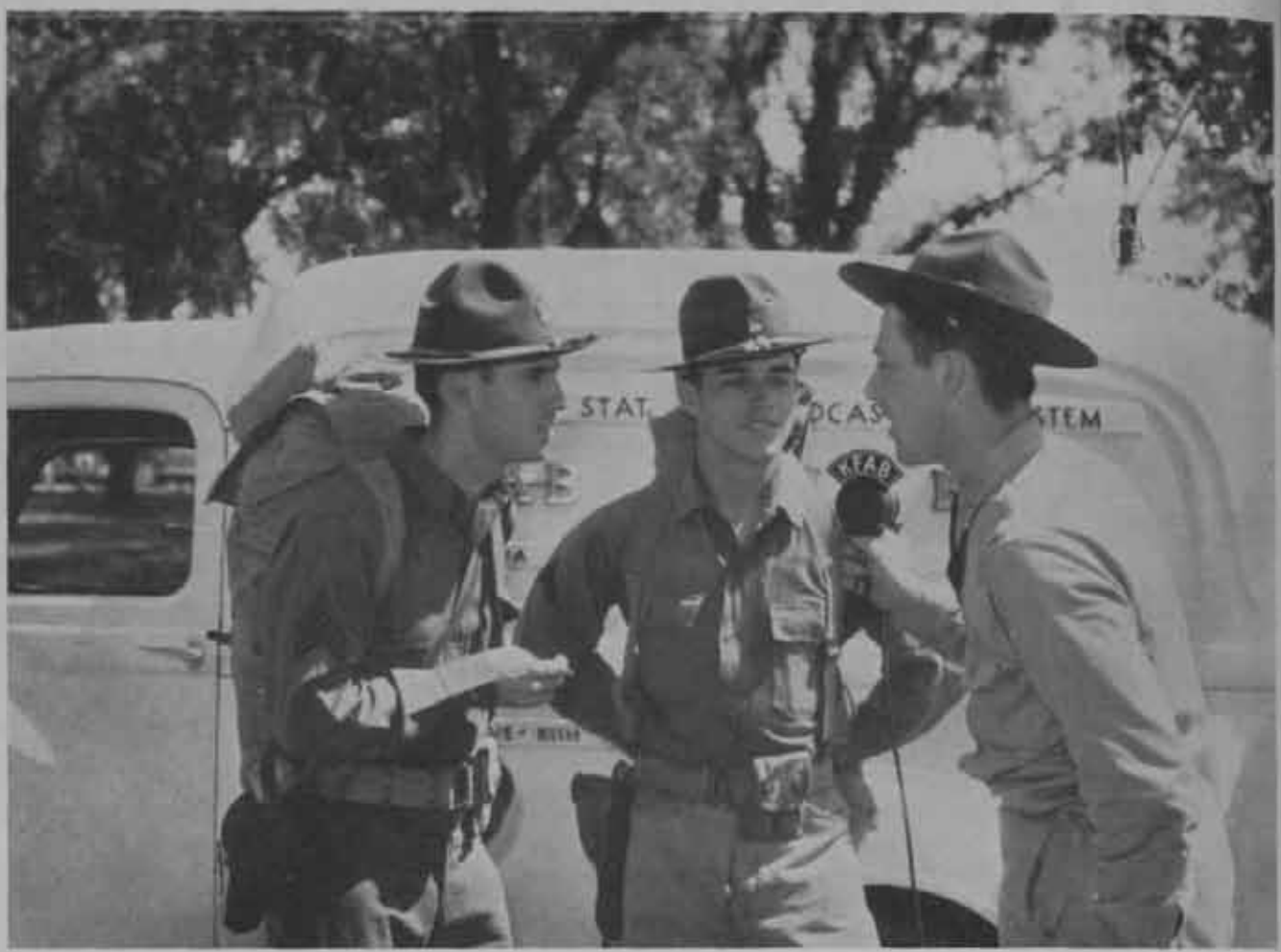
The radio officer, once he has landed some time on the air, may work up his program in great detail and have every angle covered. But when he actually gets on the air he may find everything going wrong—in fact things go wrong far more often than they keep to schedule. Therefore the announcer must be prepared to "ad lib." Anyone subject to "mike fright" must be kept off an assignment of this sort. The job requires an officer with an agile tongue and complete understanding of all that is going on about him. He must never be caught napping after a program has been launched. Programs of the man-on-the-street type may be used and in these the program director must be able to ask intelligent questions and have them ready to spring as opportunity offers.

Throughout all radio word-pictures there must be movement and a touch of drama. For instance, you cannot just say that "the troops are moving out." Describe the movement, give it color, make a story of it. Give a word-picture of the whole panorama and explain how the present scene fits in.

It is especially essential that the narrator take for granted that his listeners know nothing much about the Army. Therefore technical terms are definitely out, except for a few generally accepted ones. This is not such a handicap as it might seem, for we are trying to acquaint the public with the Army.

The radio publicist gets into trouble by airing his private views or grinding an axe—not even an Army axe. A news broadcast is not the proper place for such activities. What listeners want is a straightforward account of what is going on, not a patriotic pep talk with three cheers for the Army, Navy, and Marines. A radio officer must not expect to get fifteen minutes of undiluted praise of the Army into every fifteen minutes of broadcast time. His material must have real news or entertainment value. The advertiser who devotes his entire time to boosting his product doesn't have any listeners. The Army is in the same position. Moreover, station managers

THE SOLDIER AT THE MICROPHONE



Man-on-the-street type interview with troops arriving at summer encampment of the Nebraska National Guard

will not carry a program of this sort for the Army. They might, on the other hand, carry the advertising panegyric because it is paid for.

There is no time of the day or night when you can plant an unattended microphone just anywhere in an Army post and expect to pick up an interesting program. The only possible exception is the bandstand during a concert. This means, of course, that the microphone needs the services of a director-announcer to take care of stage and explanation. With proper staging, Army programs will compare favorably with many other air features.

The essential techniques and some of the problems involved in arranging for radio publicity are well illustrated by the successful experiments conducted in connection with the 1937 Fourth Army Maneuvers and the 1938 Nebraska National Guard encampment at Camp Ashland. The second of these more closely parallels the situation with which post publicity officers have to deal. It also confirmed the findings of the first, more general experiment.

The 1938 Nebraska National Guard encampment went on the air with a series of thirteen programs of fifteen minutes each and a concluding program of one-half hour.

Coverage was so complete that the broadcasts were available to every radio listener in the state. Not all of the nine Nebraska stations could carry all the programs, but every radio station in the state, with one exception, did carry at least four. The station not participating was bound by a policy which forbade carrying a program originating through a competitor's facilities, and was virtually forced to prepare one broadcast of its own originating at the camp. Competition between radio stations is just as keen as between newspapers—they cannot afford to ignore live program material.

Thus every station in Nebraska carried at least one program dealing with National Guard camp activities. This was the first time that any even got such complete coverage in that state—even the Governor's Day ceremonies usually get no more than a special program on one station. The Guard program, in fact, gave many Nebraskans their first radio contact with the military.

After it had been decided to offer a program, the proposal was submitted to all radio stations in the state. A 10,000-watt Lincoln station was prevailed upon to act as the key or originating station with permission to rebroadcast the program. Periods open on the originating station's schedule were listed and other station managers were requested to indicate time preferences. From those preferences the periods of broadcast were chosen.

A brief résumé of the programs went out so that station

managers could choose those they preferred if they were unwilling to carry all of them. The training schedule for the National Guard encampment furnished the basis of the program. It was mimeographed and distributed in this form:

BROADCASTS FROM NATIONAL GUARD CAMP
AUGUST 8-21, 1938

Monday, August 8

11:00-11:15 AM

Description of troops' arrival; Man-on-street type interview in various companies as men pitch camp.

Tuesday, August 9

11:00-11:15 AM

Interview with quartermaster and supply officers, originating from quartermaster office. It is always of interest to civilians to hear how many miles of cookies troops will eat, and so on.

Wednesday, August 10

11:00-11:15 AM

Interview with medical officers and description of field hospital. General public always finds sanitation and disease-prevention interesting.

Thursday, August 11

11:00-11:15 AM

Interview with howitzer officers and explanation of howitzer company's duties. Few people know much about the howitzer and its place in modern war.

Friday, August 12

11:00-11:15 AM

Description of gas and chemical warfare demonstration. Gas bombs and grenades will be exploded and troops will run through the gas. For demonstration, tear gas is used. This should be interesting.

Saturday, August 13

8:00-8:15 AM

All the infantry troops in a full-field inspection, and then parade following the inspection. This should be instructive and interesting.

Sunday, August 14

2:30-3:00 PM

Band concert by 110th Medical Regiment band. This program will include only military music.

Monday, August 15

5:30-5:45 PM

On-the-spot description of a formal guard mount. Mounting the guard is one of the most colorful of military ceremonies.

Tuesday, August 16

11:00-11:15 AM

All infantry units in field exercises. Description of extended order and combat principles. Impressive.

Wednesday, August 17

11:00-11:15 AM

On this day troops march at dawn on a two-day maneuver. They will be designated as the Red Army and the Blue Army. One defends a position near the State Fisheries, the other attacks. This broadcast will be a description of the actual attack as it takes place from an advanced position.

Thursday, August 18

11:00 AM

This will be a fifteen-minute remote broadcast from a spot where the troops march by on their return to camp after the maneuver is over. Should be very colorful.

Friday, August 19

8:00-8:15 AM

Infantry troops in riot-duty exercises. Description of the movements with backgrounds of actual instruction and comments by instructors and men.

Saturday, August 20

8:00-8:15 AM

The infantry regiment holding battalion inspections. Inspections are always interesting.

Sunday, August 21

2:00-2:30 PM

A description of the Governor's Day ceremonies. This is Army *Show* Day. Should be immensely colorful.

The "cue" sheet is important for the coördination of programs, for no radio station wants to publicize another. Station XYZ does not care to broadcast a program which, following the opening bugle call and the theme music, begins: "Station BUZZ present an official program of the Nebraska National Guard. . . ." The cue sheet is the device that gives the local outlets a share of credit. The cue sheet used last summer follows:

BUGLE CALL AND MUSIC WILL ORIGINATE THROUGH *(key station)*

IMPORTANT:

CUE SHEET:

NEBRASKA NATIONAL GUARD PROGRAMS

AUGUST 8-21, inclusive

OPEN ON ZERO AS SCHEDULE: (EXAMPLE: 11:00:00) *WITH*

BIZ: BUGLE "FIRST CALL"

MUSIC: "STARS AND STRIPES FOREVER," FADE AFTER TEN SECONDS FOR

LOCAL ANNOUNCER: "(Local station) presents an official program of the Nebraska National Guard originating at the Guard camp near Ashland, Nebraska, and coming to you through the facilities of stations *(key station)* and *(local station)*."

MUSIC: UP AFTER TWENTY SECONDS FROM FADE: CONTINUE FULL FOR TEN SECONDS FADE GUARD CAMP ANNOUNCER: INTO SHOW

CLOSING CUE:

GUARD CAMP ANNOUNCER: "This program, authorized by Adjutant General H. J. Paul, is an official presentation of the Nebraska National Guard and originated in the National Guard Camp at Ashland, through the facilities of *(key station)* and affiliated Nebraska stations."

LOCAL ANNOUNCER: "This is station ..... at ..... Nebraska, an official outlet for Nebraska National Guard programs, by command of Adjutant General Paul."

(Note) GUARD CAMP ANNOUNCER'S CLOSING CUE WILL COME 14 minutes 30 seconds from first note of bugle call on 15-minute shows—29 minutes, 30 seconds from first note of bugle on half-hour shows. In other words, your local announcer will have 30 seconds for local identification.

As the cue sheet indicates, a fadeout comes after ten seconds of theme music. This permits the local announcer to name his own station in the opening announcement. After twenty seconds the music resumes and the show takes up from camp as broadcast through the originating station and rebroadcast through the local station.

The closing cue signals the end of the program and the local announcer takes over for his local "plug" or takes over permanently if the closing music is to be omitted.

Only two of these Nebraska broadcasts failed to go off as scheduled. The two-day maneuver was called off because of bad weather, and it was necessary to substitute for these periods.

The Nebraska National Guard broadcasts were, in general, favorably received by the public. Studio heads without exception also approved of them, and the 400 pieces of fan mail received echoed the managerical applause. The nature of the programs had much to do with this favorable reception. For one thing, no program savored of propaganda; all were held to straight reporting. Throughout the series the commentator confined himself to verbal reporting on the scenes covered.

In sum, the Army must have "radio officers" to plan usable programs, get radio time, and work closely with the stations that put them on. The Army's radio programs must be dramatic; they must entertain; they must avoid propaganda. The Nebraska National Guard programs have pointed the way. The Army is missing a bet if it keeps off the air.

The German Army utilizes heavy machine guns on dual mounts in defense against low-flying attack planes.

The Sky Target

By LIEUTENANT WALLACE M. NELSON,
U. S. Marine Corps
and
LIEUTENANT EDWIN P. PENNEBAKER
U. S. Marine Corps (Aviation)

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

The "sky target" is a moving imaginary point in the sky positioned in the elements of azimuth, altitude, range, speed, and direction, by an airplane in another portion of the sky. The action of tracking the plane with the director causes the gun to fire at the offset target. As the plane is tracked recording instruments make records of the relation of the center of burst to the position of the sky target. The problem of determining hits remains essentially the same.

The sky target is not a substitute for the sleeve target but gives a means for experimental firing not feasible at present. This includes fire at higher speed targets, incoming gliding targets, and certain maneuvering targets. The sky target can also be adapted to supplant the sleeve target entirely.

In brief, the operation of the sky target consists of tracking the actual plane and firing in another portion of the sky. The plane thus becomes a free target without safety restrictions—*it is a wartime target.*[1]

[1]The November-December, 1938, COAST ARTILLERY JOURNAL carried an excellent article, "Something to Shoot At," by Major S. L. McCroskey, C.A.C. The author clearly stated the deficiencies of the sleeve target and the reasons why something better is desirable. The sky target has not been directly compared to the radio controlled target since the advantages and disadvantages of each in relation to the other are quite obvious. It is believed that either—or both—methods would prove very helpful.

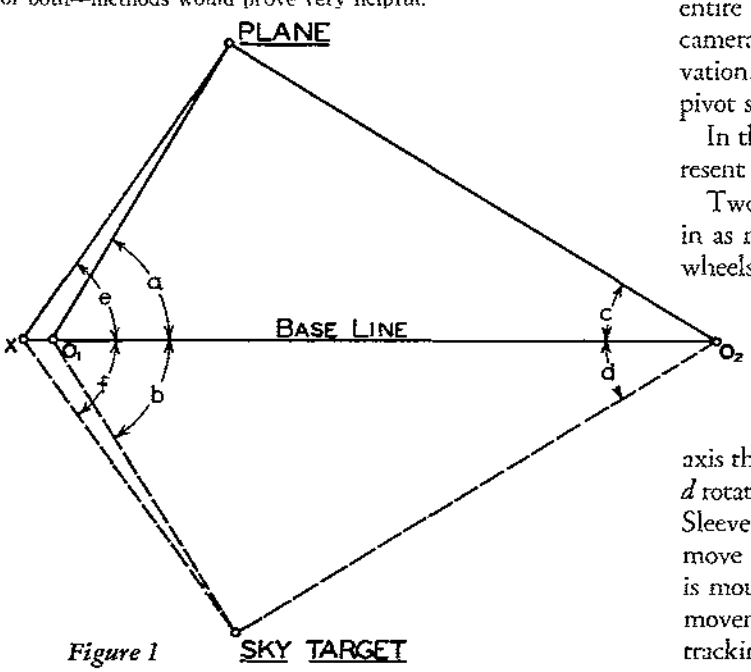


Figure 1

The theory of firing and recording the fire in another portion of the sky is quite simple. Referring to Figure 1, o1 and o2 represent the positions of the recording theodolites; X represents the position of the guns. o1 and X, of course, are ordinarily very close together.

All instruments are oriented along the baseline. Then as the plane is tracked by the recording theodolite let us assume that a device has been introduced which causes the movement of the tracking telescope from the baseline toward the plane to produce an equal and opposite movement of the camera lens, thus making angle *a* equal angle *b*, and angle *c* equal angle *d*. Thus we actually take a picture of the sky on the opposite side of the baseline and at an equal distance from it.

By causing the azimuth bugs of the guns to move opposite to their present motion by an equal amount (either mechanically or electrically), we cause the guns to shoot toward the recorded point in the sky, since angle *e* will equal angle *f*.

It is possible to track the plane quite accurately and for all practical purposes the sky target can be assumed to be in the center of the camera film. The bursts then are referred to the sky target for determination of whether they are hits.

To produce this result two devices must be provided: first, one that will cause the tracking scope and the camera lens of the recording theodolite to move equal amounts in opposite directions from the baseline as the plane is tracked; and second, a device that will cause an equal and opposite movement of the azimuth bug on the guns.

The development of two such devices should not be insuperably difficult. The value of the sky target would justify the work of development.

Outlined briefly below is a schematic arrangement to accomplish the desired end in so far as the cameras are concerned. Undoubtedly this arrangement can be greatly improved upon, but the writer is satisfied as to its mechanical practicability. A means of support for the various pivots involved has been worked out, which permits entire freedom of movement of the tracking scope and camera in 360 degrees of azimuth and 90 degrees in elevation. However in the interest of brevity a discussion of pivot support is omitted.

In the schematic diagram (Figure 2), broken lines represent the azimuth train and solid lines the elevation train.

Two elevation and two azimuth handwheels are shown, in as much as in this particular arrangement these handwheels are fixed and as the tracker moves around to keep on the target in azimuth, one set of handwheels would be more convenient for him than the other.

As the azimuth handwheel is turned about axis *a*, bevel gears transmit this motion to pinion *b* and pinion *c*. As these pinions rotate about a vertical axis they rotate discs *d* and *e* in opposite direction. As disc *d* rotates it moves the standard *f* which is mounted upon it. Sleeves on this standard constrain the elevation disc *g* to move around the vertical axis *h*. If the tracking telescope is mounted on the elevation disc *g*, it follows that proper movement of the azimuth handwheel will cause the tracking telescope to remain on the target in azimuth.

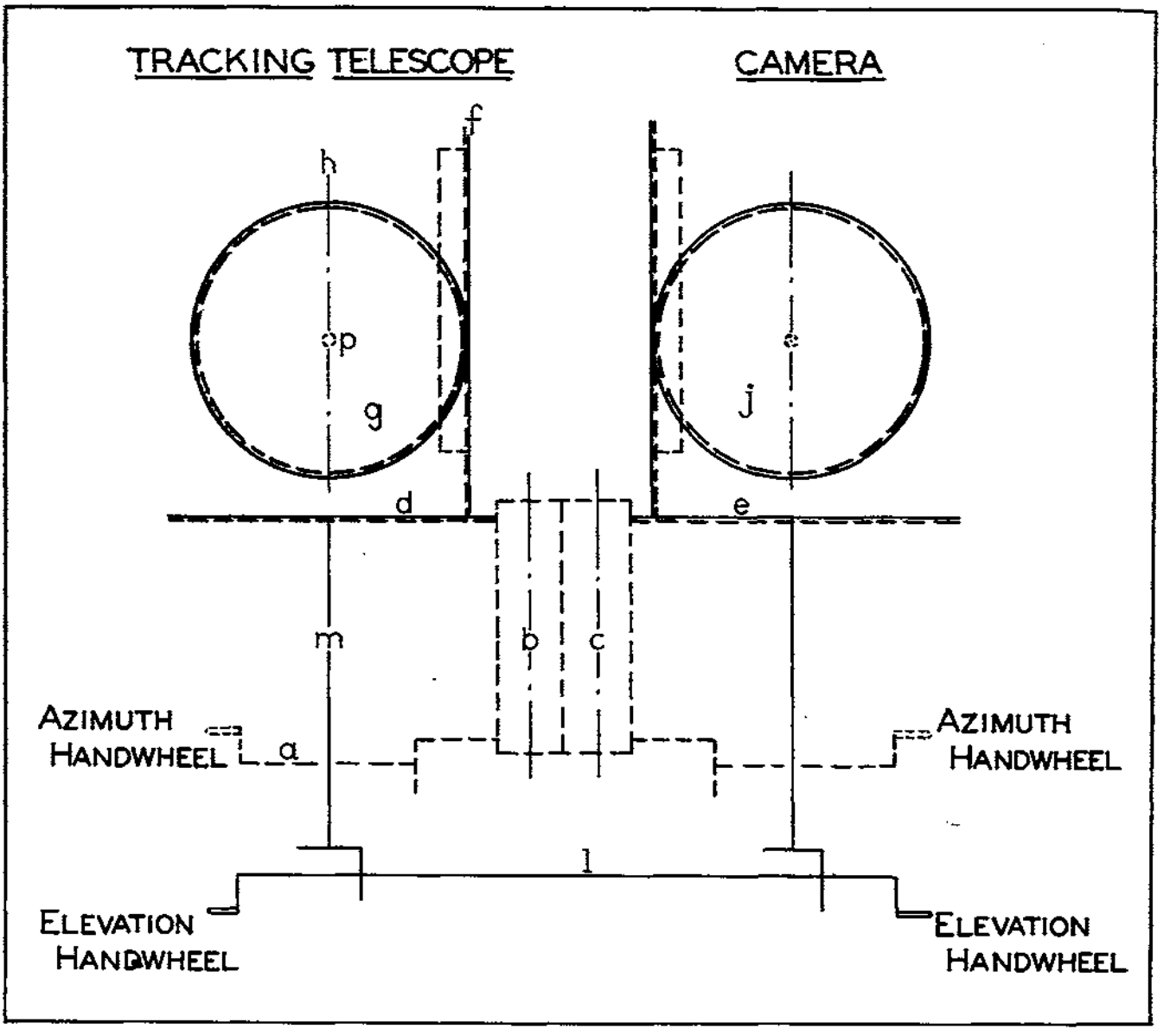


Figure 2

Since the direction of rotation of disc *e* is reversed from that of disc *d*, if we consider the camera to be similarly mounted on elevation disc *j*, it follows that the movement of the azimuth handwheel will cause the camera to move equally in amount and opposite in direction to the tracking telescope. If the camera and telescope are laid parallel on the baseline initially (or converged at a distant point on the baseline) the desired result is obtained.

As the elevation handwheel is rotated around axis *l*, bevel gears transmit this motion to shaft *m* which has screw threads which engage in corresponding threads in the center of the disc *d*.[2] Disc *d*, being prevented from rotating by the hand on the azimuth handwheel, is thus constrained to move vertically on axis *m* along the pinion *b*. This motion results in similar vertical motion of the standard *f*. On the edge of this standard next to the elevation disc *g* is a rack gear which engages the gear teeth on the circumference of the elevation disc *g*. Then as rack *f* moves vertically, disc *g* moves about horizontal pivot *p* and imparts an elevation angle to the telescope which is mounted on it. A similar sequence operates the movement in elevation of the camera.

The device to cause the director to track the plane and the gun to fire on the target appears simple enough. The motion of the electrical azimuth bug could be reversed electrically or mechanically; or else a reversing gear could be inserted between the mechanical azimuth bug and the gun. The idea seems simple enough to require no illustration. The quadrant elevation and fuze transmitted by the director and received by the gun would naturally remain the same.

The use of the sky target would necessitate more complicated recording equipment and particularly trustworthy trackers. Calibration of the equipment before firing

[2]A movement of the azimuth handwheel will obviously cause disc *d* to move up or down the shaft *m* (if the elevation handwheel is considered fixed) thus causing a movement in elevation. However this sketch is only intended as a rough schematic to indicate one means of accomplishing the desired result and this apparent difficulty could easily be avoided by any one of several mechanical means.

would be a definite problem. Visual records could still be taken by an adaptation of the mechanism shown in Figure 2, but the worth of parallel records might not warrant it.

In so far as spotting is concerned, spotting scopes with a device similar to that used for the recording theodolite would be necessary. However past results show spotting to be more of a hindrance than a help, and much valuable data would result without dealing with spots.

The tracking telescope operator's accuracy could be checked by providing a checking scope, or by taking an additional camera record of the plane itself. In the latter case a method might be evolved for making corrections for slight inaccuracies of tracking by applying the variation between the plane and the film center of the checking camera to the film center of the recording camera to obtain a corrected film center. However, with well trained trackers personnel tracking inaccuracies are negligible and can be disregarded.

The mechanical arrangement of the tracking telescope and camera could be so devised as to permit optional use of the sleeve target. Introduction of a reversing gear (or its mechanical equivalent) would cause the tracking scope and camera to move together in azimuth, as well as elevation. This optional arrangement would also serve to give a means of checking the instrument and training the tracking operators.

The use of the sky target would bring many advantages. Any type of plane can be used provided it obtains the desired ceiling. This eliminates the necessity of using only high-powered craft to obtain requisite speed and altitude—a type of plane that is not always available for towing sleeves.

All in all, this device has possibilities great enough to warrant experimentation. It may be found impracticable to make it a standard article of gun battery equipment, but it would undoubtedly open up a new field of experimental firing closely akin to wartime conditions.

Hundreds of Coast Artillery Reserve officers and organizations representing all three components of the Army participated in a recent antiaircraft field problem in Southern California. Among the units engaged were the 63d, 519th, 975th, 976th, and 977th Coast Artillery (AA); the 3d, 625th, and 626th Coast Artillery (HD); and the 251st Coast Artillery (AA), California National Guard. The picture shows a command post during the exercise. Left to right: Colonel Paul D. Bunker, executive for Reserves, Southern California; Colonel Francis H. Lincoln, executive, Ninth Coast Artillery District; Colonel E. A. Evans, commander of the provisional brigade; and Colonel E. A. Stockton, Jr., umpire.

THE CAMPAIGN

OF PERSISTENCE

BONAPARTE IN ITALY

PART III

By FLETCHER PRATT

The Rains of November

I

The Mantua Country, 4 Brumaire—3 Frimaire, An V (October 25-November 24, 1796).

The old gentlemen clanking with medals, who might have been observed passing down the street incongruously called Cabbage-Market, and so on through the hall of the K.K. Hofburg, between the great paired frescos of *The Going Forth to Battle* and *The Victorious Return*—these men were not depressed. In spite of the unhappy conditions in Italy, the loss of various small alliances near the Rhine and Po, and the irritating certainty that the English had sent a man to Paris to discuss separate peace, these gentlemen, the members of the Aulic Council, could consider the position of their country as excellent.

For there was plenty of time for Austria to work out her Continental politico-military problem. For that matter, the Aulic Council had time for everything; it was immortal, could afford to regard battles, campaigns, even entire wars as incidents. Its junior member had been in uniform for more than forty years; and in their aggregate of nearly ten centuries' military experience, the high councillors had learned that the Victorious Return belongs ultimately to that nation which can exert unremitting pressure across broad reaches of the map and calendar. The French intelligence was sharp and often finely tempered, but *leichtsinnig*, lunatic; lacking that essential discipline in cooperation without which its most spectacular successes were interjections, whose points finally blunted and turned from the marmoreal stability of a system based on the law of averages.

The summer campaigns of the Rhine armies were over, the council's resources free for the one field in which the results had been unsatisfactory—Italy. The French had achieved certain successes there (it appeared to the old gentlemen) by the typical Gallic trick of concentrating a first-class effort in a second-class field. The Austrian commanders in Italy had been thus far men not quite or not yet worthy of places at the council table—Beaulieu, appointed for his implacable hatred of those revolutionaries who had wrecked his fine house at Jodoignes, using the priceless collection of maps and books to kindle the fires wherewith they melted down his antique medals for gold; Wurmser, who had really no reputation but that for courage, gained as an officer of light horse.

Yet there were not wanting signs that the pressure transmitted through even these relatively incompetent ducts was having its effect in Italy—or perhaps the French, those creatures of erratic impulse, were displaying their normal capacity for surrounding themselves with hatreds. Materially, the results were the same; troops drilling in Rome, the Papacy certain soon to denounce its treaty with the Directors; the Genoese banking interests so unfriendly to France that she had been forced to send soldiers; the King of Sardinia's roads pullulating with bandits who had been soldiers; Naples stirring; Venetian peasants coming to the Austrian outposts with gossip of a French army much sick and with no reinforcements.

If the full weight of the Empire could now be applied to the thin shell of French soldiery around Mantua, there should be a crash; and thanks to the cordon system, the means were at hand for such an application. When Graf Wurmser made his late unfortunate effort to relieve Mantua a member of the great council itself had already been laboring to construct the cordon inside his—Freiherr Alvinzy von Berberék, who had been a soldier at fifteen and was now sixty, very young for a general command, but a man of ability beyond his years. He had raised the Tyrolean Landsturm to the number of 20,000 and assembled it at Neumarkt (Map 2), then gone to Görz in the Friuli to superintend the training of some new Croat and Serb regiments, with whom were brigaded the troops who had come in from Galicia, veterans of the Polish army taken into the Austrian service when their country was extinguished. General Davidovich, a stout fellow, could lead the Tyrolers down on Trent. Alvinzy himself should go straight across the Venetian flats on Verona, with his Croats, Serbs and Poles, to whom were added the men General Quosdanovich saved from the late disaster—27,000 all told.

All the better that it would be a winter campaign. With snow in the Alps of Savoy the French could hardly undertake sending men down the long walk from Strasbourg or Lyon, and they had none nearer Italy.

II

On the night of October 25th a man was captured on the outposts of Masséna's division, whose skulking manner, military back and ignorance of Italian proclaimed him

Map 1: General Map

secret messenger or spy. The search gave no result. Mathieu Dumas, the athletic mulatto who was brigadier there, had his suspect stripped and tied to a table, then brought in a couple of camp butchers with their bloody aprons and cleavers, indicating where they should make the first cut. The messenger was not that much of a hero; he shrieked a confession and a dose of purge having extracted the metal capsule from its hiding place, Bonaparte learned the Austrian plan.

Wurmser was to make his sortie from Mantua on November 24, a month hence, a month to operate on the divided Austrian armies. As soon as Masséna's scouts reported Alvinzy in movement toward the Brenta, orders

for the counter-stroke went out. Bonaparte would hold him at Bassano; Vaubois, who had the biggest of the divisions, was to attack Davidovich "in such a manner as to take a large number of prisoners, throwing him back on Neumarkt with his organizations broken," then come fast down the Brenta onto Alvinzy's rear.

On November 3d Vaubois delivered his attack against the Austrian head of column on the road beyond Lavis. It was both fierce and long-sustained, but the whitecoats had nearly three to one of him, enough to make good their defense at the point of contact and still spare men to send under Wukassovich, that stern Slav fighter, in a circuit to the French flank by the valley of the Avisio. The brigadier there had scouted his front in the morning and found nothing and his force was now weak with detachments for the main battle, from which came only gloomy news. In the closing twilight Wukassovich hit him by surprise; the brigadier was taken with half his men, a battalion wiped out, Vaubois's flank turned and the French sent tumbling in on Trent, tired, dismayed, the spell of victory broken that had been theirs since the dawn of Montenotte.

Bonaparte in Verona was roused before dawn to hear the news. This was worse than Sahuguet's failure after Bassano, looking like weak moral fiber; but it might be cancelled by a change of plan. Vaubois was to let go Trent and make his defense at the defile of Caliano, where stood the La Pietra castle so boldly taken in that last campaign. Bonaparte himself would beat Alvinzy in a battle at the crossings of the Brenta, circle the hills up that stream as he had circled them down and fall on Davidovich's rear. Masséna was to fall back from Bassano on Vicenza, but keep contact with Alvinzy's vanguard, to attack him as soon as the Austrians were astride the river; Division Augereau moved out in close support of Masséna.

The clash came on 7 November, Masséna attacking violently at the first light of day, winning, and driving the Austrians back to the left bank under heavy loss. Bonaparte himself, riding in with Division Augereau to finish them, encountered enemy elements on the road straight east out of Vicenza, lower down than he had expected, but drove them also in on Bassano without difficulty. It was now falling dark, but the reserves were ordered up to win the bridges and pound the beaten imperials back across the Friuli before they could rally.

But as this reserve marched up through the village of Carmagnano the whole night blazed with flanges of fire and they were counter-attacked at the bayonet. Alvinzy, a trickier tactician than Bonaparte imagined, had crossed on a wide front, over a new-built bridge at Fontaniva as well as at the permanent Bassano structure, and all the day's fighting had been done against only one of his wings. The men in Carmagnano were part of the other—Croats, with wonderful stomach for combat. Bonaparte swung Augereau around and brought him down on them, but they would not give up, not even when a battery of shell-guns came up to smash them in the face, not till they were all dead.

But now it was midnight and past, the bridgeheads to the far bank not won yet—and at this moment came a Job's messenger from the north. Two of Vaubois's demi-brigades had panicked in the defile of Caliano; he had been heavily defeated. His formations were streaming down the Adige with Davidovich coming along like a cloudburst behind; might be in Verona or Peschiera by the next noon.

III

Bonaparte had not slept that night and did not. Long ago he had suspected Vaubois, a count, as one of those dry formalists of the old régime, but thought the man had head enough to outweigh a dessicated heart, which was true while the troops were going forward against numbers something like their own at contact points. The first defeat, at Lavis, showed he neither had nor could inspire his men with *sans-culotte* recklessness, and already on the 15th the young archangelic Brigadier Joubert had been sent up to be his inspiration.

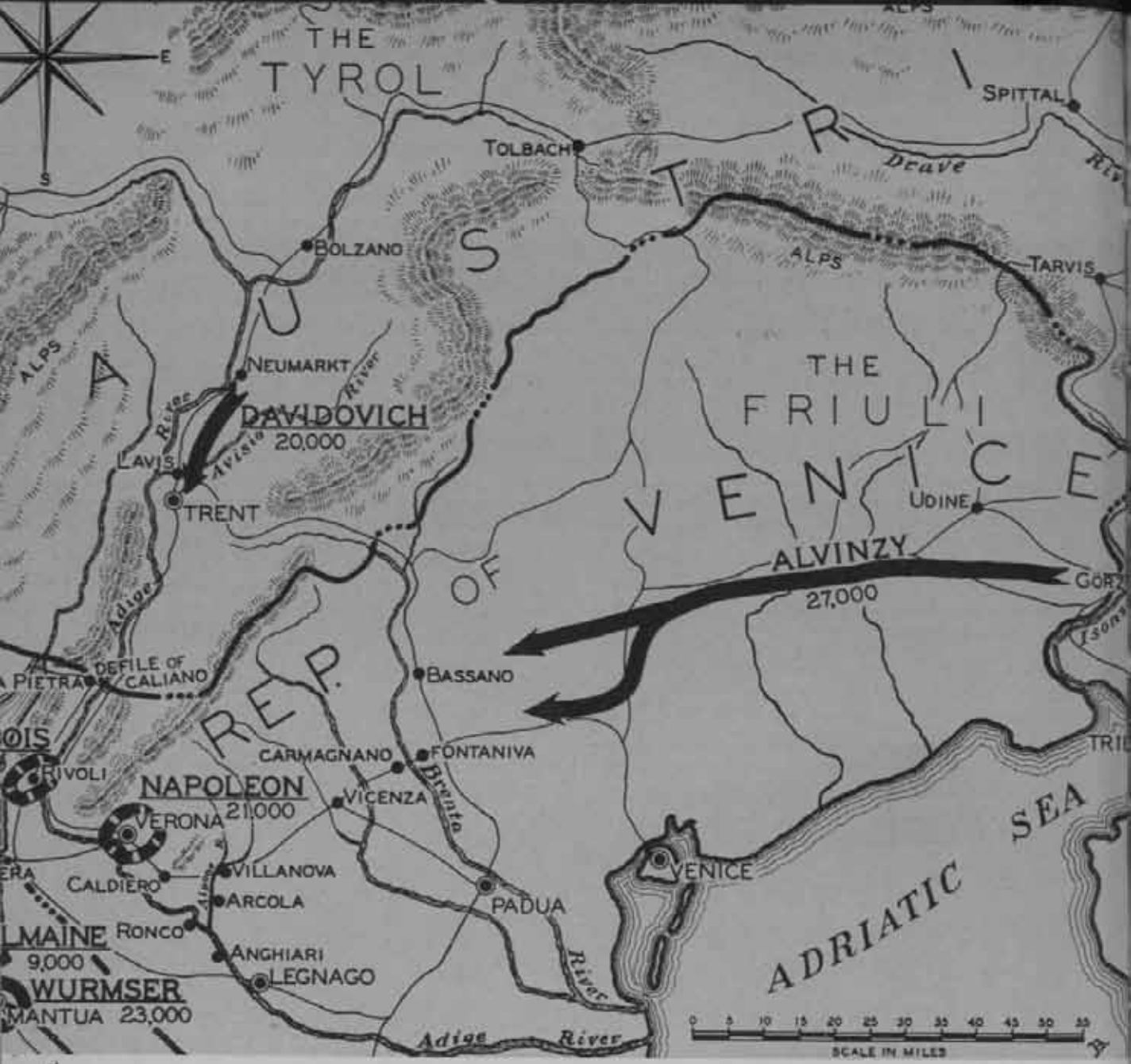
Now Bonaparte went himself, riding all night; found Vaubois's men camped on the high plateau of Rivoli, overlooking the Adige roads, with their general trying to bring them out of the dumps by discipline and Joubert by encouragement, two methods that did not march together. The men were ordered paraded; the commander in chief addressed them, special attention to the two demi-brigades that had broken:

"Soldiers! I am not satisfied with you. You have shown neither discipline, constancy nor courage. You let yourselves run away in panic terror from a position where a handful of really brave men would have stopped an army. Soldiers of the 39th and 85th, you are not French soldiers. Chief of Staff, have it inscribed on the standards of these men, 'They are no longer of the Army of Italy!' "

Down the line old veterans caught their breath, burst into protest and tears, as the general rode away from them with his face set like ice.

IV

The mechanical problem was less easily solved than the emotional. One could privately make Joubert commander and Vaubois commander's clerk of the division that had belonged to the latter—not publicly, men must be made to feel personal responsibility for the Caliano failure. One could order up a battalion of garrison troops; send Masséna the mountain expert to gauge the position at Rivoli. All of these are palliatives; on the grand scale there was nothing but concentrate and wait for an Austrian blunder—21,000 men at Verona, against whom Alvinzy strode with 27,000; 8,000 at Rivoli, facing Davidovich's 20,000; 9,000 holding the outlets of Mantua against Wurmser's 23,000. The last was not due to move for three weeks more and could be counted on to hold that schedule; and Bonaparte felt himself equal to demolishing Alvinzy, but only if the latter blundered before Davidovich, coming down the gorges certain as a glacier,



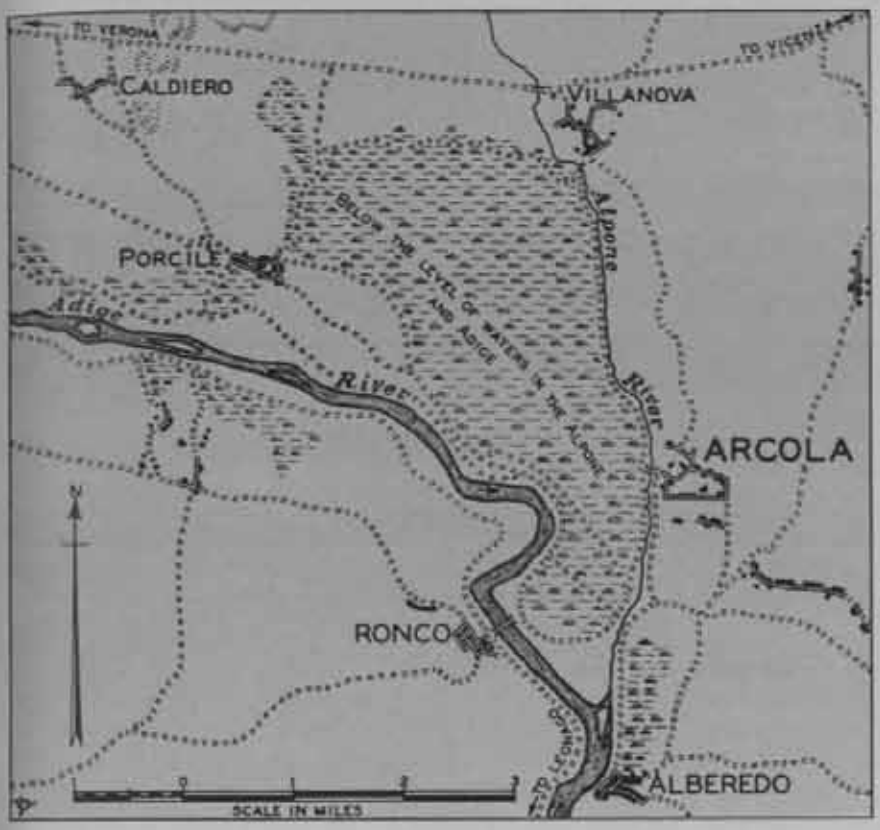
Map 2: The Plan of Alvinzy

united with him or cut the French communications.

The rear guard spied toward Vicenza like questing hounds; on the morning of November 12th they brought word Alvinzy had pushed his advance across the slow stream Alpone and taken station on a spur of mountain jutting across the road at Caldiero. Here was the blunder: a chance to smash that head of column before the Austrian gross came through the neck at Alpone's bridge; Bonaparte issued a proclamation:

"Soldiers! The liberty of Italy, the happiness of France depend upon your courage. Your generals will do their duty; when the drums beat, soldiers! remember to be worthy of yourselves. I have only two words to say; they will be enough for Frenchmen: Italy! Mantua! Once more behave as you have behaved before and Europe will no longer contest with you the title of the bravest and most powerful nation of the world."

The drums beat, then, the columns marched. At dusk they prodded in the Austrian pickets; at dawn drove for-



Map 3: Arcola

with a northeast wind that blew it into the faces of the Gauls. Masséna's drive suddenly faltered, his front collapsed, one battalion surrendered complete; Augereau was flanked, and with the gale pounding their backs, the defeated French went stumbling into Verona. That night Bonaparte could hear them talking in the streets: "We can't fight this war alone. That army against us there is the one Jourdan and Moreau should have taken care of. What's the use of beating them? The Austrians will just send down another."

ward, Masséna on the left where the ground was high, Augereau on the right in a maze of walls, gardens, and vines. It was hard fighting under sullen November clouds, through pouring rain, with every point a fortress. Toward noon things began to look dirty; the French guns could not get to the front through the mud, the Austrian were all in position, and the pressing attacks found Alvinzy had worked the same tactical trick as at the Brenta, a double strength vanguard on a wide front. Bonaparte himself was in the fighting at noon, leading regiment, brigade, even squad. Caldiero was taken, retaken, taken again, three times; but the rain now froze to sleet and hail,

V

Night of despair; the old gentlemen in the K. K. Hofburg were right. Night of despair: Bonaparte to the Directory—

"Here we are, abandoned in the middle of Italy. The killed, the wounded, are the élite of the army; those who remain are blunderers in whom the men have no confidence. The heroes of Lodi and Castiglione are dead or in the hospital. Joubert, Lannes, Lanusse, Victor, Murat, Rampon, Pijon, all were wounded. Perhaps the hour of Augereau, of Masséna or Berthier, or of my own death will strike next."

Night of despair; in Venice the papers said "*Furia*

francese can accomplish nothing against the leaden obstinacy of these Croats." Man for man they equalled the French; Alvinzy was not a blunderer, our people waver, inconstant in defeat—nothing now remains but to use the last dregs of their declining morale in some wide fantastic blow that will give them a winning advantage.

Night of 15 November, 24th Brumaire; all quiet in Verona, but any Juliet who leaned from her balcony had seen armed men standing in the street. The drums tapped low and quick; they marched, out through the western gate toward Milan. Retreat? "No, comrade, no," a grenadier was heard to say. "Watch that little corporal of ours; he'll flank them a hot one."

He was right; a kilometer from the Milan gate the guides filed south, then east of south down the Adige; by break of day they were at Ronco (Map 3), crossing the narrow wooden bridge that Chasseloup-Laubat had built during the night. Sluggish Alpone flows into the Adige just below; the triangle between the two streams and up to the post road is all marsh which will bear men only rarely, crossed by causeways of the height of a meter and the breadth of ten, each causeway single-lined with trees. Halfway up the easternmost the village of Arcola stands beyond Alpone, with a stone bridge from causeway to street; where the western dike meets firm land on its way to Caldiero, there is another town, Porcile. Division Masséna turned sharp left at Ronco up the Porcile causeway, onto the flank of the Austrian army where it lay crammed between Verona and the Alpine spurs; Division Augereau hurried toward the Austrian rear, by way of Arcola.

It did not get through. Alvinzy, himself contemplating a flank swing through a narrower circle, had posted in the town a Colonel Brigido with two regiments from the Seven Mountains of Hungary, men whose hearts were granite. Augereau brushed their outposts aside but at the bridge hung in swaying combat with them, while flankers moved among the tussocks or sank shrieking where the quagmires sucked them down. Augereau seized a flag and placed himself at the head of the column, bellowing "Cowards! Do you fear death so much?" and gained a few yards, the fierce fearless man; but the time loss was fatal. Alvinzy had been warned; at noon a fresh brigade of Croats under General Mittrowsky arrived from his reserve, more deployed as skirmishers along the river banks to fire into the flank of the French column—their rush was stopped.

But Arcola must be won or there was no victory; one more defeat would shatter the army, body and soul. Bonaparte galloped his horse down the road; dismounted among wounded and dying, organized another column, recklessly taking the lead in person. Lannes, Junot, Marmont, Dallemagne, pushed past to protect him with their bodies and the column flung itself into the smoke with a yell. There was a shock of cannon; more smoke through which came a counter-column of Croats, dish-faces red with fury. Marmont heard a shout, "The General!" and looked round to see Lannes being carried back with a second and ghastly wound while Bonaparte was waving his arms from the quicksand beyond the lip of the causeway. With the aid of the general's young brother Louis, Marmont got him out and back along the causeway, a few feet ahead of the onrushing Croats, whose tight column crumped as a big gun fired into them right past the shoulder of the retreating Bonaparte.

The afternoon was a tangle of murderous skirmishing interspersed with charges from alternate sides—all failures. At twilight it looked as though the French had won when a little force under Guyeux came up Alpone's farther bank and pushed the exhausted Austrians from Arcola, but it was too late—Bonaparte had already given orders to recross the Adige during the night.

VI

There was a council of war at imperial headquarters in the evening—Alvinzy, Quosdanovich, Weyrother, Mittrowsky, very grave. Bonaparte had been held for the day at Arcola, but was on their flank and rear; if they turned to face him another flank would be exposed to whatever force might debouch from Verona; their losses in Arcola had been dangerously heavy; at Porcile one brigade had fired into another and nearly 2,000 men had been taken prisoner. The sense of the meeting was toward retreat; but a peasant was led in at this moment who said Guyeux had evacuated Arcola. Faces brightened; Alvinzy ordered his trains back to Vicenza, but gave Mittrowsky another brigade, ordering him to attack through Arcola on Ronco in the morning, while divisional general Provera led another column from Porcile on the same point and a strong front held toward Verona.

The day came in with icy rain, under which Mittrowsky, advancing along his causeway, bucked head-on into a new attack by Augereau. The Croats' charge was the fiercer; after a few moments' swaying combat the French were pushed back into Ronco. But here, on a little firm ground, Bonaparte had planted riflemen either side the causeway. They riddled the onrushing Croats from both wings; Augereau rallied with the bayonet and drove them right back to the Arcola bridge. There Mittrowsky gathered supports and rallied in turn, the fighting hung equal, long intervals of slow skirmishing alternate with reasonless bursts of savage hand-to-hand.

On the other causeway Provera ran into a cloud of French riflemen who picked off all the officers at his head of column; the men huddled, lost momentum and at that moment were violently struck by Masséna. They broke, were borne back through Porcile, losing many prisoners. But beyond Porcile Masséna dared not go till Arcola was won, and it had not yet been won, nor nearly, when dark and the driving rain sent the French back once more to the right bank of the Adige.

VII

That night it was Bonaparte who held anxious conference. Davidovich had attacked Joubert during the day and taken Rivoli from him, but as usual with Aus-

trians, halted to organize his ground and get up the supply men. Joubert thought the defiles below Rivoli could be held long enough to give one more day's purchase. Last chance; the besiegers of Mantua were called on for a draft, marching up through the wet night, the defenders of the Legnago bridge brought in a circuit round Arcola to take it far from the rear. Last chance, but chance even if the last, that one more fight would break the Austrian nerve. Masséna had beaten them twice; their losses at Arcola had been frightful, far heavier than ours, for their system made them stand in line as targets while we hid behind trees; Mittrowsky's brigade had been almost wiped out at Ronco.

Last chance; Bonaparte planned to the final inch and bullet. Marmont should take fifteen heavy guns and cannonade the Porcile causeway from beyond the Adige along which Masséna should attack again, with only half his division, sending the rest to replace Augereau against Arcola. Augereau should cross at Albaredo and come up the far bank of the Alpone on Arcola's rear.

Last chance and a misty day, the 18th of November, with Marmont's artillery pounding through the fog. He had the range to a nicety, there was no more stuff left in the Austrians of Provera's command, and Masséna's lead brigade easily won Porcile. In front of Arcola the other brigade failed; the Croats drove them, coming on in pursuit so hotly Bonaparte ordered the Ronco bridge blown up. He was premature; Masséna had a demi-brigade hidden in a willow copse, which charged into the Croats' flank and rear, hove them into the marsh, killed or took prisoner three thousand men. Lower at Albaredo Augereau was in difficulty, making some progress but not fast enough to win victory by night, the last night Davidovich would allow.

Last chance; Bonaparte summoned a lieutenant of hussars, a giant black from the islands, Hercules Domingue. Take four trumpeters, said the general, and twenty-five horsemen. Ride wide around the Austrian left where they face Augereau; blow, shout and charge.

It was five o'clock, dusk and a lull in the battle when the Austrians heard, far and then near, along their rear the trumpets call; down through the mist came this monstrous blackamoor with pounding hooves behind. The wing battalion broke; Augereau fell on again, more battalions, taken front and flank as he turned in, broke, the whole line rolled up, they fled. Augereau went singing on into Arcola; Masséna joined him, the Austrians were driven from the field, heartily beaten at last.

Next daybreak the Army of Italy marched into Verona by the opposite gate from which they left it; marched out again, joined Joubert, utterly crushed Davidovich. When Wurmser made his sortie from Mantua, three of the French divisions were ready for him; he was thrown back into the city with heavy loss, and now touched the pit of despair, since he had begun to eat the cavalry horses a month before, had ten thousand sick and four thousand dead of the fevers.

VIII

Feldmarschal Alvinzy von Berberék to Graf Nostitz, President of the Aulic Council:

After the late battle even Vicenza was no longer a sure position and we were under the sad necessity of retreating from it that night. Our losses have been so heavy as to be indescribable. In this command I have not left 15,000 men.

Louis Bonaparte to his friend Fleury:

It was a war of officers; all the brave ones are dead or wounded; there are now demi-brigades commanded by lieutenants and battalions by quartermaster-sergeants. The soldiers are not the same; they want peace; there is no more energy, no more fire in them; all the brave ones are dead.

Napoleon Bonaparte to Mme. Bonaparte:

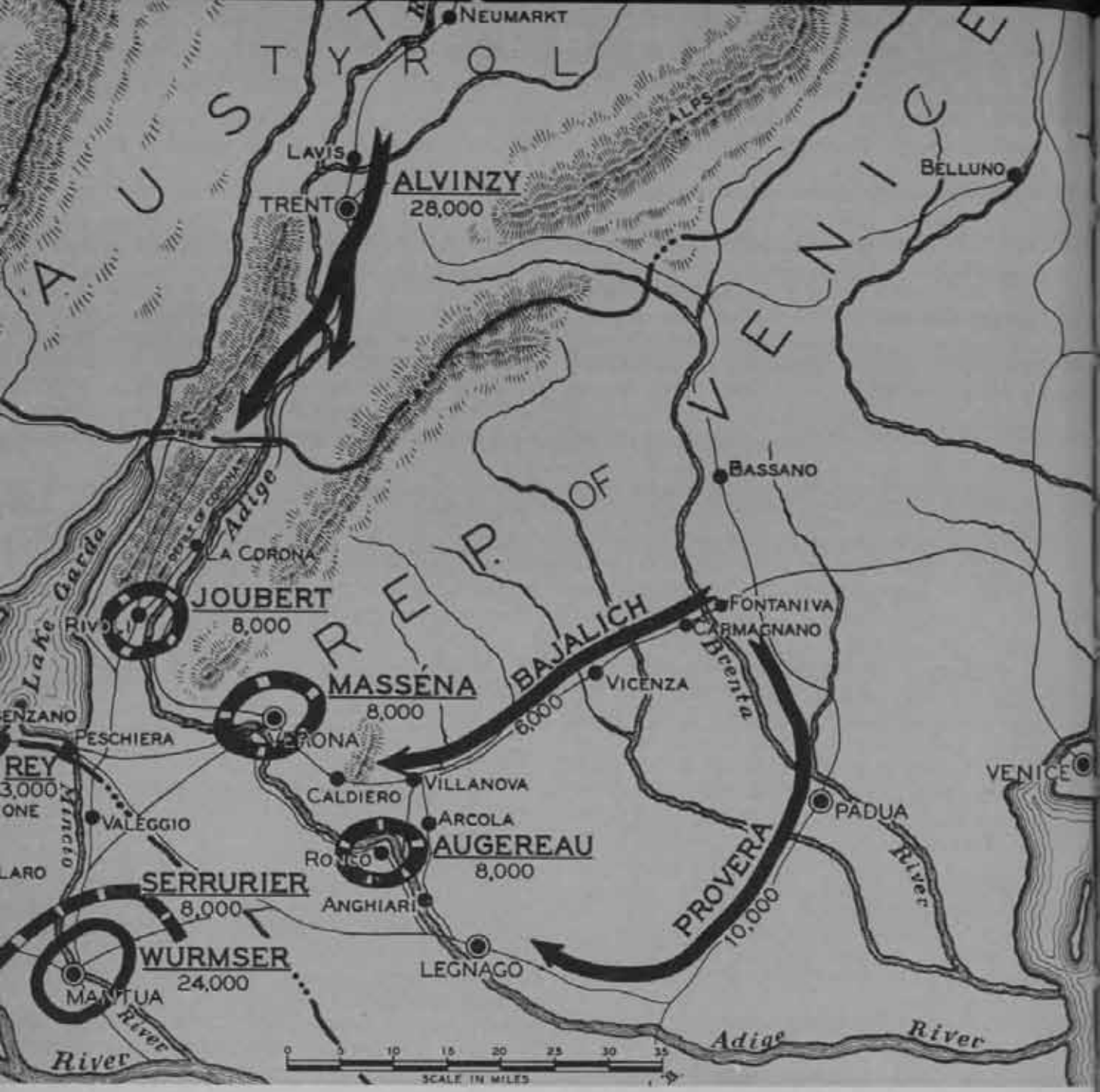
A whole month and no letters! I no longer love you; I detest you. You are malevolent, awkward, stupid. What business is so important that it keeps you from writing to your lover? Who is this personage, this new lover of yours, who absorbs all your time, so that you can give your husband no attention? Josephine, be careful; one of these nights the doors will fly open and I will stand before you.

Night in Midwinter

The Mantua Country, 3 Nivôse—14 Pluviôse, An V (December 3-February 2, 1797).

The heavy guns had been drowned in the lagoons round Mantua when Marshal Graf Wurmser came down to take his beating at Castiglione. There were no more in Italy, and without them the siege was only a blockade; and on the south side not even that while Austrian cavalry mounts remained uneaten. They carried riders swift through the lines into that open triangle between the Mincio and Po which was known as "the Seraglio" from the opulence of its fields and women. But the Seraglio was now bare and brown as a miser's cupboard, the horses disappearing into the stew-pot at fifty a day, and Colonel Graham asked permission to get away, conceiving an English military observer would be of more service with the field armies than cooped up in a fortress. The old Marshal-Count gave him godspeed and a ciphered letter for the Aulic Council; disguised as a countryman, the *Engländer* slipped through on Christmas night and away to Venice, with a string of garlic over his arm.

There was a French special envoy in the city, Major Marmont of their staff, seeking alliance with the Most Serene Republic, but Graham understood he was to get nothing beyond the favors of certain ladies who were affected by his fine military swagger. The Ten and the families shuddered at the thought of French alliance; were honest men of business, which is based on international



Map 4: Situation before Rivoli

credits and respect for financial establishment—what would happen to their commercial connections if they struck hands with these outlaws of the Bourse, who emptied bank vaults into their pockets? No; and again No; Modena had made such an alliance under the shadow of the transmontane bayonets and now Modena's family was deposed, Modena had been turned into a department of a gimcrack Cispadine Republic, with lawyers, *lazzaroni*, and thieves in the palace, giving orders to their betters. *No;* that tough old Empire beyond the snow-caps had known defeats before, but always returned stronger than ever to punish doubt.

Yet French drums beat in Verona streets, French guns stood at Padua bridge. *Che va piano va sano;* if Venice helps Austria it must be by stealth. Slyly, then, pass through to Rome General Colli, late of His Sardinian Majesty's service, to take command of the new army the Pope is raising; secretly furnish arms for that force. When the Pope's troops move it will be time to help them stab the French in the back.

Perceiving an Englishman could do nothing in Venice till Austria had a victory, Colonel Graham pressed on to Trent, where he found activity and an impressive atmosphere of hope, chiefly based on the arrival of new officers and men from the Rhine. Alvinzy von Berberck was preparing an operation; had much reinforcement on hand. Tyrolean sharpshooters, useful in broken country, more of those same stout Croats who fought so well at the bridge of Arcola. Nothing but ineluctable chance and the reasonless panic before black Hercules' handful of

dragoons had cost them victory there, they felt—men, plan, leadership were justified by the event.

Staff-officer Wyrother accordingly plotted the new campaign on the same scheme as the last, with improvements only in detail. A main force should clutch the French, while a subsidiary one slipped past their wings to relieve Mantua, pick up Wurmser's men and fall on Bonaparte's rear with the new Papal army aiding. General Provera should lead the relievers, 10,000 strong, moving by Padua (Map 4) and the river crossings, since he must conduct a great convoy of provision, and the flatland roads would be needed in that wild winter weather. General Bajalich to take 6,000 by the foothill road on Verona, striking early to draw the French reserves to their center and make them think this campaign was planned like the last. Alvinzy himself, 28,000 under arms, would come down the Adige from Tyrol as main army. The Empress has broidered their standards with her own white hands. March, therefore, under God, for Kaiser and Fatherland, though the dour Graham pinches snuff and writes home he would "entertain Sanguine hopes of Success if the quality of the Troops were better." It is the second week of January, 1797.

II

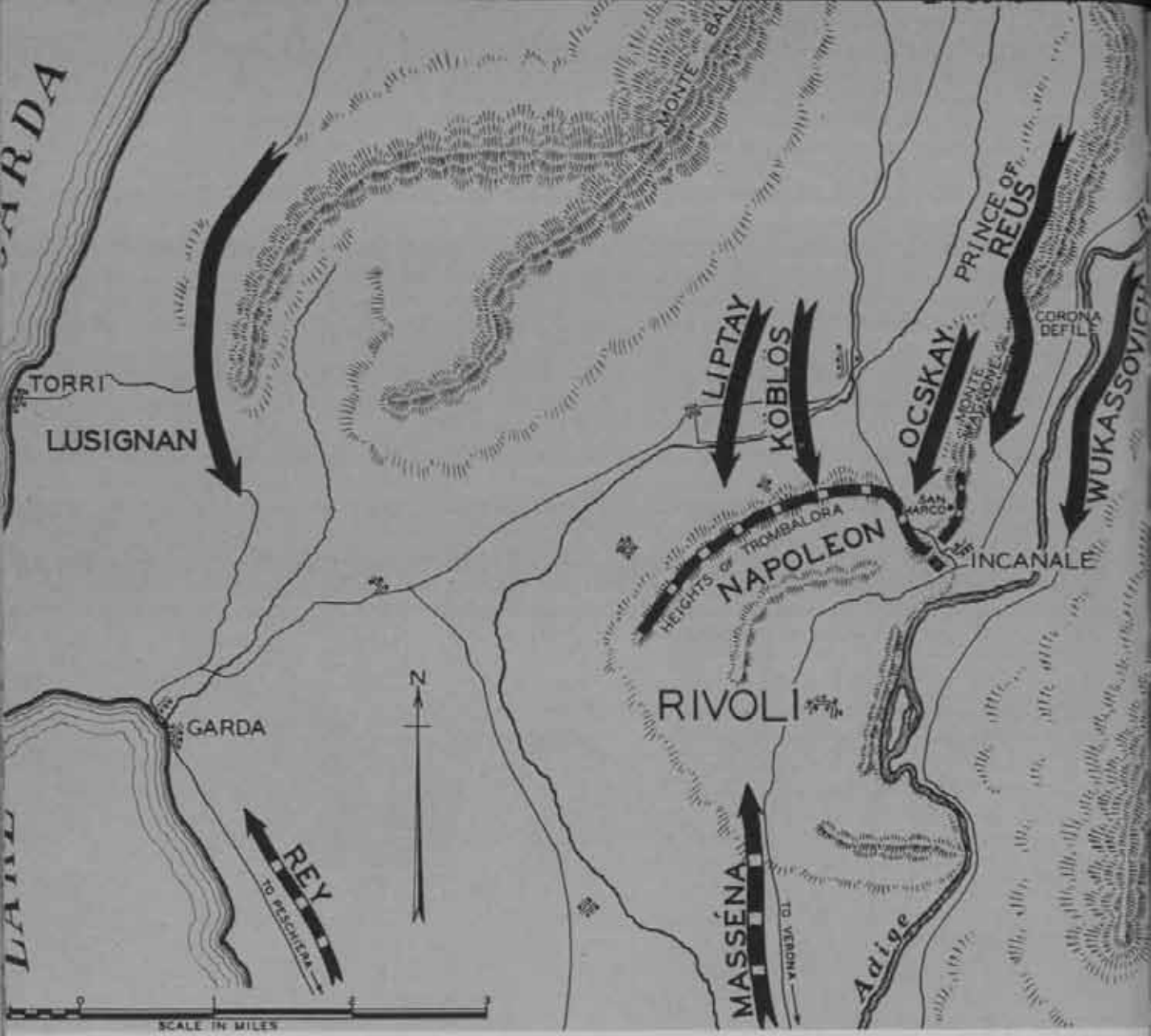
During the latter days of November and the month of December a dribble of reinforcements had come down the passes. The 10,000 men from the Rhine who had been promised, or half-promised to Bonaparte in Italy were still lacking; but those who came were enough to restore the men's spirits by giving them a chance to strut before recruits who regarded them as the heroes of the world. Local Italian levies had set more soldiers free by taking over constabulary duties; the army had been reorganized in four big divisions, slightly over 8,000 men each, with a reserve of 3,000. Augereau was at Ronco to watch the lower Adige crossings; Masséna in the center at Verona, where headquarters were; Serrurier, now recovered, taking over the siege of Mantua from Irish Kilmaine, who was being recalled to lead a division in the expedition by sea to his native isle. Vaubois had been relieved from command of the northern flank—"a brave man, who would be a hero in command of a besieged fortress, but not suited to such a campaign as this," Bonaparte reported—giving place to the electric Joubert, with his angled brows and sharp eyes underneath, like a heraldic eagle. General Rey had the reserve, at Desenzano; Lannes was moved up to command Dallemagne's old detachment of storm troops, the latter being sent home with a bad wound which did not heal and a sword of honor.

The enemy were moving; on the 9th of January Augereau reported heavy concentrations in the country between the Brenta and Adige, and that same day one of his outlying parties lost two guns and some prisoners in a sudden onset near Padua, while Austrians in force approached Vicenza. This looked like a repetition of the attack that led to Arcola. Bonaparte ordered Rey's reserve up to Valeggio, Victor with a brigade from the Mantua siege out to Castellaro, more artillery up to Joubert. Augereau was to slide toward Masséna, looking toward a concentration at the center of the long line, but was to keep strong rear-guards out down the Adige.

On the morning of the 12th, early, an Austrian column was made out on the foothill highroad, moving on Verona—Bajalich's force, whose strength and composition the French did not yet know. Good scouting showed their front excessively narrow; in the afternoon, Bonaparte threw in Masséna's whole division and part of Augereau against the front and flank of this ribbon of men at the heights of Caldiero. It was over 12,000 against less than 6,000; by twilight the white-coats were badly broken, had lost their guns, 600 prisoners, over a thousand casualties. There was no effort at rally or rear-guard; Bonaparte instantly realized that this push at his center was only a featherweight, but was still puzzled as to which of his wings the Austrian main body was approaching. Joubert's report for the day, clear and precise as the edge of a diamond, said his positions at the Corona defile had been attacked all day by fresh relays of troops. Augereau's, muddled and badly written, spoke of a long Austrian column in motion, fighting at the Legnago bridge, and a cavalry picket that had broken through the Austrian screen near there to identify two pontoon trains behind the head of Provera's move.

Marmont's understanding was intellectual where Augereau's grew out of emotion, and the former had education enough to systematize observations. Bonaparte sent him down to the Adige front, and himself mounting in a carriage, rode to and fro along the river bank most of the night and all the next day, questioning peasants, noting the small indications of war—a burned barn, the distant throb of guns, pickets and refugees. Marmont's report and what he himself saw totted up to the same result—the force facing Augereau was a small army with a big train. Joubert, on the other hand, said he had had to fight all morning to hold himself at La Corona, and in the afternoon had been driven from it by two powerful columns, one working round his right by the opposite bank of the river, one round his left behind a mountain there. He was withdrawing as the message was written; meant to hold the southern edge of the plateau of Rivoli with its village till night fell, then pull out.

Bonaparte countermanded this last directive; the plateau and the whole plateau, must be held to the last man. Rey was ordered up on Joubert as fast as he could go; as soon as Masséna's men finished their evening soup, they were to set out on a hot-foot night march for the same place. Above all, every gun within reach was to go up at a pace to kill horses. Tomorrow would be the big battle and it would be at Rivoli; even with Masséna and Rey fully in hand, the French would be outnumbered, would have no possible advantage but in artillery, for if Bonaparte knew his Austrians, their own cannon would be delayed by snow and mountain screes. As the last words of these orders left his lips, the general mounted and rode north into the gloom with the Company of Guides around him.



Map 5: Battle of Rivoli

III

Alvinzy had correctly judged La Corona and the Rivoli plateau as the last French defensive nucleus in the mountains. He planned to flood them out by the same tactic of heavy-headed columns across a broad front he had used so successfully at the Brenta and Caldiero in the last campaign. There were to be six columns here, with the smallest of the six, 3,000 men under Wukassovich, working along the east bank of the Adige, and the Prince of Reuss (Quosdanovich acting as brain) leading the largest 8,000 strong, down the main road on the right bank through the Corona defile. Both had pierced the French outer defenses that evening of January 13; in the dusk they camped, while the army staff rode forward to make plans for the morning's battle.

The French, by their campfire, were evidently in line along the northwest face of the triangular Rivoli plateau (Map 5); let Reuss keep to his road, which would bring him to the Rivoli height clear behind the Gallic right flank, by way of the narrow and winding ravine of Incanale. Wukassovich should cover this advance with cannon and musket from beyond the river, crossing with the bayonet if he could.

A ridge runs north from the upper point of the Rivoli triangle, Monte Magnone, black with wind-tortured pines. Here had stood a French flank-guard the day before; it was now lightly held by a few battalions forming the link between Reuss' column and the three of the Austrian center, now spread across a stretch of low ground at the foot of the wide northwest face of the triangle, known as the heights of Trombalora. Ocskay, Köblös, Liptay, headed these three columns, their men 5,000 each; they would make the main attack. Behind them as they lay in the valley west of Monte Magnone that night the giant shoulder of Monte Baldo jutted against the stars; beyond that shoulder, through another valley deep with snow, the sixth Austrian column toiled forward—4,500 men under a colonel who bore the crusad-

ing name of Lusignan. This force was to circle the whole plateau; in the morning, at the height of the fight in the center, mount it by way of an easy track behind the French left rear while the Prince of Reuss took the sans-culottes from their right rear.

Evening reports said the guns could not be pulled through the heavy snows, the horses were exhausted. The men were grumbling over this and over their dinner of stockfish soup while their officers growled they had been "spoiled by the constant accompaniment of cavalry and artillery" so they could do nothing for themselves. Against these disadvantages was the fact that the French were clearly much inferior in number; and everyone thought Alvinzy's plan a masterpiece.

Far in the south, beyond the range of eye or ear, cavalry were riding and cannon throwing flakes of fire across the dark at the bridge of Legnago.

IV

It was two in the morning, with disingenuous lights from moon and snow slanting across faces haggard with fatigue, when Bonaparte reached Rivoli plateau and rode from point to point, inspecting the enemy campfires that lay "like a belt of stars" around the heights. From their location Alvinzy's arrangements were clear and the huge numbers he would bring to the field in the morning. Masséna was still out on the roads; there was no report at all from Rey. A courier was dispatched to the latter, slightly changing arrangements. His leading elements were to come on with the cannon to the plateau, the rest to switch leftward out to Garda on the lake, acting from that point against the column of Lusignan when it made the wide sweep which was its evident purpose. How much artillery had we? Thirty guns, not counting Rey's. Good, said the general, and himself arranged their placement.

His circuit of the camps had now brought him to the northern angle of the plateau. Even among the tricky shadows it was clear that if that southerly spur of Monte Magnone, known as the height of San Marco, could be recovered and held, the connection between Reuss' column and that of Ocskay, the next in line would be broken, which would disjoint the Austrian attacks. Let it be done, now, at once, before dawn. Joubert had the brigade of General Vial roused from their cloaks, got them into line and sent them forward. By four o'clock, under the first pale steely light of a crisp winter day, the day of 25 Nivôse, January 14, there had been a battle on those heights and the heights were French.

This left Bonaparte with a line long and excessively thin, from the Trombalora crest to that of San Marco. Just after daybreak it was assaulted by Alvinzy's three center columns, Ocskay, Köblös, Liptay, Croats and Tyrolers shoulder to shoulder. Bonaparte thought to break them with a counterstroke and artillery fire from the wings. Ocskay was stopped but the other two columns would not break, pushing in on the French left so hard the 85th demi-brigade gave way and the rest of the line had to fall back.

It was eight o'clock; Liptay worked round the new left flank and it looked as though everything were going, but now the first demi-brigades of Division Masséna came onto the field, with their commander sweating himself blue in the face and banging the recreants of the 85th over the head with the flat of his sword. His men had marched all night, but battle worked on them like a cordial; they flew at the Austrians with the bayonet and hurled them down the slopes, Liptay and Köblös driven in. Now as battles do, this one stabilized down to long-range shooting and a period of realignment, with more of Masséna coming in all the time.

At eleven, Alvinzy's three center columns came on again, Ocskay this time against the San Marco crest, which he won in a rush. Liptay and Köblös again won the edge of the plateau; the French line was an angle, with both wings wavering, Lusignan's men coming into view in their rear, and the outpost that had held the Incanale defile flying to where Bonaparte stood to say 8,000 Austrians of Reuss' command were at their heels. All around the Austrians were clapping their hands in applause of their own effort; a band struck up the Racóczy. In the French lines "Faces grew long; the men said little, but all looked at the general."

He never blinked. "We have them now," he said calmly, and ordered counterattacks all along the line. The earliest demi-brigades of Rey were with him, deployed along the south front of the plateau with their guns to hold Lusignan, the rest away behind that column firing into its rear; Masséna was partly fronting Ocskay, partly faced rear against the head of the Incanale ravine. As Reuss' big column emerged to the flat crest with its band, the head received a violent musketry fire from both flanks; a battery of guns raked it from right ahead, and down on the mass galloped a young Major Lasalle, not yet twenty-one, with a regiment of hussars at his back. The leading ranks went down, the next stopped, the rear elements packing forward into a dense crowd which was furrowed by another discharge from the guns as Lasalle drew aside, and another charge from Lasalle as the guns reloaded. A cannon-ball touched an Austrian ammunition wagon in the midst of this mass; the powder exploded, the crowd became a screaming, panic-stricken rabble, into whose rear Lasalle's squadrons pounded with red sabres.

At the peak of the plateau Ocskay had driven into Masséna's line, but as a narrow salient that slowed under increasing fire from front and flank. As the movement touched halt, Bonaparte threw in Lasalle here also. Ocskay broke, and without a moment's pause, Joubert and Masséna wheeled through the place where he had stood into the flank of Köblös' column, breaking that and Liptay too in one great sweep. Lusignan had been held; now Joubert swung right around the pivot to take him in flank, while Rey closed on his rear, capturing the whole column. By five o'clock Alvinzy had lost 10,000 men in killed and prisoners; those he had left were a mob.

Young Lasalle, who had ridden on into the backs of Oeskay's men, came into headquarters late to make his report, and stood for a moment, white and shaking with fatigue. Bonaparte looked up, then pointed to the corner where eleven battle standards, stiff with the gold embroidery worked into them by the Empress of Austria, lay in a heap.

"Sleep there," he said. "You have the right."

V

For himself there was neither sleep not rest. The evening report from Augereau, who knew how to do everything on a battlefield, but nothing till he reached one, confessed that Provera had hoodwinked him, stealing a crossing of the Adige at Anghiari while pretending to fight for one at Legnago. Guyeux's brigade had lanced into his flankguard and broken it up, taking 500 prisoners, but that was a local action, behind the screen of which Provera slipped away toward Mantua. Augereau had captured or killed everyone the Austrian left at the Adige bridges, but this did not help the fact that Provera was a day ahead on him. That

Map 6: Mantua and environs

meant old Serrurier, with only about 8,000 men would presently have to face a sally from Wurmser's 24,000 in the city while Provera dropped on the back of his neck with 9,000 men more—too much.

Bonaparte fortified himself with a dash of brandy and dictated swift orders—Lannes operating independently in the south country with his brigade, to pick up the force under Victor, fall on Provera's rear, delay him, slow his march. Augereau in pursuit of Provera. Rey to be under Joubert's orders, Joubert to keep after Alvinzy, don't let him rally. . . . Division Massena was paraded and its four freshest demi-brigades chosen out for another frantic night march; the rest of these tired men were to sleep only till cock-crow, then follow on. All must arrive at Mantua, thirty-five miles, during the circle of the sun, before Provera could cover the eighteen miles of better roads that stood between him and the fortress.

On the north and east of the wide lagoon spread round Mantua (Map 6) by the Mincio are two hamlets, the town of San Giorgio, the Duke's palace of La Favorita.

both now turned into forts. San Giorgio was the weaker; toward it through the hazy dawn of the 16th January there came a regiment of Austrian horse for a surprise attack, all wrapped in white mantles, the special uniform mark of the French Berchemy hussars, who were with Victor. A sergeant had left Serrurier's lines to gather wood for breakfast, taking a drummer-boy, his tambour over his shoulder. As the riders came trotting through the lines of mist, this sergeant (name now wiped from history) gazed, then shouted, "Those are not our men! Their uniforms are too new. Beat, Boy!"

The drum rolled alarm; down came the Austrians with a shout, and right over the valiant pair, but inside San Giorgio the French had time to stand to arms in their underwear and greet the rush with a salvo of cannon that emptied half the Austrian saddles. Provera, swinging along behind with his main body, obliqued rapidly past against La Favorita, while Wurmser poured through the fortress gates against the same post.

A day earlier they might have broken through to junction; but now Bonaparte was in La Favorita with those four demi-brigades of desperate marchers from Masséna. Victor had joined after missing Lannes in confused counter-matches. Serrurier counterattacked Wurmser's head of column and drove it in; Bonaparte formed line between La Favorita and San Giorgio, and pushed Victor into Provera's center at the bayonet before the latter could arrange his formations. There the 57th gained the name of "The Terrible" still borne on its battle-flags; under Victor's leadership they tore through the Austrian lines, rolling them back both directions—right into the arms of Augereau, Lannes, and the rest of Masséna, who had closed round during the night. By two in the afternoon, neither flight nor fight was any longer possible for the relieving column. Provera surrendered complete.

No more hope for Wurmser; the horse-meat was all gone. On the 2d of February, less than three weeks later, seven men around a little baroque table in La Favorita signed terms that surrendered Mantua, Italy, and all they contained to France. Bonaparte was present, but incognito, saying nothing till the papers had been drawn. The Austrian envoys, who had not seen him before, did not realize till he put his name to the documents that this young man was the terrible soldier who with 36,000 men, had captured 40,000 of theirs in this last campaign, not to mention those dead.

[THE END]

GUNNER HEROES

By Staff Sergeant H. E. Smith
DEML (RS)

Possibly because its armament places it some distance back of infantry front lines in trench warfare, the Coast Artillery Corps is sometimes mistakenly regarded by the man in the street as a "safe" branch of the military service. That its fixed positions in rear of the fighting lines can produce outstanding individuals who win military decorations for exceptional heroism is not any too well known.

Consider the fact that in France in 1918 no fewer than fifteen men of the Coast Artillery Corps of the American Expeditionary Forces achieved the signal honor of winning the Distinguished Service Cross, second highest award for heroism within the gift of the United States. Moreover, of those fifteen awards, a trio were made posthumously, those three recipients having been killed in action or fatally wounded in the performance of their deeds of valor.

First Lieutenant Herbert W. Hall, a Bostonian serving in the 44th Artillery, Coast Artillery Corps, was in charge of a trainload of ammunition being sent to two 8-inch howitzer batteries operating against the enemy near Thiaucourt on September 27, 1918. The light railway track had been destroyed by enemy shellfire, so Lieutenant Hall secured a detail of engineers and worked with them to repair the track. The German artillery located the spot and hammered it unmercifully. The engineer officer was killed by an exploding shell during this terrific fire. Hall assumed full charge, continued the work under the continuing barrage, showing utter disregard for personal danger and so inspiring the men of the detail by his calmness, courage, and decision that the repair was soon effected and the vitally necessary ammunition went forward.

Second Lieutenant Leonard C. Hoskins, who hailed from East Las Vegas, New Mexico, served in the 52d Artillery, Coast Artillery Corps, and was one of the three DSC men who received that award posthumously. He left shelter during a terrific enemy artillery bombardment to fearlessly enter a shell-swept area, and was killed by shellfire while leading some of his wounded men back to safety. Lieutenant Hoskin's Distinguished Service Cross was presented to his father, Mr. D. T. Hoskins of East Las Vegas.

A distinguished Artillery officer, who already had won the Congressional Medal of Honor as a young lieutenant in the Philippines in 1899, was the highest ranking Coast Artilleryman to win the DSC in France. He was Colonel Charles E. Kilbourne, Coast Artillery Corps, who was at the time, September 12, 1918, serving as Chief of Staff of the 89th Division. Throughout the fighting near Thiaucourt from September 12 to the end of that month, he repeatedly exposed himself to machine-gun and artillery fire during the continuing advance of his division, displaying unusual calm judgment and strong determination in reorganizing combat lines and getting troops forward to their objective. Colonel Kilbourne, a resident of Portland, Oregon, subsequently was promoted to the grade of brigadier general in France and commanded the 36th Artillery Brigade to such good effect that he was also awarded the Distinguished Service Medal.

Corporal Clyde W. Linton of Battery E, 42d Artillery, Coast Artillery Corps, displayed a remarkable courage and devotion to duty as a telephone lineman in charge of the exposed wires of the communications section of his battery during the strong German attack near Suippes on July 14 and 15, 1918. Again and again this young Coast Artillery soldier from Akron, Michigan, went out into the shell-swept open in order to repair breaks in the wire and keep communications open. On the second day of

the battle, while again out in the open, he was struck by an enemy H. E. shell and severely wounded but dropped out of action only under vehement protest.

A Newark "Cosmoliner," Sergeant Frank W. Moehler, also of Battery E of the 42d, was wounded early in the same action near Suippes on July 14, but continued in action, directing the fire of his gun crew for more than eight hours under a most intense enemy bombardment, until all the ammunition was expended. Through that eight-hour period Sergeant Moehler, growing weaker from loss of blood, was repeatedly urged to withdraw himself to a dressing station for medical treatment but he steadfastly refused to drop out of action.

A Chicagoan, First Sergeant George A. Nowlin, was of that redoubtable Battery E, 42d Artillery and he too proved up in the best fighting traditions of the Corps during the Suippes engagement. While the firing position of his battery was under most intense shelling on July 15, Sergeant Nowlin personally assembled the scattered members of the gun crew and succeeded in quickly organizing the firing sections at their posts. On several occasions he carried wounded men of the battery long distances to dressing stations, scorning personal danger and throughout the action assisted also in the repair of exposed telephone lines, vitally necessary to the battery's liaison, when the wires became ripped by the terrific shell-fire.

Private Albert L. O'Connell, hailing from Battle Creek, Michigan, and serving with Battery C, 60th Artillery, Coast Artillery Corps, was another Coast Artilleryman to make the supreme sacrifice in action. Near Montblainville on October 4, 1918, Battery C came under a devastating fire and several of the men fell wounded. Private O'Connell, one of several volunteers, dashed forward to rescue some of these wounded men. He reached a fallen comrade and was bringing that wounded man back in to our lines when a German shell made a direct hit, killing the wounded man and fatally wounding O'Connell. The posthumous award of the Distinguished Service Cross was made to the heroic soldier's mother, Mrs. Mary O'Connell of Battle Creek.

A Sharon, Pennsylvania, man, Private Howard C. Pulker, Battery C, 42d Artillery, Coast Artillery Corps, was a chauffeur to whom no regular duty had been assigned during the Suippes engagement in mid-July, 1918. Voluntarily, he went forward under terrific fire and on July 14 and 15 succeeded in carrying back safely several wounded French and American soldiers. On one such voluntary rescue mission Private Pulker saved a desperately wounded American soldier carrying an important message to a battery commander, and Pulker unhesitatingly carried this important message through himself.

Another man to whom no particular duties had been assigned at the outset of the Suippes engagement was Private 1st class Orville R. Taylor of Battery E, 42d. He, too, immediately volunteered to act as stretcher-bearer,

A portion of Battery A, 42d Coast Artillery on track with a 220-mm. gun at Montreaux Chateau, September 14, 1918

and throughout the two-day battle carried several French and American wounded soldiers to safety. On the second day of the bitter fighting Taylor, whose home was in Upland, Indiana, was severely wounded in the foot, while carrying a wounded comrade in to safety, but as soon as he had had his wound dressed at the advanced aid station this intrepid Artilleryman hurried back to the lines in an effort to be of aid to his wounded comrades.

Sergeant Lawrence Winiger, hailing from French Lick, Indiana, and serving in Battery C, 60th Artillery, Coast Artillery Corps, dashed fearlessly forward, under intense fire, to the aid of wounded comrades during the action near Montblainville on October 4, 1918. While engaged in rescue work Sergeant Winiger was severely wounded.

An Elizabeth, New Jersey, man, Private Frederick A. Woodward of Battery E, 42d Artillery, Coast Artillery Corps, acted as runner during the action near Suippes on July 14 and 15. Throughout the two-day engagement he fearlessly crossed shell-swept areas time after time in order to get the many important messages he carried through. On July 15 he received a painful wound while carrying such a message, but struggled gamely to his knees and crept several hundred yards, delivering the message before collapsing from his severe wound.

Four junior officers of the Coast Artillery Corps, flying as observers with the Air Service in France received the Distinguished Service Cross for outstanding heroic feats, one of them receiving the award posthumously. The flying gunners were First Lieutenant Gardner P. Allen, of Flint, Michigan; First Lieutenant Spesserd L. Holland, Bartow, Florida; Second Lieutenant Francis B. Lowry, Denver, Colorado, and Second Lieutenant Roland H. Neel, of Macon, Georgia.

Lieutenant Allen was flying as an observer in a scout ship of the 8th Aero Squadron above Thiaucourt, France, on October 9, 1918, on a photographic mission. Two combat planes were flying as protective convoy. Suddenly a massed attack formation of eight enemy planes dived on the ship in which Lieutenant Allen was flying. The Fokkers cut the plane's flying wires, shot its landing wire, riddled the elevators and punctured both wings of the American ship. Lieutenant Allen had been taking pictures of the enemy terrain back of Thiaucourt—his assigned mission—but throughout the enemy attack he followed his mission, coolly taking photographs as the German airmen fired at him, the plane, and the pilot. The convoying attack planes counter-attacked the Fokkers, releasing the photographic mission ship so that it could return to an awkward but safe landing just behind our lines.

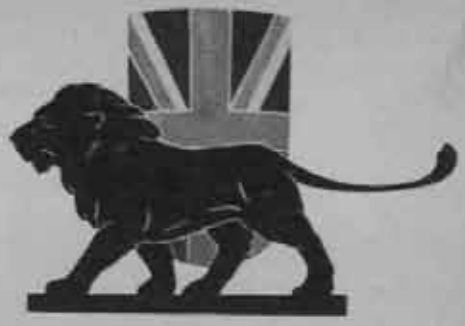
On a like photographic mission, Lieutenant Holland took off in a scout ship of the 24th Aero Squadron on the morning of October 15, 1918, and made for the enemy rear. In order to obtain good pictures of the German positions near Bois de Bantheville it was necessary for the plane to descend to an extremely low flying level—about four hundred meters—but the pilot, First Lieutenant George A. Goldthwaite, accomplished this risky flight and Lieutenant Holland got his pictures, despite the fact that enemy antiaircraft fired upon the American flyers continually.

Near Crepion, France, on September 26, 1918, Lieutenant Lowry took off, as observer, in a plane of the 91st Aero Squadron piloted by First Lieutenant Asher E. Kelty. The objective was pictures of enemy positions for American artillery fire. In order to get photographs, the two officers flew low over the enemy lines. A German antiaircraft battery registered a direct hit, crashing the plane and instantly killing both officers. Lieutenant Lowry's Distinguished Service Cross was presented to his father, Mr. Walter B. Lowry of Denver. Lieutenant Kelty also received the Distinguished Service Cross posthumously.

Lieutenant Neel, flying observer in a plane piloted by First Lieutenant Frank A. Llewellyn, carried on successful aerial liaison with American ground troops during our attack on Frapelle, France, on the morning of August 17, 1918. The ship flew over the enemy lines at an altitude of only four hundred meters, firing on and disconcerting the German infantry, thereby aiding the American infantrymen in their attack. Despite heavy fire from fifteen antiaircraft machine guns and from many batteries of antiaircraft artillery, the American officers carried on with their mission until their machine was struck by a number of machine-gun bullets, one of which cut the elevator and broken control wire was held and operated by the Coast Artillery officer, Lieutenant Neel, under the direction of elevator control wires and caused the rudder to jam. The the pilot, Lieutenant Llewellyn. Running the plane together, in that manner, they continued their liaison work until the ship began to become unmanageable; then, in spite of its badly damaged condition, the two men brought the plane down, just behind the advancing American infantry line, to a safe landing.

☆ ☆ ☆

British Army



THE OLD ORDER CHANGETH

This soldier is clad in the British infantryman's new fighting uniform, officially dubbed "battle dress."

←Coldstream Guards→

These guardsmen are a study in contrasts —one arrayed in all the finery of a peacetime parade, the other garbed for the grim business of a gas sentry. The sheet of litmus paper on the bayonet changes color when exposed to gas.

British infantrymen now swing along in a new simplified drill, based on "threes" instead of "fours," resembling somewhat our new drill. The new drill simplifies recruit instruction and allows more time for combat training.

Mechanization not only speeds up field engineering but it also lightens the task of the soldier. These Royal Engineers are demonstrating a pneumatically operated field drill and auger.

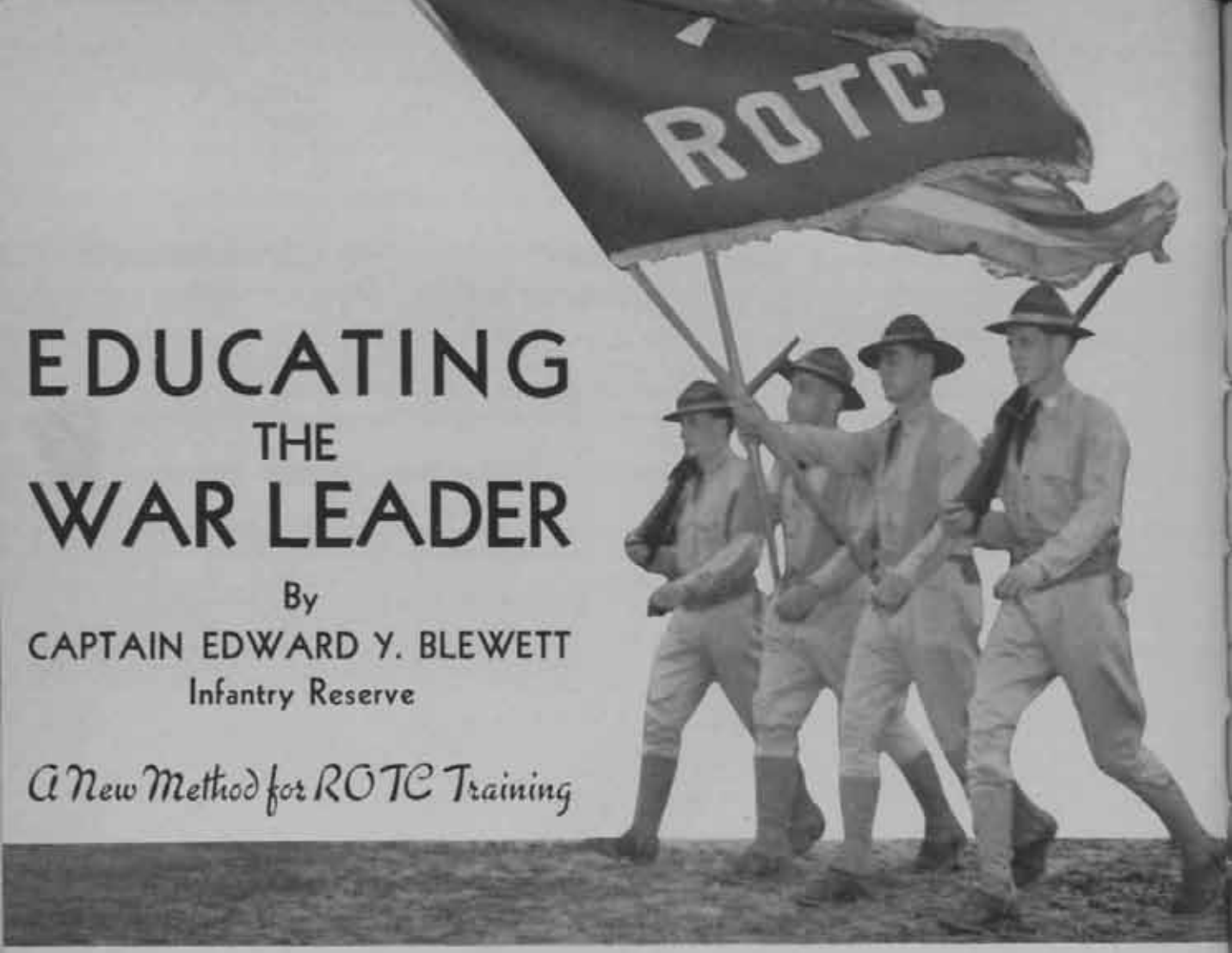
The Royal Engineers are also equipped with pneumatically operated saws that help to speed operations involving timber cutting.

Two soldiers of the South Staffordshire Regiment compare notes on old and new equipment. The soldier on the right has a bayonet of new and shorter design and carries his ammunition and water bottle in a haversack instead of hanging them at his side. The new equipment is considerably lighter than the old.

This heightfinder is part of the antiaircraft fixed defenses located "somewhere in Kent"

This is a new 4.5-inch antiaircraft gun, with a predictor in the foreground. Note the concrete walls and overhead protection for the personnel at the guns

This 3.7-inch antiaircraft gun is a late arrival in the field of AA weapons.



EDUCATING THE WAR LEADER

By
CAPTAIN EDWARD Y. BLEWETT
Infantry Reserve

A New Method for ROTC Training

"The general object of the courses of instruction of the Reserve Officers' Training Corps is primarily to qualify students for positions of leadership in time of national emergency, and secondarily to provide the nation with an electorate informed for the purpose and necessity for a sane policy of national defense." Thus is stated, in the War Department directive dated May 26, 1937, the high purpose of the ROTC. Nor could it be better stated to comply with the provisions of the National Defense Act that authorized the establishment of our eminently sane policy of educating emergency officers in peace in civil educational environments.

The colleges and universities of America exist for the education of leaders. That they have been successful in accomplishing their mission is attested by *Who's Who* and other compendia of the successful, whether we measure success in terms fiscal, spiritual, or intellectual. They have, generally speaking, been dynamic institutions, adjusting their programs of instruction to the current educational needs of their charges and the nation as a whole.

In the past few years the colleges and universities have been particularly sensitive to the demands of society and are currently subjecting themselves to a close self-examination. The publicly supported institutions of higher learning are proceeding with this task of self-analysis in businesslike fashion, exposing to the light of day for minute picking-over every phase of their programs, especially those heirlooms in the educational attic hitherto considered sacred relics of an age which believed that change, however mild, was radical and unscholarly.

It may be that this process hastened the arrival of disingenuousness with regard to the ROTC program of instruction. The increasing expressions of discontent with that program may be directly traceable to the fact that since everything is being dusted off and re-inspected with coldly critical eyes, it is only natural for the ROTC program to draw its share of attention. Perhaps the activities of Europe's boss gangsters have accelerated the process so far as education for military leadership is concerned.

The cold critic doubts outright whether the current program of ROTC instruction produces leadership of the quality desired and needed. It is true that seventy-six of the total hours authorized for the infantry basic course are given over to leadership, so called. But that the term is a euphemism is attested by the fact that the work done under this heading consists of close-order drill and more close-order drill, with now and then a student placed in command of a squad or more of his fellow students for five or ten minutes. There is actually about as much time given to education for leadership as there is in training recruits. Furthermore, the seventy-six hours allotted for "leadership" is more than three-quarters of the total of

ninety-six hours that makes up the entire basic course.

In the infantry advanced course seventy-four of a total of 160 hours are allotted for leadership, and of what does this consist? Drill and ceremonies, with emphasis on the latter. But simply turn a platoon over to a newly graduated Reserve officer with instructions to dispose his command as the advance party of an advance guard, or order him to issue the necessary instructions to his command to continue the march across country while under artillery fire—and observe his embarrassment. Give him any number of practical situations of the kind he will face in a "position of leadership in time of national emergency," and observe what education for leadership he has gained. If he can demonstrate ability at all to dispose his command according to orders, there is every likelihood that he learned to do so at the six-week summer camp of his junior year, and not in his regular course of instruction. For he gets precious little education for combat leadership during that course, and then mainly on maps. Leadership for an emergency can only mean leadership in preparation for combat, and leadership in combat itself.

At the same time, the whole program of the ROTC must be thought of as education rather than training, and there is a vast difference. The colleges and universities offer education not training, and we are hardly justified in asking that academic credit be given for ROTC work if training is our whole aim. Let me illustrate by quoting from another writer:[1]

> The best distinction between training and education that has come to my knowledge has been given by Dr. Abraham Flexner, Director of the Institute for Advanced Study. Let me quote from the article by Dr. Flexner published in the May, 1932, number of the *North American Review* and entitled, "The University in American Life": "Training is, let me repeat, concerned with skills, technique and devices. One trains cooks, one trains plumbers, one trains bookkeepers, one trains business men, but one educates scholars, one educates philosophers, one educates economists, one educates physicians." A similar line of reasoning must have been in the mind of the military philosopher who said, "To the soldier war is a trade; to the officer a science; to the general an art," which is about the same thing as if Dr. Flexner had continued with "one trains soldiers, but one educates officers and generals."

To begin with, fifteen hours devoted to the rifle and rifle marksmanship in the first year of the basic course is subject to challenge. Is this work for which college credit should be given? Will it be of any value to the advanced course student when he goes to summer camp two years later? Will not the student who ends his military education with the basic course need to have many additional hours on the range if his country calls him to service? Could not sanitation and first aid be taught just as well by the department of physical education to serve the needs of the "basics" with a few hours of practical work given to advanced course students on some rainy day during summer camp? Is it college grade work when we allot eighteen hours to stripping and assembling the automatic rifle and give a student an "A" on a quiz because he can tell in perfect fashion why the sear spring is so important an item in the operation of the weapon? Is map reading of any real significance to a freshman unless he is given realistic examples of the need for an officer to possess such a skill? Why does a modern American youth need to devote four hours to reviewing the operation of an internal-combustion engine and the vehicle it propels? Most high schools dispose of this in a course in general science in the second year. And so it goes. These questions are not all original with the author. They have been asked of him and are being asked of others in colleges and universities all over the nation. And though answers can be given, they do not seem to be acceptable to the questioners.

But it will not do merely to ask and answer questions nor will it suffice to offer suggestions for a reconstruction of the program of instruction. Curriculum building is a favorite all-season pastime of college faculty members. It is the equivalent in educational circles of the military man's perpetual indoor sport—the building of the perfect infantry division. It may be worthwhile, however, to consider a few broad principles that might govern a revision of the program of instruction, with an occasional excursion into the realm of curriculum construction by way of illustration.

If we consider again that our program is to be built "primarily to qualify . . . for positions of leadership in time of *national emergency,*" then perhaps we can agree that our program must be made up of *essentials,* of material that will represent a minimum of the fundamental stuff with which the young officer needs to be equipped for leadership at a time when frills and furbelows can be safely overlooked. As we begin, we must also look again at the secondary objective of the program, that of providing "the nation with an electorate informed for the purpose and necessity for a sane policy of national defense." It is worth noting here, parenthetically, that the ROTC basic course student of today calls what we give under this heading *propaganda.* He means that he doesn't entirely believe it. He thinks that it is chiefly an attempt on the part of his Army officer instructor to justify his job! We can admit, I think, that this starts the instructor off with his freshmen with two strikes on him.

Motivation, a favorite word in the professional jargon of educators, is nevertheless a key to the success of any educational program. It makes the difference between a class of students who regard the instructor with a "so what?" attitude and a class that devours everything placed before it. Students are "motivated" in courses by a variety of causes, but if for no other reason they may be motivated because a subject contains general information. One student may be motivated to success in the basic course because he wants to make good grades and thus qualify for the advanced course, though the average freshman regards the problem of his admission to candidacy for a commission as a remote matter. Another student may be motivated by a desire to secure an honor ranking in all

[1] "Training, Education, and Promotion," by Lieutenant Colonel Bernard Lentz, Infantry. The INFANTRY JOURNAL, July-August, 1934.

courses of his program, still another may find "drill" the only subject in which he can really achieve, and still another may be motivated by purely patriotic reasons. There is without doubt little unanimity of thought by students about the basic course.

Synthesis is another good educational word in favor these days. It suggests in its educational connotation that there should be some integration of all the subject-matter courses that make up a program. It suggests also that students, if given a general view of a broad subject before delving into its component parts, may be motivated to succeed in mastering the details if they are shown why mastery is necessary and how the details are related one to the other. In some cases synthesis may be accomplished before the details are tackled, and in others after the details have been disposed of, and under still other circumstances both before and after.

Integration, a word used above, is deserving of more complete definition. It suggests that the task of fitting the parts together is very essential, whether the subjects are military, or items from fields of knowledge like history, psychology, speech, English composition, mathematics, chemistry, and the like.

Assuming, then, that any program of ROTC instruction would continue divided into the basic course and the advanced course, it is suggested that the entire first year be devoted to class meetings in which the instructor seeks to accomplish the necessary motivation by synthesis. Two class meetings of one hour each week might be devoted, with the assistance of a specially prepared text, to the whole general picture of the military art, beginning with sketchy outlines of the ancient periods but with greatest emphasis, of course, upon the modern period. The approach to this should be definitely military and not historical. Historical points should be brought out by inference only, and tactical and logistical lessons brought home through selected practical illustrations. There would be splendid opportunity for emphasizing the qualities of leadership of famous commanders, for bringing home the main lessons of tactical successes and failures, for pointing out the absolute necessity of adequate supply in war.

The course, as it proceeds, might well take up smaller and smaller units, with its climax the tactics of the infantry battalion. Each student in the class should be expected to report periodically on reading completed from a bibliography furnished at the outset by the instructor. These reports should be written, and presented as monographs before the class. Each student should be assigned tactical problems for solution, even though no direct instruction may have been given in the tactics on which his problem is based. Nor should he be marked down for making mistakes. It would be expected and hoped, as a matter of fact, that he would make mistakes.

Remember that the course seeks to show the student the exceeding complexity of modern military art in order to motivate him to master the details that are to follow. Remember, too, that the current conception of the ROTC program is that it is drill and more drill, and that it is dry stuff at best, with little opportunity for integration with the rest of the college curriculum. Here, it might be noted that the course proposed would offer opportunities for lectures by faculty members of other college departments, those having to do with the several fields of knowledge which may be drawn upon in the course.

The opportunity which such a course would present for providing "the nation with an electorate informed of the purpose and necessity for a sane policy of national defense" is also worth emphasis at this point. The author's ideas on this phase of a fundamental approach to later military studies is perhaps best expressed by the following quotation from an article entitled "An American Military History Foundation," written by Lieutenant Colonel Joseph M. Scammell, Infantry, NGUS, in The INFANTRY JOURNAL for May-June, 1933: "It is time that the universities, applying the scientific method to the study of war, were given a chance to discover what are the actual facts of war, to develop in our future political leaders and makers of public opinion the power to see things as they are, to understand and to teach what war is and what it means; so that our statesmen and voters may know how best to avoid wars or at least how best to restore peace." Colonel Scammell refers here to the need for research by accomplished scholars, but this statement is a very pat expression of the secondary aim of the proposed course.

Two other phases of the work of the first year remain to be considered. Military techniques, drills of various sorts would continue, of course, but only for one afternoon each week and then only under the students of the advanced course. It is assumed that the new simplified infantry drill would have been authorized by the time a program like that proposed could be undertaken. One ROTC unit in a southern college experimented with the tentative simplified drill in 1932-33 and found it admirably adapted to the needs of the program. The hours normally allotted to close-order drill were reduced appreciably because the students progressed so rapidly. The time saved was used for teaching extended order, combat principles, first aid and hygiene, musketry, and other subjects. If this is the case, close-order drill and ceremonies could occupy a generous part of the outdoor fall season, and extended-order drill and terrain exercises the spring outdoor season.

The opportunity thus afforded advanced course students to exercise leadership on their own in the field as well as on the parade ground would be of unquestionable benefit. Besides, and in an intensely practical spirit, with field officers being used exclusively for ROTC instruction nowadays, close-order drill in the school of the soldier, squad, platoon, and company, and extended-order formations might be just as well handled by cadet officers. And cadet officers can do it if they have to, and do it well. The summer camp instruction could be organized to prepare advanced-course seniors for giving such instruction. It would be necessary, of course, to reduce the amount of time now allotted at camp for close-order drill, physical drill, firing on the rifle range, ceremonies, and the like.

but are we not concerned still with *essentials?* A new camp schedule covering this instruction, while perhaps designed in part to prepare the seniors for training "basics," is still directed toward qualifying the future Reserve officer for leadership on M-day. What better objective could a camp schedule have?

A general officer of the regular establishment, while commenting conversationally recently concerning the ability of advanced course students to successfully handle the practical phases of military instruction in the ROTC program, harked back to his experience as the PMS&T of a large prewar ROTC unit. The general (then a field officer) was the only officer on duty at the university when the National Defense Act of 1916 created the forerunner of the modern ROTC. He had to get things done and he had a large number of students to do them for. He decided to turn the practical instruction over to senior students and handle administration and highly theoretical matters himself. His enthusiastic comment on the work accomplished by his tyro instructors offers a strong argument for giving such work to upper-class ROTC leaders.

Nor would close- and extended-order drill be the only practical instruction that might be handled by upperclassmen. During the indoor season advanced course seniors could profitably handle practical work in infantry weapons—the rifle, the automatic rifle, and the pistol. However, a considerable reduction in the time spent on mastering the manipulation of these weapons will do no harm. They would have to be relearned, anyhow, in the event of mobilization.

The mechanics of operating the program here envisioned would be no more difficult than at present. In many respects they would be simpler. The total of ninety-six hours required of first-year students in the existing infantry basic course can be divided into two categories, practical and theoretical. In the practical category totaling seventy-seven hours there is now included leadership (forty hours), military sanitation and first aid (six hours), map reading (sixteen hours), and weapons (fifteen hours). In the theoretical section there is orientation (eight hours), discipline, courtesies, and customs of the service (three hours), organization (eight hours).

Whether or not it is thought desirable to teach in the first year all the subjects now included in the practical category, there would be plenty of time in a thirty-week academic year to devote to it two and a half hours each week, or a total of seventy-seven hours. The overview or synthesizing course suggested above could certainly be given in sixty one-hour class meetings during the thirty-week year.

It should be understood that the author is working on the assumption that in the average university the basic student sits in class two hours each week of the academic year, and engages in practical work (usually as a member of the entire ROTC unit) two and a half hours each week. Any variation from this assumption to meet a local situation can, of course, be made.

The average institution could furnish enough classrooms or other larger indoor areas to conduct the program during the indoor season. Even the urban colleges and universities can and do arrange to find terrain adequate for outdoor extended- and close-order drills. An institution that has no grassy smooth parade ground is in the last analysis better off than one that has. For since the emphasis should most certainly be placed on extended-order work, a few ridges and valleys would do no harm.

The teaching-staff problem would be solved by using upper-class students. The PMS&T and his staff would still be busy men and none now allotted to ROTC instruction could be dispensed with. The pay given to advanced course students should be continued and would be the more easily justified since it would represent compensation for services actually rendered.

What of the remainder of the program? The second year of the basic course would be conducted in the same manner with the sophomores participating as corporals in the instruction of the ROTC unit under the direction of cadet officers. Repetition of the terrain exercises in which they have already participated as freshmen would still be serving the objective of preparing them for service "in positions of leadership in time of national emergency." The theoretical instruction given the sophomores for the same sixty one-hour meetings during the thirty-week year might cover much of the ground now covered by combat principles (forty-two hours) which is already included in the sophomore program, aerial photographs (five hours), defense against chemical warfare (three hours), and field fortifications (five hours), now included in the junior program, and combat intelligence (six hours), now included in the senior program.

It probably would not be wise to include these subjects as separate units, for "packaging" of military knowledge is apparent in the current program as a whole. It would be preferable certainly to make the theoretical work of the sophomore year the first step in detailed combat principles after the general course, the synthesis, of the freshman year. In other words, the process of analyzing the synthesis already built up might well begin in the second year, and it should be concerned, of course, with the smaller tactical units. Here would be the opportunity to show why the "horseshoe nail" might cause the loss of the battle, assuming that the student would be sufficiently motivated by this time to want to know how each detail of military effort should be accomplished, and his own peculiar part in its accomplishment. Each student should be expected to submit his solutions to small tactical problems posed by the instructor, after first being told that learning by rote is the antithesis of what is desired. The aim here should be to develop a knowledge of governing principles and their proper application. If the student goes on into the ORC, he will be grateful for instruction of this type for the Army Extension Courses are so organized and conducted. Examinations at the end of semesters in all courses had best be set up to require the student to reveal a comprehensive grasp of the material covered rather than to answer stultifying

(and boring) questions of fact. The theoretical part of the sophomore's program would, of course, be taught by the PMS&T and his staff.

In the junior year the student should participate as a sergeant in the practical instruction of the unit as a whole. Since students in the advanced course can be held for ninety one-hour class meetings during a thirty-week academic year, instruction can be more intensive. The program should be built, of course, in anticipation of the summer camp that follows the end of the year, and the larger share of the time should be devoted to continuing the analysis of combat principles with emphasis upon the estimate of the situation in order to develop judgment.

The correspondence of the author includes a letter from an Infantry captain which is deserving of quotation: "The Army is already a pioneer in the development of judgment, or logical thinking by officers, through the use of the estimate of the situation. After all, judgment is perhaps the quality most essential in military leaders.

"This is especially true in the case of Reserve officers for in the event of a sudden call to active duty they can be quickly trained in techniques while deficiency in judgment would be almost impossible of replacement. One of the principal objectives of ROTC classroom instruction should be the development of ability to arrive at proper decisions in simple combat situations."

There should be opportunity, however, in the junior year for consideration of the *employment* of weapons. Stripping, assembling, nomenclature, and all that, should be left for the summer camp. The necessity for acquiring skill in handling a weapon will be more apparent to the student after learning the principles of its employment.

The existing program for the senior year also needs some tinkering. It is highly desirable to accomplish in the senior year some synthesis of the work of the entire four years and this could be done chiefly through the drill and terrain exercises previously described. The greater part of the senior program should, as in the previous two years, be devoted to work in combat principles to include the company and the battalion. There should be continual emphasis upon the tactical maneuvering of units, including problems of supply, transportation, and communication. To provide time for this essential, the sixteen hours now allotted to military law should be dispensed with. Military law can be taught successfully through the subcourses of the Army Extension Courses. It is not an essential, though it is, of course, important. The time devoted to military history and policy (sixteen hours), since its equivalent would already have been covered in the first-year synthesis, could also be eliminated.

There now remains for consideration one other essential which is, in effect, the keystone upon which the entire proposed curricular structure is dependent. Any program of ROTC instruction, let me repeat, is designed to educate for *leadership*. The whole program is based on the assumption that we can take the raw product with its variety of personality traits and mold it in the stature and substance of a man who can cause other men to follow him no matter where he leads. The program as proposed has so far either assumed that traits of leadership will be acquired through some process of absorption, by the power of example, or by the trial-and-error method. One, or a combination of these with others, is the current method.

It is proposed, however, that a definite and clear-cut system of developing leadership ability be established in the ROTC program as a complement to the theoretical and practical phases previously discussed. Each officer on duty with an ROTC unit should be assigned the task of studying a certain number of students. Students should be assigned to officer advisers on some quota basis. Some equivalent of the soldier's service record should be used in which material on the student could be noted and filed. The cumulative personnel record now used by the personnel officer of a great number of American colleges and universities is worth inspection as a pattern for this type of record. Students should be closely observed in military classes. Observations gained by instructors in other departments should be obtained by the officer-instructors of the military department. Evidence of leadership on the athletic field, in the fraternity house, in extra-curricular activities generally, should be noted and evaluated.

Each officer-instructor should also have periodic conferences behind closed doors with each of his charges. A schedule of these conferences should be worked out as early in each semester as possible. The officer-instructor would be expected to use the conference period to gain an understanding of the student, to advise him, to seek to eliminate weaknesses in his personality, to strengthen his desirable attributes, and to assist him generally to make of himself the leader in civil as well as in military affairs that he has the power to become. Such conferences would often be helpful in helping the student with the problems that face him in his military educational activities. The military departments of American colleges and universities can render a most worthwhile service to themselves, to the institutions in which they serve, to the nation as a whole, and to the individual students if some such personalized sort of instruction is instituted.

A program of instruction for infantry units has been considered in this article. There appear to be no reasons why the principles proposed could not be applied to ROTC units of the other arms. Standing-gun drill, cordage, stable management, and the other skills which make up the training of recruits in other arms, are likewise secondary to education in military thinking.

It is assumed, of course, that officer personnel adequate in numbers and ability to the task here considered would be required. Some special training prior to assignment to ROTC duty might be necessary, though it is submitted that there are in the Regular Army today any number of officers well qualified to carry out successfully such a program, if these can be made available. If the "training for positions of leadership in time of national emergency" is the important element in our scheme of National Defense, and it is agreed that it is, then personnel equal to the task as herein outlined can and should be provided.

ROTC, University of San Francisco

By
Lieutenant Colonel Frank Drake, Coast Artillery Corps
and
Major William F. Lafrenz, Coast Artillery Corps

The University of San Francisco, a member of the Jesuit Educational Association, was founded in 1855. It is situated on a site which commands a panoramic view of the city and San Francisco Bay. The military department, consisting of a battalion of four batteries and a band, was initially organized in August, 1936.

The University catalog states: "The military course is established in the University of San Francisco for patriotic motives in an endeavor to coöperate with the National Government in its plan for National Defense. Its object is twofold: first, to qualify young men for leadership in time of emergency; second, to assist the student in his preparation for citizenship."

The 4-year course of study conforms to the program laid down by the War Department. During the basic course, that is, the first and second years, one hour a week is devoted to classroom instruction in the fundamentals of citizenship and basic military science. Two hours each week are devoted to practical exercises which include artillery and infantry drills. These are for the purpose of developing a spirit of leadership. The completion of the basic course qualifies students for appointment as noncommissioned officers in the Organized Reserves.

Selected students who have completed the basic course are offered two additional years of voluntary training in the advanced course. During this period three hours each week are devoted to classroom instruction in the more advanced military subjects and two hours each week are devoted to drills and practical work. The completion of this work, plus a six weeks' camp, should enable a student to enter efficiently upon his duties as a second lieutenant in the Officers' Reserve Corps upon graduation.

Training

Every energy on the part of the Regular Army personnel assigned as instructors is bent upon the task of creating the highest degree of proficiency in the graduate. If the ROTC graduate is to be a success, he must be as thoroughly trained as possible for the arm or service in which he has elected to serve. If he is to do a first-class job as a battery commander or range officer, his training must intimately acquaint him with the technique of drills, combat employment, powers, limitations, and other characteristics of the weapons which he is to employ.

The systems of instruction employed in the military classrooms follow the modern educational methods used by other departments at this institution. Maps, drawings, and other instructional material are prepared well ahead

of time, and if practicable these are arranged in the classroom before the class assembles. After roll call, which is usually taken by a member of the class, questions are asked and answered. The subject matter of the assigned lesson is then presented and discussed by the instructor. In order to insure that students study their current lessons prior to coming to class an occasional written recitation is held without previous notice being given. The last period of each subcourse is devoted to a review examination. Those passing satisfactorily are excused from taking the final examination in the subcourse, given at the end of the semester.

For the purpose of promoting discipline, instructors wear the uniform at all classes and formations. A delinquency list is kept and posted daily on the bulletin board. At the end of each month the battery having the best record in discipline is rewarded by being the earliest to be dismissed after drill during the succeeding month. In future, the most outstanding battery for the term will be awarded a banner.

The system used in grading also follows that used in the institution, except that final grades are weighed as follows: Academic grade 60%, Leadership and Soldierly Deportment (Demerit Record) 40%. Students therefore are not marked solely upon examinations, but upon their demonstrated abilities to function efficiently.

The size of the sections vary from as few as three to as many as sixty cadets. Classroom instruction periods are staggered during morning and afternoons throughout the week so as to provide for every student registered with the military department. Reasonable concessions are made by members of the faculty to prevent conflicts when registering, so no real difficulty is experienced in accommodating every one in ROTC classes.

All cadets are released to the military department for practical instruction between 11:00 A.M. and 12 noon on Tuesdays and Thursdays. Batteries of two platoons composed wholly of freshmen or sophomores, except for officers and noncommissioned officers facilitate practical artillery training. A complete battery is detailed for this instruction—cadet officers being utilized to the fullest extent to assist in this training. One platoon goes to the plotting room and fire control stations, the other platoon receives instruction on the 155-mm. and 3-inch antiaircraft guns. Systematic, progressive, and practical instruction applying theory learned in the classroom is given as follows:

Observing Station Detail

(1) Setting up azimuth instruments, (2) nomenclature, (3) orientation of instruments, (4) actual observing on stationary and moving target, (5) use of telephones.

Plotting-Room Detail

(1) Nomenclature and adjustment of fire control apparatus, (2) duties of each man in the plotting room, (3) proper use of telephones, (4) actual tracking of moving target, (5) methods of applying corrections in the plotting room.

Platoon at Guns

(1) Nomenclature, description and functioning of various parts of gun and carriage, (2) duties performed by each cannoneer, (3) drill at gun (students are rotated in as many positions as time permits) to include following moving targets and pointing the gun from actual data obtained from tracking, (4) preservation of gun and matériel to include dismantling of breech block, filling of recuperator and recoil system, (5) placing gun in traveling and firing positions.

Owing to the limited amount of artillery equipment available, much of the student's knowledge of artillery matériel must be acquired through the study of drawings, pictures, and classroom explanations. Since the University of San Francisco is primarily a liberal arts college, many of its students have not had sufficient basic technical training to develop a keen interest in artillery matériel and the application of mathematics, and they find it extremely difficult to assimilate this kind of information. The inclusion of a moving picture projector with slides and training films in the authorized equipment for ROTC units, together with demonstrative drills and display of equipment by the 65th Coast Artillery (AA), during its visit at the University of San Francisco on March 7, 9, and 13, 1939, will assist materially in putting over artillery instruction.

The Jesuit system of education, which aims to train by disciplining the several powers of the student with a view to developing character, has many military aspects. This method emphasizes the fulfillment of civil, social, and religious duties, and military training finds an important place in its curriculum. In such an institution there is no lack of sympathy and coöperation on the part of the faculty for the military department, although it is true that training has been handicapped by the lack of a gymnasium and drill ground. This necessitated drilling in

1—In the plotting room. 2—At target practice for the Hearst Trophy. 3—An explanation of the mysteries of the director. 4—The 65th Coast Artillery demonstrates for the students.

The gun position overlooks the city and bay. Baseline and target on lower field are shown.

city streets. These and other difficulties, however, are gradually being overcome. A new building now provides the unit with suitable classrooms, small-bore range, and plotting room. The campus has also been enlarged by the purchase of adjacent land and this is being leveled and surfaced to provide a suitable drill field.

Artillery Matériel and Layout

The following is a brief description of the Coast Artillery layout. In addition to the matériel listed in paragraph 28, AR 145-20, this unit was furnished with a switchboard BD-78 and a standard lead-acid storage battery.

Seacoast Setup

When a new classroom building was erected by the University in 1938, arrangements were made with the school authorities to excavate a basement under the building for use of the ROTC as a plotting room and rifle range combined. This basement, 125 feet long, 25 feet wide and 8 feet high was fitted out with a standard 50-foot, 6-target gallery range at the rear end, and a combined plotting room and classroom at the forward end.

Enough salvage fire control cable was obtained to put in an underground communication net from the switchboard, located in the plotting room, to a B' Station, B" Station, and the gun park, located on the crest of the hill in rear of the plotting room.

Twelve-pair lead-covered, rubber-insulated fire-control cable (Type 216) was used. Separate cables were run to each station and the gun position, where they terminated in terminal boxes JB-11. This hook-up gives 10 complete pairs to each station, two pairs being dead-ended in the cable. All thirty pairs were connected to the first thirty switchboard line jacks. W-69 wire was utilized to connect the plotting room outlets to the switchboard jacks. Five line jacks on the switchboard were connected in parallel and were designated "A" Jacks. The T.I. apparatus was mounted on the top of the switchboard and wired to bus bars through one of the fuses. The 10-second, 15-second, 20-second, and 30-second intervals of the T.I. apparatus were connected to four line jacks. In order to get the observing interval desired, it is only necessary to cross-connect that interval to one of the "A" Jacks, and the other T.I. switchboard jacks from each situation and the plotting room to the other four "A" Jacks.

Cross connections on the switchboard are made by means of the patching cords furnished with the switchboard rather than by means of permanent cross connections. This has the advantage that it can be utilized for instruction in signal communications, because with the extra pairs available it is easy to simulate a line failure on any telephone or T.I. bell.

A left-handed baseline 200 feet in length was laid out along the edge of the new drill field; the B' station being located within 40 feet of the plotting room.

The 155-mm. gun was emplaced in the vicinity of the B' station, the pintle center of the gun being located 52 feet to the left of the B' and 24 feet in rear of the baseline.

The near edge of the athletic field is located about 800 feet in front of the baseline and is 64 feet lower in elevation. The far edge of the field is about 1,100 feet from the baseline.

Targets can be simulated by having a cadet walk across the lower field in various directions and at various speeds. Eventually, by means of a system of wires and pulleys,

a target will be towed across this field to simulate a moving target. Spotting can be simulated by having a man accompany the target. When he receives the signal that a shot has been fired, and a splash is to occur, he will drop a marker representing the splash of the shot at a predetermined point in reference to the target.

Spotters can read the deviation of the splash, and battery commander's adjustment corrections can be applied in the customary manner. A series of shots can be fired, the splashes indicated, and a complete fire adjustment problem can be worked out in accordance with a predetermined "shoot." By judicious choice of splashes, more involved problems in gunnery and fire adjustment for advanced students can readily be carried out.

By assuming that one foot on the ground corresponds to ten yards on the plotting board, the miniature baseline system allows the use of a 2,000-yard baseline and permits plotting courses on the plotting board with ranges from approximately 9,000 to 13,000 yards, and an azimuth range of about 80°

The miniature baseline has another advantage in that it overlooks the waters of San Francisco Bay, about five miles away. Ships traversing this portion of the Bay can be readily tracked from both B′ and B″ stations. By changing the orientation data on the B″ instruments so that it will read a fictitious azimuth (moving the orientation of B″ station 15° in a clockwise direction), the effect is the same as lengthening the baseline to about 6,000 feet and ships tracked with this fictitious data for the B″ station give courses on board at mid-range.

When a depression position finder becomes available, the drop in elevation between the B′ station and the lower field will give a favorable depression angle so that the vertical base system can be employed in actual practice, using the same scale as for the horizontal base system.

The proximity of the plotting room, B′ station, and the gun is an effective aid to instruction. All cadets are within voice-range of the instructor and yet are far enough removed to give the student a clear picture of the entire position finding system.

When fully established, this system will be superior to a sand table in that it gives a much more realistic picture of the entire problem to the student. The utilization of actual water-borne targets at ranges comparable with those actually used in service is also a decided advantage.

Antiaircraft Setup

The 3-inch AA gun, model 1918, on the trailer mount M1918, is emplaced alongside the 155-mm. gun. A project is now under way to enclose the gun park and the B′ station in a man-proof wire enclosure.

When drill is being held, the AA computor M1917 (RA Corrector) is emplaced on the knoll in rear of the gun park. A normal communication system from the guns to the computer is being installed, utilizing some of the spare pairs in the B′ station cable and gun cable. Power will be obtained from the switchboard. An altimeter baseline about 1,200 feet in length, using field wire and EE-5 telephones, will complete the set-up. Correction for a 64-foot difference in elevation between the two stations is necessary. Here again this unit is fortunate in that commercial planes are usually flying within range of the battery when drills are being conducted.

To augment the commercial plane targets, an overhead trolley system by means of which a miniature plane can be towed along various courses and speeds in the vicinity of the gun park, is to be constructed as soon as funds are made available by the University.

* * *

We entertain no delusion that this relatively new unit has reached a stage of excellence comparable to some of the more outstanding ROTC organizations. But it has steadily improved since its establishment and the reopening of classes this fall will find, for the first time, a full complement of Advance Course students, some with ROTC camp experience. The unit will then enter upon a period that promises a splendid future.

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With or Without Mustard?

By Captain Lathrop R. Bullene, Coast Artillery Corps

This time-honored query of the hot-dog vendor calls up, for most of us, only visions of a July day at Coney Island. But to the harassed captain of an antiaircraft artillery gun battery in war, the question may have a much more ominous significance. While scanning the heavens for enemy bombers he will at the same time keep a weather eye on the treetops for the next heart-stopping assault by the vicious ground-strafing attack planes, and whether the next "dishing out" is to be with or without mustard may be for him an exceedingly grim question.

The average American citizen spends little time worrying about chemical warfare or the defense against it. Even to many in the Army, chemical warfare means little more than gas mask drill by the numbers plus a little fun with tear gas. When the company commander selects a nice wooded valley in which to bivouac his men does he always remember that gas tends to run downhill and is most persistent in the woods? In Europe, on the other hand, protection against aero-chemical attack is considered a matter of greatest importance to both the soldier and the civilian. Witness, for example, the careful gas-proofing of the Maginot Line, the construction of gas-proof subway stations in Paris, and the far-flung activities of the Air Raids Precautions in Great Britain. And even he who runs can hardly avoid seeing pictures of gas-masked Londoners, from bobbies to babies.

However, the author has no intention of attempting to cover so broad a subject as chemical warfare, nor to discuss political or tactical questions. He asks only that the reader grant the possibility of "Blue" being at war with "Black," and that Black is prepared to use chemicals in war, as he has been doing in one form or another since the siege of Plataea, 429 B.C. Based on this assumption, the author hopes to present to actual and potential battery commanders some of the problems which may confront them in active service as a result of the introduction of this rather unfamiliar form of attack.

Let us re-state two military axioms: First: A commander is primarily responsible for the success in battle of his organization. Second: The commander of every unit is responsible for the protection of that unit. Put them in the cocktail shaker, manipulate in the approved manner, and what do we get? The commander of an AA gun battery, naturally and rightly, devotes most of his energies to perfecting his tactics and technique for offensive action, but he cannot forget about local defense. This means not merely setting up his four machine guns in some convenient place, but rather a careful preparation to combat all forms of enemy assault on his battery. This certainly includes assault by chemicals. Some may think that the latter is a problem for the Chemical Warfare Service, but this is no more true than that protection against machine-gun bullets is a problem for the Ordnance Department. Experimental and development work on protective methods is done by the C.W.S., but when it comes down to the protection of an individual battery, in this as in every other case, "the battery commander is responsible."

This article will limit itself to a discussion of antiaircraft artillery units employed in the defense of rearward areas, troops or installations, as that is where the comparatively few available units will most probably be located. Most emphasis is placed on the gun battery, not because the other elements of the regiment are of lesser importance, but because their problem is less difficult. Machine-gun platoons are normally so scattered and concealed as to present poor targets, and are of course highly mobile. Searchlights will be well concealed during the daytime, and when in operation at night are more liable to attack by destructive munitions than by chemicals. Other elements of the regiment can usually secure a fair measure of protection by cover and concealment. But the gun battery, especially while firing, is necessarily out in the open and vulnerable to assault. The battery commander has selected an alternate position, to be sure, but in many cases the tactical situation will not permit him to move on the spur of the moment. He will just have to stay and take it.

Our battery, being well behind the lines, is obviously beyond range of hostile artillery and chemical troops, but this is no time to turn in the gas masks. The defended area will certainly be a vital one, for we will never have enough AA to use it in the defense of dusty cross-roads. The Black commander may well decide that the destruction of this objective is of sufficient importance to warrant risking the loss of some of his expensive bombers. If so, he will surely employ every possible aid to push them through at least to the bomb release line. The planes themselves will be camouflaged, perhaps silenced, and will further reduce their vulnerability by proper route formations and maneuvers at high altitudes, but they will by no means always rely on such passive means of defense. Hence the gun battery becomes a juicy target for the attack aviation. These hedge-hoppers will attempt to destroy or

Estimates of the situation must include defense against chemicals

neutralize the batteries covering most effectively the bombers' routes of approach, and they will most probably make the attempt by direct assault on the firing batteries. Blinding of the instruments by chemical smoke is an effective form of temporary neutralization when it is successful, but there are many variables to be figured for the laying of an effective smoke blanket. The number of planes required could probably be better employed in harassing the batteries.

The assault will normally come just prior to the passage of the bombardment through the critical zone, and will employ all available weapons. These are machine guns, fragmentation bombs and chemicals. They can be used singly or in combination. The two first named are extremely effective, so much so that we often ignore the chemicals entirely. Bullets and bombs have the advantage of being immediately destructive to both personnel and matériel, whereas a man can be thoroughly soaked with mustard and still continue to function for several hours. Why, then, use chemicals at all? Before attempting to answer this question, let us examine briefly the weapons and agents available for use by aircraft.

The A-17 attack plane mounts four fixed and one flexible .30-caliber machine guns. Its bomb load is either twenty 30-lb. fragmentation or chemical bombs, or four 100-lb. demolition bombs. Two 20-gallon chemical tanks may be substituted for the bomb load. The present standard chemical bomb is a streamlined affair carrying about 10 pounds of chemical. It has a direct impact fuze in the nose and a burster charge sufficient to rupture the case without excessive dispersion of the agent. The contamination produced is much the same as that caused by the detonation of an artillery shell. All nations are doubtless striving to perfect the chemical bomb. The Soviet Army, for instance, has experimented with air-burst bombs which spray the liquid over a larger area.

The chemical tanks mentioned above are of the non-pressure type which use the force of gravity for eduction and the shearing effect of the slip-stream for the atomization of the liquid. The agent is thus disseminated in the form of a mist of very fine particles which drift with the wind as it settles. To have a reasonable chance of hitting the target, the spraying plane must fly close to the ground, but these are normal tactics for attack aviation.

Chemical agents suitable for this method of dispersion are screening smokes, lacrimators, and vesicants such as mustard gas, lewisite and ethyldichlorarsine. Mustard, which is affectionately called betabetaprimedichlordiethylsulfide by chemists, or Hellish Stuff by many doughboys, is by far the best all-around agent for this purpose, so the discussion will be confined to it.

The pattern of contamination on the ground depends on several variables, such as altitude, wind direction and velocity, etc. As a rough approximation, one airplane flying at 100 feet altitude can cover a band about 800 yards long by 200 yards wide with liquid mustard which drops like the gentle rain from heaven, but with rather different results. Thus it is quite possible for one flight element of three planes to contaminate effectively an entire battery position and quite an area of the surrounding terrain.

Mustard casualties are produced in four ways: first, contact with the liquid droplets in the air at the time sprayed; second, contact with liquid droplets on vegetation, equipment and matériel during and after spraying; third, breathing the mustard vapor during and after spraying and fourth, the vesicant action of the mustard vapor on the skin. In other words, mustard gas is a quadruple-threat player in the game of war.

We are now in a position to state some reasons why assaults on antiaircraft artillery batteries are more likely to be with than without mustard. First let us consider the factors of Time and Space, twin idols of Leavenworth. As for time, a bullet or bomb fragment flying through the air is a serious menace, but after it has reached the ground it is no more dangerous than a pebble or a tin can. A rain of mustard, on the other hand, drenches vegetation, clothing and equipment with a liquid which vaporizes so slowly that its persistency may run up to two or three days, depending on weather conditions. The droplets settle into hard-to-reach places inside the base housing, under the firing platform, at the bottom of the fuze setter, etc., which tends to further increase persistency.

Consider next the space factor. Machine-gun bullets are very effective within a beaten zone which can be calculated quite accurately. With a persistent chemical agent, on the other hand, the vapor resulting from evaporation of the liquid has a vapor density considerably higher than that of air, so that it tends to hug the ground and flow down into low places, slit trenches and dugouts. Furthermore it may be dangerous a thousand yards downwind from the contaminated area.

As stated above, casualties can be produced either from direct contact with the liquid, during or after the spraying, or by contact with or inhalation of the vapor. This gives us a clue to the physiological action of mustard gas. It is primarily a vesicant. The vapor penetrates all ordinary clothing after about ten minutes of exposure, causing severe blisters which appear in a few hours. The blistering action is most severe on parts of the body where there is the most perspiration. The results produced by contact with the drops of liquid are similar, but more severe. In addition, the vapor is a powerful lung irritant. If unprotected personnel remain within a mustardized area, a very high percentage of casualties is inevitable. This means that gas masks and protective clothing must be worn continuously by all personnel of the battery. Anyone who does not believe that this will not reduce efficiency should try it for a few hours. Even though the battery moves to its alternate position, personnel will still have to be protected until decontamination of the matériel is finished.

From the foregoing it might appear that the battery could be sprayed with mustard and still continue to function for several hours. For this reason many officers can see no reason at all for the use of chemicals just before the bombers make their effort. However, put yourself in the place of the individual soldier when he sees this dark rain

settling upon him and smells the characteristic odor of horse-radish. Can you blame him if his mind wanders from the business of loading or matching pointers and conjures up a picture of himself in the hospital with inflamed eyes, abdominal pains, a racking cough and deep, sloughing ulcers on sensitive parts of his body?

Assuming that mustard spray has been used against an AA gun battery, where exactly should the battery commander look for contamination? The writer does not know of any exact tests upon which to base a reply, but from general information as to the properties of HS, the following are most likely to be affected:

Ground, vegetation and shrubbery around the guns.

All painted metal surfaces, except where nitro-cellulose lacquer has been used. The latter is highly resistant.

Leather parts such as equilibrator covers, field telephone cases.

Anything made of wood, such as ammunition racks, boxes and seats.

Camouflage nets and sand-bag revetments.

Canvas paulins, breech and muzzle covers.

Fabrikoid ammunition cases and ammunition itself.

Rubber covered gun cables (slow absorption).

Fire control instruments.

Grease and oil used to protect unpainted metal surfaces.

Telephone switchboards, field wire, field glasses and other signal equipment.

Last but not least, the kitchen and ration trucks are quite likely to be within the contaminated area, causing much profanity among the cooks and KP's, as well as serious danger to everyone who eats.

This list might be expanded until it would look almost like the table of basic allowances, for the items not liable to contamination are really quite few. Included are all bright metal parts, for metal itself won't absorb mustard.

Having painted the offensive picture, let us look at the defensive side; that is, the possible protective measures. These can be divided into technical and tactical protection.

Technical protection includes, of course, individual and collective protection of personnel. These subjects are discussed so thoroughly in the *Basic Field Manual* that it is not necessary to say anything about them here, except that the battery should be thoroughly trained in individual protection, and should apply measures of collective protection so far as the tactical situation permits.

To be more specific, it is quite probable that some form of protective clothing will have to be worn almost continuously, and gas masks carried on the person at all times when in the open. Some European armies have protective capes, designed to be slipped on over the uniform whenever an attack is imminent.

Whenever the battery is in a semi-permanent position, it will be desirable to construct gas-proof shelters at both the occupied and the alternate positions for the command post, ammunition storage, shelter of personnel, etc. Such construction requires many man-hours of hard work, but it may pay big dividends in comfort and efficiency.

The foregoing remarks would apply to almost any unit in the theater of operations. However, for antiaircraft artillery gun batteries there are a few additional measures of protection which the writer believes might well be considered. These are:

The use of nitrocellulose lacquers wherever standard O.D. paint is now used. Paint absorbs mustard quite readily, and decontamination is difficult, but the lacquers are highly resistant.

Covering of the guns, instruments, etc., with protective paulins and covers when not actually in use. Canvas readily absorbs mustard, but it can be so treated that it will greatly delay penetration. Unfortunately the covers themselves will be so contaminated after a severe attack that they will probably have to be discarded.

Reduction to a minimum of all leather, fabric and wood in the battery equipment.

Rubber covered cables should normally be well buried in the ground. Portions which cannot be buried could be wrapped spirally with strips of protective canvas, these strips to be discarded if contaminated.

Such articles as small instruments, Lewis charts, etc., should be kept under protective cover whenever possible.

Thought should be given in the design of future equipment to the elimination of places on guns, carriages and directors which are hard to reach by hand but are still exposed to the air.

Food supplies should be kept in air-tight metal containers, and the kitchen and ration trucks well protected.

After the attack has been made, the battery commander is faced with the serious problem of decontamination. Whether or not he will be able to have the work done immediately will depend on the situation, but he should remember that decontamination must be done promptly to be effective. Furthermore, it is a lot of hard work to decontaminate a battery, as the following remarks on the technique of decontamination should prove.

Battery Area: A thorough contamination of the shrubbery and ground in which the battery is emplaced will cause so much trouble that "a solution" is to move out immediately to the alternate position and decontaminate the guns. Obviously this will not always be possible, so the battery commander will have to do what he can by having the underbrush cut or burned, and contaminated ground covered with a mixture of clean earth and chloride of lime, or even a blanket of earth alone at least three inches thick. This work is slow and tedious, and must be done by personnel wearing gas masks and protective clothing.

Fabric and Wood: These will usually have to be discarded, though fabrics which can stand it can be decontaminated by long-continued boiling or steaming. There is not much that can be done with wooden parts except to burn them.

Metal Parts: Such parts as outriggers, firing platforms and outer surfaces of guns and mounts can be swabbed off with bleach solution, that is a mixture of chloride and

lime and water. Since this mixture is highly corrosive, it would not be practicable to use it on bearing surfaces or delicate parts such as data receivers. These can be cleaned with alcohol, kerosene or gasoline. These are not neutralizing agents, as is chloride of lime, but are merely mechanical solvents, and must be disposed of after use as they will contain mustard. A non-corrosive destroying chemical would be ideal for such purposes.

Canvas covers and camouflage nets: Discard them, for there is not any practicable way to decontaminate.

Large Matériel: Decontamination of such items as trucks, guns and tractors should be accomplished as follows: Wipe off visible droplets of the agent with oil-soaked rags. Cover the entire contaminated surface with bleach solution, using improvised swabs such as rags wrapped around an old broom. Repeat the application. Finally wipe off the second coat and dry the surface with clean rags. Individual parts such as carburetor, generator, wheels, data receivers and breech blocks will usually have to be disassembled and cleaned separately. For all of this work drainage must be provided to run off the contaminated bleach, and gas masks and protective clothing must be worn.

Leather and Rubber: Discard them as practicable. However, gun cables are too expensive to be lightly thrown away, so an attempt should be made to save them by washing with bleach solution. This will be effective if you don't wait too long, for rubber absorbs mustard rather slowly.

The foregoing might be summarized by saying that decontamination is a mess, an operation to be avoided if humanly possible. The ounce of prevention is still worth at least a pound of cure. Methods of prevention will be next discussed.

The most effective measures that can be adopted for the protection of a battery from aero-chemical attack are movement and military action to defeat the attack before it occurs, plus the old stand-bys, cover, concealment and camouflage.

Movement to Position: Every effort must be made to prevent location of the column by hostile observation, in order to avoid aerial attack on the battery while it is on the road and especially vulnerable. It is probably true that a unit as small as a battery can move about in the rear areas even in daylight and be fairly safe, but the battery commander will naturally not want to take undue chances, so will adopt a dispersed formation and follow covered routes of approach when possible.

Road reconnaissance prior to a march should always include chemical reconnaissance. This includes not only the location of gassed areas, but also the marking of low, wooded portions of the road which are favorable for chemical attack, and the location of alternate routes. In an emergency, the motor column can be taken through a mustardized area, the troops wearing gas masks, but the vehicles must be decontaminated at the first opportunity. This operation is so tedious that it is far better to avoid the contaminated area if at all possible.

Selection of Position: We are all familiar with the requirements for a good gun battery position as stated in the *Coast Artillery Field Manual*. It is not the intention of the writer to attempt any revision of this valuable publication, but he believes that more emphasis should be placed on the measures for security from aero-chemical attack. Many of the factors which make for good cover and concealment are also favorable for this form of assault. For example, all forms of chemical agent tend to collect in low places. Again, a position surrounded by trees high enough to furnish flash defilade. Again, the same surrounding trees which furnish flash defilade for the battery will help mask the approach of the attack airplanes. Trunnion—high shrubbery may be excellent natural camouflage, but it certainly adds to the troubles of the battery in its midst when it gets thoroughly drenched with mustard spray. The woods in which we are prone to place our motor parks, kitchens and bivouacs increase the persistency of gases. It is true that the overhead cover of the trees furnishes some protection against the spray, but not perfect. If rain is able to reach the ground through the trees, so is mustard.

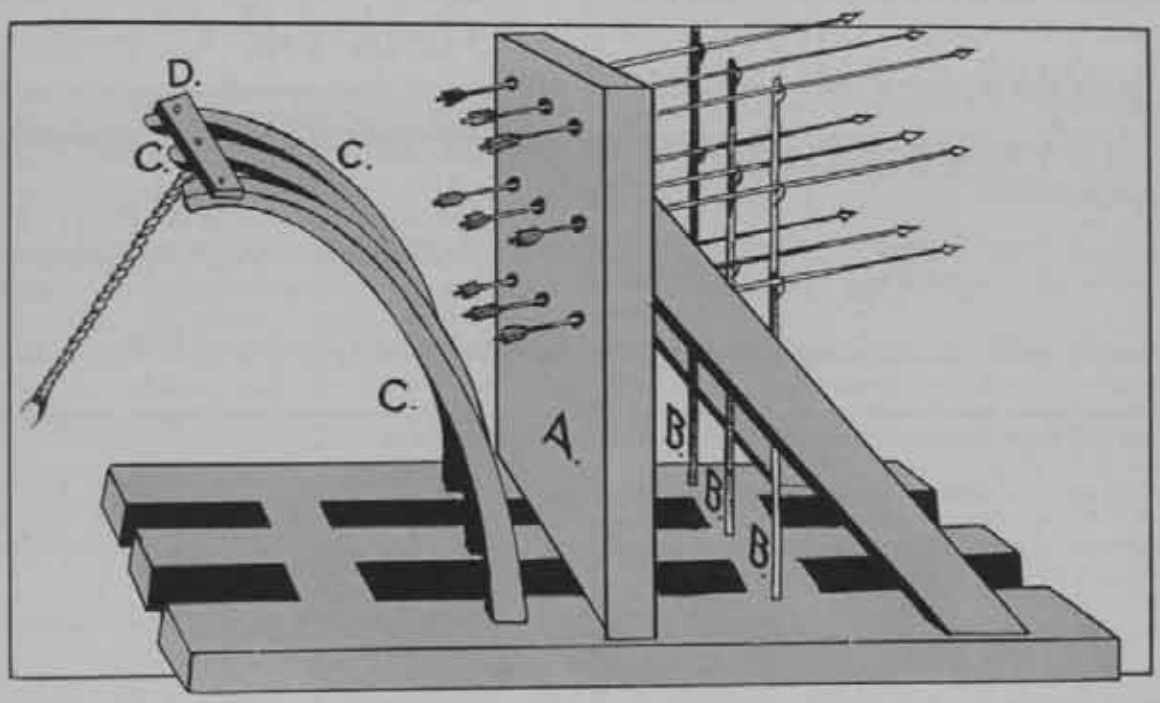
It is not contended that the battery commander should ignore the precepts of the *Field Manual* and emplace the battery in the middle of the parade ground, but he should weigh these opposing considerations in his mind and make the best compromise between them.

Local defense machine guns are, of course, just as effective against chemical spraying planes as against those dropping fragmentation bombs, hence there is no need to elaborate on their employment, except that prevailing wind direction may at times be considered. It is quite possible for the planes, when attacking a well-defended battery, to release the spray some distance upwind and let it drift over the battery. This method is not as effective as direct assault, but could be used on occasion.

To be perfectly fair, it must be admitted that chemical attack has many limitations. It is affected by weather condition to a greater extent than any other weapon. The physiological effects of mustard gas are delayed for several hours, whereas a machine-gun bullet acts "right now." Further, this physiological effect varies greatly with the individual, some being much more resistant to mustard than others.

In spite of these admitted drawbacks the writer believes that areo-chemical attack has great potentialities of danger to antiaircraft batteries, and should therefore be given due consideration by the Coast Artillery. To this end, instruction of soldiers in defense against chemical attack should be stressed and made interesting, so that its importance will be realized. Officers should become thoroughly indoctrinated with the principles of chemical warfare, so that the estimate of any situation will automatically include the means for active and passive defense against that rather new and untried form of attack, the chemical rain. If we are not to be caught napping some day in the future, now is the time for the antiaircraft artillery to become "gas conscious."

From Ballista to Breech Loader



Chapter 2: THE POLYBOLOS

The Story of Artillery Through the Ages

By W. A. WINDAS

As Alexander the Great lay on his death-bed, his generals gathered about him, asking him to appoint a successor to the throne. Taking the royal signet ring from his finger, he threw it to the floor, and said, "to the strongest."

There were many candidates for this job of "strongest" —each voting for himself! The many-sided civil wars which followed were long and bitter—now one man in the ascendant, and now another.

The final outcome was the complete break-up of the vast Macedonian empire, each province being ruled as an independent kingdom by the general of Alexander who happened to be strong enough to hold it. Each of these kingdoms undertook its own expansion, carrying Greek culture and learning still farther into the eastern European area.

In these civil wars, soldiers would support a leader only as long as he "did right by them"—that is, paid them well. This does not seem to have affected the fine Macedonian discipline but it did make men less trustworthy. Troops were bought and sold on the battlefield itself, and it became the accepted thing for a man to change sides as often as he liked.

The untrustworthiness of the armies, made for a development of artillery such as had never been seen before. Each leader sought to supplement men by machines which could be used not only to enforce loyalty on the battlefield, but also to damage the enemy.

None of these engines of war was more interesting than the polybolos—the first recorded machine-gun of history. It was manufactured in many different styles and models.

The type illustrated worked by tension rather than by torsion. That is, the action of a bend—not a twist—supplied hurling force. The arrows were held in the magazine (A) and their upper ends rested on supports (B) which were adjustable for elevation. The springs (C) could be released simultaneously or successively. In the latter event, the top-strap (D) was removed. The piece could then deliver three quick flights of three arrows each. These arrows were longer and heavier than any fired from a bow. The effective range of the piece is doubtful, but probably did not exceed 300 yards.

Although this type of polybolos was clearly not designed for use against moving targets, it can be seen that a battery of such weapons could maintain considerable fire volume. At close range the polybolos must have had severe punishing effect upon the closely-set ranks of the Macedonian infantry phalanx.

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 matériel and methods of training and by fostering mutual understanding, respect and coöperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.

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The Coast Artillery Journal

MAJOR AARON BRADSHAW, JR., Editor

The JOURNAL prints articles on subjects of professional and general interest to officers of all the components of the Coast Artillery Corps in order to stimulate thought and provoke discussion. However, opinions expressed and conclusions drawn in articles are in no sense official. They do not reflect the opinions or conclusions of the Chief of Coast Artillery or any other official or branch of the War Department.

The JOURNAL does not carry paid advertising. The JOURNAL pays for original articles upon publication. Manuscripts should be addressed to the Editor. The JOURNAL is not responsible for manuscripts unaccompanied by return postage.

News and Comment

Coast Artillery Association ROTC Medal

Outstanding Coast Artillery ROTC students now have the opportunity to compete annually for a medal to be awarded for exceptional ability. The medal is made possible through the generosity of the United States Coast Artillery Association which recently authorized its bestowal and laid down rules governing the selection of the recipient.

The board of officers which formulated the conditions that govern the award decided on the following rules which have been approved by the Chief of Coast Artillery:

1. The award—a gold-plated silver medal—will be known as the "United States Coast Artillery Association Medal."
2. Only one medal shall be awarded to a unit.
3. The award is limited to Senior Coast Artillery Corps ROTC units.
4. The award is based on records made during three years of military and academic work.
5. The medal will be presented to a student who has completed the 1st Year Advanced Course. The presentation will be made at a final parade at the end of the academic year, or at an appropriate ceremony at the beginning of the next year.
6. The medal will be awarded in accordance with the recommendations of a three-man board of officers appointed by the Professor of Military Science and Tactics with the approval of the President of the institution concerned.
7. The selection of the outstanding students will be made as nearly as possible on the following basis:
   a. Academic grades, exclusive of military subjects ..... 30 points
   b. Grades in military subjects—theoretical and practical ..... 40 points
   c. Personal qualifications ..... 30 points

Under the head of "personal qualifications" the board will weigh and consider the student's attainments in character, initiative, force, leadership, cooperation, loyalty, industry, military bearing, and neatness.

Each Professor of Military Science and Tactics at an institution having a Senior Coast Artillery ROTC unit will annually be sent a letter announcing the award and setting forth the conditions that govern selection.

The board of officers that drew up the conditions for the Association consisted of Colonel E. W. Thomson, Coast Artillery Corps Reserve, Major Milo H. Brink-

ley, Coast Artillery Corps Reserve, and Major W. H. Warren, Coast Artillery Corps.

Annual Meeting

Our Chief, General Sunderland, visited New York the week-end of April 28 as the guest of honor at an impressive review given him Friday evening by the 244th Coast Artillery (TD) New York National Guard commanded by Colonel Charles H. Ellard. The review of the 244th was preceded by a banquet, and followed by a dance and buffet supper.

On Saturday afternoon, April 29, General Sunderland visited Fort Totten and was tendered a review by the 62d Coast Artillery (AA). The ceremony was followed by a business meeting of the New York Chapter, U. S. Coast Artillery Association. Later General and Mrs. Sunderland attended a reception which was followed by a buffet supper and dance.

The social activities and ceremonies attracted a large gathering of National Guard and Reserve officers and their ladies.

At the New York Chapter meeting General Sunderland outlined the progress which has been made by the Coast Artillery Corps recently and the plans for future development.

The following were elected officers of the New York Chapter for the ensuing year:

Colonel C. S. Gleim, 245th Coast Artillery (TD) N.Y.N.G., President.
Colonel Earl Biscoe, Coast Artillery Corps, Vice-President.
Colonel R. S. Allyn, CA-Res., Vice-President.
Lieutenant Colonel Malcolm W. Force, 244th Coast Artillery (TD), N.Y.N.G., Vice-President.
Lieutenant Colonel C. I. Clark, CA-Res., Secretary-Treasurer.

The annual meeting of the National Association was discussed at some length. It tentatively was decided that a meeting of all chapters of the National Association would be held in New York City next fall under the sponsorship of the New York Chapter.

The New York Chapter has also elected an executive committee of seventeen energetic junior officers representing all three components. This committee will plan and operate the convention of the National Association. The group is already hard at work and the Coast Artillery Corps may confidently expect big things from this group of enterprising officers. As their plans mature appropriate announcements of the details will be carried in The JOURNAL.

Prize Essay

Reader response to the 1938 prize-winning essays clearly shows that the competition has a definite value in stimulating professional thought. Moreover, the JOURNAL obtained several valuable manuscripts that probably would not have been submitted if the competition had not been held. All in all, the prize-essay contest benefits everybody.

We should like to point out that the contestants need not necessarily be professional writers. The governing factor in selecting the winning essay is not brilliant writing but whether or not the essay makes a contribution to professional advancement. Under these conditions even the hardiest of field soldiers stands a chance to win.

You may be interested to learn the basis on which the board picks the winner. Each essay is graded and marked by the following standard:

Subject and Theme		
Broad general interest	15%	
Timeliness	10%	
Originality	5%	30%
Treatment		
Thoroughness	15%	
Logical arrangement	15%	
Value of conclusions	15%	45%
Style		
Clarity and effectiveness of expression	25%	25%

If you plan to enter an essay in the current competition, now is the time to go to work. Although the deadline for submitting essays is four months off (September 30th) you should be assembling and organizing your material now. Your actual writing job will then be much easier and will not be interrupted by further search for facts.

Read the conditions that govern the 1939 competition. These are set forth on page 283. You will note that these conditions are virtually identical with those that governed the 1938 award. If you are in doubt about any detail or want further information, drop the editor a line.

Antiaircraft Defense Guns

By General F. Culmann, French Army

In order to show a possible starting point for antiaircraft guns of the future, the characteristics of a 90-mm. gun constructed in 1938 by Schneider & Company for coast defense work are given below. During the crisis of last September, guns of this type were transported to Paris for the defense of the capital.

Caliber	90-mm.
Muzzle velocity	820 M/S
Weight of projectile	11.3 Kg.
Weight of explosive charge	1.330 Kg.
Weight of cartridge	20 Kg.
Vertical range	11,600 M
Horizontal range	17,450 M
Fields of fire: elevation	— 10° to + 80°
Fields of fire: direction	360°
Weight: firing position	5,730 Kg.
Weight: traveling position	8,320 Kg.

We should note that this gun is not only twenty per cent larger in caliber than the "powerful" 75-mm. model, but also that its muzzle velocity is greater by 2.5 per cent —an increase to 820 M/S from the 75's 800 M/S.

The 90-mm. shell weighs almost twice as much as the 75-mm. shell. Since the effect of air resistance decreases in inverse proportion to the size of the projectile the larger projectile will retain its velocity better than the smaller and therefore its time flight will be reduced. Increasing the size of the gun is still the most effective means of securing accurate fire since the distance between the target and the mid point of a group of shots diminishes as a cube of time of flight and possibly still more if the target is maneuvering. In order to keep abreast of the increase in speed of modern airplanes we must have a shell of great internal capacity.

The French 90-mm. gun is considerably more powerful than the German 88-mm. gun employed in Spain. The cartridge of the former weighs twenty kilograms (projectile 11.3 kg.), whereas the latter weighs only 14.5 kilograms (projectile 9 kg.).

This 90-mm. gun can be fired at a rate of approximately thirty shots per minute. It is equipped with automatic breech and firing mechanisms. It has mechanical loading and tamming devices and an automatic regulator for continuous fuze setting.

Bombing of Electric Plants

That bombing of electric utilities along the Ebro River, in Spain, did not curtail service for any length of time was stressed by Mr. Arthur C. Hobble, technical director of the Ebro Irrigation and Power Company, in a talk delivered last month to the Army Industrial College.

The Loyalists, said Mr. Hobble, repeatedly attempted to bomb a large outdoor electric switching station at Pobla, near Tremp, but antiaircraft guns preserved the station from destruction. On three occasions, he said, Loyalist planes escaped the AA barrage, and dropped bombs all about the station, but there were no direct hits on the structure.

Bombs exploding on the ground sprayed shrapnel upward at an angle of 30 degrees, cutting the steel uprights and struts in places and damaging insulators, but there was no collapse of the structure, the utilities director said.

A 300-mile long transmission line was bombed repeatedly, but, said Mr. Hobble, "Our line crews were ready for quick emergency repairs, so there was never an 'outrage' of more than one hour at any time."

Mr. Hobble added that both sides refrained from bombing utilities properties so long as they felt there was any chance for them to secure control of those properties, because electric power was essential to both sides. As it was, enough damage was done. The Tremp plant was bombed by the Insurgents in 1937, and a direct hit registered through the roof of the high tension room where there were a number of oil switches. The oil spreading over the floor was set afire, which probably caused more damage than the actual bombardment.

"I would emphasize," said Mr. Hobble, "the necessity of designing and constructing all large and important power plants and sub-stations, located in strategic places, of heavy or reinforced concrete. Our later power plants, built since 1918, are of heavy reinforced concrete construction. The large Camarasa plant has over a hundred tons of steel reinforcement. The roof of this plant has no less than 12-inch thickness of reinforced concrete. The Camarasa plant was bombed repeatedly. It is located in a gorge or canyon with rocky walls rising for over a thousand feet on both sides. The Loyalists occupied the cliff just above the power plant, and it was very easy for them to throw bombs down on the power house roof. So you can imagine what would have happened to that plant had it not been properly constructed to resist such attacks. That plant resisted aerial bombardments and the throwing of incendiary and explosive bombs of all kinds. The dam was also under attack as well as auxiliary equipment such as the spillway gates. . . . Many attempts were made to destroy this auxiliary equipment, but without success. Of course, the dam was so solidly constructed of massive concrete that no appreciable damage was done to it."

Mr. Hobble gave other instances of attacks on plants which did not end their operation. In Barcelona, he said, Insurgent bombs put the steam boiler equipment out of commission and damaged the sea water jetty, supporting structure for a long line running into the sea to obtain condensing water. The Loyalists were able, however, to put the plant in service again long before Franco captured the city.

—*Army and Navy Journal*, April 15, 1939.

British 4.5-Inch AA Gun

The illustration on page 244 discloses a new and interesting type of fixed antiaircraft weapon now being installed at strategic points on the British coast. The following data concerning this gun should be of interest:

Caliber	4.5 inches
Weight of round	85 pounds
Weight of projectile	56 pounds
Range	20,500 yards, horizontal
	13,500 yards, vertical
Rate of fire	10 rounds per minute (estimated)

These weapons are fundamentally of the naval type. Each installation is surrounded by an "unclimable" fence. Stout concrete walls insure protection to the personnel from bomb splinters. The installations are said to include underground ammunition storage magazines.

The fuze is of the mechanical clockwork (Tavarro) type. It is reported that over one million rounds of ammunition are now available for these weapons.

Cadets at UCLA Get AA Demonstration

The ROTC cadets of the University of California at Los Angeles recently witnessed a demonstration of the latest in antiaircraft devices when a detail from the 63d Coast Artillery (AA) appeared on the campus.

Fifteen men accompanied the matériel from Fort MacArthur and showed nearly one thousand cadets how enemy planes are brought down. Included in the equipment were a 3-inch AA gun, a height finder, a 50-caliber machine gun, a director, a sound locator, a searchlight, and a power plant.

The various day and night demonstrations attracted large crowds who came to see what AA modern equipment can do in action. The arrangements for the display were under the direction of Major Don R. Norris, Coast Artillery Corps, assistant professor of military science and tactics at the University.

British Antiaircraft School

The School of Anti-Aircraft Defence at Biggin Hill, Kent, is one of the most prominent instructional centres of the British Regular and Territorial Armies. Devoted to the problems of defence against attacking aircraft, the Gunnery Wing of the School has the primary purpose of training instructors and officers for the anti-aircraft units of his Majesty's Forces.

While the detection of approaching hostile aircraft by means of sound locators, searchlights, range- and height-finders might be termed the passive part of anti-aircraft defence, A.A. gunnery is the active and powerful reply of ground forces to the invader's attempted attack.

The use of anti-aircraft guns of the latest types is extensively practised, and model aeroplanes are the targets for shooting exercises in the grounds of the school. The instruments and arms used are of extremely complicated construction, useless to the untrained but powerful weapons unless in the hands of trained teams accustomed to close and fast co-operation. Connected by field telephony, the sound detector, as soon as he discovers the approaching "plane," informs the operators of range- and height-finding instruments, who, in turn notify the searchlight units. Combined efforts spot the hostile aircraft and "catch" it in the light of powerful projectors, thus making it an easier prey to the fire of the gunners. Only well-rehearsed co-operation and intensive knowledge of the subject can bring about satisfactory results. To safeguard these, the School of Anti-Aircraft Defence at Biggin Hill is training a steadily growing number of A.A. experts.

—*United Services Review.*

Germany's Balloon Barrage

A recent number of the *United Services Review*, carries an interesting notice to the effect that Germany intends to guard Berlin and other industrial centers with a balloon barrage which resembles that of London. The illustration accompanying the article shows a ground staff undergoing training with a sausage balloon quite similar in appearance to those used in the London defenses.

Antiaircraft Machine-Gun Sights

Many claims are advanced on behalf of the new sights and correctors for automatic cannon of the 20-mm. to 40-mm. types by British Army enthusiasts. It is interesting to note that British authorities have arrived at the conclusion that individual tracer control is not satisfactory for automatic cannon. They apparently have concluded that a follow-the-pointer system is the solution to this problem.

Wear the U.S.C.A.A. Insignia

Official emblem to be worn on civilian clothes, by officers of all components of the Army.

Bar is of bronze, gold-plated, center enameled red (for Coast Artillery), with panel of black and gold at ends designating an officer. Bar equipped with gold-plated shank back button. Illustration is actual size. Bar, is only part that shows, when worn. Neat and distinctive in appearance.

Lapel Bar and Lapel Ribbon Now Official U.S.C.A.A. Insignia

The new 7/8" wide lapel ribbon comes in the same color combination as the lapel bar.

PRICES

One lapel bar 50c
12" length lapel ribbon 50c

COMBINATION OFFERS

Two lapel bars 75c
Two 12" lengths of ribbon 75c
One lapel bar and 12" length of ribbon..... 75c

Any combination of 50c items, totalling $5.00 or more, subject to 10% discount, when shipped to one address.

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery
MAJOR GENERAL A. H. SUNDERLAND

Executive
COLONEL JOSEPH A. GREEN

Matériel and Finance Section
LIEUTENANT COLONEL H. B. HOLMES, JR.
MAJOR J. T. LEWIS
MAJOR S. L. MCCROSKEY

Plans and Projects Section
LIEUTENANT COLONEL A. G. STRONG

Organization and Training Section
LIEUTENANT COLONEL D. D. HINMAN
MAJOR AARON BRADSHAW, JR.
MAJOR W. H. WARREN

Personnel
LIEUTENANT COLONEL K. T. BLOOD

☆ ☆

Hawaiian Separate Coast Artillery Brigade

BRIGADIER GENERAL FULTON Q. C. GARDNER, *Commanding*
LIEUTENANT COLONEL C. M. S. SKENE, *Chief of Staff*
MAJOR F. A. MACON, *Adjutant General & S-1*

CAPTAIN W. H. DUNHAM, *S-2 & Gunnery*
LIEUTENANT COLONEL J. H. LINDT, *S-3*
MAJOR H. R. BEHRENS, *S-4 & War Plans*

CAPTAIN I. H. RITCHIE
Com. and Engineer Officer

CAPTAIN W. H. KENDALL
Sec. Atb. Officer

CAPTAIN S. E. WHITESIDES, JR.
Chemical Warfare Officer

LIEUT. W. A. CALL
Ordnance Officer

COLONEL H. C. MERRIAM
Commanding Harbor Defenses of Pearl Harbor

LIEUTENANT COLONEL F. F. GALLAGHER
Commanding 64th Coast Artillery (AA)

COLONEL W. D. FRAZER
Commanding Harbor Defenses of Honolulu

By Lieutenant Milan G. Weber

BRIGADE NOTES

A new system of staggered target practices has been adopted and furnishes a balanced training program. Batteries of the Harbor Defenses of Pearl Harbor fire their seacoast practices during the first six months of the year. During this period the units of the Harbor Defenses of Honolulu are engaged in antiaircraft activities. During the next six months the remaining target practices are fired. The 64th Coast Artillery (AA) is dividing its ammunition allowance into three parts, and is conducting three separate and distinct target practices each year. Thus every unit of the brigade is always in training for its wartime assignments.

The valuable lessons learned from the firing exercises and the joint Antiaircraft-Air Corps exercises held at Fort Bragg last fall were disseminated to Regular Army officers of all branches at an interesting lecture given by Brigadier General Fulton Q. C. Gardner, at Fort Shafter, during February. Over 300 officers attended. A similar lecture by General Gardner was given to approximately 200 Reserve officers at McKinley High School in April.

Five batteries of the 11th Field Artillery are now engaged in firing antiaircraft target practices with 1918 guns and R.A. Correctors at Kawailoa, on the North Shore. The field artillerymen engaged in this work were trained by Captain Pierre B. Denson, 64th Coast Artillery (AA), until his departure for the mainland on the March transport. Since that time Captain William V. Davis, 55th Coast Artillery, has been in charge of the training. Preliminary practices and those service practices fired to date indicate that very good results are being obtained.

A blackout of the entire Island of Oahu is now planned, to take place on some night during the week beginning

Even 6-inch guns spoke their piece into the mike for the Army Day broadcast. Note the operator shielding the microphone with his hand.

May 15th. The blackout, under the direction of the Hawaiian Department, is planned to include all civilian, military, and naval elements.

All units of the Brigade are now preparing for the department maneuvers which take place during May. Command post exercises and general alerts are being held at this time.

Changes in Brigade Staff

Since the departure of the March transport, several changes have been made in the brigade staff. Lieutenant Colonel C. M. S. Skene, is the new chief of staff. Lieutenant Colonel John H. Lindt, now fills the S-3 position, with Major Henry R. Behrens, as S-4. Captain I. H. Ritchie, is communications and engineering officer.

Pearl Harbor

This command has completed all of its seacoast target practices for the year. The scores for the practices calculated to date are as follows:

Battery	*Armament*	*Score*
A, 15th C.A.	155-mm. modified	57.3
A, 15th C.A.	155-mm. modified	118.1
B, 15th C.A.	12-inch B.C.	114.1
C, 15th C.A.	155-mm. modified	95.3
C, 15th C.A.	155-mm. modified	171.4
A, 41st C.A.	8-inch railway	82.3
B, 41st C.A.	8-inch railway	288.7
C, 55th C.A.	155-mm.	62.4

In Captain Porter T. Gregory's 8-inch railway practice of Battery B, 41st Coast Artillery, a new fire adjustment board invented by Lieutenant Milton H. Clarke was used. This board accomplishes mechanically what the fire adjustment chart ordinarily does when the magnitude method of adjustment is used.

The 1st Battalion, 55th Coast Artillery, commanded by Major Rolla V. Ladd, went on a road march to Nanakuli, March 21-23. The heavy column was loaded on barges for the crossing of the Pearl Harbor Channel. The light column proceeded on the overland route to Nanakuli. The return trip was accomplished in the same manner under cover of darkness. No unusual difficulties were encountered by either column. The stay at camp involved an infantry situation, messing being accomplished by the use of individually-cooked meals.

The Reserve Officers' Association of Honolulu had its monthly meeting at Fort Kamehameha on March 15th. At this meeting a very interesting lecture on the Battle of Jutland was given by Lieutenant Colonel R. H. Van Volkenburgh.

Honolulu

These defenses have completed their 3-inch antiaircraft firings at Sand Island. All of these are additional assignment practices fired with the M1A1 director. Scores are as follows:

Battery	*Score*
A, 16th C.A.	21.7
C, 16th C.A.	47.4
E, 55th C.A.	102.4
F, 55th C.A.	65.5

Major General C. D. Herron, Hawaiian Department commander (center), at the microphone during the Army Day broadcast.

The Hawaiian Department part of the Army broadcast of April 2d went into the microphones at Fort DeRussy, Major General Charles D. Herron, the department commander, and Battery D, 16th Coast Artillery, commanded by Captain Milo G. Cary, going on the air. Four shots from 6-inch disappearing guns were fired.

64th Coast Artillery

Battery I completed its first series of machine-gun practices at Kawailoa. The following scores were obtained:

.30 cal. day	79.9
.30 cal. day	108.1
.30 cal. night	32.8
.50 cal. day	78.1
.50 cal. day	77.5

The first and second battalions moved to Nanakuli on March 22d and established a camp under the direction of Major Daniel H. Hoge. Algetoba trees were cut down near the beach and a firing point was cleared so that all gun batteries were in line. This enabled all organizations to track the targets simultaneously.

One-third of the annual allowances of ammunition were expended in firing trial shots and preliminary and record practices. Scores have not been computed to date. Searchlights are now engaged in their practices.

ROYALTY INSPECTS NEW SOUND LOCATOR

During a recent visit to Aldershot Their Majesties the King and Queen of England witnessed a demonstration of the latest devices in AA protection

Fort Monroe

BRIGADIER GENERAL F. H. SMITH, *Commanding*

LIEUTENANT COLONEL PAUL H. FRENCH
Commanding 2d Coast Artillery (HD)

COLONEL F. P. HARDAWAY
Commanding Harbor Defenses of Chesapeake Bay and 51st Coast Artillery (TD)

CAPTAIN PERRY MCC. SMITH
Commanding 52d Coast Artillery (Ry)

By Major L. W. Goeppert and Lieutenant C. G. Dunn

Spring has come to Fort Monroe with that suddenness so typical of Virginia. It was winter and then it wasn't. The Fleet, too, has come—and gone. We saw it and then we didn't see it. We can vouch for its having been here because it got in our mine field and because we had the worst traffic jam in the history of the Peninsula.

So also have come the other usual changes. Batteries B, C, and D, 2d Coast Artillery and the Coast Artillery School have departed for Fort Story for the usual school instruction, and the annual target practices. Batteries A and B, 51st Coast Artillery, and Battery F, 52d Coast Artillery soon follow. Battery B, 2d, now the searchlight battery, finishes its work with the school this week and tours to Fort Eustis for its searchlight practice. Battery A, 2d Coast Artillery is now in the midst of its annual mine practice.

OLD LIBERTY THEATER

Close to the hearts of personnel of the Corps who have served at Fort Monroe during the last twenty years is the old Liberty Theater. Long a familiar landmark and an amusement center not only for the post personnel but the entire Peninsula, it closes its doors for the last time on May 7th and soon thereafter will be razed.

Many remember the Liberty's opening night, March 7, 1920; a night that was a grand climax to an unscheduled event of the same day, the burning of the old Chamberlin Hotel. The musical comedy, *Tumble In*, presented by the Jimmie Hodges Company, was the feature. The Liberty had its faults then as now, for scarcely had the curtain gone up than curtains, drops, and border lights came down with a crash.

During its life, in addition to movies, amateur dramatics, boxing events, and many of the biggest Broadway attractions were staged. Some of the more familiar were: *Venus, Music Box Revue, Sally, Irene and Margie, The Gingham Girl, White Cargo, Artists and Models, George White's Scandals, Models, Eve, Linger Longer Letty, The Great White Way, Rose Marie, Rio Rita, Follies, Little Old New York, East Lynn, The Green Hat, The Merchant of Venice*, Coeburn's Minstrels, Van Arnam's Minstrels, and the famous magicians, Blackstone and Thurston.

Even as the Liberty Theater opened on a note of laughter, so will it close, with the Dramatic Club's presentation of the three-act farce *Petticoat Fever*.

ATHLETICS

The basketball, bowling, and boxing season came to an end in March and April after several months of the keenest competition in many years. First, second, and third places in basketball were taken by Headquarters Battery, 51st Coast Artillery, the Coast Artillery School Detachment, and Headquarters Battery, 2d Coast Artillery, respectively. First, second, and third places in bowling were taken by Battery B, 51st Coast Artillery, Headquarters Battery, 2d Coast Artillery, and Battery F, 52d Coast Artillery, respectively. The annual trophy standing to date, which involves ten batteries, shows Headquarters Battery, 2d Coast Artillery leading Headquarters Battery, 51st Coast Artillery, for first place by three points. The annual boxing tournament was won by Battery A, 51st Coast Artillery, with Battery A, 2d Coast Artillery a very close second, and Headquarters Battery, 51st Coast Artillery, third.

FORT MONROE DRAMATIC CLUB

On the evening of April 12th the Dramatic Club presented the two-act operetta *Hearts and Blossoms*, by Lida L. Turner and R. M. Stults, produced and directed by Major Gordon B. Welch, assisted by Major Parry W. Lewis, Captain Carl F. Tischbein, Lieutenant John McM. Gulick, and Mrs. Sidney F. Giffin. *Hearts and Blossoms* was one of the most pretentious and elaborate productions ever attempted by the Dramatic Club. Its producing staff, cast, and orchestra involved a total of forty-five officers and officers' wives. It was beautifully presented to one of the largest audiences to fill the Liberty Theater in several years. Final rehearsals for the last production of the season, the three-act comedy, *Petticoat Fever*, being directed by Lieutenant Charles G. Dunn and to be presented May 7th, are under way and everything points to a successful climax to a splendid season.

PERSONNEL

Recent arrivals to the post have been Captain and Mrs. Emmor G. Martin, Lieutenant and Mrs. Maurice M. Simons, Lieutenant and Mrs. John Alfrey, and Lieutenant and Mrs. Seneca W. Foote.

Recently departed from the post are Major and Mrs. Otto B. Trigg, Captain and Mrs. William B. Stryker, Lieutenant John McM. Gulick, and Lieutenant and Mrs. Willard J. Hodges, Jr. As befitted a couple who had been here a long time and were well known by many throughout the Peninsula, Major and Mrs. Trigg were ushered off the post with more than the usual ceremony. The last we saw of them, they were gazing mournfully over the rail of the boat at a black mule trimmed in red, while the bugler sounded "stable call."

First Coast Artillery District

Brigadier General Edmund L. Daley, *Commanding*

Colonel Rodney H. Smith, *Executive*

Major Robert T. Chaplin, *Adjutant*

Colonel Otto H. Schrader
Commanding Harbor Defenses of Portland and Portsmouth

Colonel Monte J. Hickok
Commanding Harbor Defenses of Boston

Lieutenant Colonel William C. Foote
Commanding Harbor Defenses of Long Island Sound

Major Edward L. Supple
Commanding Harbor Defenses of Narragansett Bay

Captain Charles N. Branham
Commanding Harbor Defenses of New Bedford

During April the First Coast Artillery District joined with other 1st Corps Area units in a formal ceremony at Boston to welcome Major General James A. Woodruff, new corps area commander. General Woodruff's last station was Schofield Barracks where he commanded that post and the Hawaiian Division.

Brigadier General Daley, district commander, later entertained General and Mrs. Woodruff at dinner at the Algonquin Club in Boston. Guests included: Brigadier General J. M. Cummins, Brigadier General W. B. Burtt, Colonel and Mrs. B. F. Miller, Colonel and Mrs. Rodney Smith, Colonel and Mrs. R. E. Haines, Major Robert Chaplin, Lieutenant John J. Stark, Miss Barleon, Lieutenant D. K. Paige, U.S.N., and Miss Eileen Cummins. The party attended the annual military ball of the Army and Navy Club at the Copley Plaza Hotel.

During the past two months General Daley has addressed various military and civilian organizations throughout the district on the timely subject, "Defending the Coast of New England." The organizations before which the general appeared include the Kiwanis Club, Quincy, Massachusetts; the Men's Club, Union Congregational Church, Braintree, Massachusetts; the Brookline, Massachusetts, Kiwanis Club; the Trinity Church Men's Club of Boston; the Allston-Brighton Kiwanis Club, Boston; the Gloucester, Massachusetts, High School ROTC; the 240th Coast Artillery, Maine National Guard, Portland; the 26th Division Staff at Boston; the Brighton Men's Club, Brighton, Massachusetts; and the Babson Institute, Boston, Massachusetts.

Colonel Rodney H. Smith, district executive, spoke at a dinner and meeting of the Coast Artillery Reserves in Boston on April 27. Colonel Smith's subject was "The American Military Mission to Brazil." General Daley and Major R. T. Chaplin, district adjutant, were guests at the meeting which was arranged by Major Lucas E. Schoonmaker, instructor for Boston Reserve units.

General Daley leaves us in the near future for San Juan, Puerto Rico. Here he will command the newly-formed department that is charged with the important task of providing defense for the West Indies area.

Harbor Defenses of Portland and Portsmouth

Several changes in the personnel at Fort Preble will occur in the near future. First Lieutenant Erven C. Somerville, 8th Coast Artillery, will be relieved in time to enable him to attend the 1939-40 session at the Coast Artillery School. First Lieutenant Clifton L. MacLachlan, will join the 8th Coast Artillery upon completion of his tour of foreign service in Panama. Staff Sergeant Harry J. Dawe, Headquarters Battery, 8th Coast Artillery, Fort Preble, Maine, now on detached service at the Coast Artillery School, leaves New York on June 1, 1939, for foreign service in the Philippines. Staff Sergeant Lester B. Leigh, Headquarters Battery, 8th Coast Artillery, has been ordered to Panama and leaves the United States on June 1st. Technical Sergeant Charles J. Bales, has been transferred from the 59th Coast Artillery, Philippine Department and is now on detached service and furlough en route to join.

Colonel and Mrs. Otto H. Schrader and Major and Mrs. R. J. Imperatori were guests of the Bath Iron Works on April 8th, at the launching of the *Sims*, newest of the Navy's destroyers. Celebration of Army Day was combined with the launching. Governor Lewis O. Barrows of Maine, and his staff were present at the impressive ceremony as the beautiful ship slipped down the ways at 4:09 P.M. After the launching a very enjoyable collation was served to the launching party and the ladies. The battery of Coast Artillery, National Guard, stationed at Bath participated in a street parade.

Major and Mrs. Harry W. Line entertained on April 10th, for the officers of the National Guard and the officers detailed to make the annual inspection of the 240th Coast Artillery. Colonel Otto H. Schrader and Major Imperatori attended the annual banquet of the 240th Coast Artillery at which General E. L. Daley was guest of honor. Colonel Charles B. Meyer, reported in Portland on April 17th for duty as Unit Instructor Coast Artillery Reserves.

Harbor Defenses of Boston

By Lieutenant Norman A. Congdon

Gunners' examinations completed, the garrison of the harbor defenses of Boston is now engaged in the practical application of its book learning to the solution of mining and gunnery problems. Colonel Monte J. Hickok, whose previous orders to Panama were recently revoked, will return from two months' leave in time to command during the active training period.

While the garrison will have no direct contact with the National Guard this summer, demonstrations for Or-

Major General James A. Woodruff inspects the colors of the First Coast Artillery District upon taking over command of the First Corps Area at Boston. Others in the inspecting party are Brigadier General J. M. Cummins, commanding the 18th Infantry Brigade; Brigadier General E. L. Daley, commanding the First Coast Artillery District; Colonel B. F. Miller, corps area chief of staff; and Major F. C. Milner, color guard commander.

ganized Reserve personnel are scheduled for several occasions in the near future.

In their own behalf, the local defenders will first fire their additional antiaircraft gun practice during May, to be followed by submarine mine practice in July. Meanwhile the normal maintenance of the numerous installations constituting the Harbor Defense continues.

Harbor Defenses of Long Island Sound

By Lieutenant Charles L. Andrews

"The Army put on a spectacular show," according to the *New London Day*, "at Fort H. G. Wright, Fishers Island, N. Y., in observance of Army Day. Although raw weather, with a brisk wind, was not conducive to comfort, the full program arranged by the 11th Coast Artillery, which mans the fort, attracted many persons from New London and vicinity to the island. Civilian residents at the island were among the spectators."

Batteries A, B, and C, acquired 100% qualification in gunnery as a result of the winter's indoor work. Headquarters Battery scored 93.9%, an excellent percentage considering the special duty details the battery furnished.

Culminating their year of academic work, the Thomason Act officers have just fired a series of sub-caliber adjustment courses. Each officer was given an opportunity to act as battery commander, battery executive, range officer, adjusting officer, and gun pointer.

The post will be practically devoid of personnel at various times this summer. The first activities which will call for the presence of our personnel elsewhere are those at Fort Adams. A cadre consisting of all the post's junior officers, the band, and forty-four men will go there early in June and remain two months. This detail will train Reserve officers, and conduct the annual CMTC. Most of the remaining officers and troops go to Pine Camp, New York, for the First Army maneuvers in August. National Guard regiments from Connecticut, Rhode Island, and Massachusetts will come to Fort Wright during the summer for active training.

The 11th Coast Artillery celebrated Organization Day on March 28 with a special morning program at the post theater and a free movie for the whole command in the evening. The program consisted of band selections, reading of hurricane citations and commendations, history of

the regiment in an address by the commanding officer, presentation of recruits to the colors, and presentation of trophies.

The post .22-caliber rifle championship went to Headquarters Battery. Eight matches were fired involving four positions: prone, sitting, kneeling, and standing. Final scores:

Headquarters Battery	5,815
Battery C	5,652
Battery B	5,368
Battery A	5,259

The post rifle team journeyed to the Coast Guard Academy on March 10 to fire against the crack cadet team. The soldiers lost in all positions—by sixteen points prone, forty-one points kneeling, and thirty-two points off hand. The Coast Guard Academy team has a fine record in its intercollegiate competitions to date, and backers of the post team are in no way discouraged. The veteran 13th Infantry rifle team defeated the newly-organized 11th Coast Artillery team by a score of 1319 to 1278 on April 13. The post team shot very well considering that this is their second shoulder-to-shoulder match.

All organizations are doing their best to round their baseball teams into shape, but the New England spring weather has not yet been suitable for limbering up winter-bound muscles.

Following a cocktail party given by Captain and Mrs. Dunham on February 21, a large number of officers and their wives attended a dance at the United States Coast Guard Academy in New London.

The Submarine Base Club invited the officers and ladies of Fort Wright to a supper and dance on April 18 in honor of the commander and visiting officers of the Submarine Force, United States Fleet. Twenty-two persons took the trip to New London and enjoyed the function, the fog failing to dampen anyone's enthusiasm.

The Noncommissioned Officers' Club has elected as its new president Staff Sergeant Daniel Hatfield, World War veteran and past-commander of Fishers Island Post No. 1045, of the American Legion.

Harbor Defenses of Narragansett Bay

By Captain Virgil M. Kimm

With the advent of spring, the 10th Coast Artillery has swung into strenuous artillery drill. On April 6—Army Day—the organization gave a public demonstration of all types of armament ranging from 3-inch AA guns to 12-inch mortars. The 155-mm. armament was exhibited and gave a true to life picture of actual field conditions. One gun and tractor were displayed in the traveling position, and another was emplaced in a typical firing position, complete with data lines. The drills on the latter were witnessed by Lieutenant Governor McManus of Rhode Island and General Dean of the Rhode Island National Guard.

On April 12, the first increment of the Atlantic Fleet entered Narragansett Bay for the Army-Navy-Fleet-Air Corps maneuvers in this area. The naval vessels provided drill facilities far more realistic than the usual type of target available to the range section in these waters.

At the ceremony in Boston on April 19, welcoming General Woodruff, our new corps area commander, the 10th Coast Artillery was represented by the regimental colors and a guard in charge of Staff Sergeant Fred W. Aydlett and a selected squad in charge of Corporal James F. Murray.

The new Officers' Club was formally opened on April 29th with a dance and reception for the Navy, whose hospitality at the Training Station has been frequently enjoyed by the personnel of the post. The club, which fills a long-felt need, was secured through the efforts of the post commander, Colonel Baxter, Infantry, and the post quartermaster, Major Flinn. The building measures 94 x 52 feet over all. There is a large dance floor with a huge fireplace at the north end; and a long sun porch overlooking the bay. A bar is included among the many attractive features of the club. A name for the bar has not yet been selected and suggestions from officers formerly stationed here are welcome.

Reserve officers training at Fort Adams during March and April included Lieutenant Thomas B. Cox, Lieutenant Lawrence Blackey, and Lieutenant William C. Davoll.

Visiting vessels at Fort Adams during March and April included the USAMP *Baird*, Captain N. A. McLamb, commanding; and the DB Boats *L-42* and *L-50* sent from Fort H. G. Wright for annual overhaul in Narragansett Bay.

Harbor Defenses of New Bedford

By Captain Charles N. Branham

Spring comes to Fort Rodman, hesitantly, like the small, unwilling boy whose route to the schoolroom passes a sand-lot baseball field, but unmistakable signs of spring increase daily. So confident are we that summer is just around the corner that the annual metamorphosis of the snowplow into a lawnmower has already been effected. Armament and personnel are soon to be freed from their winter clothing. Grade "A" grease and overcoats are giving way to light oil and perspiration, and WPA paintbrushes wave outside as well as inside.

The USAMP *Baird* called twice recently at New Bedford, incident to extensive ammunition movements in and out of the post—a long needed transfer which has now been completed.

Local groups of the Regular Army, National Guard, Reserves, ROTC, American and British Veterans' organizations, and many civic organizations combined forces to celebrate Army Day. Flags and patriotic decorations made the city streets a mass of red, white, and blue, during the day and an impressive ceremony at night closed the observance here of the 22d anniversary of our entrance into the "last" World War. Nowhere in New England is patriotic enthusiasm more evident on all appropriate occasions than in New Bedford.

Corregidor

Brigadier General Walter K. Wilson, *Commanding*
Colonel Frederic A. Price, *Executive*

Colonel George Ruhlen
Commanding 59th Coast Artillery (HD)

Colonel William C. Koenig
Commanding 60th Coast Artillery (AA)

Colonel Willis Shippam
Commanding 91st Coast Artillery (PS) (HD)

Lieutenant Colonel J. B. Crawford
Commanding 92d Coast Artillery (PS) (TD)

By Lieutenant Colonel R. E. Phillips

Those of our readers who have served in the Philippines, will remember the months of February and March are crowded with all types of service firings, the calibers ranging from 3-inch to 14-inch. This year, counting both antiaircraft as well as seacoast, thirty-two separate practices were completed during these two months which cover the news period on which we are reporting. Records going forward carry a high percentage of recommendations for excellent ratings that we feel are justified and hope will stand up. We are allowing each regiment to tell its individual story in this connection.

Shifting transport sailing schedules have kept our short-timers somewhat jittery but the *Grant* has just demonstrated that it is still a going concern, by bringing us eighteen new officers and taking away twenty-one. The staff families and many others, reluctantly bid good-bye to Colonel and Mrs. T. A. Terry who left on the *Grant* March 30th. Colonel Frederic A. Price has succeeded Colonel Terry as harbor defense executive. General Wilson's aide, Lieutenant Mattern and his bride recently returned from their wedding trip to Indo-China and Java. Lieutenant Mattern relinquished his duties as aide to Lieutenant Spengler on March 31st.

The monsoon winds, which since last November have blown so steadily from the northeast, vanished during this last week and their place has been taken by fitful and feeble China Sea breezes out of the southwest. These have brought us a few sample copies of what the hot season, now near at hand, will be like and have started a flood of requests for recuperative detached service at Baguio.

A lenten lull has characterized Corregidor Club activities during March. With a view to distributing club management burdens more evenly over the membership, a policy of appointing new members to committees semi-annually, has been adopted. The new house committee members are Major Cotter and Captain MacFall (Finance Dept.); the golf committee Colonel Patterson (AGD), Captain J. W. Smith and Lieutenant Cordes. Lieutenant Dice has taken over badminton, and Lieutenant Metz the Officers' Beach Club. Captain Caluya continues on in charge of tennis.

The officers of Destroyer Squadron Five were guests of the Club on Saturday, March 11th. About sixty arrived at the North Dock on the *Paul Jones*, at 9:00 A.M., and were taken on a visit to various defense installations that occupied the remainder of the morning. After the sight-seeing tour visitors were joined by about forty "hosts" at a 1:00 P.M. luncheon. Felicitations and expressions of appreciation were exchanged after lunch by the senior commanders of the two services, General Wilson for Army and Captain P. I. Carroll for the Navy.

The alumni of the Military Academy gathered at the department Officers' Club at Nichols Field for the annual West Point dinner on March 18th.

After two years of compiling the Corregidor news your correspondent now concludes his last contribution and announces his new status of "short timer."

59th Coast Artillery

Primary assignment target practices have been the major interest since the beginning of February. Battery C, Captain Raleigh R. Hendrix, commanding, opened the season with a smoothly-conducted shoot at a high-speed target and set a high standard for succeeding batteries. Batteries B and E were next, both firing turret guns at high-speed targets and getting well above the average in hits. Battery D fired the last of the 2d Battalion practices with a precision fully equal to that of the earlier shoots. The 1st Battalion then took over the stage, Batteries A and F firing the same day and both knocking out scores that should be well up toward the top for that class of armament. Battery G finished the season for the regiment. Although misfortune blighted the first part of the practice, the personnel continued undiscouraged by the jinx which has repeatedly baffled hitting with the particular battery in use, and finished the practice with a good proportion of hits.

Regardless of what ratings our scores may bring, we are sure the present season has hung up one record. Three direct hits were obtained on the high-speed target —a water sled without superstructure and hardly larger in area than the base of the standard pyramidal target— during the six high-speed practices. Battery B was first to put a shell through the target, which disappeared in foam and kindling wood so fine that no scrap was recovered. Batteries C and F likewise put holes through the target and thus obviated all controversy about the deviation of those particular shots. The harbor defense ordnance officer forthwith proceeded to devise a smaller target in the hope of avoiding future strain of this kind on his maintenance funds.

Battery B, which spent a six-week period at one of the outposts training for their service practice, supported their change of scene in fine spirit in spite of various untoward happenings. In one instance, a recruit, unable to keep his

blankets tucked in because of the strong and persistent easterlies that blew across his bunk at night, resorted to sleeping on the floor with the canvas cot stretched out on top of him. This unique expedient was revealed by the inventor's indignation when his bunkmates attempted to rescue him from what they thought was a bunk turned turtle.

The social highlight of the month of March was the reception for the Army and Navy given at Malacanan by President and Mrs. Quezon. Encouraged by an appropriate harbor boat sailing to and from Manila, the captains and field officers donned their shiniest buttons and responded to the invitation in such numbers that the skipper of the *Hyde* hung out the SRO sign on the trip home.

Battery B said goodbye to First Sergeant Walter R. Shaw at a farewell dinner in honor of his retirement after thirty years service. The regiment also honored First Sergeant Shaw who stood his last parade beside the regimental commander.

The arrival of the March transport is the occasion of the customary round of receptions and farewells. Major Louis H. Thompson is the senior of the new arrivals in the regiment. Captain Kirkpatrick assumed command of Battery D when Captain Tucker departed for his new station at Fort MacArthur. Captain Conzelman is familiarizing himself with Battery B, pending departure of Captain Tredennick on leave to visit foreign countries. All four of the lieutenants assigned to the regiment drew duty at the outposts. Lieutenants Conigliaro and Gerlich go to Battery E at Fort Drum while Lieutenants Holmes and Hauck are on duty with Battery G at Fort Hughes. Captain Crim, with his family, departed early in March on an extended tour leading through Asia and Europe back to the United States. Lieutenant Baynes also said goodbye to the post, going on leave to China and Japan and thence to recuperate at Baguio preparatory to returning to Fort Monroe. Lieutenant Cozart departed for a detail in the Ordnance Department, at Watertown Arsenal.

At present the regimental baseball team is being organized by Captain Hendrix and Lieutenant Leist, the two coaches. Although the team lacks a well-balanced pitching staff, every other position is filled with an experienced player. We all wish it much success in the department tournament which opens the first of April.

60th Coast Artillery

March transport time witnessed a wholesale turnover in the officer personnel. The following officers sailed for their new stations: Captain Legare K. Tarrant, Fort Scott and C.&G.S. School; Lieutenants George E. Keeler, Jr., 2d Coast Artillery, Fort Monroe; Robert L. Anderson, 61st Coast Artillery, Fort Sheridan; Charles W. Hill, 51st Coast Artillery, Fort Monroe; Bernard S. Waterman, 52d Coast Artillery, Fort Monroe; Harry R. Hale, 51st Coast Artillery, Fort Monroe; Alfred Ashman, 62d Coast Artillery, Fort Totten. Departing officers and enlisted men received the usual short-timers parade. In addition, the 60th lost the services of Lieutenant Foster LeR. Furphy, transferred to harbor defense staff. The regiment will miss the loyal and efficient service they cheerfully gave.

The *Grant* brought the following second lieutenants: Richard G. Ivey, Lawrence C. Baldwin, Earle M. Shiley, Aaron A. Abston. They are already showing ability and willingness to uphold the regimental traditions. Second Lieutenant Kenneth Glade was transferred to the 60th and assigned to duty with the Philippine Army School at Fort Wint as replacement for Lieutenant Anderson. Second Lieutenant Richard H. Mattern joins the regiment on March 31st.

Major John H. Harrington and Captain Samuel H. Morrow leave us at the end of March on terminal leave.

Owing to target practices, athletics have played a very minor rôle during the past two months. Battery A won the regimental baseball championship with Battery D a close second. The regimental baseball team has been formed and its practice games to date show plenty of hitting power, as well as defensive ability. Corporal Neuwirth, one of the best catchers the Rock has ever produced, will be hard to replace.

Upon completion of preliminary firings the gun battalion started record practices, completing the firing program on February 27. The practices were fired under the new TM-2160-35 which was received just before record practice and involved a number of training changes. After the gun batteries had each fired two of their three record practices a radiogram was received stating that a new scoring formula was to be used. Results of all practices were tentatively scored under the old formula and on the arrival of the new formula practices were carefully analyzed and scores computed. It was found that, in general, the new formula reduced the scores at least 50 or 60 per cent. Final results of all practices are not yet available.

Additional assignment target practices of the other regiments followed immediately after the 60th record practices. They were fired both from Corregidor and the outpost gun positions. They were completed on March 21st and appeared to be very good, although final results are not yet available.

The 60th is now preparing for the war-condition period April 3-8, inclusive.

91st Coast Artillery (PS)

The regiment lost the following officers to harbor defense headquarters: Colonel Price as harbor defense executive; Lieutenant R. F. Moore as assistant ordnance officer; Lieutenant H. M. Spengler as aide-de-camp to General Wilson.

The following officers were assigned to this regiment from the March transport: Colonel Willis Shippam who becomes regimental commander; Captain H. W. Smith who goes to Fort Frank to relieve Captain J. L. Hogan who now commands Battery C; 2d Lieutenant J. S. Byrne, who goes to Battery G.

Lieutenants N. A. Skinrood and J. B. Yost spent a

month on detached service at Camp John Hay.

Captains Hartman and England have taken leave to visit Japan before returning to the States on the May transport.

The target practices, both guns and mine, were very successful during the past target season and will be something for other regiments to compete against. All practices were excellent.

Despite the hardships inflicted by target practices, the 91st Coast Artillery (PS) was able to hold a successful inter-battery baseball league during February and March. Battery A, led by the able veteran Sergeant Estorba, took first place with ten victories and no defeats. The pitching of Sergeant Estorba and Private Villarin and the hitting of Sergeant Estorba, Corporal de la Cruz, and Private Villarin kept Battery A well in the lead. Battery E, seriously handicapped by the lack of pitchers, took second place with seven victories and three defeats. With Lieutenant Melvin R. Russell as officer-in-charge of the regimental team, our hopes are high for the post and department championships which will be held during April and May.

92d Coast Artillery (PS)

The 92d Coast Artillery (PS) closed a most successful service target practice season with the target practice of the artillery section of the 3d (Guard) Battalion on March 14th.

During the past year, under the leadership of Lieutenant Colonel Warren, all firing battery commanders have made an effort to bring the batteries to the highest point of firing efficiency. Colonel Warren conducted the sessions of the officers' school from January 1st to February 28th; his subjects being preparation of fire, conduct of practice and fire adjustment. Comparison of this year's scores with those of last year indicates that the efforts to improve were most successful.

The artillery section of the 3d (Guard) Battalion deserves special credit. This section is composed of men from Batteries E and F. All of their artillery training is done in the late afternoons after they turn in their Bilibid prisoner work gangs from the day's work.

Target practices being over, the regiment is now in the midst of preparation for the war condition period.

Departures: Lieutenant Colonel and Mrs. Albert H. Warren and Colonel Warren's mother, Mrs. Emma Warren, and Captain and Mrs. George E. Young and the four little Youngs boarded the transport leaving March 30th. Colonel Warren goes to Organized Reserves, 9th Corps Area with station at San Francisco; Captain Young to Fort Winfield Scott where he will serve with the 65th Coast Artillery (AA).

The officers and ladies of the 92d entertained Colonel and Mrs. Warren and Mrs. Emma Warren with a regimental *despedida* March 17th. Cocktails were served at the quarters of Major and Mrs. McMorrow, dinner at the quarters of Lieutenant and Mrs. Irvine, and dancing took place at the quarters of Captain and Mrs. Kyster.

The regiment greatly regrets the departure of Colonel Warren and Captain Young and their families.

Lieutenant Colonel John B. Martin, and Lieutenants Frederick A. Miller and John D. Wood arrived on the March transport. Colonel Martin has been assigned to the 3d (Guard) Battalion and the civil prison stockade; Lieutenant Miller to Battery F and Lieutenant Wood to Battery E. Captain Melecio M. Santos has been transferred from the 91st Coast Artillery (PS) and has taken over Captain Young's former battery, Battery E.

Lieutenant Colonel James B. Crawford assumed command of the regiment March 30th.

German 88-mm. antiaircraft guns in action

Panama Canal Department

COLONEL WILLIAM R. NICHOLS
Department Artillery Officer

COLONEL EDWARD W. PUTNEY
Commanding Harbor Defenses of Balboa and 4th Coast Artillery (AA & HD)

COLONEL WILLIAM T. CARPENTER
Commanding Harbor Defenses of Cristobal and 1st Coast Artillery (AA & HD)

LIEUTENANT COLONEL AVERY J. FRENCH
Commanding Fort Randolph

FORT AMADOR

By Captain John H. Kochevar

Now that the regimental, departmental and sector maneuvers are over we realize more than ever that adequate defense of the Canal depends upon the close cooperation of all forces.

On March 6, the seacoast battalion with the 14-inch railway guns moved to the Atlantic side to participate in a problem of defending the Atlantic entrance to the canal. The entire movement was without a single mishap or hot box, much to the surprise of all railroad and army officials involved. This efficiency cut to a minimum the time required for moving the troops. Battery G, the railway battery, is to be highly commended for the superior condition of its rolling stock that made this record-breaking movement possible.

On March 6, Batteries B and F, 4th Coast Artillery were called out on short notice to relieve two 33d Infantry companies that had been holding the front line in the maneuvers of the Pacific Sector mobile force. Having accomplished their mission and proved that they could be relied upon as excellent support for infantry, these batteries returned to Fort Amador two days later.

On March 9, the seacoast battalion returned to the Pacific side, having completed its part in the problem on the Atlantic side. By 8:30 o'clock of the same morning, Battery D was at the mine dock rigging and loading the lighthouse tender *Favorite* for mine planting the next day. Battery E, 1st Coast Artillery which had traveled the Canal on the mine planter *Graham* also was laying shore cable and preparing equipment for mine planting the next day.

On March 10, Battery E, 1st Coast Artillery planted its group from the *Graham* and was followed by Battery D, 4th Coast Artillery which planted its group from the *Favorite*.

On March 13, all troops of the 4th Coast Artillery, with some batteries of the 1st Coast Artillery attached, moved to their maneuver positions. All seacoast targets were readily reported, illuminated, and brought under fire. The potential antiaircraft targets met a similar fate. The speed, smoothness, and teamwork of all organizations attested to a high state of training and efficiency.

On March 15, all Coast Artillery troops moved to barracks and picked up where they had left off target practices. Battery I, 4th Coast Artillery was called out as field artillery to lend fire power in the department mobile force problem. Although without previous warning of the move, the battery loaded guns on trailers and was ready to move within an hour thus adding another laurel to our wreath.

During the maneuver period the only time lost due to sickness or injury directly attributable to maneuvers was that of a soldier who caught his finger in the breech mechanism of an AA gun. He was taken to the station hospital for treatment and one hour and thirty-five minutes later he was back at his post. This excellent record resulted from the lectures and publications of the Medical Department on preventative measures and camp sanitation.

A delegation of Colombian army and naval officers spent several days visiting the Canal Zone and the Republic of Panama. A sector review was held for these officers at Fort Clayton. Many social affairs were given in their honor by various army and navy officials. Before leaving the zone the Colombian officers gave a lovely cocktail party at the Fort Clayton Officers' Club.

The baseball nine won the first half of the sector baseball schedule which assures them a place in the playoff for the sector championship. The post track team, under their coach Lieutenant Cherubin, is getting a daily workout. The battery basketball teams have started playing preliminary games to polish up for the opening of the battery league.

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Coast Artillery Board Notes

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

THE COAST ARTILLERY BOARD

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MAJOR GORDON B. WELCH, Ordnance Dept.
MAJOR FRANKLIN E. EDGECOMB, C.A.C.
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CAPTAIN EDWIN W. CHAMBERLAIN, C.A.C.

SHORT BASE ALTIMETER (CRICHLOW) (PROJECT 1132). The Coast Artillery Board has recently completed the test of a short base altimeter designed by Captain Robert W. Crichlow, Jr., Coast Artillery Corps. The object of this project was to determine whether or not such an altimeter is suitable for use as fire control equipment for antiaircraft artillery.

Standard equipment for the measurement of altitudes is, at present, the M1 height finder; M1920 altimeters being limited standard. For some time past efforts have been directed toward the development of a short base altimeter which will supplement the height finder or will be a substitute therefor in the event that a demand, occasioned by an emergency should be too great to be supplied. The M1 height finder, while an excellent instrument for the purpose, is expensive and its slow manufacture constitutes a serious bottleneck in the supply of antiaircraft fire control equipment. The M1920 altimeter is not wholly satisfactory due to the length of base line necessary and the difficulties of target identification incident thereto. It is believed that effort should be directed toward the development of a simple and cheap instrument which will be capable of measuring altitude when utilizing a relatively short base line, such an instrument to supplement the height finder as emergency equipment or to substitute for the height finder when the latter can not be supplied.

Figure 1: Front view of short base altitude computor

Figure 1 is a picture of the altitude computor. Essentially it consists of a fixed base A, graduated logarithmically around its outer edge in cosecants and marked in terms of the corresponding angles from 0 to 3200 mils. Concentric, within this fixed outer scale, is a movable inner scale C provided with a pointer B which can be clamped to any desired value on C and thereafter turns with the scale. Scale C is graduated logarithmically and marked in terms of linear distance. A third scale D, within scale C and concentric therewith, is free to move independently. This scale carries a fixed pointer E and is graduated logarithmically in tangents and marked in terms of the corresponding angles from 65 to 1438 mils. A pointer F is pivoted at the center of the slide rule and is free to rotate through 6400 mils.

Figure 2 shows a supplementary piece of equipment to be used with the short base computor. The necessity for this device is discussed below. This box consists of two handwheels by means of which the base end angles are set, and three reading windows with counters on which the two base end angles may be set and the T or target angle read. By means of a differential the O_2 azimuth is subtracted from the O_1 azimuth and the angle T obtained for use on the computor.

Other equipment necessary for the operation of the altitude computor consists of two observing instruments at the ends of a base line, the necessary communications equipment and a time interval system. In the initial tests, when the instrument was being tested as an altimeter, observation instruments AA BC M1 were used at the O_1 and O_2 stations. Field wire and EE5 telephones were used for communication and a simple time interval system was improvised. For later tests, when the instrument was used solely as a range finder, azimuth instruments M1918

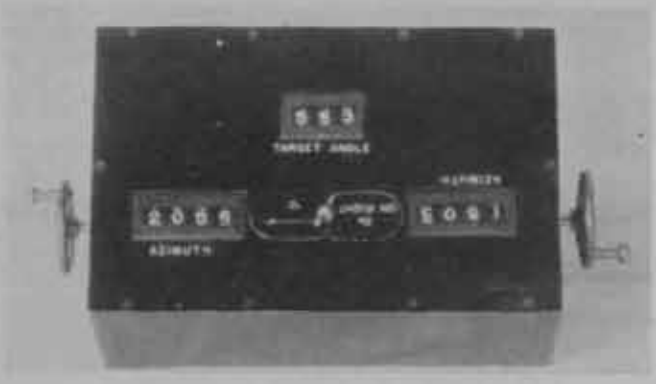


Figure 2: Top view of target angle box

were used. Communications and the time interval system pertaining to the harbor defenses were used solely for convenience.

The short base altitude computor solves for altitude by first solving for horizontal range (using the base end angles and the base line length) and then converts this horizontal range into altitude using the angular height measured from O_1. The horizontal triangle involved may be referred to on Figure 1. Angles O_1 and O_2 are measured with reference to the direction of the base line. Angle T is determined and, using O_2 and T and the side $O_1 - O_2$ (the base line) the side O_1T is determined. Using O_1T and ε_1, the angular height from O_1, the altitude is determined.

Operation of the computor is as follows:

a. The base end observing instruments are set up and oriented so that they read angles as indicated in Figure 1; i.e., the O_1 instrument reads 3,200 mils when pointed at the O_2 instrument and the O_2 instrument reads O when pointed at the O_1 instrument.

b. The slide rule is oriented by loosening the two screws in the pointer B, setting it to the proper base line length on scale C and clamping it there by tightening the screws.

c. The O_1 and O_2 instruments track the target. On signal (from the time interval system) simultaneous readings are taken of azimuth at O_2 and azimuth and angular height at O_1. These readings are then transmitted to the computor by telephone.

d. Pointer B is set to the O_2 angle on scale A. At the same time both the O_1 and O_2 angles are set on their respective counters on the target angle box. The angle T is read therefrom and the pointer E is set to this value on scale A. The horizontal range (O_1 — T) may now be read on scale C beneath the line on pointer E.

e. Pointer F is then set to the angular height from O_1 on scale D and altitude is read on scale C beneath the line on pointer F.

Accuracy tests, conducted prior to the field tests, showed conclusively that a computor of this type can be built which will possess all the inherent accuracy necessary for the purpose intended. This fact being established the questions remaining to be determined by field tests were:

a. Whether or not the accuracy of the measurement of the base end angles, when tracking a target at high speed, was such as to permit the determination of accurate ranges and altitudes with the length of base line used.

b. Whether or not the operational characteristics of the computor were such as to permit its use as an altimeter considering the time factor involved in altitude determination for antiaircraft fire.

c. If the computor proved unsuitable for use as an altimeter whether or not it was suited for use as a range finder for rapid fire seacoast batteries.

Since initial altitudes for antiaircraft gun batteries must be determined while the target is still at a long horizontal range, the T angle, from a short base line, will be small. For example, considering a target flying 200 miles per hour at 15,000 feet, the T angle will be but 82 mils for the most favorable aspect of a 1-000-yard base line, decreasing to 56 mils for the least favorable aspect (assuming that two base lines normal to each other are provided) at the time when the initial altitudes must be obtained to open fire at maximum range. When a 500-yard base line is used these values of the T angle decrease to approximately 40 mils and 28 mils, respectively. A one-mil error in the T angle under these circumstances will represent corresponding horizontal range errors of 150 and 250 yards when a 1,000-yard base line is used and 350 and 500 yards when a 500-yard base line is used.

From the above, the necessity for extremely accurate determination of base end angles is apparent. The high speed and the small size of aerial targets make this determination difficult particularly if the observing interval is short. Tracking must be precise; each instrument must track on the same point on the target; and readings must be accurately made. Initial tests showed that accurate reading was impossible unless tracking was halted at the end of each observing interval to permit the reading being made while the dial was stationary. This procedure frequently was found to be difficult when using the short observing interval necessary for antiaircraft work. The difficulty arises from the fact that the target passes out of the field of the observing instrument before the reading is completed. This results in a loss of smoothness in succeeding tracking due to the fact that part of the observing interval is lost while picking up the target again. The accuracy of succeeding readings suffers thereby.

The operational characteristics of the computor, while not prohibitively involved, were found to be awkward when short observing intervals were used. A ten-second interval was found to be the practical minimum within which base end readings could be transmitted and set and the altitude read. With low altitude targets, approaching normal or nearly normal to the base line, operators setting the O_2 and T angles interfered with each other to a certain extent although this generally was not serious. With the exception of the above, operational characteristics were satisfactory, ease and accuracy of operation increasing as the observing interval was increased.

As has been pointed out earlier, the computor solves for

altitude by first solving for the horizontal range from O_1 to the target. This fact suggested the possibility of the use of the computor as a short base range finder for rapid fire seacoast batteries, particularly mobile batteries. From the nature of seacoast targets it appeared likely that the chief factor adversely affecting the accuracy of the instrument when used as an altimeter; i.e., the difficulty of measuring base end angles with the required degree of accuracy, would be present to a considerably less degree in this case. The angular travel of seacoast targets is relatively small and a longer observing interval may be used. Such targets permit a smoother and more precise track.

The computor solves for the horizontal range from the O_1 station to the target only, relocation for the gun position not being possible, hence to be used as a range finder the primary station must be located at or near the guns. This limitation is not believed to be serious since both fixed and mobile rapid fire batteries are generally so sited that observation over the field of fire generally may be had close to the battery position.

Results of the first tests, conducted at Fort Monroe, indicated that the computor was unsatisfactory as a means for measuring altitude. The speed of operation, necessitated by the short observing interval, and the impossibility of measuring the base end angles with the required degree of accuracy introduced accidental errors which were prohibitively large. These errors were aggravated in the case of the determination of initial altitudes since, at the time that these initial altitudes were being measured, the T angle was very small. The conduct of effective antiaircraft fire requires that initial altitudes be accurate. Initial altitudes actually obtained during the tests were erratic and contained errors of such magnitude that effective fire would have been impossible.

Consistently better results were obtained when using the computor as a range finder for water borne targets. These results may be attributed to the following:

a. Observing intervals were longer, intervals of 10, 15, 20, and 30 seconds being used. It was found that a 15-second interval afforded sufficient time for careful and unhurried operation.

b. Due to the smaller angular travel of the target much smoother tracking was possible. Tracking could be halted to permit the precise reading of the dials.

c. The size of the target was greater thus permitting observers to track on a definite point such as a mast or a funnel.

d. The fact that horizontal range is not converted to altitude removes a source of error since the measurement of angular height is subject to the same inaccuracies as the measurement of the horizontal base end angles.

The Coast Artillery Board concluded that:

a. The subject computor is not satisfactory as a short base altimeter for the use of antiaircraft artillery.

b. The range finding characteristics of the computor are such as to warrant further test, in connection with other experimental matériel, with a view to the possible incorporation of the computor in an emergency fire control system for rapid fire batteries.

Transportation for 1939 AA Searchlight Equipment. The fact that the new Sound Locator M-2 with platform mounting now has been standardized in place of the older M-1 trailer types, has indicated the necessity for a restudy of the entire problem of transportation for the new antiaircraft searchlight section. Trucks with body sizes hitherto provided have not sufficient room to transport this new sound locator and all other necessary equipment within the bodies of the trucks.

The Coast Artillery Board has discussed this matter at length with the Chief of Coast Artillery and the Engineer Board. A number of different solutions were considered, among them being:

a. To provide, as at present, two trucks of 2½-ton capacity for personnel, power plant, searchlight, and accessories, and, in addition, a light ¾-ton two-wheel trailer with straps or other hold-down devices to carry the five component loads of the Sound Locator M-2.

b. To provide one 2½-ton and one 1½-ton truck to carry personnel and all equipment except the power plant, which would be towed, probably by the larger truck.

c. To provide two 2½-ton trucks with bodies sufficiently large to permit the stowing of all personnel and equipment within the trucks themselves.

After careful consideration the last of these suggested solutions was agreed upon. By actual trial the Engineer Board found that all personnel and equipment, including the Sound Locator M-2, could be stowed satisfactorily in two truck bodies approximately 165" x 91". This size conforms reasonably to common commercial practice.

It is expected that the lay-out of the 1939 equipment in the two vehicles will be somewhat as follows:

a. In Truck A: Sound locator (5 component loads).
Binocular Box,
Spare parts and tool box,
Searchlight,
Comparator.

b. In Truck B: Power plant,
Power cable and reels,
Controller cable and reel,
Sound locator cable and reel.

Personnel will be distributed equally between the two trucks.

The Engineer Board is proceeding with the design of suitable hold-down devices for this equipment.

Improvement of Spotting Set, PH-32. As a result of recent recommendations of the commanding officer, 62d Coast Artillery, the Coast Artillery Board has made a study of the Antiaircraft Spotting Set PH-32, to determine the advisability of initiating action to redesign the present equipment in order to eliminate certain objectionable features. After careful consideration of all adverse criticism presented the Board concluded that:

a. Engineering studies should be initiated by the proper

agency with a view to a suitable redesign of the Spotting Set PH-32.

b. Engineers undertaking such redesign could profitably consider the best features incorporated in the design of the Askania Kino-Theodolite believed to be in possession of the Ordnance Department.

c. Should a redesign of the Spotting Set PH-32 be authorized, consideration should be given to items listed below:

(1) Improved film feed mechanism.

(2) Positive film take-up mechanism.

(3) Suitable rheostat control.

(4) Standard leveling mechanism.

(5) A film gate of anti-corrosive metal.

(6) Utilization of the Elbow Telescope, M2 (Ordnance) (field of view 155 mils), as a tracking telescope. Camera field of 100 mils to remain unchanged.

(7) Built-in exposure meter for each camera.

(8) Interchangeable camera lens permitting substitution of a telescopic lens with a field of 50 mils for future use with heavy antiaircraft gun practices at long range. Camera to be equipped initially to cover a field of 100 mils, additional lenses to be procured when needed.

(9) Protection of film from static sparks.

(10) Provision of four magazines, each with a 200-foot capacity, per camera.

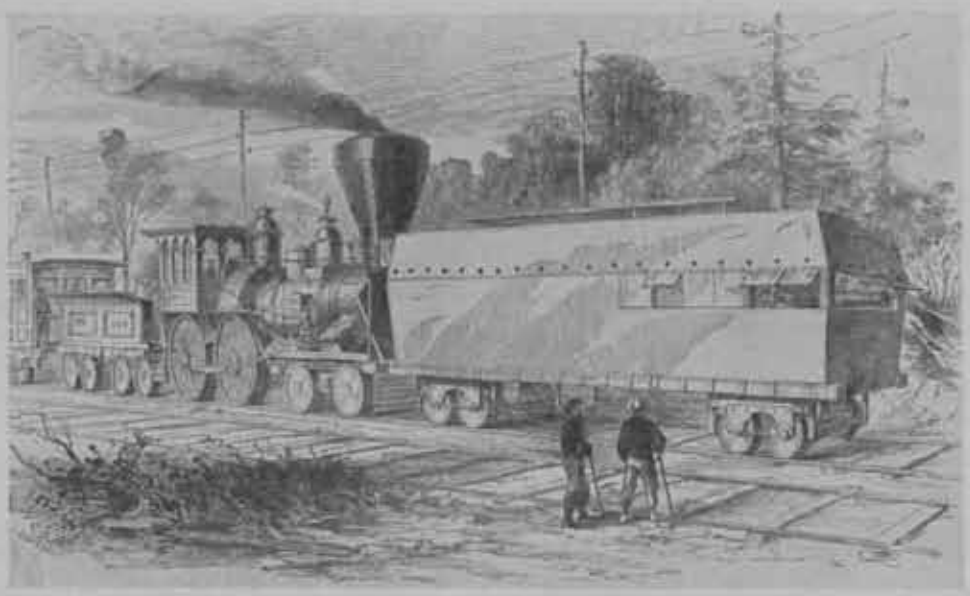
(11) Provision of appropriate filters.

(12) Utilization of standard commercial products whenever practicable.

(13) Provision of a suitable electric time interval device giving a rate of change of time counters of one per second.

(14) Provision of a suitable viewing device as a substitute for the present projector equipment.

Accordingly, the Chief of Coast Artillery has requested the Chief Signal Officer to undertake a redesign of this equipment along the lines suggested by the Board. It is expected that funds will be available in the near future for the purchase of a number of new spotting sets. It will probably be possible to incorporate in this new equipment most, if not all, of the suggested improvements.



Early Railroad Battery

THIS IS BELIEVED *to have been the first attempt at a railroad battery. Produced at the Baldwin Locomotive works in May, 1861, it was a heavily armored car, equipped with a revolving rifled gun and had loopholes for muskets. There is no evidence that the weapon saw action. It appears that it spent the period of the Civil War on an old siding in the yards at Alexandria.—Journal of the American Military History Foundation.*

Coast Artillery Orders

(March 1 to April 30, 1939)

Colonel H. W. T. Eglin will retire upon his own application, July 31.

Colonel M. J. Hickok, from 9th, Ft. Banks, to Panama, sailing New York, June 14, revoked.

Colonel R. F. Maddux, from instructor, Mass. Natl. Guard, Boston, to Panama, sailing New York, August 1.

Colonel W. G. Peace, from Fort Worden, to his home and await retirement.

Colonel E. B. Walker, from 2d, Fort Monroe, to Hawaii, sailing New York, August 15.

Lieutenant Colonel R. B. Cocroft promoted Colonel April 1.

Lieutenant Colonel C. S. Doney, from instructor, Arkansas Natl. Guard, Little Rock, to Sacramento High School, Sacramento.

Lieutenant Colonel C. A. French, from CCC, Boston, to Univ. of Minnesota.

Lieutenant Colonel J. L. Homer, from student, Army War College, to 61st, Fort Sheridan.

Lieutenant Colonel E. C. Mead, from Org. Res. 7th Corps Area, to 3d, Fort MacArthur.

Lieutenant Colonel R. M. Perkins, from War Department General Staff, Washington, D. C., to Hawaii sailing New York, August 15.

Lieutenant Colonel J. C. Ruddell, from student, Army Industrial College, to student Army War College.

Lieutenant Colonel E. H. Underwood, from Univ. of Alabama to Panama, sailing Charleston, August 3.

Lieutenant Colonel Eugene Villaret, relieved from military attache and military attache for Air to Rumania, March 24. Previous orders amended.

Lieutenant Colonel L. B. Weeks, from student, Army War College, to instructor, C.A.S.

Major H. G. Archibald, from St. Ignatius High School, San Francisco, to Panama, sailing San Francisco, July 18.

Major J. C. Bates, from Sacramento High School, to Hawaii, sailing San Francisco, June 24.

Major A. L. Bullard, from 69th, Ft. Crockett, to instructor, Arkansas National Guard, Helena.

Major H. F. E. Bultman, from instructor, C&G.S.S., to student, Army War College.

Major A. H. Campbell, from U.S.M.A., to the Philippines, sailing New York, October 11.

Major J. T. Campbell, from the Philippines, to Michigan State College.

Major F. L. Christian, from Panama, to Org. Res. 3d Corps Area, Washington, D. C.

Major L. R. Crews, from Kansas State College to the Philippines, sailing New York, September 12.

Major J. T. deCamp, from Panama to 52d, Ft. Hancock.

Major R. E. DeMerritt, from Hawaii, to instructor, Mass. Natl. Guard, Fall River.

Major D. L. Dutton, from student, Air Corps Tactical School, Maxwell Field, to Hawaii, sailing Charleston, July 20.

Major M. B. Gibson, from 6th, Ft. Winfield Scott, to William Chrisman High School, Independence, Missouri.

Major W. R. Goodrich, from Hawaii, to Utah State Agric. College.

Major M. C. Handwerk, from instructor, C.A.S., to student, Army War College.

Major William Hesketh, from instructor, Conn. Natl. Guard, Bridgeport, to student C&G.S.S.

Major L. W. Jefferson, from 2d, Ft. Monroe, to student, Army War College.

Major W. Q. Jeffords, Jr., from 6th, Ft. Winfield Scott, to student, C&G.S.S.

Major A. L. Lavery, from the Philippines, to Org. Res., 2d Corps Area, Buffalo.

Major Samuel McCullough, from student, C&G.S. School, to the Philippines, sailing New York, September 12.

Major H. S. MacKirdy, from Quartermaster Corps, to Kansas State College, Manhattan.

Major H. A. McMorrow, from the Philippines, to Org. Res., Minneapolis.

Major M. H. Parsons, from 14th, Ft. Worden, to 2d C.A. District, New York.

Major G. A. Patrick, from the Citadel, Charleston to student C.&G.S.S.

Major P. W. Rutledge from instructor, South Carolina Natl. Guard, Columbia, to student, C.&G.S.S.

Major W. W. Scott, from student, C.&G.S.S., to Panama, sailing New York, August 1.

Major V. C. Snell, from Hawaii, to Logan Senior High School, Logan, Utah.

Major E. H. Stillman, from Logan Senior High School, Logan, to the Philippines, sailing San Francisco, October 4.

Major J. R. Townsend, from student, C&G.S.S., to student, Army Industrial School.

Major W. H. Warren, from office Chief of Coast Artillery to student, Army War College.

Major A. V. Winton, from instructor, Mass. Natl. Guard, Fall River, to office, Chief Natl. Guard Bureau, Washington, D. C.

Captain G. M. Badger, from 62d, Ft. Totten, to Army War College.

Captain Edward Barber, from student, C.&G.S.S., to student, Army War College.

Captain R. W. Berry from West Point, to student, C.&G.S.S.

Captain H. A. Brusher, from the Philippines, to 62d, Ft. Totten.

Captain G. C. Bunting promoted Major March 1.

Captain N. A. Burnell, 2d, from student, C.&G.S.S., to student, Army War College.

Captain J. F. Cassidy, from Univ. of California, Berkeley to student, C.&G.S.S.

Captain E. W. Chamberlain, from Coast Artillery Board to student, C.&G.S.S.

Captain A. K. Chambers promoted Major March 1.

Captain E. E. Count, Jr., from 62d, Ft. Totten, to student, C.&G.S. School.

Captain R. W. Crichlow, Jr., from instructor, Washington Natl. Guard, Camp Murray, to Coast Artillery Board, Ft. Monroe.

Captain F. J. Cunningham, from Univ. of Delaware, Newark, to student, C.&G.S.S.

Captain M. G. Cary, from Hawaii, to student, C&G.S.S.

Captain W. V. Davis from Hawaii to student, C&G.S.S.

Captain M. K. Deichelmann, from student, Air Corps Tactical School, Maxwell Field, to 61st, Ft. Sheridan.

Captain L. A. Denson, Jr., from the Philippines, to student, Army Industrial College.

Captain J. V. deP. Dillon, from Judge Advocate General's Office, and Org. Res. 3d Corps Area, to U.S.M.A.

Captain H. J. Dunham, from 6th, Ft. Winfield Scott, to student, C.&G.S.S.

Captain R. A. Ericson, from student, C.&G.S.S. to 62d Ft. Totten.

Captain B. F. Fellers, from student, Army War College, to West Point.

Captain L. D. Flory, from 62d, Ft. Totten, to student, Army War College.

Captain R. T. Frederick, from student, C&G.S.S., to Hawaii, sailing New York, July 18.

Captain J. E. Harriman, from student, Army War College, to office Chief of Coast Artillery.

Captain A. R. Hartman, from the Philippines, to U.S.M.A. Previous orders revoked.

Captain F. L. Hayden, from student, C.&G.S.S., to 6th Corps Area.

Captain Hobart Hewett, from student, Army War College, to Hawaii, sailing New York, August 15.

Captain J. F. Howell, Jr., from student, C&G.S.S., to Univ. of California, Berkeley.

Captain F. B. Kane, from instructor, C.A.S., to student, C.&G.S.S.

Captain W. S. Lawton, from student, C.&G.S.S., to Hawaii, sailing New York, August 15.

Captain L. L. Lemnitzer, from instructor, C.A.S., to student, Army War College.

Captain J. R. Lovell, from student, C.&G.S.S., to German General Staff School, Berlin.

Captain Donald McLean, from West Point, to student, C.&G.S.S.

Captain J. H. Madison, from 62d, Ft. Totten, to instructor, C.A.S.

Captain D. D. Martin, from student, Air Corps Tactical School, to Hawaii.

Captain A. D. Miller, from CCC, 3d Corps Area, Baltimore, to the Philippines, sailing New York, September 12.

Captain J. E. Mortimer, from student, C.A.S., to 69th, Ft. Crockett.

Captain T. W. Munford, from Va. Poly. Inst., to student, C.&G.S.S.

Captain P. B. Nelson, from 61st, Fort Sheridan, to student, C.&G.S.S.

Captain A. B. Nicholson, from student, Air Corps Tactical School, to 62d, Ft. Monroe.

Captain W. L. Richardson, from student C.&G.S.S., to U.S.M.A.

Captain J. S. Robinson, from The Citadel, Charleston, to student, C.&G.S.S.

Captain R. W. Russell, from Univ. of Alabama, to Panama, sailing Charleston, August 3.

Captain W. C. Rutter, from 2d, Ft. Mon-

roe, to student, advanced technical course, C.A.S.

Captain J. A. Sawyer, from student, Signal Corps School, to Ft. Monmouth.

Captain F. F. Scheiffler, from student, C.&G.S.S., to instructor, Washington Natl. Guard, Olympia.

Captain C. Q. Shelton, from student, Air Corps Technical School, Maxwell Field, to Hawaii, sailing Charleston, July 20.

Captain W. B. Short, from 69th, Ft. Crockett, to the Philippines, sailing San Francisco, June 27.

Captain M. L. Skinner, resigned, April 30.

Captain D. H. Smith, from Michigan State College, to student, C.&G.S.S.

Captain P. M. Smith, from 52d, Ft. Monroe, to student, C.&G.S.S.

Captain A. C. Spalding, from West Point, to student, C.&G.S.S.

Captain R. E. Starr, from student, Army War College, to student, Naval War College, Newport.

Captain W. K. Stennis, from Mississippi State College, to the Philippines, sailing New York, September 12.

Captain G. H. Stubbs, from student, C.&G.S.S., to the Philippines, sailing New York, September 12.

Captain J. F. Sturman, Jr., from student, C.A.S., to Panama, sailing New York, August 1.

Captain L. K. Tarrant, from 6th, Ft. Winfield Scott, to student, C.&G.S.S.

Captain A. R. Thomas, from 13th, Ft. Barrancas, to Quartermaster Corps, March 20

Captain E. B. Thompson, from student, C.&G.S.S., to Panama, sailing New York, August 1.

Captain D. C. Tredennick, from the Philippines, to student, C.&G.S.S.

Captain W. L. Weible, from student, Army Industrial College, to office Chief of Staff.

Captain D. M. Wilson, from student, C.A.S., to Va. Poly. Inst., Blacksburg, Va.

Captain C. M. Wolff, from 65th, Ft. Winfield Scott, to student, C.&G.S.S.

Captain J. T. Wrean, from the Philippines, to Mississippi State College.

First Lieutenant C. L. Andrews, from 11th, Ft. H. G. Wright, to U.S.M.A.

First Lieutenant W. H. Ball, from student C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant Edward Bodeau, from student, Ordnance School, Aberdeen Proving Ground, to G.H.Q. Air Force, Mitchell Field.

First Lieutenant W. H. Brucker, from 13th, Ft. Barrancas, to Ft. McPherson.

First Lieutenant W. A. Call, transferred to Ordnance Dept., April 10.

First Lieutenant E. N. Chace, from student, C.A.S., to student, advanced technical course, C.A.S., September 8.

First Lieutenant A. J. Cooper, Jr., from student, C.A.S., to student, advanced course, C.A.S., September 8.

First Lieutenant G. H. Crawford, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant C. G. Dunn, from 51st, Ft. Monroe, to U.S.M.A.

First Lieutenant H. W. Ebel, from student, C.A.S., to 2d, Ft. Monroe.

First Lieutenant F. W. Ebey, from student C.A.S., to Hawaii, sailing New York, August 15.

First Lieutenant D. D. Edison, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant C. H. Fernstrom, from Panama, to student, advanced technical course, C.A.S.

First Lieutenant R. G. Finkenaur, from student, C.A.S., to 2d, Ft. Monroe.

First Lieutenant T. D. Flynn, resigned.

First Lieutenant W. G. Fritz, from student, C.A.S., to 2d, Ft. Monroe.

First Lieutenant R. E. Gallagher, from student, C.A.S., to 63d, Ft. MacArthur.

First Lieutenant H. A. Gerhardt, from C.A.S., to U.S.M.A.

First Lieutenant S. F. Giffin, from C.A.S., to U.S.M.A.

First Lieutenant R. D. Glassburn, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant Edward Gray, from student, Ordnance School, Aberdeen to duty at Aberdeen Proving Ground.

First Lieutenant C. E. Green, from student, C.A.S., to Panama, sailing New York, August 1.

First Lieutenant P. W. Guiney, Jr., from 6th, Ft. Winfield Scott, to U.S.M.A.

First Lieutenant E. E. Hackman, from student, C.A.S., to 2d, Ft. Monroe.

First Lieutenant R. W. Hain, from student, C.A.S., to Hawaii, sailing New York, August 15.

First Lieutenant T. F. Hoffman, from student, C.A.S., to 14th, Ft. Worden.

First Lieutenant K. R. Kenerick, from C.A.S., to U.S.M.A.

First Lieutenant V. H. King, from student, C.A.S., to West Point. Previous orders revoked.

First Lieutenant C. L. MacLachlan, from Panama, to 8th, Ft. Preble.

First Lieutenant F. J. McMorrow, from student, Ordnance School, Aberdeen Proving Ground, to Wright Field, Dayton.

First Lieutenant S. McF. McReynolds, Jr., from student, C.A.S., to 6th, Ft. Winfield Scott.

First Lieutenant R. L. Matteson, from student, C.A.S., to 2d, Ft. Monroe.

First Lieutenant S. M. Mellnik, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant J. E. Metzler, from 6th, Ft. Winfield Scott, to U.S.M.A.

First Lieutenant E. W. Moore, from student, C.A.S., to 3d, Ft. Rosecrans.

First Lieutenant R. W. Moore, from student, C.A.S., to Panama, sailing New York, August 1.

First Lieutenant R. R. Moorman, from student, C.A.S., to 6th, Ft. Winfield Scott.

First Lieutenant R. M. Nelson, from student, C.A.S., to student, advanced technical course, September 8.

First Lieutenant M. L. Ogden, from student, C.A.S., to student, advanced technical course, C.A.S., September 8.

First Lieutenant C. L. Partin, from Hawaii, to Univ. of Maine, Orono.

First Lieutenant P. S. Peca, from student, C.A.S., to 1st C.A. Dist., Army Base, Boston.

First Lieutenant W. A. Perry, 3d, from Ft. Stevens, to student, C.&G.S.S.

First Lieutenant A. C. Peterson, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant J. S. Piram, from student, C.A.S., to 13th, Ft. Barrancas.

First Lieutenant C. W. Powell, from student, C.A.S., to 13th, Ft. Barrancas.

First Lieutenant G. F. Powell, from student, Ordnance School, Aberdeen Proving Ground, to Ft. Bliss.

First Lieutenant L. C. Ratcliffe, from student, C.A.S., to U.S.A.M.P. "General J. Franklin Bell," Ft. Worden.

First Lieutenant M. M. Simons, transferred from Air Corps to Coast Artillery Corps, March 17, 51st, Ft. Monroe.

First Lieutenant W. M. Skidmore, from student, C.A.S., to Panama, sailing New York, August 1.

First Lieutenant W. F. Spurgin, from 2d, Ft. Monroe, to Panama, sailing New York, June 8.

First Lieutenant T. V. Stayton, from C.A.S., to U.S.M.A.

First Lieutenant J. DuV. Stevens, from student, C.A.S., to 51st, Ft. Monroe.

First Lieutenant A. J. Sutherland, from student, C.A.S., to 52d, Ft. Hancock.

First Lieutenant E. O. Taylor, from student, C.A.S., to 51st, Ft. Monroe.

First Lieutenant J. F. Thorlin, from student, C.A.S., to the Philippines, sailing New York, September 12.

First Lieutenant H. S. Tubbs, from student, C.A.S., to 63d, Ft. MacArthur.

First Lieutenant R. A. Turner, from C.A.S., to U.S.M.A.

First Lieutenant W. M. Vestal, from student, C.A.S., to 13th, Ft. Barrancas.

First Lieutenant W. E. H. Voehl, from student, C.A.S., to 69th, Ft. Crockett.

First Lieutenant R. L. Williams, Jr. from student, C.A.S., to 69th, Ft. Crockett.

First Lieutenant Y. H. Wolfe, from student, C.A.S., to 11th, Ft. H. G. Wright.

Second Lieutenant C. F. Cordes, Jr., from the Philippines, to 52d, Ft. Hancock.

Second Lieutenant C. A. Cozart, from Watertown Arsenal, Mass., to Raritan Arsenal, N. J. Previous orders revoked.

Second Lieutenant L. R. Drake, from the Philippines, to 62d, Ft. Totten.

Second Lieutenant M. J. Hickok, Jr., from Panama, to 62d, Ft. Totten.

Second Lieutenant J. W. Romlein, from the Philippines, to 51st, Ft. Monroe.

Second Lieutenant W. J. Worcester, from 52d, Ft. Monroe, to Panama, revoked.

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The Contributors

CAPTAIN EDWARD Y. BLEWETT, Infantry Reserve, is Dean of the College of Liberal Arts, University of New Hampshire.

HOBART BRITTON, who illustrated "The Glory of the Soldier," is a native of the North Georgia hill country. After a year on the Mexican border with the 5th Georgia Infantry during the 1916 rumpus, he served in France with the 28th Division. He is a free-lance artist, making his headquarters in Richmond, Virginia. For recreation he prowls Civil War battlefields with reprints of old maps.

CAPTAIN LATHROP R. BULLENE, Coast Artillery Corps, was born in Missouri. After service as sergeant, Missouri National Guard in 1916, he enlisted in the regular army, signing up with the 9th Company, Coast Defenses of Fort Monroe in February, 1917. In June, 1918, he won an appointment to the Military Academy and was graduated as second lieutenant, Coast Artillery Corps in 1920. Captain Bullene is a graduate of the Coast Artillery School Basic Course (1921) and the Battery Officers' Course (1931). He is now on duty with the 62d Coast Artillery, Fort Totten.

LIEUTENANT COLONEL FRANK DRAKE, Coast Artillery Corps, was born in Nevada. Graduating from the Military Academy with the Class of 1910, he was appointed a second lieutenant, Coast Artillery Corps. All his service has been with that arm. Colonel Drake is a graduate of the College of Mines, University of Nevada (B.S. 1906), and The Command and General Staff School (1932). He served a four-year detail with the General Staff Corps during the period 1932-1936. At the moment he is P.M.S.&T., University of San Francisco.

CAPTAIN FRANCIS S. BRATH, Military Intelligence Reserve, was born in Kansas. Graduating from the University of Nebraska in 1925, he began newspaper work with the *Nebraska State Journal*. He served as publicity officer for the Nebraska National Guard for three summer encampments and also served a tour with the press section during the 1937 Fourth Army maneuvers.

MAJOR WILLIAM F. LAFRENZ, Coast Artillery Corps, a native of California, was appointed a second lieutenant, Coast Artillery Corps in August, 1917. He is a graduate of the University of California (B.S. 1916), The Coast Artillery School Battery Officers' Course (1928), Advanced Gunnery Course (1929), and Advanced Course (1933). Major Lafrenz is assistant P.M.S.&T., University of San Francisco.

MAJOR BRYAN L. MILBURN, Coast Artillery Corps, is a native of Arkansas. He entered the service as a second lieutenant of Coast Artillery in August, 1917, and his subsequent service has been with that arm. Major Milburn is a graduate of the University of Arkansas (A.B., 1922), The Coast Artillery School Advanced Course (1931), The Command and General Staff School (1935), and The Army War College (1937). He is an instructor at The Command and General Staff School, Fort Leavenworth.

LIEUTENANT WALLACE M. NELSON, U. S. Marine Corps, hails from Minnesota. A graduate of the Naval Academy Class of 1935, he is on duty with the 15th Regiment, United States Marines, San Diego.

LIEUTENANT EDWIN P. PENNEBAKER, U. S. Marine Corps, was born in Montana. Graduating from the Naval Academy with the Class of 1935, he subsequently graduated from the Marine Corps School Basic Course and the Naval Air School at Pensacola. He is now on duty at the Naval Air Station, San Diego.

FLETCHER PRATT, the well-known New York historian, has just published *Secret and Urgent*, a book that tells all about the art of the cryptographer. His biography of Napoleon, portions of which you have been reading serially in The JOURNAL, will appear shortly under the Doubleday, Doran and Co. imprint.

STAFF SERGEANT HERBERT E. SMITH, DEML, is a member of the staff of the Recruiting Publicity Bureau, Governors Island, New York. With the exception of a brief period with the Field Artillery (90th Division, AEF), all his service has been with the Infantry. At varying times he has been borne on the rosters of the 4th, 31st, 38th, and 44th regiments of Infantry, at such diverse places as the Presidio of San Francisco, Siberia, Fort Missoula, and the Philippine Islands.

W. A. WINDAS, a free-lance artist and writer, is a resident of Hollywood, California.

MAJOR THOMAS R. PHILLIPS, Coast Artillery, is widely known in civilian as well as army circles for his writings on the current military scene. He is an instructor at The Command & General Staff School.

BOOK REVIEWS

GERMANY AND A LIGHTNING WAR. By Fritz Sternberg; Translated by Edward Fitzgerald. London: Faber & Faber, Ltd., 1938. 345 Pages. $4.00.

When men of extreme radical outlook write of anything, and particularly of world affairs, we who live in a democracy that daily grows in its distrust of non-democracies expect to find a rabid presentation—a presentation so biased as to be without value. Here, however, is a work by an author of leftist sympathies which deserves the closest study. Doctor Sternberg is a German who is, it should be said, as far from being an admirer of the present rule in Soviet Russia as he is from being a supporter of the Nazi government of his Fatherland. With an academic thoroughness reminiscent of many a solid German work of research, he has studied his country in its present plight. He has hunted through official and semi-official Nazi propaganda and censored writings to find the hints that show what he believes to be the true state of the nation and its actual "war potential." Presenting, also, briefer analyses of the other major powers, Dr. Sternberg sets their "war potentials" against that of Germany to see who will win the next war.

It won't be the German Reich, says Dr. Sternberg. In the first place, the von Schlieffen plan is no longer workable. Soviet Russia, despite her backwardness in technical skill, her almost total dependence on oil fields that lie, an easy aerial target, but three hundred miles from her borders, and despite what this author believes is the steadily smouldering opposition to the Stalin government —despite all these—the Soviet of today is not the slow-paced awkward Great White Bear of 1914. Her tremendous improvement in strength and resources guarantees, almost beyond a doubt, that there will be no gaining of a lightning decision. Thus, if Germany fights again, it must be on two fronts in full earnest. There can be no mere containing on the east.

To the west lies France whose potential for war, points out this author, is also higher than when the World War opened, notwithstanding her somewhat troubled state. France, says Dr. Sternberg, has 2,200,000 motor vehicles to Germany's 1,500,000. She has had uninterrupted military service since the World War closed and she is the only big industrial nation in Europe where this is true. She was weakened in 1914 by German occupation of her industrial areas, a condition improbable in a next war of the near future. She should also be able to finance her imports for war. She has tremendous colonies of fighting men to draw upon; she has the greatest production of armament in Europe now in operation; and her agricultural resources are such that she will never starve in war. And Great Britain is her strong supporter.

Great Britain, thinks Dr. Sternberg, lags well behind the rest of Europe. But still she has might, and a strength hardly less than it was when the first World War began. Besides, is it possible, he asks, not to count at least upon the "benovolent neutrality" of the United States?

Our own country, ocean-safe, has not the immediate war potential of other nations. She has not needed it. But, thinks Dr. Sternberg, writing many months ago, "It is possible that as a result of the growing tension in the Far East, the production of war material in the U.S.A. will increase even in the present period. Further, preparatory work with a view to accelerating the process of industrial mobilization is on the increase. Apart from the organization of her own war industry, the U. S. A. is in a position, thanks to her own enormous economic reserves, to increase the war potential of her friends to a decisive degree . . . a war carried out on various parts of the globe will probably, for purely military-technical reasons, last a long time and therefore the enormous war potential of the U. S. A. will once again be brought into action."

Of Germany herself, Dr. Sternberg does not deny her power to strike. But how, he asks, will she be able to buy the imports she will need in war? It will be many a year, too, before her military training catches up from her imposed post-war neglect of it. And her foodstuffs will again be hard to maintain. She may be organized, militarily and industrially, as a single unit for war, but "in the event of a two-front war the total economic potential of Germany's enemies will be so much greater than Germany's own, and so much greater even than Germany's plus her allies, that despite a slower industrial mobilization it will still be so-

perior to Germany's own." Of her probable allies, thinks Dr. Sternberg, Italy might be a strong help for a few months, but for a few months only. She can get into action fast, but "her heavy industry is weak, her raw-material situation calamitous, her finances bad and her transport routes highly vulnerable." Japan must enter any war that is soon to come practically creditless. It is true that "the mailed fist has already descended on China," but "the weakness of the biceps behind it will manifest itself in the coming world war." Taken together, Italy and Japan can only be of help in a short war.

But a short war is impossible against Soviet Russia. The next war of Germany may perhaps begin, it is Dr. Sternberg's belief, as a "divided war"—a one-front war, a war to the east or to the west. But it won't be "divided" for long. Germany must reckon always on a two-front conflict.

Nor can a great air fleet bring the war to a quick end. "Germany's industries are just as vulnerable to air attack as those of the Western powers, and far more so than those of Soviet Russia." In support of this point the author quotes the expressed opinion of writers in German and Austrian military magazines. "*The greater part of Germany's heavy industries is still situated near the western frontier,* and this cannot be altered because of the position of her coal deposits. . . ." She is doing what she can to remedy what may well be her fatal weakness. But as Dr. Sternberg again emphasizes in italics, ". . . on the whole, *Germany's industries are just as vulnerable to air attack as those of the Western Powers, and far more so than those of Soviet Russia.*"

The most vital question of all from the German viewpoint, thinks this German writer, is whether internal weaknesses of morale will not lose a war for the Nazi government in short order, for we, outside, know little enough of what the German masses really think. Here Dr. Sternberg masses some imposing evidence: He quotes Himmler, head of the secret state police (the *Gestapo*) in a newspaper article of September, 1937, to the effect that "In a future war we shall have to fight not only three fronts land, sea, and air, but on a fourth front—the home front."

At some length Dr. Sternberg quotes from numerous other sources, mainly Nazi, to bring out these internal weaknesses, particularly among the German workers. These, he says, will be between death at home and death in the firing line once a major war begins; and what kind of fighting morale can be expected under these conditions?

Germany and a Lightning War is imposing in the mass of data Dr. Sternberg has collected from the mouths and pens of Nazi Germans. It is a book that must be studied by all who would attempt to discover and weigh the real situation in the world today.

AMERICAN ARMIES AND BATTLEFIELDS IN EUROPE. Prepared by the American Battle Monuments Commission. Washington: Government Print-

Prize Essay Competition 1939

First Prize $200.00

Honorable Mention Prizes . 100.00

a. PERMISSIBLE COMPETITORS:

Any member of the Coast Artillery Association at date of submission of essay.

b. SUBJECT:

To be selected by the author. Appropriateness of subject for Coast Artillery readers is a point to be considered in awarding prize.

c. PRIZES:

(1) *Number:*

(*a*) One First Prize—$200.00. Not to be awarded if no essay submitted is outstanding.

(*b*) Not to exceed two Honorable Mention Prizes—$100.00 each.

(2) Awarded by Chief of Coast Artillery upon recommendation of Board of Officers appointed by him. Membership of Committee to be published only after awards for the year have been made.

(3) *Time limit.*

No essay received after September 30th will be awarded a prize.

(4) *Payments.*

Payments of prizes will be made immediately after awards are made. All essays submitted become the property of the COAST ARTILLERY JOURNAL. Any person receiving a prize for an essay will receive no other compensation. If any essay is published the author of which received no prize, such author will be paid at the usual rates.

d. HOW SUBMITTED:

Essays will be submitted to the Editor of the COAST ARTILLERY JOURNAL in a sealed envelope bearing the notation "Prize Essay Contest." The copy submitted will contain nothing to indicate its authorship, will be signed by a "nom de plume," and will be accompanied by a separate sealed envelope containing the nom de plume and also the name of the writer. This latter envelope will be delivered to the Chief of Coast Artillery when received and will be opened in the presence of the Editor of the COAST ARTILLERY JOURNAL after the relative merits of the essays have been determined.

e. FORM:

(1) Essays should be limited to approximately 8,000 words, but shorter articles will receive consideration.

(2) Three typewritten copies of each essay will be submitted on letter size paper (one original, two carbons) with double-spaced lines. At least one of any illustration will be a drawing, tracing, or photograph, not a blue print or brown print.

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ing Office, 1938. 547 pages; 561 official photographs; 120 maps. $2.75.

American Armies and Battlefields in Europe has been compiled as a part of the project of the Battle Monuments Commission to commemorate in a complete and lasting manner the accomplishments and services of the American forces in Europe during the World War. The book constitutes a revision and elaboration of *A Guide to the American Battlefields in Europe,* which was published by the Commission in 1927. Twenty thousand copies of that book were printed, and the supply was completely exhausted within nine months.

The photographs in the book are from American, German, and Allied sources. Of the 120 maps, twenty-seven are in color, nine are colored inserts, and three are colored large-scale maps covering the operations of the divisions which participated in the Aisne-Marne, St. Mihiel, and Meuse-Argonne offensives.

The contents of the book include a review of the actions of American units in the Aisne-Marne region, in the St. Mihiel area, in the Meuse-Argonne operation, on the Champagne front, on the British front north of Paris, on the Belgium front in Flanders, on the Vosges front, on the Italian front, in the Archangel sector, and in the Services of Supply. A section is also devoted to the operations of the U. S. Navy in European waters during the World War.

The historical data pertaining to the main operations in France are accompanied by detailed battlefield guides. This excellent work also contains considerable miscellaneous statistical information and general facts concerning the AEF. H. L.

THE DRAGON WAKES. By Edgar Ansel Mowrer. New York: William Morrow & Co., 1939. 237 pages; illustrated with six maps; index; $2.00.

The Dragon Wakes is a rather trite title to a sketchy word picture of the war consciousness and national spirit seen and felt by the author among Chinese of all classes during the summer of 1938. More apropos seems the title of the opening, historical-background chapter: "The Jellyfish Turns." This was the reaction the Japanese met to their surprise soon after the "incidents" at Peiping and Shanghai in 1937. Says Mr. Mowrer: "The Chinese jellyfish had turned and its sting was biting deep into the pride and the body of Nippon."

The author travelled through much of China, interviewed hundreds of natives from the highest to the lowest, talked with foreign observers, and got to the Lunghai Railway front just as the westward retreat was taking place, so despite his sore feet he had to hoof it with the soldiers and refugees. A good reporter, correspondent Mowrer has put all his interviews and experiences together and turned out a very readable book.

Unfortunately much has changed in China since Mr. Mowrer was collecting impressions: Hankow and Cantor have fallen. He foresaw these conquests as did the Chinese

leaders. Even so, he felt that "Rump China"—the big prolific Southwest—could carry on, with military supplies coming through the backdoor from Burma and Indo-China.

Has Japan occupied China? The author puts it like this: owing to the sabotage and guerilla warfare being carried on behind them the Japanese have occupied China "about as effectively as a few swimmers can be said to 'occupy' a swimming pool: they went, that is, virtually where they pleased on condition of making the requisite effort. But even when they were going ahead fastest, the waters were closing in behind, relentlessly obliterating all but a foamy track in the wake of the advance." The metaphor may be somewhat exaggerated, but it does seem to be true that the Japanese army has not come up to expectations. Perhaps China's lack of the implements and cohesion found in the Japanese machine will eventually be offset by her defensive "jiu-jitsu tactics . . . yielding to the adversary's muscular effort in order that he may overreach himself and bring about his own undoing."

Tied to roads and railways and watercourses, few and far apart, the Japanese occupation struck Mr. Mowrer like "stretching a few clotheslines across a yard. But though the stretching was easy, the protecting was a problem, while between the lines the Chinese never ceased to come and go at will."

He found the most powerful factor favoring Chinese capabilities was the excellent morale uniting civilians and soldiers in the common cause. Once the soldier ranked next to the criminal; today he is revered; and the generalissimo, Marshal Chiang Kai-shek, is a symbol. Also the women are behind and even in the army as they have always been everywhere during national crises.

> The Chinese had surprised the world by their failure to succumb to certain weaknesses reported traditional, incompetence in the leaders, venality, lack of popular morale and patriotism, failure to show team work. The China of 1938 was overcoming them all to an increasing degree and, despite the depth of the Japanese military penetration, was stronger than at the beginning of the war a year before.

That time and space are with the Chinese and against the Japanese is what one may deduce from Mr. Mowrer's reasoning. The longer the war lasts and the farther west they are pushed, the more homogeneous and unified become the people under Chiang Kai-shek. These same conditions complicate the opponent's problems of guarding ever-lengthening communications, add more millions to the mounting war cost, wear down the spirit of the invading troops who had been promised a short, decisive conquest, and increase the antagonism of neutral powers.

The author closes his report on China with this prediction:

> Sooner or later it will be up to Japan to decide whether it wishes to limit its objectives and withdraw to the north with considerable plunder but great loss of face and the possibility of a new and worse war on its hands five years thence; or whether it prefers to continue an indecisive struggle until forced by sheer exhausion to clear out, not only of occupied China, but conceivably from stolen Manchuria as well. . . .

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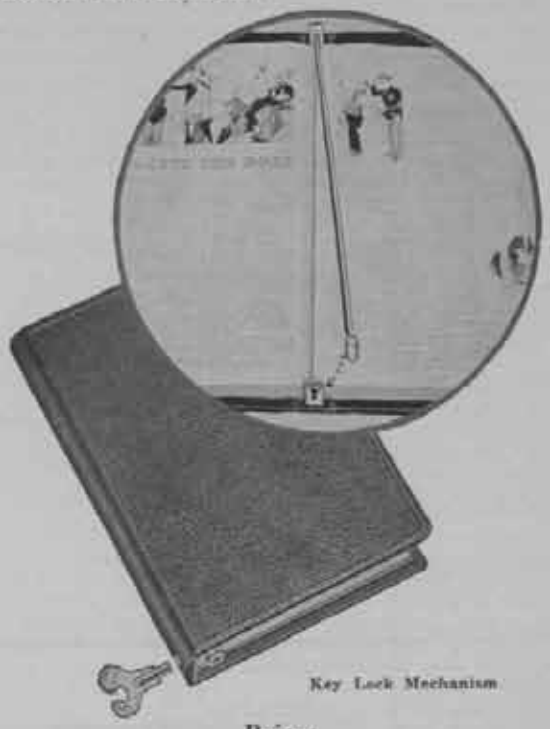

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Whatever his reliability as a prophet, Mr. Mowrer writes well. W. G. J.

OUR MAGINOT LINE: THE DEFENSE OF THE AMERICAS. By Livingston Hartley. New York: Carrick & Evans, Inc. 1939. 315 pages; maps. $2.75.

This book presents a rather sobering view of the American defense problem in the light of post-Munich happenings. Mr. Hartley, former member of the United States Foreign Service and the State Department, does not feel very happy about the prospects of the European democracies in the inevitable struggle with the dictators. In a post-Munich world he sees little likelihood of an early check being applied to the expansionist drive of the "have-not" powers. He regards Nazi Germany as the principal and probable disturber of American security. As England succumbs to the menace of German military power, our old safeguards in the Atlantic will pass away. He thinks it possible for Germany, Italy, and Spain to cancel Britain's naval surface strength without indeed destroying the Grand Fleet. With Nazi and Fascist naval bases in Spain, with possible occupation of the French coast, with U-boats attacking England's commerce, and the fleet bases menaced by German bombers, England might be forced to surrender part of the Grand Fleet as a measure of appeasement or base it outside the North Sea. Author Hartley is honest enough to admit that these are just "possibilities," but his succeeding chapters indicate that he thinks they are probabilities.

He stresses the fundamental conflict of ideals between the United States and Nazi Germany and finds little hope for sustained peaceful relations. He does not share the view that aggressive intentions against South America can be halted by taking over a few strategic islands in the Atlantic in trade for dead-horse war debts. There are many very real difficulties in the way of such a transfer. Once totalitarian power is established on the Atlantic coast of Africa, the drive toward the lush and undefended acres of South America seems easy in his pages. Realistically he emphasizes the immense cost and probable waste effort involved in any attempt to bolster the military power of South American states. Our Maginot line is the Atlantic ocean and once penetration of this area is made by a bloc of aggressor powers, our defense problems are multiplied on a vast scale.

Mr. Hartley's views on the subject of an ostrich-with-his-head-in-the-sand policy for the United States are familiar to those who have read his book: *Is America Afraid?* Like the other democratic countries we have passed up early and cheap opportunities to check aggressor nations, and now he feels that any effective action will be costly. A super-armament program without a clear idea of its future employment he regards as costly folly. Limited intervention at once in a European war on the side of the democratic powers with planes and military

equipment might turn the balance and maintain our Atlantic safeguards.

While the reviewer does not share all of Mr. Hartley's views, the latter's opinions are stated convincingly. He has had the courage to tear down a lot of straw-house defense ideas which continue to give shelter to many an ill-informed American citizen. Military readers will be amused at the somewhat naïve underlying assumption that all the military and naval operations in this imaginary but impending struggle will be carried out with unvarying luck and wisdom by the totalitarian powers and with consistent muddling and ill-fortune by the democratic powers.

H. A. D.

✓ ✓ ✓

LEE, GRANT AND SHERMAN. By Lieutenant Colonel Alfred H. Burne, DSO. New York: Charles Scribner's Sons, 1939. $3.00.

The English seem to have studied our Civil War with great care. The new book by Lieutenant Colonel Burne covers the last year of the war with excellent results.

The amazing thing about this book is the manner in which the author has clarified his subject. Too often a book of this period is filled with so many details that it is difficult to get a clear-cut picture of what was actually happening in the East and West. The author has expertly shown what was occurring. It is all clear-cut. There is nothing confusing.

The estimates that the author makes of the three generals—Lee, Grant and Sherman—are powerfully supported. The reader who does not agree with the author's personal estimates will find much to cogitate upon. The reviewer does not entirely agree with Colonel Burne in some of his estimates—Hood, for example—but welcomed the marshaling of material that supported the author's opinion. In many cases it has shaken or revised already formed opinions, if it did not completely change them.

Most American books have paid too little attention to the Appomattox Campaign, perhaps since it marked the end of the war. Colonel Burne covers this thoroughly and accurately. There is much to learn there.

Anyone who desires to understand the last year of the Civil War, without researching, should not overlook this book. The maps and charts are excellent and help greatly in illuminating the account of the campaigns. A book well worth reading.

C. O.

✓ ✓ ✓

SCIENCE AND MECHANIZATION IN LAND WARFARE. By Donald Portway, Brevet Lieutenant Colonel, Cambridge University Officers' Training Corps. Cambridge: W. Heffer & Sons, Ltd., 1938. 158 pages. $2.50.

This textbook, written for candidates for regular army commissions in non-technical branches of the British Army, is mainly a brief review of modern science. As such, it is to be heartily recommended to any reader whose grasp of general science has become shaky in the five, ten, twenty or more years since last he took an examina-

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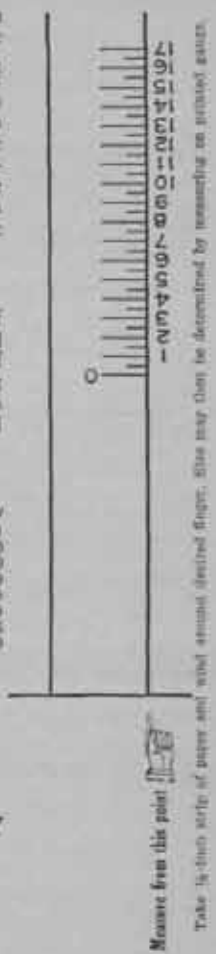

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tion in chemistry, physics, or electricity. These sciences have raced forward with the speed of stratosphere flight (a topic of the book), and such summaries as Colonel Portway's are especially useful in keeping us abreast. Television, teletype, silencing aircraft engines, modern chemicals of war—a few of the matters covered—indicate how close to the present Colonel Portway comes.

As a matter of fact, he does not stop with the present. It is the way in which Colonel Portway strides occasionally into the future that makes of his book more than simply a well-written textbook. The potential British officers who will study it will be challenged on page after page to think forward upon science in the warfare of tomorrow. N. T.

* * *

ARABIAN ANTIC. By Ladislas Farago. New York: Sheridan House. 1938. 319 pages. $2.50.

From a perusal of this volume one infers that Mr. Farago aspired to enter Arabia for the sole purpose of writing a book about the Yemen and when he was denied entrance, wrote the book anyhow.

For the information of inquisitive readers, the Yemen is an extensive region forming the southwestern portion of Arabia. It contains the domains of the Imam Yahya, along the Red Sea and the British protectorate of Aden guarding the Gulf of Aden, which leads to the Arabian Sea. Aden, by the way, is the haven for refugees from Syria, Tunisia, Lybia, Egypt, Palestine, and for various agents trying to undermine the British government.

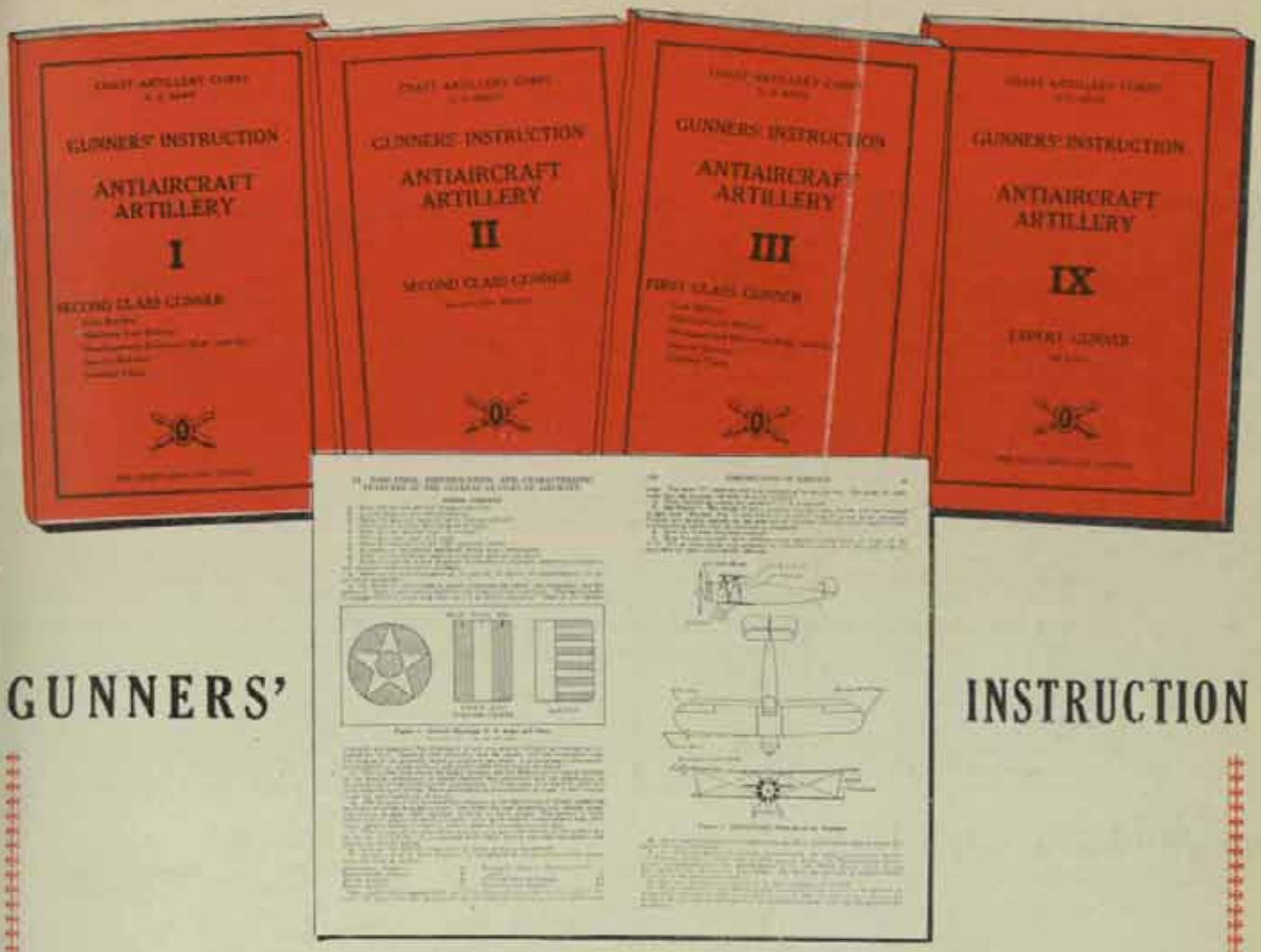
It is in Aden that the author spends most of his time: making acquaintances among the Parsees, while observing their ghat chewing (Arabia's favorite narcotic) and joining them in the smoking of hubble-bubbles. Mr. Farago describes his difficulties in getting anywhere beyond Aden on a Hungarian passport because the Arabian officials had never heard of Hungary. According to them there are only four countries in Europe: Britain, France, Germany, and Italy. However, by perseverance and bribery, he finally penetrates the Yemen as far as Hodeida. There he is held prisoner for a short time until the Imam decides that the infidel should be banished. Whereupon Mr. Farago is put on a dhow and sent out to sea to await a steamer—if any. His subsequent moves are put in for padding.

That in general covers *Arabian Antic*. The book contains considerable information for those interested in Mohammed, near-eastern pornography, and international skullduggery. E. D. C.

* * *

DEFENDING AMERICA. By Major George Fielding Eliot. New York: Foreign Policy Association, 1939. 33 pages. $.25.

This brief pamphlet contains a summary of Major Eliot's views on the defense problems of America. They will be familiar to the readers of his recent book: *The Ramparts We Watch* which was reviewed in the January-February issue of INFANTRY JOURNAL. H. A. D.



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