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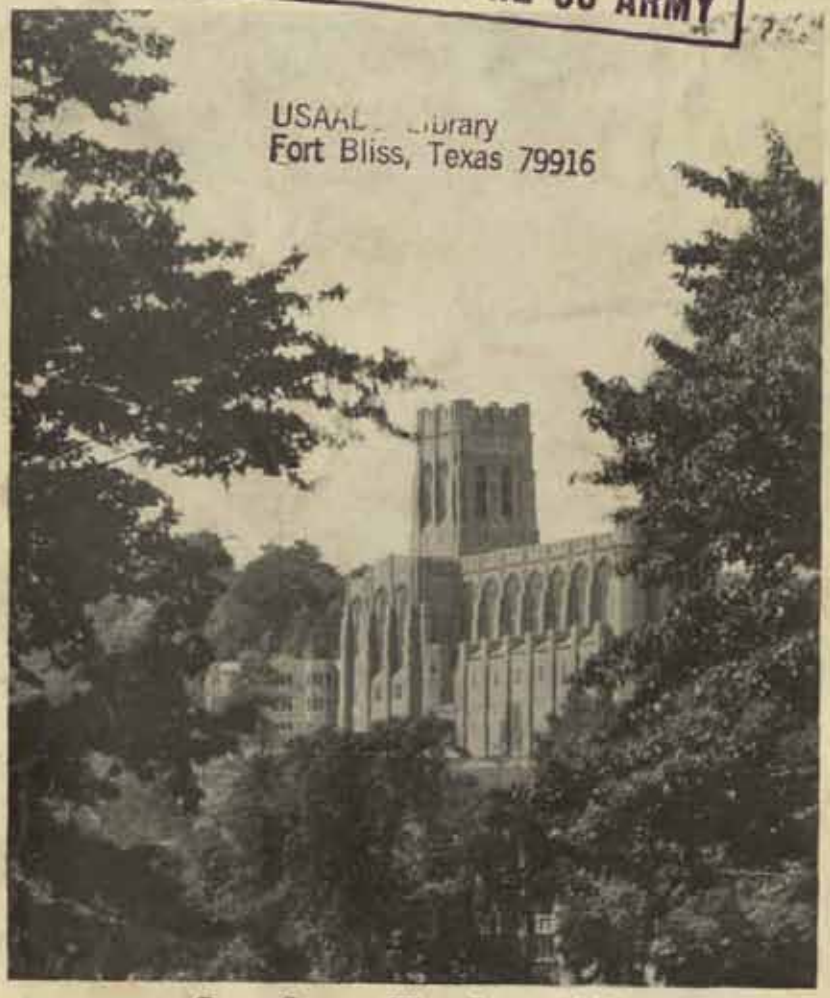

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LIEUT. COL. E. E. BENNETT, C.A.C., *Editor*

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Major General William F. Hase

In Memoriam

MAJOR GENERAL WILLIAM F. HASE

Chief of Coast Artillery

President, United States Coast Artillery Association

Born, August 31, 1874—Died, January 20, 1935.

"None knew him but to love him, none named him, but to praise."

An officer of the highest military ability and professional attainments.

A man who exemplified in every degree the highest attributes of the American gentleman.

A patriot devoted to the best interest of the nation under whose flag he served with outstanding distinction.

A leader especially endowed by nature to inspire confidence and loyalty. Possessed of the qualities which induced others to voluntarily accord him the utmost respect and highest admiration.

A friend whose kindly, courteous and considerate nature endeared him to all with whom he came in contact.

A Coast Artilleryman to whom has been entrusted many responsible positions, vitally affecting the welfare of his branch, until finally his outstanding merit caused him to be elevated to the highest position within the Corps.

GENERAL HASE attended the University of Wisconsin, from which he graduated in 1897 with a degree of LL.B. Immediately after the outbreak of the Spanish-American War, he took the examination and was commissioned a second lieutenant of Artillery on July 9, 1898. The War over, he was detailed as a student at the Coast Artillery School, and was one of the distinguished graduates in the class of 1902. In 1908 he was again ordered to the Coast Artillery School as a student in the Advanced Course from which he graduated the following year. From 1909 to April, 1912, he was a member of the Coast Artillery Board. From 1914 until the early part of 1918 he served in the office of the Chief of Coast Artillery where his breadth of vision and understanding of the problems greatly aided in the successful functioning of the Coast Artillery Corps in the World War. He organized and trained the 45th Regiment, Army Artillery, and sailed with it for France in October, 1918. After the Armistice he was detailed to duty with the A.E.F. General Staff as G-4 of the Advanced Section S.O.S., where he supervised the evacuation of 150,000 men and all the installations of the Section.

General Hase graduated from the School of the Line in June, 1920; from the General Staff School in 1921; and from the Army War College in 1922. His next assignment was as Chief of Staff of the Hawaiian Department. From 1925 to December, 1928, he was commanding officer of the Harbor Defenses of San Francisco; from there he sailed for the Philippine Islands as executive officer of the Harbor Defenses of Manila and Subic Bays. He returned to the States in May, 1931, and took over the duties of Executive Assistant in the Office of the Chief of Coast Artillery where he served until his appointment as Chief, in March, 1934.

General Hase was cited in general order No. 17, Headquarters, Department of the Gulf, August 23, 1905, for "especially meritorious acts in the service for saving two enlisted men from drowning in the Gulf of Mexico, off Pickens Point, Florida, on July 24, 1904."

General Hase was awarded the distinguished service medal; the accompanying citation was promulgated in G. O. No. 60, War Department, 1919. "For specially meritorious and conspicuous service as senior assistant to the Chief of Coast Artillery in the preparation and execution of plans for the effective accomplishment of the duties assigned to the Coast Artillery Corps in the operations in France."

The United States Coast Artillery Association

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

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b. Persons who have rendered distinguished services to the Association or to the United States."

Rhodes and Morale in Coast Defense

By Fletcher Pratt

THERE is something paradoxical in the whole business of coast defense; for when a coastal fortress is powerful enough to constitute a genuine threat to an attacker, in the event of war it becomes a liability to the nation that built it. The invader masks or circumvents it; the investment in material and trained men is a loss for combat purposes, yet the fortress must be kept in being, supplied and maintained, lest it become a base for the enemy.

The logical deduction would be that the only valid method of protecting a coast-line is a system of diffused and highly mobile defensive units, capable of quick concentration on any threatened point. But this only holds good when the object of the invader is raiding or a blow at a point farther inland. When an objective of strategic value lies on a coast, it must be provided with fixed defenses at any cost.

The rarest event in military history is an attack on a good system of coast defenses—or even quite a poor one, as every American should know who remembers the howls for coast defense that went up from the Altantic seaboard during the Spanish War and the ensuing sublime spectacle of Civil War monitors anchored off the harbors, waiting for Cevera's armored cruisers to turn up and blow them to pieces. But when a good coastal fortress is attacked there are military fireworks of the first order. No operation in warfare more severely taxes the resources of both sides, and none is more instructive to the student.

Of all the campaigns of this type in military history, perhaps the great defense of Rhodes, at the time when military history was just beginning, should have first rank. It is the perfect example both of how to attack and how to defend a seaboard fortress, and its demonstration of how active the passive business of coast defense can be made is as timeless as though it took place yesterday.

Rhodes, in the third century B.C., was an island republic, living by its seaborne commerce. Antigonos the Emperor, who had gathered all Asia Minor under his rule and was trying to add to it the rest of the fragments that composed the heritage of Alexander of Macedon, had reached the point of attacking Egypt. An attempt to invade that country by land had proved so convincing a failure that it was evident the kingdom of the Ptolemies could be assailed only from the sea. But this was likewise impossible while Rhodes existed; for Rhodes had an excellent navy, and was bound to Egypt politically by alliance and economically by the Egyptian grain trade. Thus Rhodes occupied the position of an outlying coastal fortress for Egypt; thanks to the fluid nature of its seapower, it could neither be masked nor evaded, and a direct attack on its powerful fortifications became a strategic necessity. The Emperor picked a quarrel with the republic, declared war, and sent his son, Prince Demetrius, to capture the city.

Demetrius was one of those men whose careers bring an element of dime-novel adventure into the sober pages of history; one of your universal geniuses, equally renowned as soldier, poet, architect and admiral; the greatest rake of his time and one of the greatest inventors of any time. He spent six months making the preparations for the attack, and they were as complete as anything could be. The shipyards of Phoenicia turned out 200 warships to his order, of a new design invented by himself, larger and more powerful than anything afloat. Forty thousand veteran troops were gathered at Patara on the Asiatic mainland; their transports and trains alone required a thousand ships. The produce of half the granaries of Asia was earmarked for this armada, brought down to Patara by an elaborate system of caravans, and arrangements made for daily convoys to carry supplies over to the island while the army was there. Finally Demetrius formed an alliance with the Cretan pirates that gave him 50 more ships.

Forty vessels might be an overestimate of the Rhodian navy. The republic had a citizen body of 7,000 males, well enough trained under the Greek system of universal service to be counted as a good grade of militia, though not professional soldiers. When hostilities became imminent, the levy was called out, aliens expelled from the city, and the shipyards were set to work, day and night, turning out new warships. (Note that even this early the guiding principle at Rhodes is not defense but counterattack). On the mole of the inner harbor two big stone-throwing catapults were erected, and three more were placed on pairs of old ships, decked together and moored across the harbor mouth as a floating battery.

Demetrius arrived before these preparations were completed, swept past the city and landed on the east end of the island. He was cautious; the warships were formed in a line with prows outward across the bay where he landed, the army drawn up for battle facing the walls, and his pioneer corps, thus protected, constructed a circle-wall as his base on Rhodian soil. As soon as this was finished, lines of circum- and contra-vallation were rapidly run across the neck of the island and a sea blockade of Rhodes established.

All this was accomplished without interference from the city. A "deserter" even came in to tell Demetrius of the general panic within, and satisfied that he was dealing with an unenterprising defense, the prince sent most of his fleet off on convoy duty. But a week later "it came on to blow;" Execestus, the Lord High Admiral of Rhodes, knifed through the blockade at night with a division of three fast ships and fell on the Imperial island-

base just at dawn. The bay was crowded with provision-ships, a big convoy that had come in only the day before. Execestus was in among them before anyone knew of his arrival, swiftly carried six by boarding, set them on fire and pulled out in time to avoid pursuit. Twenty ships burned with all their cargoes, and Demetrius hurriedly established night-patrols off his base, a precaution that turned out quite useless, as the Rhodians were too clever to repeat their trick.

But meanwhile the prince was preparing a surprise of his own. The defenders expected him to attack the land side of the city, and he encouraged this idea with all sorts of feints and half-attacks against the gates, while behind his ring-wall, and in the greatest secrecy, preparations were being made for an assault on the sea-side. The *piece de resistance* was three huge siege-engine ships, with a couple of big merchant vessels built together, catamaran-fashion, as the base of each. They were provided with an extensive system of internal trussing, and each carried a seven-storied tower, every story of which was filled with the most powerful missle-throwing weapons that could be constructed. The towers were plated with iron (the first use of armor in history!), and covered with rawhide, and each of the unweildy craft was given a twenty-foot floating boom to protect it against ramming. To assist these monsters were some twenty smaller vessels, "testudo-ships," heavily sheathed in planking, some mounting stone-throwers for battering the walls, others javelin-throwers for clearing them.

One moonless night a dozen Demetrian warships bumped against the mole of the great harbor and discharged a flood of men upon it. The few Rhodian guards were cut down; the landing party took the whole mole and rushed on to erect a mud rampart at its landward end. Before dawn five catapults had been installed there, and at daybreak the testudo-ships came into the great harbor and began to pick men off the sea-wall of the city. The Rhodians lost heavily in a day of bombardment, a tower showed signs of weakness where the stone-throwers had battered it, and the three siege-engine ships were ordered up to complete the job the next morning.

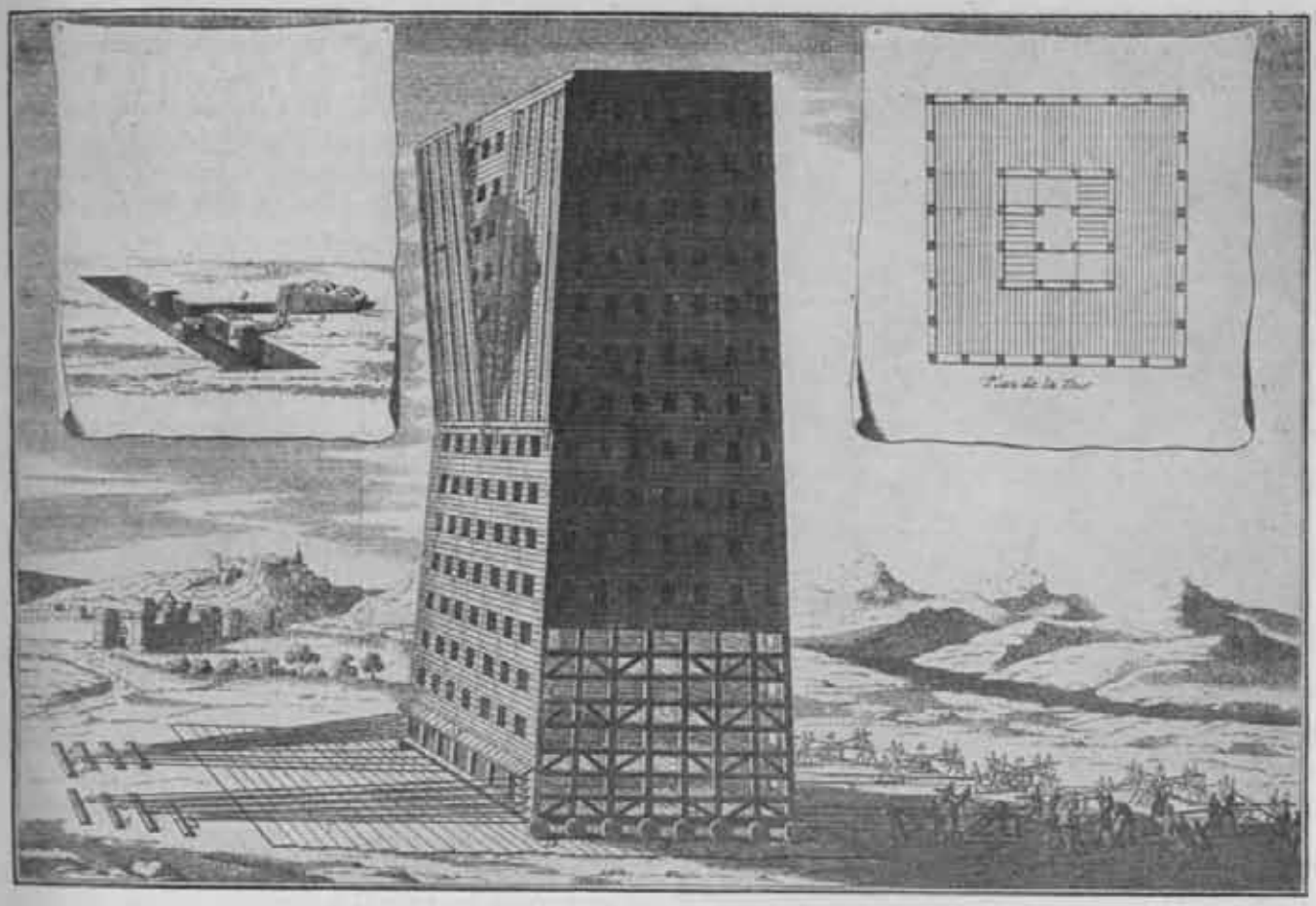
But the defenders had that rarest and most precious of military qualities, the ability to recover from successful surprise. About two o'clock in the morning the men on the Imperial testudo-ships were wakened by shouts and trumpets, and the next moment were plunged into a wild, hand-to-hand grapple on their own decks. The Rhodians had put out from the little harbor in a swarm of small row boats to make a counter surprise. There was savage fighting in the dark, which presently became shot with flame as ship after ship was carried and set on fire. The Rhodians, carried away by their success, hung on too long; dawn found them still fighting, and Demetrius sent more testudo-ships and some warships down from the base which, with daylight to work in, made havoc of the small boats.

The Imperial offensive was hampered but not scotched; aided by the light of the moon the tower-ships had been brought into the great harbor and were hammering the seawall of the city. A series of minor attacks from the point d'appui on the mole kept the defenders on their walls, and they lost a good many men, picked off by the fire of the catapults, while the stone-throwing machines were banging at their masonry. The program was maintained for eight days, an intelligent use of superior force, which threatened to end by wearing the defenders out. This process was too slow for Demetrius, however; by evening of the eighth day a section of wall, including two towers, had come down and he ordered a grand assault for the next morning.

A blind man could have seen it was coming, and the Rhodians were quite prepared to meet it. As the storming column mounted the breach it came under a violet cross-fire from over a hundred small catapults, mounted frame to frame inside, and as effective as artillery at this range. Simultaneously the water-gate of the city was flung open, and a deep, narrow column of Rhodian spearmen dashed out to take the stormers' supports in the flank and fling them into the sea. A division of Rhodian ships burst from the little harbor to make a lightning dash on the invaders' rear, and a surprise prepared by the chief constructor of the Rhodian navy, Callios, popped up, in the form of a pair of monstrous forceps, which reared over the wall and began to tear the beaks off all the Imperial vessels in reach. The assault came to a dead halt, almost a panic, and Demetrius pulled out with the loss of a thousand men and six ships.

The effort to overwhelm the defense having failed, he went back to surprise. A week later the three tower-ships were brought into the great harbor and moored close to the mole separating it from the little one, and while the testudo-ships did counter-battery work against the Rhodian artillery on the walls, they showered firebrands and pots of burning pitch among the Rhodian shipping. The surprise was complete, the effect tremendous. Before sundown half a dozen warships had burned to the water's edge; and only the most desperate efforts kept the whole Rhodian navy, dockyards and all, from going. A few more days of this and the town would be lost. There was no wall between city and little harbor, and a general conflagration would certainly be accompanied by an assault the Rhodians would be unable to oppose.

That night there was a meeting of the whole citizen body in the market-place; volunteers for a forlorn hope were asked, and when every man in town offered, picked crews chosen to man the three best ships available. At daybreak, as the tower-ships began to move in to take their places for another day of bombardment, out dashed the High Admiral, Execestus, with his three ships. Two of them flung themselves on the convoying Imperial warships surrounding the bombers, and as they swung apart to avoid the shock of the rams, the admiral steered straight through for the nearest tower-ship, ran down one of the towing vessels, charged it again and again till its boom



Artist's conception of the Helepolis used at the siege of Rhodes.

collapsed in a whirl of splintered logs, and drove straight into its side.

As his ram withdrew the Rhodians on the wall saw the seventy-foot giant swing gracefully down in an ever-hurrying arc, dropping men from every story, and then capsize. With Demetrius' ships attacking them from all sides, Execestus and his gallant companions were already after another of the bombers; its boom shattered, rammed from both sides at once, it sank slowly on an even keel. There was no third attempt; Execestus' ship, racked by a dozen glancing ram-blows, sank under his feet; one of his supporters had her oars swept away and was captured; the third sank as she tried to escape, her sides beaten in by catapult-stones.

The attack on the Rhodian shipping was ruined. The testudo-ships could not get within effective range, the remaining tower-ship could accomplish little alone. But it had been so near success that Demetrius would not abandon the idea. The siege simmered down to a blockade while he built a still more gigantic tower-ship, with the hulls of six vessels planked together as a foundation. He imagined she would be unsinkable.

The defenders had gained a few weeks' time; they used it for a vigorous counter-offensive on the ocean. Blockade-runners began to get out; six of them gathered at Alexandria and were able to run back in with the welcome reinforcement of 650 Egyptian regulars. Another division went out one night, lay in the offing all day, and the next night came in to treat Demetrius' works on the great harbor mole to an unexpected attack from seaward. They wiped out the 400 men stationed there, and by the next morning had it consolidated as part of the defensive system. And worst of all, during a storm that sent the Imperial guardships scurrying for the beach, they came driving out of the night into Demetrius' base on the bay. They caught the new tower-ship unprotected and in fifteen minutes had her under water.

That ended the attack from the sea side. Demetrius, finally realizing that he could do nothing to protect his bombers from Rhodian raids, abruptly changed the incidence of his plans. Siege engines were set up all along the land side of the city, and a huge moving tower, invented by the prince himself, was put in hand. It was 75 feet square at the base, armored with iron, moved by wheels, and tapered upward through nine stories, each loaded with the most powerful catapults that had ever been built. The bottom story alone held 48 of them, the top story nine. A super-tank, a monster out of an H. G. Wells dream, called the "Helepolis," taker of cities, capable of striding forward to breach any part of the wall in a day and crushing all resistance behind the breach.

It took a couple of months to build, and had the Rhodians worried, but they kept on with their shipbuilding and naval operations. One group of raiders rushed up out

A demi-lune erected inside a breech in the wall.

of the sea at dawn against the Imperial base at Patara, sank the guardship on duty in the neck of the harbor, burned a group of transports and got away; another pulled a brilliant night attack on a convoy, wrecked two of the convoying vessels and burned out the grain-ships; still a third turned up off Crete, fought a pitched battle with Demetrius' allies, the pirates, and carried off their leader's head as a trophy.

Demetrius, meanwhile, was not idle. Miners were imported from Anatolia to dig under the walls; the Rhodians found them out, countermined, and fought a series of savage combats with the invaders in the subterranean galleries. Demetrius sent "deserters" into the town to see what they could accomplish. One of them tried to bribe a captain in the city's service. He took the bribe, promised to admit 500 men on a given night; did admit them, then slammed the gate shut behind them and cut them down to the last man, with the whole Rhodian force assembled for the purpose.

It was a week after this that the Helepolis moved forward, flanked left and right by other tank-like engines. It smashed up the wall easily; a whole section, including a tower, went down in three days. The Rhodians had a demi-lune up inside; the Helepolis lumbered toward it; it was hastily built and could not last a day. Demetrius ordered a storming-column to follow the monster engine.

But that night came the counter-attack. A sudden concentration of small catapults began throwing stone balls at the Helepolis; they knocked loose some of the iron plating, then changed to pots of flaming materials and set the engine ablaze while a sally made fire-fighting difficult. The whole Demetrian army turned out; the sally was beaten back with loss, but the Helepolis had to be hauled out of action for repairs.

When it came on again, it found the ground inexplicably difficult. Without any visible reason it seemed to be sinking into the ground, finally did sink in to the hubs, bogged down definitely, quite unable to go either forward or back. The Rhodians had turned the city sewers into its path and mired it. Nevertheless the smaller engines got across the breach, demolished the demi-lune, brought down another tower, and found a second demi-lune inside that.

The defense had been wonderful, but both sides were now in serious straits. In Rhodes they were desperate for men; the original 7,000 had been reduced to 4,000. Outside, the besiegers were actually beginning to grow hungry, so serious were the Rhodian raids. One massed rush actually burst through for long enough to run in Ptolemy's best general, Alexander of Egypt, with 1,500 regular troops, and within a couple of months more Rhodes would have enough ships to offer a naval battle. Demetrius would have to work fast.

There was one more effort in him. After a week of relative quiet he formed a storming column of 1,500 picked men for a silent surprise. They were hidden among the engines opposite the breach with weapons and armor muffled and ordered not even to speak. At the darkest hour of the night, they ranked up cautiously, and made a swift, massed charge.

It was a complete success; the guards were swept aside and the storming column went right on, winning several blocks of houses and all the palaces around the theater before the alarm was given. Confident that the whole man-power of the city would be drawn to the danger-point, Demetrius ordered out his warships for an attack on the harbor and rushed in supports behind the storming column.

Once more the magnificent Rhodian resiliency. Instead of being withdrawn to meet the storming column the harbor-guards were doubled; when the Imperial ships came out of the dark, they ran into a hornet's nest and were beaten off with the loss of three vessels. The gates were stoutly held against the covering attacks that presently developed against them. As for the storming column itself, the streets leading into the section it had won were barricaded and flaming arrows shot into it, till every building spouted fire. At daybreak Alexander of Egypt and his 1,500 regulars charged through the smoking streets with the citizen-soldiers behind them. The whole Imperial column was wiped out, the supports that crowded in behind it cut to pieces. Riding the flood of their rush, the Rhodians dashed out on the heels of the

beaten army, overflowed the siege-lines like a torrent of burning lava, and destroyed half the engines in them before Demetrius could achieve enough order to drive them in.

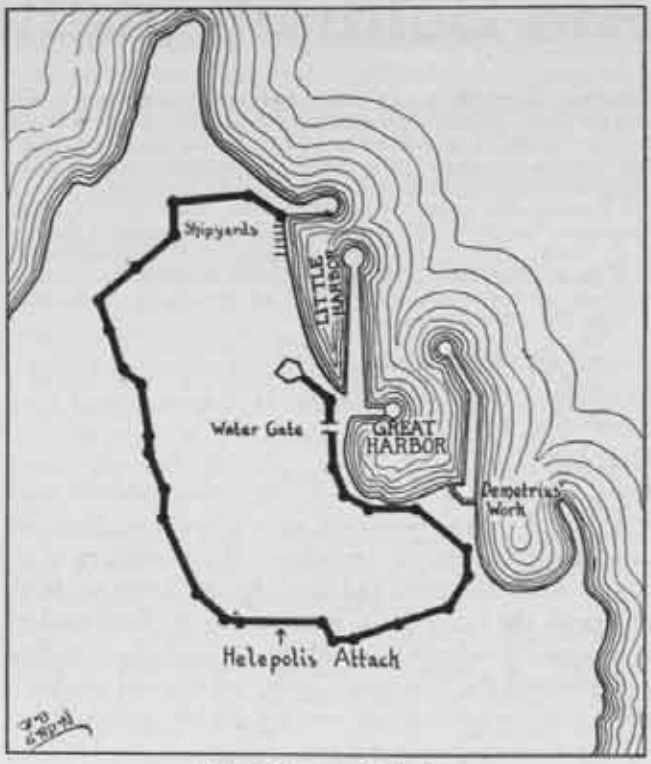
This time it was checkmate. Demetrius was farther from taking the city than in the beginning. He had lost nearly 10,000 men, his blockade was virtually broken, and if he stayed any longer would have to risk a sea-fight that, win or lose, would cause him fatal damage. He could do nothing but what he did—make peace and go home.

Two features stand out in this most remarkable of sieges: the constant use both sides made of surprise and the energy of the defense. A passive defense, particularly of a point of inherent strategic worth, is a risky business. The greatest possible gain is one of time, and though this may work for the defense, it is far more likely to favor the attacker. Few besiegers give up because their patience is exhausted, or their resources.

Of course a defender who embarks on counter-attacks risks considerable losses, and the Rhodians did suffer severely; Demetrius could better afford the 10,000 men he lost than the Rhodians could their 3,000. And the case must necessarily be the same in any attack on a coastal fortress, for an invader is not going to attack it at all unless he has an overwhelming numerical superiority.

And it does not appear that the Rhodian counter attacks vitally affected the course of operations in a physical way, save in the single case of the tower-ships. It was not the Rhodian counter-strokes that brought about the raising of the siege, but the threat of the Rhodian navy, a factor only indirectly connected with coast defense. The Rhodians could have built the same number of ships with just as deadly a threat if they had remained perfectly quiescent during the siege, and conserved their manpower. In fact, the counter-strokes were costly beyond all proportion to the material result they yielded.

But the material loss was accompanied by an equally decisive gain. It is the destruction of a defender's morale, not his material resources, that causes sieges to succeed. To take a few more recent cases, Bazaine surrendered Metz, the Russians Port Arthur, while the fortresses were still physically full of fight, lacking neither in provisions, men nor material. But ruined Verdun, impoverished Ladysmith, held out in spite of material handicaps. The enforced inactivity of the defender, watching the progress, however slow, of the enemy, has an effect on his morale that has not received adequate attention. Indeed, the whole problem of defense may be summed up in this —keeping up the spirit of the defenders.



The defenses of Rhodes.

And it is in this that the siege of Rhodes had most to reach us today. The Rhodian counter attacks were costly, but they produced a visible, even if unimportant result. Every man in the city participated in them, sooner or later; they gave him something to think about, they "kept his mind off his troubles" and most of all they gave him a feeling that the defense was making progress. The meanest citizen could understand the significance of events like the first attack on the Helepolis or the recapture of the great harbor mole—they meant that the defenders were as good men, as brave and clever, as the attackers. And when the defenders of any position once become convinced of this, there is very little that any attacker can accomplish against them, for the sole advantage any attacker enjoys is that, by fighting in the open, he is in a position to claim himself a better man than the one who fights behind a wall.

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NOT ONLY HAS DISARMAMENT *done nothing to prevent war, it has done the cause of peace a lot of harm. It has focused our attention upon the materials of warfare rather than upon the spirit which prompts their use. It is perhaps symbolic of an age which lives and thinks in terms of material things. Peace exists in spirit; it cannot be sold to the world like a patent medicine, nor given to us by an act of legislature.*—W. ARMIN LINN.

Are Soldiers Militarists?

EDITOR'S NOTE: As a part of one of the courses given at a college for young women, the students are conducting a survey of the leading colleges to ascertain the attitude in regard to the major social issues of today. Each student is assigned a college from which she endeavors to determine the prevailing opinion of faculty and students on a major social or economic question. The letter in question had to do with war and national preparedness. Colonel S. C. Vestal, C.A.C., was asked to speak for the Massachusetts Institute of Technology. His reply so well defines the position of the army on the points in issue that we consider it worth while to print the correspondence.

Colonel Samuel C. Vestal,
Mass. Institute of Technology,
Cambridge, Mass.
Dear Sir:

As a student at College, I am taking a course with Professor ————————, in which the students are conducting a survey of the colleges of this country to ascertain what influences and teachings are being set forth as regards the major social issues of today. Each student is assigned a college from which she endeavors to find out, through the President, Dean, faculty and students, the prevailing opinions concerning the big questions.

One of these questions is the war question, and as head of the Department in Military Science at M.I.T. any statement which you would be willing to make would be truly valued and appreciated.

1. Are you a militarist in the sense that you would support any kind of a war in which the United States might become engaged?
2. Do you believe that military preparedness is a safeguard against future wars?
3. What is your feeling about the results of the Senate investigation of the munition industries?
4. What is your attitude towards conscientious objectors?

I sincerely hope that this letter may not seem to you to be too much of an imposition on your time and thought. If it proves not to be, and if you could write me a brief answer sometime in the near future, I should be most grateful.

Sincerely,

My dear Miss ————————

In answer to your letter of November 27, it gives me great pleasure to submit the following statement. You did not actually ask question No. 4; but it is implied in a statement in your letter. I have, therefore, put it in the form of a question and answered it.

1. Would I support any kind of a war in which the United States may become engaged?

Yes. Upon eight different occasions I have taken an oath to support and defend the Constitution of the United States against all enemies, foreign and domestic.

I settled this question before I took the oath the first time.

The armed forces of the United States are not deliberative, legislative bodies. The international wars in which the United States has been engaged were brought on, neither by the President, nor by diplomats, nor by soldiers, nor by sailors, but by the people themselves. In no other particular is the sovereignty of the people of the United States exercised more directly than in their control over their government on questions of peace and war.

The greatest enemies of peace are those persons who promote the idea that the United States will not fight, however great the provocation.

The Constitution vests Congress with power to declare war, a mighty undertaking which can be carried on only by the expenditure of vast sums of money. Congress is vested with unlimited power of taxation, and is given absolute control over the purse strings. Both directly and indirectly, therefore, the power to make war lies in Congress.

In no other country, in ancient or modern times, has the legislative body more fully reflected the will of the people. To this fact we owe our great strength as a nation. We cannot accept the gage of war, unless our people, through their representatives in Congress, positively will and ordain that we shall do so. When the Congress of the United States solemnly declares war, it is not for me to hesitate, or to question its wisdom.

In obedience to the will of the people, Congress has five times recognized that peace has ceased with a foreign nation. In no case did the declaration initiate a war. It merely recognized the existence of a state of war brought on by the hostile acts of the other nation. This was true, even in 1846, when the Mexicans attacked our forces, in the belief, of course, that they would have an easy victory. Our wars have come, not from our aggressions, but from the belief of other nations in our inability to fight.

When civil war arises, the existence of the United States as a nation depends upon the fidelity of those who have taken an oath that they will support and defend the Constitution of the United States against domestic enemies. In 1861, eleven states attempted to break up the Union because they were dissatisfied with the result of the presidential election in 1860. The problem involved was well stated by Mr. Lincoln, "that the Executive found the duty of employing the war power in defense of the Government forced upon him. He could either perform this duty or surrender the existence of the Government. No compromise by public servants could in this case be a cure; not that compromises are not often proper, but that no popular government can long survive a marked precedent that those who carry an election can only save the government from immediate destruction by giving up

the main point upon which the people gave the election. The people themselves, and not their servants, can safely reverse their own deliberate decisions."

We have now had nearly seventy years free from civil war, because militant minorities have realized that the Government will be able to save itself, if they appeal to force.

2. Do you believe that military preparedness is a safeguard against future wars?

I would like to narrow this question in one sense and broaden it in another by rewriting it as follows: "Do you believe that military and naval preparedness on the part of the United States is a safeguard against future wars, civil and international?"

To this question I would answer, "Yes."

The United States has never needed persuading to peace. She has always been pacifically disposed whilst other nations, or domestic enemies, were committing acts of war towards her. It is a striking fact that we have enjoyed international and domestic peace under fire-eating, virile presidents of the type of Monroe, Jackson, Cleveland, and Theodore Roosevelt; while our wars have come during or immediately after the administration of eminently pacific presidents such as Madison, Buchanan, and Wilson. It is one of the paradoxes of our national history that our wars have come from our dread of war. Domestic and foreign foes misinterpret its real significance; they go too far and bring destruction upon themselves. Our danger of war comes, not from our aggressiveness, but from the contempt of our enemies for our mental, moral, and physical preparedness for war.

We do not need preparedness so much as we need a reputation for preparedness. Contempt for the prowess of Americans on the part of the German leaders drew America into the World War. The same feeling in the breasts of the Allied leaders long kept them from giving their approval to our entry into the war on their side, and long delayed the formation of an American army after we had entered. It may come as a surprise to you that in December, 1915, sixteen months before our declaration of war against Germany, President Wilson had made up his mind that we must inevitably fight. At that time he sent Colonel E. M. House to Europe to arrange for our entry into the war on the side of the Allies; and that Colonel House failed in his mission only because the Allies did not desire us as an ally. The second volume of Colonel House's *Intimate Papers* brings out these facts very clearly. The Allies doubted the mental and moral factors of the United States even more than the physical. Neither friend nor foe would have believed it possible that an American army on the battlefields of France would be the decisive factor in bringing about the German collapse on the Western Front in 1918. But this was the case.

The greatest enemies of peace are those persons who do anything by word or deed to promote the idea that the United States will not fight, however great the provacation.

The basic cause of our wars, foreign and domestic, has been our invitational weakness. That we have had any war since we have had a constitutional government is perfectly absurd and ridiculous. If we had followed Washington's words of wisdom on preparedness, there is every reason to believe that we would never have had a war with Great Britain, or Mexico, or Spain, or Germany, or Austria, or with the Southern States.

The resolute armed nation is never in danger of attack, unless it commits the overt act of war, and thus causes other nations to combine against it in self-defense. Such a nation has an immunity from war that is worthy of our most careful study. Prussia and Prussianized Germany never engaged in a war that they did not bring on themselves. Peaceful Switzerland, armed and resolute in the right, has lived unmolested for more than a century, amidst armed and aggressive nations. The fretful porcupine, slow and feeble though he may be, neither attacks nor fears any other denizen of the forest.

3. What is your feeling about the results of the Senate investigation of the munition industries?

I believe that the President of the United States should be given large discretionary power to regulate international commerce in munitions of war. I am disposed, however, to take with a grain of salt the statements of garrulous salesmen about the innermost thoughts of statesmen with whom they have never had a word of conversation. I still believe in the international traffic in arms, particularly in time of war. It is always to the benefit of the unprepared nations, who, invariably are attacked by the prepared nations. Prussia, armed and ready to fight, protested in 1870 against the sale of arms by England to France; and Germany protested during the World War against the sale of munitions by America to the Allies. If the United States could not have bought arms in Europe during our Civil War, the Southern Confederacy might have been victorious. If the Allies could not have bought war supplies in America during the World War, the Central Powers would have won an easy victory.

I am not in favor of the movement to require the United States to manufacture in its own arsenals all munitions required in war. To produce arms and ammunition alone for a war on the scale of our last war, it would be necessary for us to expend $3,000,000,000 in the immediate future and $70,000,000 annually for the upkeep of these useless factories, which would soon become obsolescent in most of their features. If I were a communist, I would, of course, be in favor of it. The ability of our commercial people to produce munitions of war, as demonstrated during the World War, is a powerful deterrent to aggressors. It has always been used against nations that have been armed and ready to fight at the outbreak of war. It has served to prevent conquest. Any trammels put upon it will make for aggression and war, not for security and peace.

4. What influence and teachings are being set forth as regards the major social issues of the day?

The Army teaches now, through the R.O.T.C., as it has always taught its own personnel, that war is a social and economic evil or disease and that the sole purpose of the armed forces of the United States is to bring about an honorable peace whenever they are called into active service in time of war. *The people bring on war; the Army and Navy bring peace.* The most consistent body of pacifists that I know of is the corps of Army and Navy officers, who have to suffer and make sacrifices when war comes; but they do not embrace the various panaceas for war which are brought forward; from time to time, because they have a knowledge of war and its causes which is unknown to the would-be-reformers. To the best of my knowledge, no American Army officer prior to the outbreak of the World War, ever advocated neutralization as a palladium against war. It is not too much to assert that, but for the belief in the effectiveness of neutralization to protect a country, which was largely fostered by zealous "peace advocates" in America, there would have been no war in 1914. If the Belgians had been convinced, like the Swiss, of the necessity of making their neutrality effective, France and Belgium could easily have held their military frontiers. Germany was tempted to go to war by the conviction that she could overwhelm the French Army by advancing through undefended Belgian territory. It was for this reason that President Wilson, in one of his Fourteen Points, expressed the opinion that the neutralization of Belgian ought to disappear.

5. What is your attitude towards conscientious objectors?

My attitude toward conscientious objectors is that of the United States Government during our participation in the World War. The Government treated them very tenderly. This does not mean, however, that every draft evader should be given immunity merely because he calls himself a conscientious objector. The real conscientious objectors are few in number and are almost invariably of such mental and moral fiber that they would be of no use when the life of the nation is at stake.

If you desire further explanation on any point, I should be glad to answer your inquiry.

Sincerely yours,
COLONEL S. C. VESTAL, C.A.C.,
P. M. S. & T.

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A SENSIBLE REGARD *for our own safety, an intelligent concern for the lives and limbs of the men we expect to fight for the nation if war befalls us, ought to save us from the folly and waste and danger of such unreadiness as the nation found itself in 1917 and whenever war has come to it in past time. Only the pacifist mind will reject this plain lesson of experience or see in the carefully limited plans for a citizen army the bugaboo of militarism.*—CHICAGO TRIBUNE.

Chemicals—How, When and Where?

By Captain George J. B. Fisher
Chemical Warfare Service

The full and unrestricted use of chemical agents must be conceded as an extremely likely eventuality.

THE United States will not be called upon to decide if lethal chemicals shall be injected into the next war, any more than they were permitted to decide the question for the World War. Whether such agents are used at the outset, whether they are introduced in later operations, or whether indeed they may be omitted altogether, must depend entirely upon the disposition of our opponent. Actually our attitude in this regard is precisely our attitude toward war itself; we should infinitely prefer to avoid it altogether.

Yet we feel—and with increasing concern as the present era of armed peace lengthens in years—that preparations for war are well advised. So, too, we see by the same token that these preparations must, if they are to approach adequacy, take full account of the potentialities of chemical combat.

But our preparations for chemical warfare have in the past unfortunately been hampered in at least one direction. There has been considerable confusion of thought as to the status of chemical munitions under international law; this has tended seriously to impede the evolution of sound doctrine to govern the use of chemicals in battle. As a result, we find that our advances in the field of tactics have not kept pace with developments in chemical and industrial science.

Is it worth while to attempt to reformulate such doctrine—to expand and accelerate our thought on offensive chemical combat?

There is good reason for supposing that in no direction is sound military thought more to be desired, or more promising of ultimate profit; and this without minimizing the importance of either air force or mechanized ground force.

In studying modern warfare professionally—that is, unemotionally, and with due regard to the developments of industrial science which have always thrust upon the soldier the weapons with which he fights—considered in these lights, there is only one permissible approach to the chemical agents. Their full and unrestricted use must be conceded as an extremely likely eventuality.

This leaves the soldier no alternative to a thorough peace time preparation for chemical combat.

This preparation does not prematurely commit the United States to the use of lethal agents. The study of any phase of war does not commit us to a resort to arms, which has been renounced as an instrument of national policy; but no lesser conception of chemical warfare than that into which our forces were verging for the unfought campaign of 1919 will suffice to maintain our present-day armies on a sound footing.

It is interesting in this connection to note the clarity with which the French express their position. On manuals issued for the instruction of the French Army in the military use of chemicals appears this statement:

"Mindful of the international agreements to which France has subscribed, the French Government will, at the beginning of a war and in agreement with its allies, seek to obtain from enemy governments a compact not to use gas as a weapon of war. If this agreement is not obtained, France reserves the right to act according to the circumstances."

The pivotal phrase, "to act according to the circumstances," can have but one meaning. The French Army will be prepared to, if necessary, meet chemical with chemical. So will every nation of military consequence. And we cannot suppose that any important power intends to postpone its thinking and planning in the domain of chemical combat until the battlefield is reached.

Yet it is no easy task to introduce realistic chemical warfare situations into the ordinary run of training exercises. Although we can reproduce the ra-ta-tat of machine guns in battle, we have yet to devise a practicable training duplication of the insidious but less spectacular chemical arm.

These chemicals have a disagreeable tendency to mess up carefully planned situations and to inject uncertainties which render problems difficult of orthodox solution. It is much simpler to ignore them—in some respects, necessary to do so. Therefore we are instinctively inclined to limit training exercises to simulation of the less complex pre-war type of combat.

But unfortunately few of our future platoon and com-

Chemical cylinders emitting cloud of non-persistent gas.

LEFT—*Aërial photo of actual cloud gas attack in France.*

BELOW — *Experimental Chevrolet chassis adapted to transport the 4.2 inch chemical mortar.*

Loading livens projectors.

pany commanders have any experience with chemicals as they are to be encountered in modern warfare; for the most part they must depend on imagination to conjure up the essential details of offensive chemical combat.

The principles governing the use of chemicals in action, however, may be studied, and in fact must be understood if an officer is to attain competence in his profession.

THE TECHNIQUE OF CHEMICAL WARFARE

The estimate of any military situation hinges on the inevitable HOW? The response, in terms of technique, provides clues to solving the problems WHEN? and WHERE?

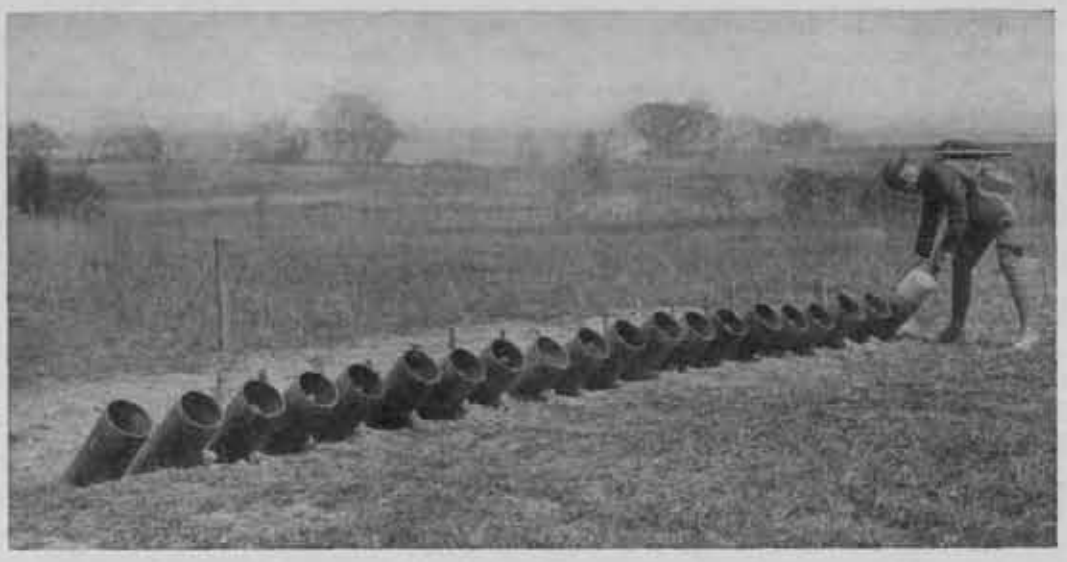
The whole technique of offensive chemical warfare is built up around two distinct methods of dispersion. One is to release a toxic gas at ground level. The other is to distribute a toxic fluid on ground surface.

The first method is in principle evanescent. It expects a sufficient volume of gas to produce a cloud which will drift toward hostile personnel and injuriously affect respiration. It is the method of opportunity, largely dependent on favoring winds. From tactical considerations it may be classed as transitory in character, generally to prelude shock action.

The second method is, on the other hand, static and more nearly self-sufficient. It derives its effect from contaminating personnel who directly contact either the fluid or its slowly generated vapor. (It has also an incidental effect on matériel.) In a very literal sense it NEUTRALIZES. It is positive and *continuing* in its action against both friend and foe.

Having firmly in mind these two distinctive methods of applying chemicals in action, there may be mentioned the specific agents which at present serve as prototypes of each. For the evanescent gas, there is phosgene. For the

C. W. & ...



Battery of livens projectors ready for use.

neutralizing fluid, there is mustard. But the names of the agents are of less importance than are their respective tactical characteristics, since any agent is no more than a contemporary answer to a continuing military requirement.

Releasing the Transient Agent

Considering first phosgene, a veteran of the World War and still our most formidable cloud gas agent, we find its effective employment to demand a fine degree of technical and tactical coördination.

It is to be remembered that the cloud gas attack was first introduced in warfare for the very definite purpose of breaking up position defense and forcing open combat. While it may be used for certain other subsidiary ends, this is still its paramount tactical usage.

Let us assume an orthodox situation in which we propose to attack by penetration an enemy battalion settled in a position defense. The outpost line of resistance, to our immediate front, is protecting local security detachments which in turn cover a main line of resistance located 2,000 yards from our own most forward elements. The battalion reserve line then fronts 500 yards behind this main line of resistance, with portions of a regimental reserve line on high ground some 600 yards farther back.

To offset the strength of the hostile organized positions, the assaulting formations may be aided by tanks; they will certainly have the support of some artillery, and in this instance they will have, too, the advantage of a chemical cloud which can be followed closely by fire and movement. We are not concerned here so much with the physiological effect of the cloud on the entrenched enemy as we are with the technique of its placement.

The technical problem involved is to place a cloud where, all things considered, it can best assist the infantry advance. This can be done with the weapons of only two supporting arms, chemical and artillery. If properly attended to (and should the gods of battle favor us) we may thus hope to overcome the enemy with only a slight preponderance of force and at relatively little cost.

If chemical troops are at hand, they offer the commander an assortment of three cloud gas weapons: the portable cylinder, the livens projector and the chemical mortar. Only artillery projectiles of the longer calibers (155-mm. and above) could be employed to produce the cloud gas effect.

With cylinders it is possible to produce a cloud to roll across the entire area which we have so nicely designated as containing the organized defensive positions of the enemy. We should wish the cloud to be particularly effective as it passes the main line of resistance and the battalion reserve line—an inclusive distance of say 800 yards; and, what is more important, not less than 3,000 yards from the line on which we could safely emplace the cylinders.

This would necessitate installing about two cylinders per yard across the frontage of the entire sector, which we determine to be 1,000 yards in width. Then, if we are fortunate enough to find a nearly six o'clock wind blowing at between four and eight miles an hour, we could hope to sweep with a quick acting, lethel, non-persistent gas, all the incidental eminences and crevices which shelter the strong centers of resistance.

But this would be a rather expensive business, both in men and munitions, because one soldier is ordinarily detailed to each cylinder, while probably 30 tons of phosgene would be required for this particular operation. Cylinders have been used on much wider frontages than this, but their greatest effectiveness was found in situations of rigid stabilization when they were employed under the direction of high echelons.

On the whole, cylinders are of doubtful utility for the type of action we are inclined to foresee at least in the early stages of war. . . . Instead of releasing a large cloud of gas behind our own lines and suffering it to largely dilute before it attains the range where its effect is most desired, it is preferable to hurl the agent in containers close to the strong points of enemy resistance. This chemi-

cal troops can undertake with either the livens projector or the chemical mortar.

The livens projectile is nothing more than a heavy chemical cylinder of slightly lessened capacity, reinforced to withstand the shock of a propelling charge which carries it to a range of almost 1,500 yards; it then ruptures and permits its contents to escape and transform into gas.

As a weapon, the projector has the advantage of being less dependent on winds and more selective of targets, but these advantages are paid for in terms of labor and logistics. It is not supposed that the projector will be worth its cost in military effort except in extensive chemical operations incident to virtually frozen situations.

The chemical mortar again offers decidedly greater range, but for a projectile of still lesser capacity. Its shell carries only six pounds of phosgene, as compared to 28 pounds for the livens projectile and 10 pounds for the 155-mm. howitzer shell. Its total weight, however, is about a quarter that of the artillery shell, so that its relative efficiency is much greater.

In a situation such as we have depicted, a chemical company serving eight mortars could quickly set up a phosgene cloud over a particular area from which stubborn resistance was expected; but the target could not be greatly in excess of 2,500 yards from the mortars. The burst of fire would be limited to not much more than two minutes, during which time about 250 rounds could be delivered. This would create a lethal concentration sufficient to immerse an area roughly equivalent to that ordinarily occupied by a scattered rifle company.

Of the three chemical weapons, the mortar is the more appropriate for minor operations. But the chemical mortar presupposes chemical troops, and there is at present much uncertainty as to what chemical troops may be available for attachment down even to regiments. Certainly they have not yet been provided for in such measure that the infantry commander can look to them with the same assurance as he does to supporting artillery.

In reckoning the value of phosgene when fired by artillery, also a purveyor of this agent, there is still another reservation which must be considered. For even observed fire, no less than 120 rounds of phosgene-filled 155-mm. shell are required to gas an area 200 yards in diameter. Moreover, technical limitations demand that the entire shoot be executed within three minutes. This requires the concentration of at least six medium batteries. Since so much fire power would seldom be under division control, phosgene shoots by artillery are, more often than not, concomitant to corps operations.

Now having considered the various possibilities of establishing a chemical cloud to directly advance an infantry attack, it may be well to examine the advantages to be expected from it.

With phosgene, or with any other non-persistent agent which may in future replace it for this particular purpose, much depends on the enemy's reaction. Should we be lucky enough to catch him off guard and without the protection of respirators, we may anticipate up to 50 per cent of chemical casualties before the advance is signalled. If he has effective masks and good gas discipline, then we can still look for 10 per cent; and to these direct casualties must be added the advantage of the inevitable confusion and impediment to action which follow the wearing of masks. The latter, in fact, represent the principal benefits to be expected from non-persistent agents—the demoralization of an opponent, the lessening of his ability to maintain the advantages of his defensive position, and the consequent ease with which we may overcome him.

Distributing the Persistent Agents

One paramount factor colors every consideration of the persistent chemical agents. We must ourselves carefully avoid the areas over which they are dispersed.

While the liquid agents may therefore be used with freedom in definitely retrograde movement, their use in the offensive is always rigidly restricted. They may be placed parallel to but not athwart our lines of movement. With them we can afford to contaminate only those portions of the terrain which we are willing to detour.

From this it will be seen that persistent chemicals are generally more suited to distant than to close targets. Hence those supporting arms having the longer reaches—air and artillery—are most useful with the liquid type agent, although chemical troops are needed for close-in action.

The dominating factor of persistency also eliminates the necessity for closely coördinating the placement of liquid agents with relation to H hour. They may be distributed hours, sometimes days, before the actual advance is to be made—in fact, before the final details of the commander's plan have been formulated. Hence the agencies used for this purpose may complete their chemical missions in periods of comparative leisure, and become available for other tasks immediately incident to the attack.

It therefore follows that, while the non-persistent agents are likely to be as exactly scheduled in the final plan of battle as are the supporting high explosive fires of the artillery, the persistent agents may be said to go into action well in advance of the attack and to so establish a far flung pre-preparation for it.

For this advanced persistent-chemical preparation, the commander has at his disposal mustard-filled shell of light and medium artillery; 30-pound chemical bombs and chemical tanks for airplanes; and also, for nearby targets, the 4.2 inch chemical mortar shell.

These munitions afford a measure of mastery over the terrain selected as the scene of pending battle. They permit certain avenues of approach, particularly those suited to the movement of reënforcements, to be blocked off. By their judicious use, defined areas, which a study of the ground indicates to be vital to the defender, can be denied him. Even division boundaries may be delineated against cross penetration.

Given sufficient persistents (and a flair for their use) the alert commander can largely arrange the stage setting for his action before the opening curtain is rung up. This is a wholly novel power, newly conferred. It was little more than foreshadowed by the embryonic tactics of the World War. Its intriguing possibilities offer proof that there is still room for generalship in modern warfare.

But one inherent weakness attaches to the chemical, mustard, which is now the principal persistent agent. It does not bring the enemy up short with a quick, decisive jolt. Its toxicity is ample, yet its action is slow. Soldiers infected with it may carry on for an hour or more before they are laid low.

Hence the potentialities of mustard must be gauged with relation to an opponent's valuation of human life. Soldiers belonging to a race that cherishes life will incline toward applying immediately the remedial treatments which nullify the effects of mustard, even if this fatally disarranges a plan of battle. Another people, imbued with fanatic fervor, may be counted on to disregard exposure, although knowing its certain result, should the sacrifice contribute to victory.

This shortcoming of mustard was fully recognized in France. To overcome it, American chemists produced lewisite. The high hopes held for this agent, never used in war, have somewhat diminished with the experience of critical peace time research, yet lewisite is still our only answer to the one defect of mustard.

Is the definite military requirement for a *quick*, persistent casualty chemical eventually to be met by something more satisfactory than lewisite? Every military power would like to know.

The Complementary Agents

There are, beside the phosgene and mustard type agents, certain other chemical compounds which also serve to influence the varying fortunes of battle. Those are classed as irritants—their effects are extremely annoying but not permanently injurious.

Important amongst these are tear gas, represented in our service by chloracetophenone; and toxic smoke, for which the United States adopts adamsite. The first produces immediate and intense lacrimation; the second nausea. Both have survived the test of military utility not only because of their positive action, but particularly because of their economy—compared to the lethal agents, minute quantities of either tear gas or adamsite smoke are required for definite effect.

Tear gas is fired from the chemical mortar and also from artillery weapons. Adamsite is released from hand munitions—grenades and candles—and the agent adamsite may also be embedded in artillery shell.

In action, these complementary agents force an opponent to mask; or, if he be without masks, to evacuate his position. Adamsite, in addition, will seek out and penetrate the least defect in a mask. Actually these agents, therefore, provide an inexpensive means of constantly harrying an enemy into wearing his respirator, with which his military efficiency is measurably impaired.

Of considerable significance in the evolution of chemical warfare is the importance which this group of non-lethal agents has assumed in the suppression of civil disturbances during the past decade.

It is interesting to recall that in the days immediately following the demobilization of the A.E.F., the War Department, in harmony with public sentiment, placed an outright ban on the domestic use of any type of chemical agent. But the utility, indeed the humanity, of the irritant agents as an aid to law enforcement, was so obvious as soon to brush away such scruples as stood in the way of their adoption.

This, incidentally, presents an epitome of the changing attitude toward chemicals in the broader field of warfare itself.

The multi-lateral agreement concerning chemical munitions to which the majority of European nations were signatory at the commencement of the World War read:

> The Contracting Powers agree to abstain from the use of projectiles, the sole object of which is the diffusion of asphyxiating or deleterious gases.

This should have applied equally against *either* lethal or irritant agents as we know them today.

This agreement automatically became invalid through the failure of its enforcement during the war. Since the armistice numerous attempts have been made to replace it with a new covenant binding nations to refrain from the use of chemicals *per se* in warfare. But with a single unimportant exception, none of these proposals has attained sufficient support to translate it into international law.

In the course of the last serious consideration of this subject, incident to the final preliminaries to the General Conference for the Limitation and Reduction of Armaments (which began at Geneva in 1932 and is now an uninterred corpse) the discussions snagged on the point whether the non-lethal agents should be considered along with those capable of producing death.

Hon. Hugh S. Gibson here expressed the views of the United States Delegation in studied terms. He said:

> * * * we seek a maximum prohibition of inhumane agencies, but, at the same time, we should not be led to bring into disrepute the employment of agencies which not only are free from the reproach of causing unnecessary suffering, but which achieve definite military or civil purposes by means in themselves more humane than those in use before their adoption. I think there would be considerable hesitation on the part of many Governments to bind themselves to refrain from the use in war, against an enemy, of agencies which they have adopted for peace time use against their own population, agencies adopted on the ground that, while causing temporary inconvenience, they cause no real suffering or permanent disability, and are therefore more clearly humane than the use of weapons to which they were formerly obliged to resort in times of emergency.

So the present policy of the United States toward chemical warfare appears to have modified from that ad-

vanced at the Washington Conference of 1922 in this important respect: Whereas we then proposed a non-discriminating abolition of *all* chemical agents, we are now inclined to eliminate from any restrictions which may eventually come into effect, those agents which we have since become accustomed to use against our own unruly nationals. Thus increasing experience with the once anathematized chemicals has tended to confirm the assertions of the pioneers who from the first claimed them to be effective as well as humane adjuncts to warfare.

This affects our military policy to the extent that today there appears no even prospective impediment to the freest use, on the outbreak of hostilities, of tear gas, adamsite and screening smokes. Our chemical troops are therefore confidently organized with a view to the unquestioned utilization of these agents, which, it must be remembered, can also be dispersed by artillery and air corps.

A certain hesitancy, however, may be said to influence our attitude toward initiating use of the lethal group of agents. While our available raw materials and our scientific advancements promise to the United States a virtual supremacy in chemical warfare, at the same time we are not unwilling to withhold the full weight of this weapon so long as this may contribute to international conciliation.

Yet the portents of the times are scarcely to be mistaken. The powers today are in little mood to limit or restrict their respective armaments. As for chemicals even the most ardent pacifist could not afford to deny his own country preparations for their fullest employment. And the army that neglects to coach itself in their various applications must be rated as deficient in capability for modern warfare.

A CPX Truck

By Lieutenant Ralph O. Bowman, 213th C.A. (AA)

A CPX TRUCK on a GMC chassis was recently constructed under the supervision of the writer by the Headquarters Detachment of the 2nd Battalion, 213th C.A. (AA), of Lebanon, Pa.

There are five distinct units built in the truck, two on each side and one on the inside. Units on the sides of the truck can be removed, by releasing bolts, and set up on the ground if so desired.

While in the field members of the Battalion Staff do all their work at the desks, as shown in the photograph. Necessary supplies, such as maps, stationary, and drafting equipment are carried in small compartments above the desks. The canvas awnings roll up above the original canvas sides. Only rear section of canvas must be removed and carried inside the truck. The ten poles and stakes for holding up awnings are carried inside the truck, being held in place by braces and heavy straps.

The inner compartment contains space for Army and Training Regulations, stationary and office supplies. Space for a typewriter is built to size, so the machine cannot move while traveling. Lower compartments are for Field Desks "A" and "B." Beneath these compartments is a space for one tray of three emergency radio batteries. The bench legs fold up inside, are easy to pack and take up little room. The light above the desk is connected to the battery whose tail gate forms a step when lowered.

The CPX truck can be set up ready for use in about ten minutes. It carries a complement of a chauffeur, staff sergeant, clerk (Cpl.), and two assistants (Pvts.). The clerk assists the Communication Officer and performs office work. The chauffeur and two privates assist in setting up truck, and after that they assist in keeping the situation maps, typing messages, keeping the journal and making up reports.

The equipment of the enlisted men, the telephone switchboard, radio, and the officers' baggage are also carried on this truck.

This truck was used during the recent annual summer encampment of the 213th Coast Artillery (AA) at Indiantown Gap, Pa., from July 14-28, 1934, where the regiment carried on tactical exercises. Its usefulness was fully demonstrated during these exercises, at it enabled the battalion staff to move easily and expeditiously from one locality to another as the situations changed.

The 213th C.A. (AA) CPX Truck.

Fire Adjustment

By Captain Leonard Davis, C.A.C.

THE following examples of adjustment problems are based on the use of the Standard fire adjustment board (described in CAFM Vol. I) with the magnitude method, or the bracketing adjustment chart with the bracketing method. The standard system of reference numbers, in which 300 represents a zero correction or a zero deviation, is used. The digit in the tens place represents units of percentage and the digit in the unit place represents tenths of one per cent, i.e. 313 represents either a deviation of 1.3 per cent over or a correction of 1.3 per cent up; 268 represents either a deviation of 3.2 per cent short or a correction of 3.2 per cent down. The data for the examples were determined by means of two different colored dice and the dispersion slide rule. A range probable error of one per cent is assumed for convenience in all examples in which the fire adjustment board is used. The value of the fork is shown in the bracketing problem.

In the examples involving the use of the fire adjustment board the following conventions have been followed:

(1) A cross (X) is used to denote the spotted deviation of a single shot.

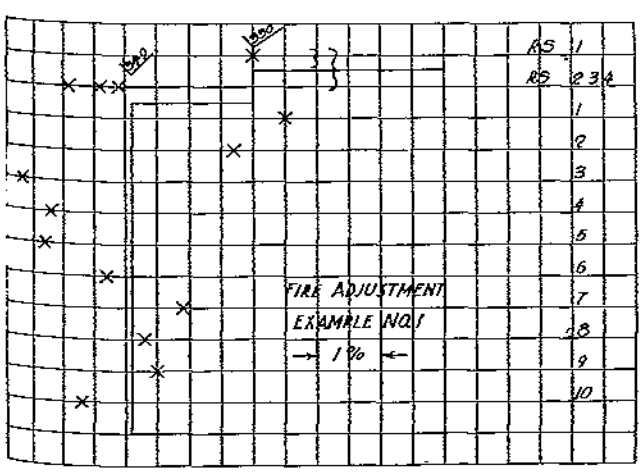
(2) A cross with an exponent is used to denote the spotted deviation of the center of impact of a salvo, the exponent being the number of shots in the salvo.

(3) A check mark shows not only the center of impact of the shots considered in making a correction but also the magnitude of the adjustment correction. The magnitude of the correction is the distance from the axis of correction to the check mark.

(4) The numbers immediately above a check mark indicate, in reference numbers, the correction ordered.

(5) The group of crosses considered in determining a given center of impact (and correction) is indicated by a bracket.

(6) The vertical scale is equicrescent, a horizontal line being used for each shot or salvo in the effect phase.



Ranging shots fired with the same or no adjustment correction are plotted on one line. No attempt has been made to plot against a vertical time scale although this board readily lends itself to such a method.

(7) Conversions from percentage to yards in the tabulated data have been made to the nearest ten yards.

(8) Percentage deviations have been converted to yards with the uncorrected range (R) as a basis.

(9) Percentage adjustment corrections have been converted to yards with the range corrected by the amount of the ballistic correction as a basis.

SYMBOLS

S = Shot or Salvo
R.S. = Ranging Shot or Salvo
R = Uncorrected Range
dR = Total or Net Range Correction
dR_b = Ballistic Range Correction
dR_a = Adjustment Range Correction
R_d = Range Deviation
P.E. = Probable Error

FIRE ADJUSTMENT (Range)

Example Number 1

SINGLE GUN — 14-Inch

Trial Fire — Ranging Shots

TABULATED DATA

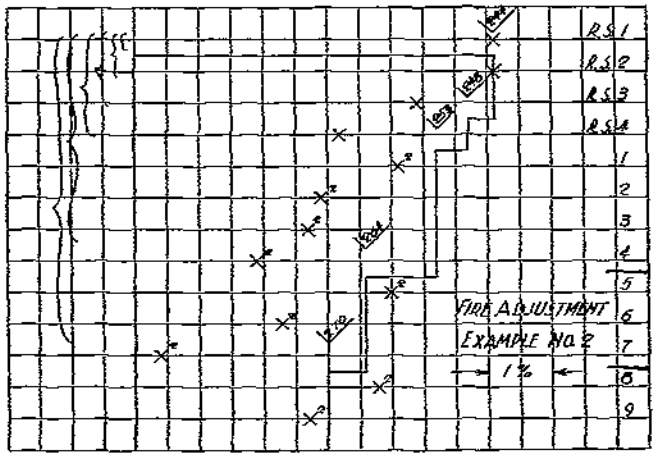
S No.	R Yds.	dR_b %	dR_b Yds.	$R+dR_b$ Yds.	dR_a %	dR_a Yds.	$R+dR_b+dR_a$ Yds.	R_d %	R_d Yds.
R.S. 1	16000	310	+160	16160	300	0	16160	270	—480
R.S. 2	16200	310	+160	16360	330	+490	16850	279	—340
R.S. 3	16300	310	+160	16460	330	+490	16950	276	—390
R.S. 4	16400	310	+160	16560	330	+500	17060	271	—470
1	16700	315	+250	16950	348	+810	17760	324	+400
2	16800	315	+250	17050	348	+820	17870	316	+270
3	16900	315	+250	17150	348	+820	17970	282	—300
4	17000	315	+250	17250	348	+830	18080	287	—220
5	17100	315	+260	17360	348	+830	18190	286	—240
6	17200	315	+260	17460	348	+840	18300	296	— 70
7	17300	315	+260	17560	348	+840	18400	308	+140
8	17400	316	+280	17680	348	+850	18530	302	+ 35
9	17500	316	+280	17780	348	+850	18630	304	+ 70
10	17600	316	+280	17880	348	+860	18740	292	—140

COMMENTS. *Example No. 1.*—A single ranging shot was ordered fired and was spotted at 270 (short 480 yards). Only one ranging shot was ordered at first so that a spot would be assured before too many rounds had been fired. Based upon the assumed P.E. of 1%, this deviation was but 3 P.E. The adjusting officer sought to improve subsequent spotting by bringing the impacts nearer the target and therefore made a full correction of 330 (based upon the corrected range this percentage correction amounted to +490 yards). The three remaining ranging shots were ordered fired at the normal interval. The correction based upon the initial ranging shot served its purpose and brought subsequent impacts nearer the target. It should be borne in mind that this may not al-

ways be true. For instance, if, by proper preparation of fire the center of dispersion has been placed on or neat the target, and if the first impact fails to give a true indication of the location of the center of dispersion, a correction based upon this single impact may move the center of dispersion away from the target. The advisability of making a correction of this type depends largely upon the magnitude of the deviation and the dependability of the preparation of fire. Continuous fire for effect was ordered after application of the correction based on the four ranging shots (349).

After the impacts of the first two shots of the effect phase had been spotted, the adjusting officer suspected that a down correction of about one per cent (net 339) might be needed. This tentative conclusion was based upon the impacts of the four ranging shots together with the first two shots of the effect phase. He decided to place confidence in his correction as a result of trial fire because it had been deliberately determined and decided not to change this correction until this evidence was definitely shown to be in error. He therefore decided to wait for at least two more impacts. Impacts three and four were short and resulted in greater confidence in the correction already ordered as a result of trial fire. There was no reason to believe that any of the four shots of the effect phase were erratic because all fell within three probable errors of the target. Shots five to ten, inclusive, showed conclusively that the correction as a result of trial fire had placed the center of dispersion very close to the target. There is no evidence of a shifting center of dispersion due to systematic errors. It must be said, however, that a shifting center of dispersion will seldom, if ever, be disclosed by so few rounds.

Too much emphasis cannot be placed upon the principle of having confidence in the correction determined as a result of trial fire. If preparation of fire has been thorough and if trial fire has been deliberately and accurately conducted the adjusting officer should be in no great hurry to discard this evidence as to the location of the center of dispersion in favor of less reliable data. A very interesting tabulation of data on this point is presented on page 20 of C.A.M. No. 13.



On the Dispersion Slide Rule the center of dispersion was initially five per cent short. The correction after the first ranging shot brought it to two per cent short. The correction as a result of trial fire placed the center of dispersion 0.2 per cent short of the target. It was assumed that the center of dispersion was not shifting.

FIRE ADJUSTMENT (Range)

Example Number 2

TWO GUNS — 14-Inch

Trial Fire — Successive Approximations

Effect — Salvo Center of Impact

TABULATED DATA

S No.	R Yds.	dR_b %	dR_b Yds.	$R+dR_b$ Yds.	dR_a %	dR_a Yds.	$R+dR_b+dR_a$ Yds.	R_a %	R_a Yds.
R.S. 1	18000	295	—90	17910	300	0	17910	356	+1010
R.S. 2	17800	295	—90	17710	244	—990	16720	300	0
R.S. 3	17600	295	—90	17510	244	—980	16530	288	—210
R.S. 4	17400	295	—90	17310	248	—900	16410	280	—350
1	17200	297	—50	17150	253	—810	16340	294	—100
2	17100	297	—50	17050	253	—800	16250	282	—310
3	17000	297	—50	16950	253	—800	16150	280	—340
4	16900	297	—50	16850	253	—790	16060	272	—470
5	16800	300	0	16800	264	—600	16200	304	+ 70
6	16700	300	0	16700	264	—600	16100	287	—220
7	16600	300	0	16600	264	—600	16000	266	—560
8	16500	300	0	16500	270	—500	16000	308	+130
9	16400	300	0	16400	270	—490	15910	297	— 50

COMMENTS. *Example No. 2.*—In this example it was assumed that the tactical situation warranted the use of the slow method of successive approximations for firing the trial fire. Single ranging shots were fired and the rule was correctly applied. It is evident that the ultimate correction determined as a result of trial fire is the same as though the center of impact of the four ranging shots had been taken. It so happened that all four ranging shots were in the upper half of the dispersion ladder. This resulted in a correction which was too large in amount but correct in sense. The opening salvos in the effect phase considered with the ranging shots indicated the need for improvement of the correction. The adjusting officer ordered a new correction after the third salvo which was effective on the fifth salvo. After the impact of the sixth salvo inspection of the fire adjustment board shows that, based on the correction 264, two salvos were over and four were short and a further correction of 270 was applied. This correction was effective on the eighth salvo. Inspection after the ninth salvo, based upon the correction of 270, shows three salvos over, three salvos short and three salvos within 0.4 per cent of the target, thus indicating that the center of dispersion is close to the target.

On the Dispersion Slide Rule the center of dispersion was initially three per cent over. The first correction moved it to 2.6 per cent short. It remained there for the third ranging shot as there was no correction ordered immediately after the second ranging shot. For the fourth ranging shot the center of dispersion moved to 2.2 per cent short; and for fire for effect it was 1.7 per cent short. The correction ordered after the third salvo brought it to short 0.6 per cent, and the last correction placed the center of dispersion on the target.

FIRE ADJUSTMENT (RANGE)

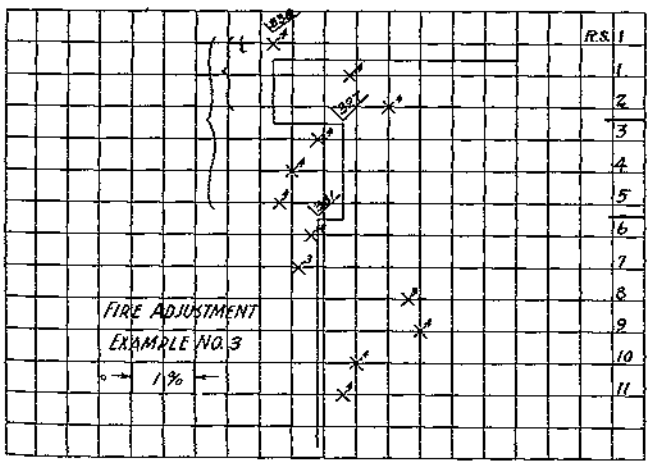
EXAMPLE NUMBER 3

FOUR GUNS — 12-INCH

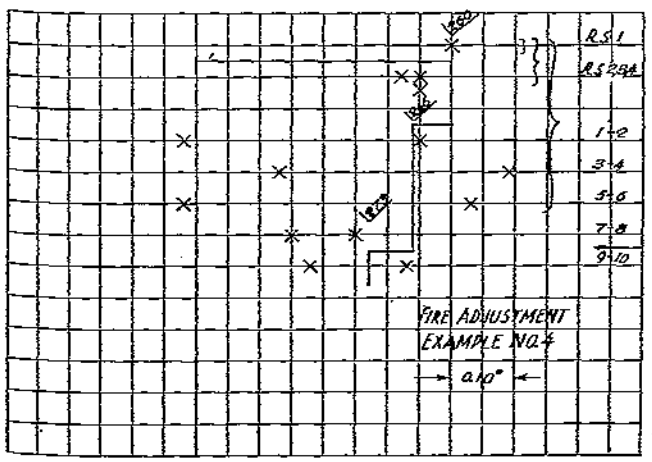
SALVO CENTER OF IMPACT

TABULATED DATA

S No.	R Yds.	dR_b %	dR_b Yds.	$R+dR_b$ Yds.	dR_a %	dR_a Yds.	$R+dR_b+dR_a$ Yds.	R_a %	R_a Yds.
R.S. 1	14000	280	—280	13720	300	0	13720	262	—530
1	14200	280	—280	13920	338	+530	14450	312	+170
2	14300	280	—290	14010	338	+530	14540	318	+260
3	14400	278	—320	14080	327	+380	14460	296	— 60
4	14500	278	—320	14180	327	+380	14560	292	—120
5	14600	278	—320	14280	327	+390	14670	299	— 10
6	14700	276	—350	14350	332	+460	14810	297	— 40
7	14800	276	—360	14440	332	+460	14900	314	+210
8	14900	276	—360	14540	332	+470	15010	316	+240
9	15000	274	—390	14610	332	+470	15080	306	+ 90
10	15100	274	—390	14710	332	+470	15180	304	+ 60



COMMENTS. *Example No. 3.*—In this problem one ranging salvo was fired, spotted, and correction applied prior to ordering salvos in the effect phase. Salvo centers of impact were observed throughout. Inspection of the fire adjustment board shows that comparatively little dispersion is indicated. It must be remembered, however, that each cross marks a center of impact and not an individual impact. Adjustment may be rapidly obtained by this method. Its use requires a well coördinated spotting section. Spotters should be trained to report the number of impacts observed in each salvo, otherwise misleading data may result. Assume a two-gun salvo in which the impacts are spread laterally. Assume further that one spotting station observes one impact and the other station observes the second impact. The plotted result will be far from the correct center of impact of the salvo. Such spotting data cannot be depended upon. Unless impacts are closely grouped, spotted data on which two base end stations report a different number of impacts should be ignored in making the adjustment.



On the DISPERSION SLIDE RULE the center of dispersion was initially three per cent short. The first correction moved it to 0.8 per cent over, the second to 0.3 per cent short and the third to 0.2 per cent over.

FIRE ADJUSTMENT (DIRECTION)

EXAMPLE NUMBER 4

TWO GUNS — 8-INCH RY.

CASE III USING DEGREES AND HUNDREDTHS

TABULATED DATA

S No.	Az. Set Fwd. Pt.	Ballistic Correction	Corrected Azimuth	Adjustment Corr.[2]	Corrected Az.	Deviation Az. Inst.[1]
R.S. 1	120.80	—0.70	120.10	0	120.10	2.60
R.S. 2	122.80	—0.70	122.10	2.60	121.70	3.05
R.S. 3	123.80	—0.72	123.08	2.60	122.68	3.05
R.S. 4	124.80	—0.72	124.08	2.60	123.68	3.08
1	126.80	—0.74	126.06	2.66	125.72	2.99
2	126.80	—0.74	126.06	2.66	125.72	3.36
3	127.80	—0.74	127.06	2.66	126.72	3.21
4	127.80	—0.74	127.06	2.66	126.72	2.85
5	128.80	—0.76	128.04	2.66	127.70	2.98
6	128.80	—0.76	128.04	2.66	127.70	3.36
7	129.80	—0.76	129.04	2.66	128.70	3.12
8	129.80	—0.76	129.04	2.66	128.70	3.02
9	130.80	—0.78	130.02	2.73	129.75	3.09
10	130.80	—0.78	130.02	2.73	129.75	2.94

NOTE: Assumed P.E. 0.10 deg.

(1) As read from the splash scale of the Azimuth Instrument M1910 on which 3.00 deg. is the normal or zero and on which the scale is inscribed to indicate increasing readings from right to left, i.e., a deviation of 2.90 is actually 0.10 deg. right.

(2) Based on a normal or zero reference number of 3.00 and following the general seacoast rule of RIGHT RAISE — LEFT LOWER.

COMMENTS. *Example No. 4.*—This example serves to illustrate the use of the fire adjustment board in making a lateral adjustment when using Case III pointing. In principle the operation is exactly the same as in range adjustment. If deviations are read from the splash scale of the azimuth instrument M1910, the scale used in plotting on the fire adjustment board should be inscribed with readings increasing from right to left. This will clarify the picture in that rights will appear to the right of the line of targets and lefts to the left. If the scale is graduated from right to left care must be exercised in reading off the desired correction. This operation is different from the corresponding operation on the fire adjustment board as used for range adjustment, due to the reversal of the graduations. When reading off a correction for range adjustment the normal of the scale is placed on the check mark and the reading is taken opposite the axis of correction. With the reversed graduations for direction adjustment the normal of the scale is placed on the axis of correction and the reading is taken opposite the check mark.

For example No. 4, a lateral P.E. of 0.10 deg. was assumed. The first ranging shot was spotted at 2.60 (right 0.40). Full correction of 2.60 (left 0.40) was applied. The remaining three ranging shots were fired at the normal firing interval and fell slightly left. A correction of 2.66 (left 0.34) was applied based upon the center of impact of all four ranging shots. A further correction was ordered after the salvo containing the fifth and sixth shots. This correction became effective on the salvo containing the ninth and tenth shots.

This graphical method of making the lateral adjustment is simple and offers little chance for confusing the record of rights and lefts. It is also much more dependable than jotting down plus and minus values and attempting to make a hasty determination of the mean or center of impact. This is particularly true when firing two or more guns.

The DISPERSION SLIDE RULE was used in making up this example. A probable error of 0.10 deg. was assumed for convenience. The only change necessary was to reverse the graduations on the scale A. The center of dispersion laterally was initially at 270 (0.30 right). The correction of 260 (left 0.40) brought it to 310 (left 0.10). The correction as a result of the trial fire (266) brought the center of dispersion to 304 (left 0.04), and the last correction moved it to 297 (right 0.03).

FIRE ADJUSTMENT (RANGE)

EXAMPLE NUMBER 5

FOUR GUNS — 155-MM.

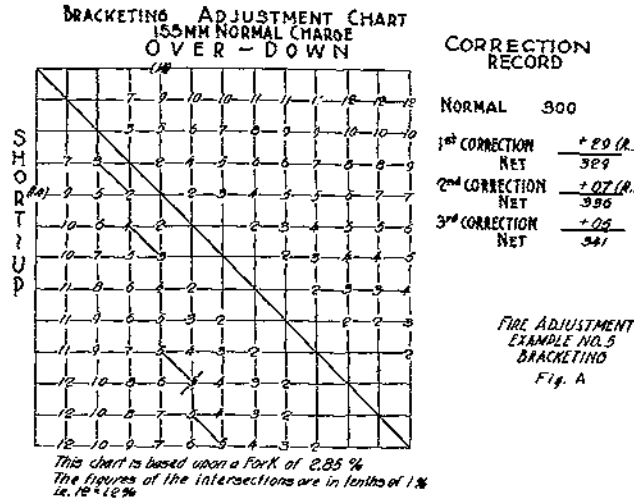
BRACKETING FORK = 2.85%

TABULATED DATA

S No.	R Yds.	dR_b %	dR_b Yds.	$R+dR_b$ Yds.	dR_a %	dR_a Yds.	$R+dR_b+dR_a$ Yds.	Ra Sensings*
R.S. 1	11000	290	—110	10890	300	0	10890	S-S-S-S
R.S. 2	11100	290	—110	10990	329	+320	11310	S-S-H-S
1	11200	290	—110	11090	336	+400	11490	O-O-S-S
2	11250	290	—110	11140	336	+400	11540	S-H-S-H
3	11300	290	—110	11190	336	+400	11590	S-S-S-H
4	11350	290	—110	11240	336	+400	11640	S-H-S-S
5	11400	290	—110	11290	336	+410	11700	O-S-H-H
6	11450	290	—110	11340	341	+460	11800	O-S-O-O
7	11500	290	—110	11390	341	+470	11860	O-H-S-O
8	11550	290	—120	11430	341	+470	11900	S-O-H-S
9	11600	290	—120	11480	341	+470	11950	S-O-O-H

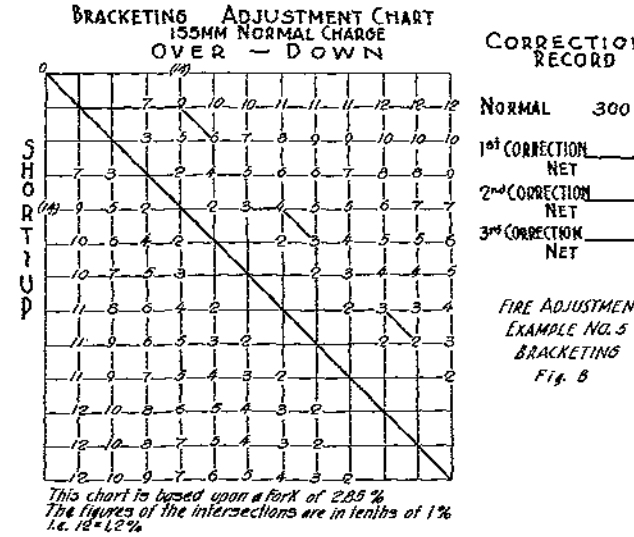
*S = Short; O = Over; H = Hit.

COMMENTS. *Example No. 5.*—This example illustrates the use of the bracketing adjustment chart. The correction record of both the trial and effect phases is kept on the right side of the chart. In this particular problem the first ranging salvo was short. A correction of up one fork (net 329) was ordered. The second ranging salvo contained one hit and three shorts. A correction of up one probable error (net 336) was applied and fire for effect ordered. Spotted data on the ranging salvos was not



FIRE ADJUSTMENT EXAMPLE NO. 5 BRACKETING Fig. A

plotted on the chart. The plot begins with the spotted data on the first salvo of fire for effect. After the third salvo an up correction of 0.5% was indicated. This correction was ordered (net correction 341) after the third salvo had been spotted and was applied on the sixth salvo. Had there been room on the chart illustrated in Fig. A, the spotted data of salvos four and five would have been plotted on a continuation of the line for salvos one to three, inclusive. As soon as spotting data on salvo six, which had a new correction, was received a new line was



FIRE ADJUSTMENT EXAMPLE NO. 5 BRACKETING Fig. B

started. This line is shown on Fig. B. One of the limitations of this chart is that in determining a correction all shots considered (plotted) must carry the same correction.

On the DISPERSION SLIDE RULE the successive locations of the center of dispersion were:

Initial—Short 4%.
After first correction—Short 1.1%.
After second correction—Short 0.4%.
After third correction—Over 0.1%.

Doubling the Efficiency of the C.A. Reserve

By Major J. C. Haw, C.A.C.

Editor's Note: This article is believed to be of vital interest to unit instructors and all reserve personnel. It shows what can be accomplished by the exercise of some ingenuity combined with a considerable amount of professional zeal. Lack of space makes it impossible to publish a detailed description and working drawing of the several pieces of equipment. If it develops that any organization desires to reproduce these gadgets the author will gladly furnish a more detailed description and clear up doubtful points. The general description and the photographs should be sufficient to enable the mechanically inclined to proceed with the actual construction and perhaps improve upon the originals.

It is evident that the greatest weakness of Reserve training at present is the fact that for fifty weeks in the year, training is entirely theoretical. The obvious step of providing equipment for drill would make artillery training almost as practical, definite, and concrete as though real Coast Artillery batteries were available. While it is true that many Coast Artillery Reserve officers live away from centers of instruction, yet in the II Corps Area, at least, the majority are concentrated in large cities; this naturally leads to greater interest, activity and enthusiasm. Moreover, the equipment described in this article could be made light and compact enough to be transported from place to place within a regimental area. At any rate, whatever the conditions in other Corps Areas, there are certainly enough Coast Artillery Reserve officers living near centers of instruction to justify the claim that the effect of providing artillery drill equipment for the Reserve would be to double the efficiency of this component of the Army within the space of a year or two.

The practicability of providing drill equipment results from the fact that cheap imitations of the real articles can be made to have virtually as much instructional value as the originals. It is necessary only to provide equipment that will illustrate principles and make possible a realistic drill along lines generally similar to the drill of the guns and instruments represented. It is estimated that $600.00 would cover the cost of a Government-made set of seacoast and antiaircraft drill equipment for a regiment, and in many places one set would serve several regiments.

Drill, itself, is something that can be learned easily and quickly. The greater value of the equipment is to be found in the opportunities it provides for portraying vividly and practically to the students the vast reaches of artillery lore that lie beyond the limits of mere drill. It has been demonstrated, too, that the use of this equipment results in greatly increased interest and attendance.

Here is a list of some of the subjects that could be taught to great advantage by using drill equipment in an Antiaircraft Artillery Regiment: service of the piece; drill of the range section; drill of the height-finder detail; operation and use of the BC telescope; the stereoscopic principle; spotting by angular deviations; spotting overs and shorts with a stereoscopic instrument; safety precautions; classes, types, and methods of fire; designation of targets; adjustment of fire; the trial-shot problem; burst problems; verification fire; fire for effect; nomenclature of guns and fire-control instruments; care of the same; orienting guns and instruments; bore sighting; clinometering; synchronizing data transmission systems; barrage fire; calibration; preparations for target practice and for action; occupation of a position; use of searchlight, sound locator, and comparator; the principles of position finding for searchlights; target practice; night firing, and flash messages and alerts.

It is obviously the duty of the Government to provide this equipment. When it is considered that in time of war at least two-thirds of our Army must be furnished by the Reserve, it is evident that it would be impossible to find any more profitable manner of spending the small sum involved. An increase of 100 per cent in the efficiency of the officer nucleus of two-thirds of the war strength of the Coast Artillery is certainly worthy of the most serious consideration. If the money is not available now, the relatively insignificant cost of the project warrants the hope that steps will be initiated to obtain the necessary funds for this project.

The War Department does not always see eye to eye with your scribe, and so you eager Reservists and Unit Instructors may encounter difficulties if you try to hold your breath while waiting for the equipment to be handed to you merely for the asking.

Setting up a claim to priority in any line of endeavor is more often than not a fine way to invite a lot of grief, but nevertheless we are going to do it. It is hereby claimed that the 514th Coast Artillery (AA), of Schenectady, New York, was the first Reserve regiment to make its own complete set of seacoast artillery drill equipment (completed March 1, 1933), and was the first Reserve regiment to construct its own complete set of antiaircraft artillery drill equipment (first drill, April 1, 1934). As a matter of fact, the members of this regiment feel that the claim should be broadened, as it is thought that the 514th is the first Reserve regiment of any branch of the service to build and use such complete equipment.

The seacoast drill equipment was very easy to make, except for the Pratt range board and the gun. The range board was a mechanical failure but served to illustrate principles and was actually used in drill, though it was not

Author's Note: This effusion really should appear as two separate articles, but editorial requirements made it necessary to condense it into one.

satisfactory. However, it would not be difficult to make one that will work. The gun was merely a stove-pipe on a tall saw-horse; it could not be traversed or elevated, but dummy traversing and elevating wheels were provided; the breechblock was merely a "back door," with a crude firing leaf to receive the primer; an open sight with deflection scale was fastened to the mount. Crude and small as this gun was, it could be used to illustrate many principles of gunnery and made possible a realistic drill. The plotting board (180° type) was small and there were no index boxes or clamps on the arms. Except for certain parts of the gun and range board, all the equipment was made of wood. Members of the regiment did all the work and furnished all the materials, except for the charts for the range board and percentage corrector. These charts, and ordnance pamphlets describing the various articles of equipment, were obtained from the Coast Artillery Board by direct request.

As all items of the equipment were of standard type (although simplified where necessary), they will not be pictured or described here. The articles made and used were as follows:

One dummy seacoast cannon and mount complete with dummy elevating handwheel and scale, dummy traversing handwheel, and sight.
One dummy projectile.
One dummy powder charge.
One loading tray.
One powder tray.
One rammer and stave.
One sponge and stave.
One hook and stave for withdrawing drill projectile from bore.
One gunner's pouch containing punch, drill, lanyard, reamer, primer, and firing mechanism.
One funnel.
One oil can.
One wrench.
One measure for hydrolene oil.
One plotting board complete (180 degree), with tally dial.
Two sawhorse supports, primary, secondary, and auxiliary arms.
Two couplers, scale 1" to 500 yards.
One Pratt range board complete.
One gun deflection board.
One corrector, percentage, complete with interpolator.
Two set-forward rulers.
One wind-component indicator.
One target.
One ruler, prediction; canned courses; cards—service of the piece, duties of the range section, etc.

General William E. Cole stated that the plotting board was better than the one he used as a young officer. The corrector, percentage, is superior to most of those in the service.

Antiaircraft Artillery Drill Equipment

The seacoast equipment was completed in two months, but the antiaircraft equipment was a different story. It took more than four months to complete, and it is doubtful if it could have been built at all without the splendid coöperation of Captain Wallace E. Durst, Q.M.C., and Staff Sergeant Nelson, O.D., of the Schenectady General Depot. The Depot furnished virtually all of the material and actually built the data computer and the gun (which was a very different gun from the crude seacoast one). We would be delighted to see other regiments surpass our efforts, but the construction work involved is great and success can be expected only if some Government agency will help fully and generously, or where Reserve officers or interested civilians have unusual skill and facilities for wood-working and metal-working, or by the expenditure of several hundred dollars, if the work has to be done commercially.

The articles are as listed below. Descriptions of the major pieces of apparatus follow:

One drill gun (3" AA).
One dummy data computer (director).
One searchlight, comparator, and sound locator unit.
One height-finder.
One BC telescope.
One target and burst board.
One stereoscopic training set.
One spotting and adjustment trainer.
One fuse setter (bracket).
One dummy round fixed 3" AA ammunition, 21-second fuse.
One bore sight (breech).
One sponge, chamber.
One sponge, bore.
One windlass (to draw target).
One glove (for loader).
One can oil.
One screwdriver.
One monkey wrench.
One pair pliers.

The articles were constructed principally of wood. While the equipment is greatly simplified and relatively very crude, it serves the following purposes very well:

a. Practically all of the important principles of Antiaircraft Artillery gunnery can be vividly illustrated by its use.
b. It makes possible a real drill, which while differing in detail from drill with service material, yet incorporates all the principal features of that drill and permits the development of experience in drill methods, in command and in teamwork.
c. It affords a realistic portrayal of all the occurrences of actual firing except the noise of firing.

The equipment is designed for indoor use, but could be used outdoors with a real airplane as target. It permits

tracking of, and simulating fire on, a moving aerial target. Spotting sights and flashes representing bursts at the target permit practice in spotting and the simulation of trial-shot problems, and even of adjustment problems on a moving target. It is designed for Case III firing but there is no communication system, all data being transmitted by voice at five-second intervals or less. However, the searchlight and sound locator unit includes a mechanical comparator.

It should be possible to provide a light, two-wheeled automobile trailer, that could be towed behind a passenger car, for each set of equipment. The equipment should be designed so that it could be easily and quickly taken down and stowed in racks, boxes, etc., and transported on the trailer. In the West the roads are full of home-made trailers that cost a few dollars only. Provision for transportation would enable the equipment to be used on outdoor maneuvers and also to be carried by Unit Instructors to small groups in outlying localities.

As an integral part of our equipment the writer provided individual cards on each of which are typed the duties of one member of the gun or range section, and additional cards for battery officers and chiefs of sections, with suitable instructions such as commands, safety precautions, property for which they are responsible, diagrams of the formation of their units, etc. Thus at the beginning of a drill each man has a card, all learn their duties simultaneously, and much time is saved. Large cards (8" x 8" or larger) are not easily lost or carried away. Shellacking makes them more durable.

A trajectory chart, and a number of large scale drawings of the lateral and vertical projections of elements of the trajectory, etc., have been hung on the wall of the drill hall. These are very instructive and should be furnished.

The coat of arms of the regiment is painted in color on each piece of equipment.

The Unit Instructor laid down the general features of the design of every article of equipment. Minor details and dimensions, and problems of construction, were worked out by the makers of the individual articles, who also effected many improvements on the original designs. The gun is the only piece of equipment for which detailed dimension drawings were prepared.

Sights

It was found that at the short distances encountered indoors, it was entirely unsatisfactory to have the vertical and lateral sights on a single instrument separated by even a small distance.

The sight on the data computer is a box with an objective aperature and sunshade in front. The ray of light entering here goes straight to the eye of the verticle tracker, being refracted through two panes of clear glass. The interior of the box being dark, the first glass, set at 45 degrees, acts as a mirror to the spotter on the right, being refracted through a third pane of clear glass interposed at an angle in the path of this ray. This third pane reflects the image a second time to the lateral tracker. The ray to the spotter on the left pierces the first clear pane immediately in rear of the objective and is reflected to the spotter on the left by the second clear pane, set at an angle. Thus all use the same objective aperature and cross hairs.

A fourth clear pane is provided at the objective aperature, and cross hairs and mil scales are drawn on this pane. The paths of the rays of light from the mil scales to the spotters being equidistant, the mil values are correct for them. As the trackers do not use the mil scales but only the cross hairs, no attempt was made to arrange the eyepieces for the trackers in such a manner that the paths of the rays to their eyes would be the same as for the spotters. Hence the mil scale does not give correct mil values for the trackers.

The loss of light is so great that with artificial illumination it became necessary to flood-light the target.

The tracking sights for the height-finder, and the BC instrument sights, are built on similar principles. None of the sights have magnifying or reducing lenses of any kind.

Battery Commander's "Telescope"

(See Figure 1)

The entire mount and mechanism were built by First Lieutenant Sewell L. Flagg, C.A. Reserve; the sight (or telescope) by Second Lieutenant Elmer G. Moffat, C.A. Reserve.

The instrument consists of tripod, upper and lower plates, elevation arc, and sight. It has levels and leveling screws, and elevating scale, movable azimuth circle, worm

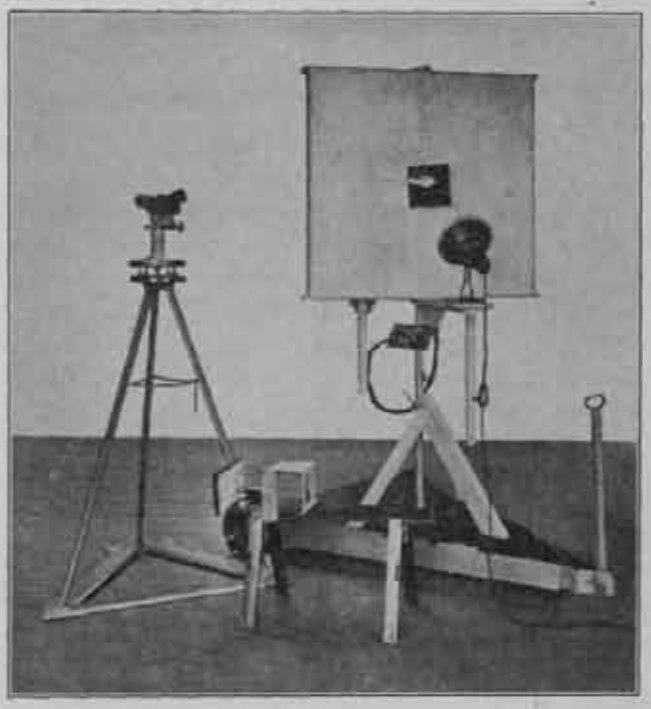


Figure 1

B.C. Telescope. Target and Burst Board. In Foreground—Stereoscopic Trainer

gear for elevating and a friction wheel for traversing. The Battery commander's telescope has horizontal and vertical mil scales for measuring deviations of bursts from target.

Stereoscopic Trainer
(See Figure 1)

Movable peepsights impress the idea that in using stereoscopic height finders exact adjustment of the interpupillary distance is necessary. Seven small disks, mounted on fine wires, are disposed in V formation with the point of the V nearest the eyepiece and each successive pair of disks higher than those in front of them. Below them is mounted a miniature airplane that can be moved. Operation consists in setting the airplane at the same distance from the eye as the nearest disk. Sky and clouds in water colors provide a background. Preliminary instruction is provided by a block carrying a row of nails, staggered in depth or by other devices, illustrating the principle of depth perception. Stereoscopic spotting may be practiced by using small white balls on the ends of fine wires to simulate bursts in conjunction with the diamonds and airplane. A cheap stereoscope is provided also, with training cards to supplement the regular views.

Spotting and Adjustment Trainer

This is simply a drawing, about two feet in diameter, representing the field of view (50 mils) of a telescope equipped with cross wires and mil scales. Sky and clouds are represented by water colors. Small balls of cotton, on the ends of fine wires, are held against the drawing to represent bursts in order to practice observers in reading lateral and vertical deviations and calling corrections. If in addition assumed overs and shorts are announced, complete adjustment problems may be worked out.

Target and Burst Board
(See Figure 1)

(Designed and built by First Lieutenant Roy H. McKibben, C.A. Reserve).

The target and burst board are carried at the top of an adjustable standard mounted on a small three-wheeled wagon which is pulled across the floor by a rope wound on a windlass to give it steady motion. The target is a miniature airplane suspended by an endless wire belt in front of the center of the burst board; it may be raised or lowered. A floodlight in front of the target illuminates it brilliantly. The burst board is a square, wooden frame covered in front with a very thin white cloth. Inside two horizontal bars, bearing flashlight bulbs, slide up and down. By the vertical movement we get the vertical deviation of a burst, then the appropriate light is flashed, its distance from the center giving the lateral deviation. A solid block of lights would be better but would run up the cost. The burst board is revolved about its vertical axis so that whatever the course of the target the board can be set approximately perpendicular to the line gun-target. The operator sits on the wagon. By announcing overs and shorts when lights are flashed, adjustment problems on the moving target may be simulated. A noise-maker (toothed wheel and spring) is provided for use with the sound locator unit.

The Height-Finder
(See Figure 2)

Built by Second Lieutenant Howard G. Krieger, C.A. Reserve, and Second Lieutenant C. R. Phiffer, Eng. Reserve.

This is the poorest item mechanically, loose parts and back lash having defeated us. The builders did excellent work but a greater degree of precision was required than in other items of material, and facilities to achieve this were not available.

Like all height-finders, this instrument measures slant range and angular height and computes altitude from these data. Unlike standard types, it operates on the principle of similar triangles, the length of the base being varied in proportion to the range and affording a measure of the range. Settings are obtained by the coincidence principle.

Our experience showed that, because of mechanical difficulties, it would be better to adhere to the normal type of design than to solve the problem by the similar triangle method; that is, better to have a baseline of fixed length with a revolving mirror substituted for the usual prism at the end away from the observer. Our height-finder is being re-constructed along these lines. The great difficulty is the necessity for mechanical precision and the avoidance of backlash, since the mirror moves through extremely small angles and the measurement of these angles (which afford a measure of the slant range) is not easy. Moreover, even slight tilting or other non-adjustment of the distant mirror throws the reflected image off the second mirror located at the eye-piece.

It is much better to adhere to the coincidence method of obtaining settings than to attempt the stereoscopic method, which is more complicated and would require a higher degree of precision in the machine-work.

Having measured the slant range, the altitude is com-

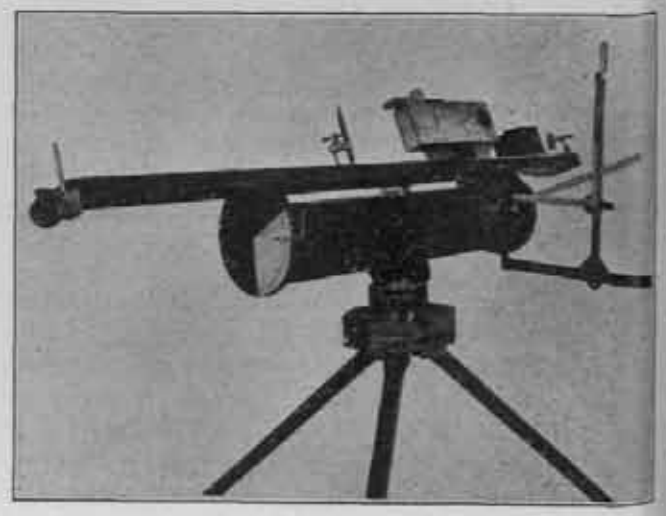


Figure 2—*Height Finder.*

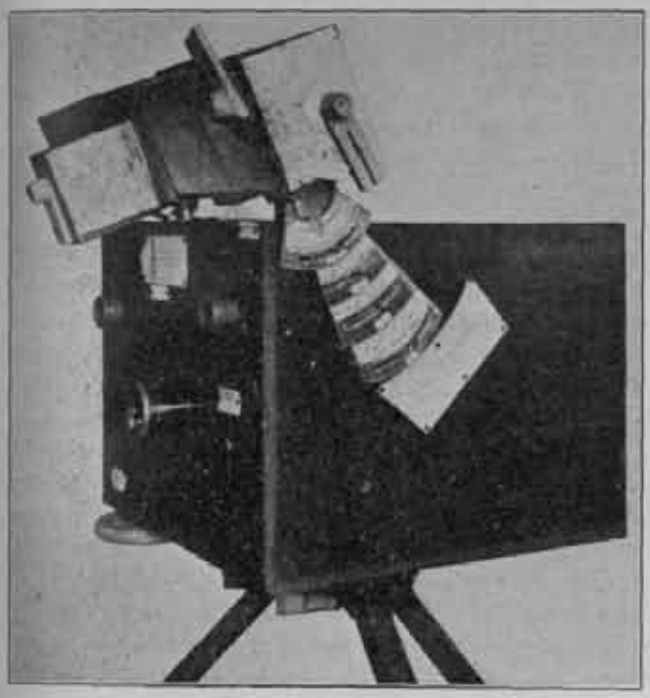


FIGURE 3—*Right and rear of Director.*

puted by a simple device graphically solving a right triangle. A ruler parallel to the direct line of sight and graduated in slant range moves in the vertical plane as the target is followed, thus always making an angle with the horizontal plane equal to the angular height of the target. An L-shaped device is arranged so that the lower line of the L is always horizontal. By moving the vertical line of the L until it touches the angular height ruler at the graduation corresponding to the slant range we reproduce the right triangle in space, and the altitude is read from the vertical member of the L at its intersection with the angular height ruler.

Actually, because of faulty design, we had to introduce an extra gadget to get our triangle out to an unobstructed position but the principle is that just described.

When drilling indoors in a room with ceilings of ordinary height, the angular heights encountered will be small unless the target is within a few feet of the heightfinder. To simulate service altitudes the altitude scale of the computing device may be drawn to a much smaller scale than is used for slant ranges. On our altitude computing device the slant range graduations along the angular height ruler are drawn to a scale of 1 inch equals 500 yards while the altitude scale is 1 inch equals 1,250 yards.

The instrument is elevated and traversed by two tracking observers by means of worm gears and handwheels. The sights have been mentioned previously. Two levels are provided for levelling the instrument. It is supported by a tripod. An angular height scale is provided.

THE DIRECTOR

(See Figures 3 and 4)

This instrument was built by the personnel of the Schenectady General Depot. Owing to the mechanical complications involved in measuring angular or linear rates, it was impossible for us, with the means at our disposal, to construct a director that would actually compute firing data. The object, then, was to produce an instrument that would permit of a realistic drill and would illustrate principles.

In a way, to a novice, this director emphasizes the basic elements of data more forcibly than a real director does, since the principal items of data are plainly and visibly forced on the attention of the operators; while the crew of a real director is chiefly occupied in turning knobs and in other manual operations whose effects are concealed inside the instrument.

With this director the target can be tracked, the true present azimuth, angular height, and fuze range can be read, true vertical and lateral deviations can be read, and vertical and lateral corrections and per cent altitude corrections can be applied.

The future fuze range, quadrant elevation and firing azimuth turned out are erroneous, because in the absence of rate measuring devices it becomes necessary to assume static values for various elements of data that are in reality continuously changing. The firing data are arrived at as follows:

a. To obtain quadrant elevation, assumed static values of the following items are added algebraically by simple mechanical scales to the true indicated present angular height: principal vertical deflection; super-elevation; vertical deflection corrections, for range wind, non-standard MV; and density.

b. To obtain future fuze range, an assumed static value of the principal vertical deflection is applied to the true indicated present angular height and a point on the fuze range chart is located by this future angular height and the altitude (from heightfinder).

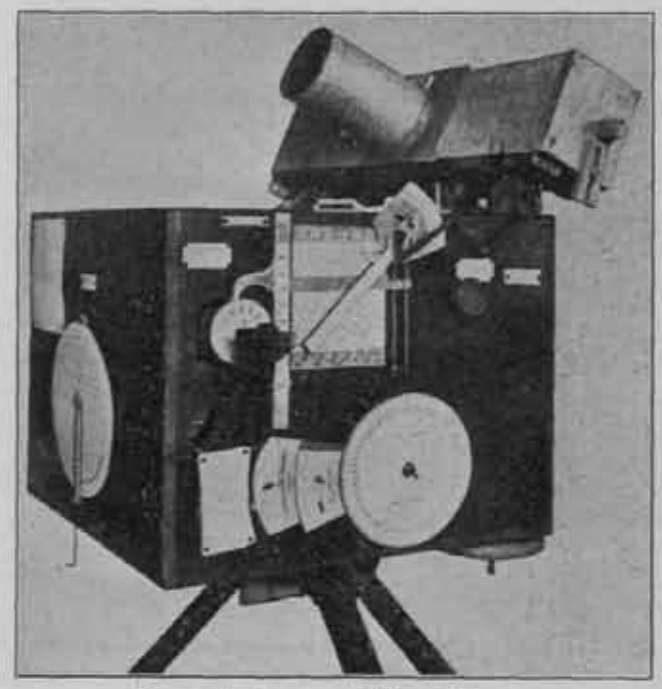


FIGURE 4—*Front and left of Director.*

The instrument is a wooden box two and a half feet square and two feet high supported by a tripod. It is provided with levels. At the extreme rear end, on top of and outside the box, a horizontal shaft supports the sight, previously described. The lateral tracker follows the target in azimuth by turning a crank which, through a worm gear, rotates the instrument about a vertical post. The lower end of the post fits in a hole in the tripod and when in place is clamped thereto. At its upper end this post carries a bevel gear mounted vertically and engaging with a bevel gear on a horizontal shaft. The left end of the horizontal shaft carrying the bevel gear carries the azimuth dial on the left outside surface of the computer. The dial can be rotated independently of its axis and clamped in any position, to facilitate orientation. Concentric with but independent of the azimuth dial is a scale for the combined correction for wind, drift, and travel. This scale also bears the index opposite which future azimuth is read and shifting the scale shifts the index. The scale and movable index are moved as a unit in applying lateral arbitrary or adjustment corrections, thus further shifting the azimuth index. The arbitrary correction movement is effected by a shaft and cord; the rear end of the shaft terminates in a knob on the rear of the computer and is operated by the lateral spotter. The knob has a catch for every five mils correction in azimuth so that the observer can apply corrections of five mils or multiples thereof without removing his eye from the telescope.

The vertical tracker turns a crank which, through a helical gear and a worm gear reduction, elevates or depresses the sight. The right end of this shaft carries a pointer which indicates angular height on an elevation scale. This scale is shifted to impart the vertical corrections previously enumerated, being connected to a system of scales similar in construction to those already described in the discussion of the azimuth dial. The whole system of scales is shifted for arbitrary corrections as described for the azimuth system; the vertical correction knob is located on the rear of the box.

The left end of the sight shaft is connected by links to a pointer indicating present angular height; and angular scale is integral with this pointer. A second pointer is set to the graduation on this scale equal to the assumed vertical travel and therefore this second pointer, or angular height ruler, indicates future angular height. It moves across a fuze range chart, and a horizontal ruler set to the altitude provides an intersection under which the fuze range is read. A three-dimensional cam shifts the altitude scale to permit the insertion of per cent altitude corrections.

A wind component indicator, similar to the standard Coast Artillery instrument, is hung on the front of the computer. Tables are provided showing, for certain points on the trajectory, and for certain speeds and directions of approach, the data to which the various scales may be set. Before tracking begins, the Battery Commander announces the point chosen, and the data for this point are set off on the scales.

The gears used in the director had to be whatever we could obtain already made up. The reduction in motion is less than standard; this is believed to serve the purpose better. The sight shaft is mounted above and to the extreme rear of the box for the purpose of allowing the sight to clear the box. The linkage in the fuze range system is necessary in order to get the fuze range chart to a position on the box where it will not be obscured by any of the operators. The sights have been previously described.

Suggested improvements: There should be rate-measuring devices; cheap automobile speedometers might be used for this purpose. There should be a continuous change in the various corrections, and altitude and time of flight should be set in wherever appropriate. It ought to be possible to build cheaply a much more realistic director; our trouble was that we had no way of securing any but the simplest parts. Something more or less along the lines of the RA corrector might be the solution. With all its faults, our director is extremely valuable for instructional purposes.

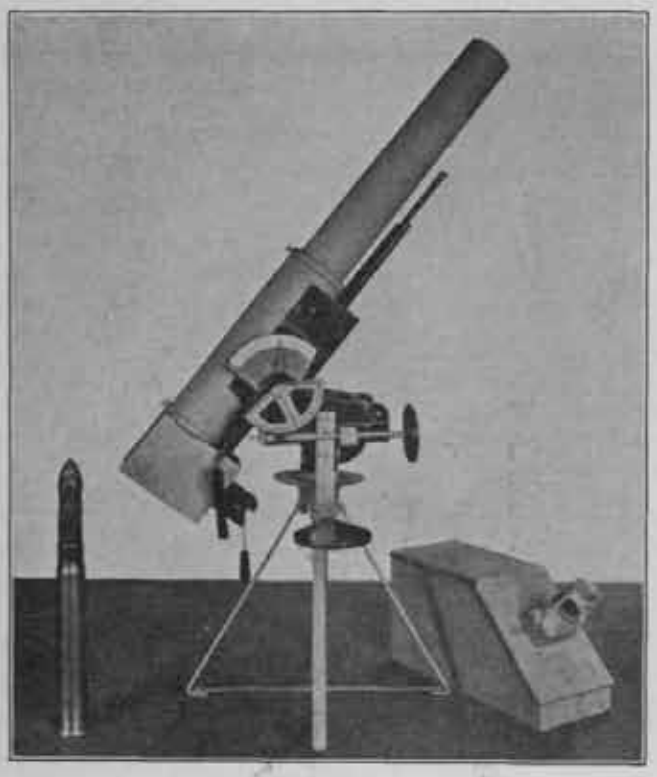


FIGURE 5
Gun and Mount

Dummy Round *Bracket for Fuze Setter*

THE 3" ANTIAIRCRAFT ARTILLERY DRILL GUN, MOUNT AND PROJECTILE

(See Figure 5)

(Dimensions and detail drawings by First Lieutenant William V. Honey, C.A. Reserve. Constructed by Quartermaster, Schenectady General Depot).

The bottom carriage is a pedestal mount with four legs of heavy strap iron. The top carriage is of wood and is mounted on a vertical steel shaft or pintle that fits into the pedestal. The gun is attached rigidly to a wooden cradle which rides on trunions that rest on the sides of the top carriage. The gun proper consists of inner and outer tubes of sheet metal. The sides of the breech are of heavier sheet metal, the rear is a wooden block.

The breech block is of wood, of the drop block type, with operating handle, shaft, and crank of conventional design; a horizontal pin through the operating crank moves in metal grooves in a recess in the breech block. The breech is closed by two springs, one on each side of the outside of the gun tube, fastened to the cradle. It is held in the open position by a spring-operated stop which is released when struck by the flange of the cartridge case as the latter is loaded. The breech mechanism is thus semi-automatic, closing as the gun is loaded. A clicking device on the bottom of the breech block simulates the noise of the firing mechanism when the lanyard is pulled. The gun is elevated and traversed by worm gears and is provided with elevation and azimuth scales and pointers. The elevation and azimuth setters ride on wooden seats hung by metal supports from the top carriage. There is a levelling screw on the foot of each leg of the bottom carriage. Dummy equilibrators, recoil cylinder, air reservoir cylinder, and floating piston cylinder, are provided. This gun is most life-like and Lieutenant Honey deserves the greatest credit for its design.

The fixed round of ammunition (See Figure 5) consists of an empty 3" antiaircraft artillery cartridge case, wooden projectile, and real 21-second fuze. There is a hole in the base of the cartridge case to facilitate withdrawal. The lightness of this dummy round saves a great deal of wear and tear on the gun.

Bracket Fuze Setter

(See Figure 5)

(Designed and made by Second Lieutenant Elmer G. Moffat, C.A. Reserve).

In appearance this fuze setter is very similar to the real article and the principle is the same. The main difference is that in order to avoid the necessity of a worm ring, the top surface bearing the stop is fixed while the lower portion carrying the slot is rotated by a gear wheel on its under side, operated by a worm, to the shaft of which the hand crank is attached. There is no provision for applying corrector settings as these are hardly needed.

Miniature Searchlight, Sound Locator, Comparator, and Remote Control Unit

(See figure 6)

(Rough design by First Lieutenant William V. Honey, C.A. Reserve; details on construction worked out, and complete unit made by First Lieutenant Roy H. McKibben, C.A. Reserve).

As these articles of equipment are inter-connected by belts, they are all permanently mounted on a single narrow table eight feet long. If they were on separate mounts it would be very difficult to secure and retain the necessary tension on the belts. The belts are braided rope and as belt dressing has been applied, there is no slippage.

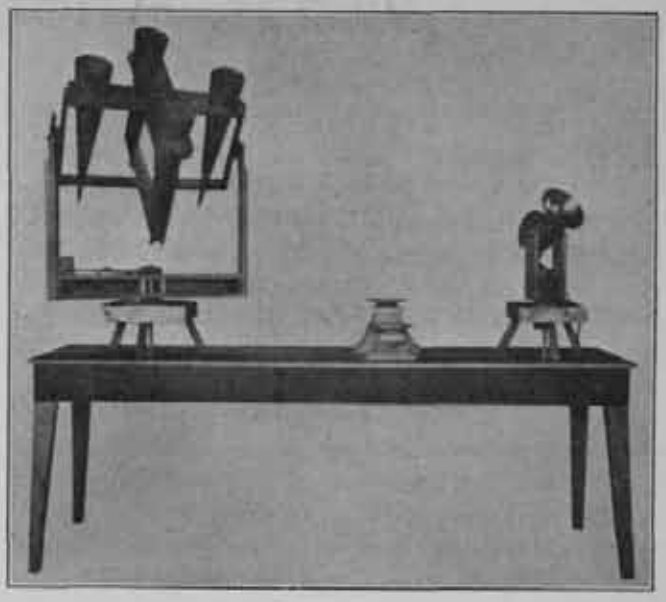


Figure 6
Miniature searchlight, sound locator, comparator, and distant control unit mounted on eight-foot table.

The sound locator consists of four cone-shaped sheet metal horns, each two and a half feet long, mounted as a unit. The horns are connected by rubber tubes to earpieces on spring headsets. Lead weights are fastened to the cradle at the small ends to counterbalance the heavier large ends. The horns are traversed and elevated by worm gears. There are elevation and azimuth scales. The rope belts, running over pulleys, operate indicator pulleys on the comparator so that a pointer attached to each of these pulleys moves with the horns.

These indicator pulleys revolve freely about their vertical shafts. The shafts, however, are moved by hand cranks and worm gears and carry discs bearing correction scales and pulleys which by means of rope belts elevate and traverse the searchlight, thus constituting a remote control mechanism. By turning the handles of the worm gears at such a rate as to keep the zeroes of the corrector scales under the indicator pointers of the comparator, the searchlight is kept parallel to the horns in elevation and azimuth. If corrections for sound-lag or other factors are desired, the handles of the worm gears are turned at a rate to keep the desired graduations of the correction scales, instead of the zero graduations, under the indicator pointers.

The searchlight consists of the reflector, bulb and socket of a Ford automobile headlight mounted on a simple mount which, as previously stated, is traversed and elevated by belts leading from pulleys on the vertical shafts at the comparator. The searchlight is provided with azimuth and elevation scales. The light can be focussed. A transformer located under the table steps down the 120 volt house current to the proper voltage for the automobile headlight bulb.

What, Another Gadget?

No, Mister, a Nickel Deposition Plant.

By Captain C. S. Denny, C.A.C.

ONE of the ways we get to Boston from Fort Banks is to take the Narrow Gauge Railway. At the East Boston terminal transfer to the ferry for Rowe's Wharf. On one trip I noticed a bootblack walking slowly, eyeing the shoes of the passengers, and as he came nearer I heard him say "Sh—ine, sh—ine, sh—ine 'em up." That is a magic phrase. The bootblack may be forgotten, but remember his cry, "Sh—ine, sh—ine, sh—ine 'em up!"

We of the Coast Artillery use these words very frequently, and constantly exert our efforts towards accomplishing its meaning. Brass on equipment, brass on 25 K.W. Sets, bores of guns, *ad infinitum* must be shined. This article is about putting the shine on the nickel plated parts of composite artillery type telephones.

It is an old army custom for a "higher up" to let out his manly chest, pumped up by some excellent piece of work of a subaltern, strain and possibly burst off a button or two, and, why not? We all hope to be the "higher up" some day and expect to have others do for us what we believe we have done for others. This time the credit belongs to Master Sergeant Lewis H. Harris, 9th Coast Artillery, who will tell you how he shined 'em up.

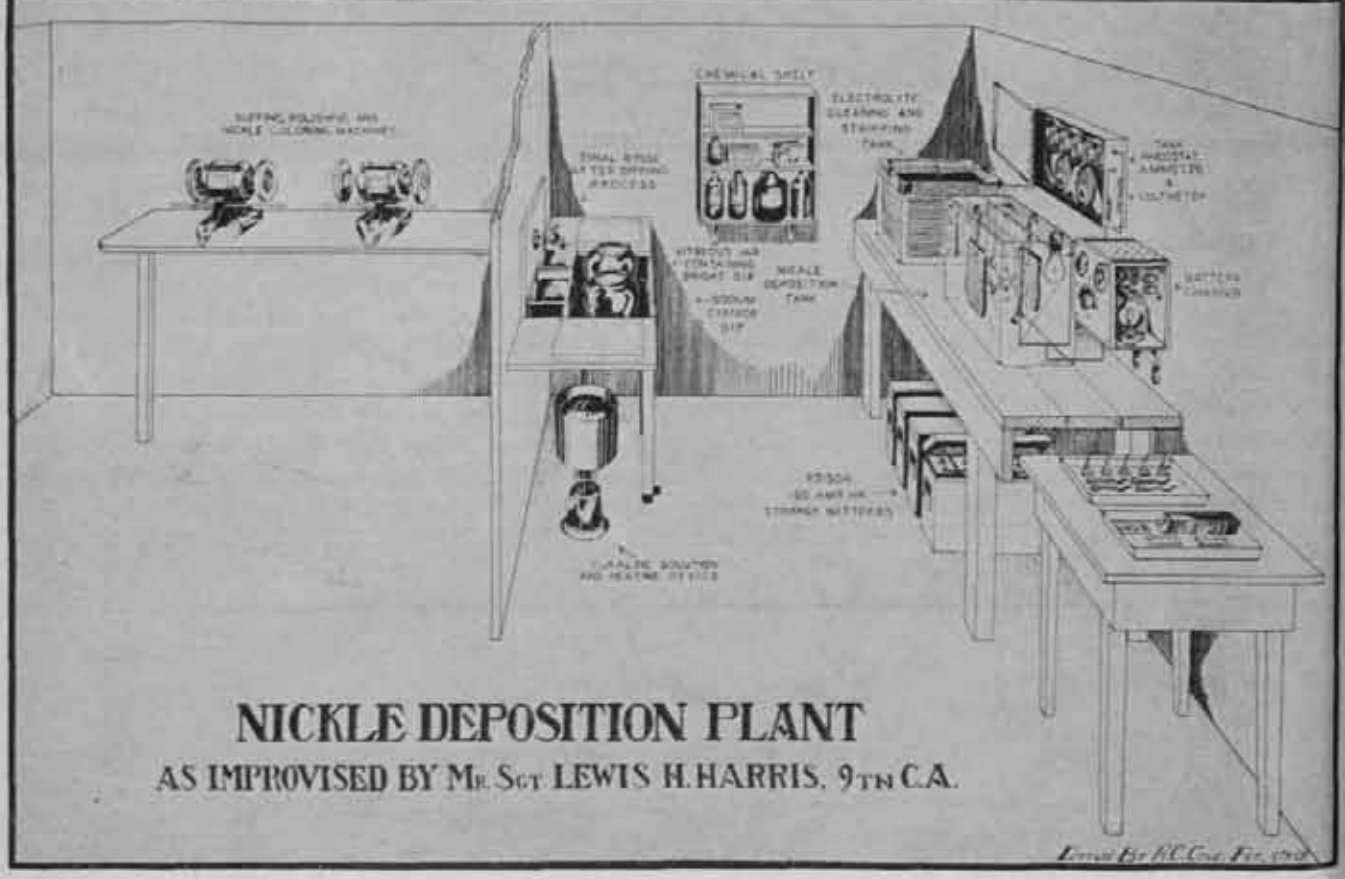
Observing the deplorable appearance of our composite type fire control telephones, installed in various base end stations, plotting rooms, and gun emplacements in these defenses, it occurred to me that much could be done to improve their appearance if the worn, stained, peeled, and corroded nickel plated parts could be refinished.

I consulted with my Harbor Defense Signal Officer as to the renickeling of these parts, and was instructed to ascertain the cost and practicability of installing a small nickel deposition plant. I visited the plating department of the General Electric Works, where I acquired valuable information on the subject.

The original sum of $12.65 was expended for nickel anodes, nickel salts, nickel chloride, buffing wheels, coloring and polishing mediums and certain acids and alkalines.

Cleaning and plating tanks, buffing and polishing machinery were found on the Post and converted to our requirements. Tank rheostats and heating equipment were fabricated from salvage. Ammeters were reshunted, the internal resistance of voltmeters was altered to meet plating conditions, and Edison batteries were used to supply the necessary direct current.

The wood telephone case, after the exterior metal parts were removed, was scraped down to the natural wood, sandpapered, then bleached. One coat of shellac, then



NICKLE DEPOSITION PLANT
AS IMPROVISED BY Mr. Sgt. LEWIS H. HARRIS, 9th C.A.

two coats of varnish (all coats being rubbed down) were applied. Roxite was used instead of varnish on half of the telephones for the purpose of comparison. Many of the boxes had to be re-glued as dampness had caused the joints to separate.

The metal parts, all having a brass base, were stripped of any nickel that had not long ago peeled off or had been polished off by some of our predecessors in search of the "shine." Metal stains were removed and the parts buffed to a high luster, then thoroughly cleaned in a boiling hot alkaline solution, scrubbed with Vienna lime and then rinsed in clear water. The parts were then ready for the plating tank. To secure a good, heavy deposit of nickel the parts should be kept in the plating tank for 40 minutes at eight amperes per square foot of plated surface. The correct ratio of amperes to square feet is highly important.

After the parts had remained in the nickel bath the required length of time, they were removed and rinsed in clean water, dried quickly and then colored on a loose buffing wheel using a lime composition as a coloring and polishing agent.

Care was taken when disassembling not to disturb the interior wiring of the telephone, and after the telephone had been completely reassembled the transmision and bell circuits were tested and faulty parts renewed.

As this work was an "in addition to other duties" job, and as there were hundreds of name plates, binding posts, and other parts that had to be nickel plated, I advise anyone contemplating rehabilitating telephones in this manner to give the subject earnest thought beforehand. Available funds and labor, of the Civil Works Administration, assured the completion of this ambitious undertaking. Incidentally, due to the severe cold weather last winter, the nature of this work afforded useful employment for some of the CWA labor, indoors. However, regardless of the amount of work done on the telephones, the results obtained fully justified the effort. The drawing by Corporal Arthur C. Cole, Headquarters Battery, 9th C.A., of the plant shows clearly the setup of the equipment necessary.

The following is the list and number of each type completely rehabilitated:

171 telephones, wall composite.
41 telephones, wall composite, plotters set.
1 telephone, desk, composite.
31 telephones, Battery Commander's, composite.
30 telephones, gun, composite.
3 telephones, cut-off jack set.
3 telephones, switch key set.
16 telephones, hand set switch.
17 base line switch boxes.
2 transfer switch boxes.
14 cut out switch boxes.

329 Total.

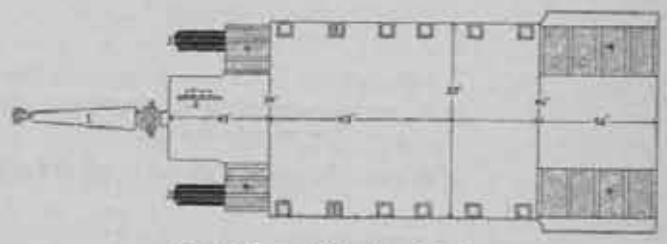
The nickel deposition plant was considered by the Signal Officer a magnificent success, after his saber chain was restored to its original "shine," and a second lieutenant's gold bars had been elevated to the rank of the owner through the nickel plating process.

An Improvised Plotting Car for 155-mm Gun Battery

By Captain A. J. Bennett, C.A.C. and First Lieutenant P. C. Sevilla, P.S. (C.A.C.)

THE question of suitable shelter for the plotting room of a mobile battery usually causes the battery commander some concern, as no provision has been made in tables of organization for this necessary adjunct. Apparently it is assumed that somehow the battery will be able to function regardless of the state of the weather. For strictly field conditions this is probably true, but when applied to the rapid emplacement of 155-mm batteries to supplement harbor defense artillery this becomes a very different problem. Usually buildings or other suitable shelter are not available in the immediate vicinity of the battery, therefore recourse must be had to some improvised shelter, usually a tent. This is not entirely satisfactory and has led to the development of a portable plotting room that can be moved to any desired location and made ready for use with the minimum of time and effort. In the selection of the kind and quality of matériel to be used, economy is usually the deciding factor and the battery commander must exercise considerable ingenuity to procure even the small amount of matériel required.

In the improvised plotting car which Battery C, 92d C. A. (PS), is using the battery was fortunate in locating a 10-ton trailer that would otherwise have performed no useful purpose. The acquisition of this trailer went a long way in solving our problem; in fact its importance was so great that the other details were of small consequence.



Floor Plan of Ten-Ton Trailer.

The Plotting Car in Action.

The first thing in the metamorphosis of the trailer was to divest it of all its component parts, above the floor and wheel covers, except the hand-brake lever. The trailer thus divested of its encumbrances provides a floor space of 65 square feet in its main or center portion with 12 and 14 square feet respectively at the front and rear ends.

The next step was to obtain necessary timbers for a suitable frame to support the overhead covering. Salvaged canvas was selected for this latter purpose due largely to its availability, not to mention its lightness and consequent managability. It was found that this offered sufficient protection for both personnel and matériel. The stake pockets attached to the edge of the floor space simplified the problem of affixing the posts to the steel frames. A visit to the salvage officer and his storerooms more than gratified the builders in the choice of materials.

The next and perhaps the most important step in the evolution of the plotting car was the installation of the various devices necessary for the range section of 155-mm gun battery. These instruments can be arranged in a number of ways. After several trials the following system of installation proved to be quite satisfactory. The plotting board was located toward the front end of the car. The Pratt range board was hung near the rear on the right side (facing the front end) and immediately on its left, the wind component indicator was installed. On the left-hand side of the plotting car we installed two gadgets consisting mainly of wooden rollers of battery construction. On the same side toward the front of the car we placed the range percentage corrector and immediately to the right of this the deflection board.

The necessary communication apparatus was then distributed in such a way as to be easily available to the man for whose use it was intended. The T. I. bell was attached to one of the posts close to the plotting board. For use at night, electric light drops have been installed. Wires from these were formed into a cable ending in a terminal strip, each appropriately labeled, located at the end of the plotting car. Figures 2 and 3 show the finished product. The boxes furnished with the plotting board are used for storing miscellaneous articles of equipment. A box with shelves (properly labeled) was placed on the right of the range board where required blank forms and other plotting room accessories are kept. In order to give the plotting car detail as much comfort as possible, mess stools were provided for each man. These are quite satisfactory and take up the minimum amount of the much needed floor space. The plotting car when completed had the following dimensions:

Height—10 ft. 9 in.
Length—17 ft. 10 in.
Width—9 ft. 4 in.

The authors make no pretense of having invented a new gadget nor of having found the "approved solution" of the problem but merely claim that we have devised a contraption that works quite satisfactorily and greatly reduces the difficulties encountered when a 155-mm battery moves to a new position.

★

THE IMPORTANCE OF FIELD EXERCISES *cannot be over-emphasized. Training by this means prepares leaders and led alike for the ordeal of battle. It fortifies units against the disaster of tactical surprise and insures them against excessive casualties in action. Field exercises form a welcome change from routine instruction and training. If their purpose and technique are well understood, if they are carefully and intelligently prepared, and if they are carried out in a realistic manner, field exercises can be made of extreme interest to all ranks.*—WISCONSIN NATIONAL GUARD REVIEW.

The Next Corporal

By Lieutenant Francis R. Sweeney
211th C.A., (AA), Mass. N. G.

"WHO'LL be the next corporal?"

That is a question which every company and battery commander is asking himself much of the time, and in very few cases is there a candidate sufficiently outstanding for the answer to be obvious. In the National Guard this is particularly true; in these organizations the battery commander sees his men for only a few hours a week, and unlike his brother of the regular service he is not afforded constant opportunity to observe them at work, at leisure and at play. The Guardsman, then, must supplement his own personal observations with those of his lieutenants, of his first sergeants, and perhaps of his other noncoms, and the promotion is apt to be his approval of their recommendations. However, not all captains seek such comments from their juniors, and those who do not are apt to delay until a vacancy exists.

"Whom do you think we ought to give those stripes to, Sergeant?"

"Why, Jones, I think, sir."

The subordinate whose opinion is asked seldom has time for a considered reply. It is possible that in many cases, given time to think over the question, his answer would be different, especially if he had some sort of standard by which to gauge his recommendations. Yet he seldom has the time; there is a vacancy open, the captain wants to fill it, and he wants his answer promptly.

Probably, as Grover Cleveland remarked of political appointments, "every promotion makes ten enemies and one ingrate." The unsuccessful aspirants seldom know why they were passed over, and resolve into morose individuals who inquire sourly, "How the hell do they pick noncoms in this outfit, anyway?" Even where the battery commander is wise enough to talk with them, pointing out the faults which need to be corrected before they may wear chevrons, they feel that it is only one man's opinion against another's, the captain's against their own, and consider themselves unjustly discriminated against because of one unfavorable judgment.

Appreciating that the limited contacts with his men afforded him by the National Guard necessitated his seeking advice as to N.C.O. material, Captain James Biggar, Battery B, 211th C.A. (AA), Mass. N.G., approved the rating plan drawn up by his Battery Executive. The scheme is designed to do four things:

1. To assist the captain in selecting available candidates for corporal.

2. To give subalterns and N.C.O's an opportunity to make recommendations at their leisure, and to provide them with a standard gauge.

3. To provide a concensus of opinion on each private's weaknesses which can be used to instruct and correct his faults or shortcomings.

An average value, representing the consensus of opinion of all his superiors, admits of little argument.

4. To show the captain what capacity for judging men is possessed by his juniors.

Rating sheets, shown in Figure I, were prepared in mimeograph form, listing the various points on which the captain wished additional information. Each lieutenant and the first sergeant filled in a sheet for each private in the battery, each chief of section for those in his section, and each corporal for the men in his squad.

The purpose of the rating sheets and their use was explained at an N.C.O. school. It was emphasized that the scheme was not an attempt at psychoanalysis or detailed character study, but an endeavor to get an estimate of each man more dependable than that of any single individual. To supplement this instruction, each rater is given the following set of notes:

This rating sheet is designed to aid the company commander in selecting privates first class and N.C.O's. It will be made twice a year, after camp and six months later, for each man by lieutenants, the first sergeant, the soldiers' chief of section and corporal. It should be the result of your careful thought and impartial opinion, unaffected by friendship for, or dislike of, the man upon whom you are reporting. There should be only one standard of comparison, and that is to rate each man as compared to the best soldier you know. Do not use it to build up a monument for anyone. Do not give a casual rating of "Excellent" all the way through because you do not want to be too hard on the man. Remember that a man who can be rated "Satisfactory" in every subject is an unusually fine soldier, and he should also have outstanding ability in a subject if he is to be marked "VS" or "EX."

Remember, too, that the caliber and ability of our noncoms largely decide the future of the battery, and if you rate a man fitted for a non-com's job, do it because you have answered "Yes" when you asked yourself, "Would I be willing to serve under him if I were a private?"

Consider the following points under each subject before you rate a man:

Soldierly Appearance. Is he a snappy soldier? How well does he wear his uniform? Does he take pride in his appearance? Is he the sort who keeps his shoes shined and his brass polished, or does he have to be jacked up on this sort of thing?

Precision and Snap. Is he good at close order drill, manual of arms, guard duty? How is his military courtesy? Is he the kind of soldier who always knows what to do in a formation, or the kind who will always be a rookie in ranks?

Knowledge of Soldiering. This sums up in one short question—"Does he know his stuff?" Can you tell him a thing once and know that he will always remember it, or is he the kind of guy who is always asking "How do you do this?" Does he know his IDR and his other duties? Is he the type you can always slap into a job on the gun

or the range section at short notice, or the kind who never can do anything but open ammunition boxes?

Ability to Instruct Others. Assuming he "knows his stuff," can he pass it along to others? Is he ready to take hold of a rookie at camp and show him the right way to do things? Is he the kind of soldier of whom a recruit in his tent instinctively asks questions, knowing he will get the right answers?

Ability to Get Along With Other Men. This is not a question of popularity—it means ability to get along. He may be quiet, not mix in very much or engage in many outside activities, but answer this one on the basis of whether he is liked by the others. Is he "Aces," "all right," or "thumbs down" in their opinion? Would he be respected and willingly obeyed if he were an N.C.O.?

Attitude on Details. Is he a goldbrick, or the kind who takes his details cheerfully? Is he the sort who is always yelling about getting stuck, or does he "take it and like it?" If you had him on detail, do you think he would do his share of the work or more, or is he the kind who is always disappearing from sight and works only when you keep on his tail?

Ability as a Leader. Is he the kind who takes charge of things in the absence of higher authority, or the kind who has no initiative? And if the former, does he do it in a way that the others accept without question, or is he the kind of self-appointed general who makes somebody ask, "Who the hell made you a sergeant?"

Behavior in Quarters. At camp, does he keep his equipment and belongings in order, or does the man in charge of his tent always have somebody picking up his stuff just before inspection? Is he the kind who is an asset to your tent, or a liability?

Battery Spirit. Does he have any interest in battery activities, or is he the "7:30 to 9:30" type who disappears as soon as drill is over? Has he the interest of the battery at heart, or is he just marking time and looking ahead to the date when his enlistment will be over?

Present Qualification as N.C.O. The answer is "yes" or "no"—is he ready for stripes now, or isn't he? If he is not, say "after another camp" if you think he needs only a little more seasoning; "sometime in the future" if you definitely think he has possibilities; "indefinite" if he is a new man, or you have not made up your mind about him; and "never" if you do not believe he ever should be a non-com.

Comparison to Present Corporals. Assuming he were a Corporal now, where would you rate him in comparison to the others? Put down the number you think are not as good as he would be. Answer this question for every man, including those whom you do not believe qualified for a corporalcy.

Remarks. Put down anything you wish which you think is not fully covered in the items above.

The five rating sheets on each man are handed over to the Company Executive for numerical evaluation and summarizing. While the sheets themselves are rated only by check marks, the various subjects have the following maximum values:

Subject	Weight
Soldierly Appearance	5
Precision and Snap	5
Knowledge of Soldiering	20
Ability to Instruct	10

BATTERY B, 211TH C.A. (AA)
FIRST CORPS CADETS
RATING SHEET

Name: *Jones, E. R.* Date: *2-1-34*

	EX	VS	S	FAIR	U	
Soldierly Appearance	—	—	√	—	—	3
Precision and Snap	—	—	—	√	—	2
Knowledge of Soldiering	—	—	√	—	—	10
Ability to Instruct Others	—	—	—	√	—	4
Ability to Get Along with Others	—	—	√	—	—	10
Attitude on Details	—	—	√	—	—	10
Ability as Leader	—	—	—	√	—	5
Behavior in Quarters	—	—	√	—	—	10
Battery Spirit	—	—	√	—	—	10

Do you consider that he is qualified now to be a noncommissioned officers? Yes—. No √. If not now qualified to be a N.C.O., when do you think he will be qualified? After another camp —. Sometime in the future √ . Indefinite —. Never —. 5

If he were made a Corporal now, to how many of our present Corporals do you think he would be superior? 0 0

Remarks: *Not very sure of himself yet. Will be a good N.C.O. when he has more experience.* —
69

(Signed)
A. B. Porter, Sgt.
(Name and Rank)

Figure I

Ability to Get Along	20
Attitude on Details	20
Ability as a Leader	20
Behavior in Quarters	20
Company Spirit	20

The numerical value of the subject ratings is transcribed as follows:

	EX	VS	S	Fair	U
5-point subject	5	4	3	2	0
10-point subject	10	8	6	4	0
20-point subject	20	15	10	5	0

The numerical values are entered by the Executive on the right of the sheet, as shown in Figure I. In addition to the ratings on these points, each man who is rated as "now qualified for noncommissioned grade" receives 20 points; "never," 0. In the comparison with the present corporals, a man receives 5 points for each corporal to whom he is rated superior. The weight given to "Ability to Instruct" is only 10 points, not because this quality is less important than the others, but because few privates have an opportunity to display their ability as instructors, and it is felt advisable not to have it enter heavily into their total score when so little is known of it.

The five rating sheets are tabulated on the summary sheet shown as Figure II. On the basis of six corporals in a battery with whom a man may be compared, the maximum mark he can receive from each rater is 190 points, or 950 from the five. On the summary sheet (for a C.A. unit), 50 points are added to this mark if the man is an Expert Gunner, 25 points if he is a First Class Gunner. He also receives a credit of 25 points for each six months of service in the company, with a maximum of 250 points. Deductions are made of 25 points for each AWL and 50 points for each AWOL from armory drills. Attendance at the last previous field training period for only eight days costs him 200 points, while failure to attend it causes a deduction of 500 points. The number of demerits assessed upon him for poor work at armory drills during the period covered by the report is also subtracted, and the net result turned over to the captain as the recommended rating.

The highest rating a man can receive, with maximum credit for service and no deductions for absence or de-

BATTERY B, 211TH C.A. (AA)
FIRST CORPS CADETS
SUMMARY SHEET

Name: *Jones, E. R.* Date: *2-1-34*

Maximum Rating		Total Rating	Corp.	C. of S.	1st Sergt.	2d Lieut.	1st Lieut.
25	Soldierly Appearance	13	3	3	2	3	2
25	Precision and Snap	11	3	2	2	2	2
100	Knowledge of Soldiering	55	15	10	10	10	10
50	Ability to Instruct	22	6	4	4	4	4
100	Ability to Get Along	50	10	10	10	10	10
100	Attitude on Details	45	10	10	5	10	10
100	Ability as Leader	35	10	5	5	5	10
100	Behavior in Quarters	50	10	10	10	10	10
100	Battery Spirit	55	10	10	10	15	10
100	Qualified as N.C.O.	20	5	5	0	5	5
150	Superiority	0	0	0	0	0	0
950	TOTAL	356	82	69	58	74	73

50 Gunnery Rating Credit	25
Service Credit	50
TOTAL	431
Less Attendance	25
Less Demerits	8

Recommended Rating: 398
F. C. Sweeney,
1st Lt., Battery Executive

Approved Rating: 398
J. B.
Capt. Commanding

Figure II

merits, is 1,250. The highest rating which has been given is 762, and the lowest 124, for which absence was largely responsible. The men are listed in order of standing, one list showing ratings only and the other the total scores including service and gunnery credits and minus attendance and demerit deductions. Each list indicates also which men are rated Satisfactory or higher in "Leadership" and "Present Qualification for Corporalcy," and no man is considered for noncommissioned rank, no matter how high his score, unless he is so marked. This is necessary because many men who are good soldiers, faithful in attendance and proficient as privates, and who consequently receive high totals, are nevertheless unfitted for command. Privates first class are appointed from the standing of the privates on the list, even though they may not be rated as qualified in leadership.

The use of the plan has produced some very interesting and informative results. It was apparent from the very first summary that it would be necessary to apply a weighting coefficient to the ratings submitted by the corporals and the chiefs of section before they could be used, due to a varying standard of excellence evident in their markings. It is essential that this be done in fairness to the members of squads and sections whose chiefs are inclined to strictness in their marks, and to prevent unwarrantably high scores for privates whose corporals and sergeants are lenient in their expectations. Adjustment to a common level is accomplished by taking the average rating given all the men in a squad or section by the lieutenants and the first sergeant, and comparing it with the average rating given those same men by the corporal or sergeant.

If, for example, the average rating for the seven men in the first squad is 100 in the eyes of the three superiors, and the corporal's rating for these same seven men averages 125, his grading of each man is reduced 20% before it is applied. This weighting does not affect the noncom's relative ratings of his men, but guards against unfairness as between members of different units. Experience to date has shown a spread in weightings all the way from a sergeant who looked upon everyone in his section with a jaundiced eye and whose ratings had to be increased by 23%, to a new corporal whose charity was greater than his judgment and whose marks were decreased by 70% before they could be used.

This fact has given the captain an excellent opportunity to learn what capacity for judging men is possessed by his subordinates. He has capitalized this by discussing the ratings with them individually, going into detail on the points where their judgment seemed far out of line with the others. This has had a strong influence in developing a uniform standard for performance in the company, and in insuring that officers and N.C.O's alike are seeking and demanding the same standard of performance from the men. It has, likewise, a beneficial effect upon the morale of the N.C.O's in letting them know that their opinions are sought and used in such important matters as promotions.

Undoubtedly the greatest value the plan has is the assistance it affords in constructive criticisms of the men. Each man's ratings are discussed with him, the points on which he is rated less than satisfactory being particularly stressed. Every care is taken to keep the marks confidential, the total score in each case being known only to the man concerned, the first sergeant and the officers. Furthermore, the summary sheet is so folded when it is discussed with the man that he sees only the totals, and can not learn nor resent the adverse opinions of individuals. However, with these totals available, the ambitious (and disappointed) aspirant for his corporalcy need no longer be content with the information that he "wasn't the best man for the job"; the very items which kept him from those chevrons can be shown to him, and there can be pointed out the faults which must be corrected before he can secure promotion. The newer men have their weaknesses demonstrated to them in time to rectify them before bad habits become fixed. An average value, representing the consensus of the opinions of all his superiors in the chain of command, admits of little argument; it is far more impressive and convincing to the soldier concerned than would be the personal opinion of any single individual, no matter how high his rank nor how respected his judgment.

Properly used, of course, the system is only a means of presenting reports on the men for the information of the captain. It is not a method of selecting N.C.O's by committee vote or majority opinion, for the final choice is the captain's guided but not controlled by the opinion of his subordinates. Our experience with the plan has been entirely satisfactory, and its continuance as a permanent feature is planned. The forms are easily prepared, and no involved or elaborate instruction in their use is necessary. The numerical summary, and particularly the use of the weighting feature, may involve the frenzied application of a slide rule and recourse to the higher levels of abstract mathematics, but this, after all, will fall upon a lieutenant, and any lieutenant, of course, can bat out something of this sort in any one of his many leisure hours.

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YOU CAN *sew brass buttons on a man, but that won't make him an officer.*—HARBORD.

Will It Happen Again?

By Major Leonard R. Boyd
Infantry

Part II

The Attack Continues

OBSERVERS on the crest of the rise at the company position reported that the tanks were leaving the ravine to the northeast of Missy. The company was formed and moved forward over the rise. No artillery fired on us and only one machine gun opened fire as the first line moved forward. The cessation of 77-mm. fire was the result of patrol action from "D" Company and from the 26th Infantry, which had reached the east side of the ravine shortly after the tanks had moved forward past our position.

In connection with the reduction of the direct fire 77-mm. guns, an incident was related to me which illustrates the methods used. Two men became separated from one of the flank patrols of the company, but continued on toward the east bank of the ravine. Hearing the sound of firing higher up on the slope, they worked their way to within a hundred yards of a well-camouflaged 77-mm. gun. At this point they were discovered and the gun was trained on them. Both the men were wounded at the first shot. One, Private Lloyd Helm, was hit by a shell fragment which tore off his chin. Helm, disregarding this serious wound, rushed straight at the gun which continued to fire at him until he reached the position. The gun crew shot at Helm with their pistols, but apparently the sight of a bloody and chinless American soldier was more than their shooting nerves could stand. Helm killed the entire crew but died en route to the rear. His companion, after telling a comrade of the deed, also died. A painstaking investigation resulted in the conclusion that there was insufficient evidence to warrant applying for a posthumous decoration for Helm, but I am satisfied that the story is true.

The action of the company in passing through the ravine is shown by an extract from the personal diary of the author: "McFaden's patrol, with the added assistance of the tanks, was sufficient to draw most of the fire from the Boche, and we advanced to the bottom of the ravine with but few casualties. The trees in the valley were torn and huge branches almost obstructed our passage and, in addition, the ground was soft from the sluggish stream which wandered aimlessly toward our left. Our counter-

Many seemed to hold to their expressed opinion that one might as well be wounded or killed early in the fight as later.

battery heavy artillery had combed the valley rather thoroughly and, while there had been no guns there, it showed what would have happened had they been there. The stream had been changed by the shells falling in it and the whole floor of the ravine was a mess of broken branches, fallen trees, and a churned up bog.

"After crossing the stream we lined up before starting out of the cover of the trees and beginning our advance up the hill. One machine gun opened up on us and halted our progress. The hill was so steep that it was impossible to walk straight up, for the grass was long and slippery; so I sent out patrols to the front and, after they had gone on about 200 yards, brought the company up some small ravines in platoon column formation. At one of our halts, I saw a group of men in a farmhouse close to the location of the machine-gun fire of a few minutes before, and I had a few of the men open fire, I along with them. We fired about thirty shots—uphill at about 400 yards —and strange to say did not see the men move, so I had firing stopped. I was rather disgusted with our marksmanship, but afterward felt better when I found that the men we were firing at were advanced elements of the 26th Infantry."

"I halted the company at the top of the hill and sent the following message:

" 'FROM: C.O. Co. D, 16th Inf.
At: Pt. 600 yds. N. of MISSY-aux-BOIS
Date: July 18, '18 HOUR: 11:20 AM
TO: C.O. 1st Bn. HOW SENT: Runner.

Was held up on the left of the objective by machine guns and 77-mm. guns. Got four tanks and attacked. Got mixed up between 26th and 28th Infantry at start. Lt. Col. Craig decided we should not remain in sector. Am moving on to take original sector unless emergency occurs.

BOYD
Captain' "

I moved off to the left to get in touch with a group of officers whom I found to be Major McCloud, 26th Infantry, and other officers of his battalion. He stated that two companies of his battalion were lost and requested that I occupy the line from that point to the 16th Infantry zone of action. I did this by placing two platoons on the line 100 yards east of the unimproved road, with combat groups of one squad each spaced over the 700 yards of front. The 3d platoon was moved to the head of the draw 300 yards east of Missy-aux-Bois, as reserve. The officers and men from the 26th Infantry were turned over to the 26th Infantry and the remainder of the 5th platoon divided among the three platoons of Company D. The Moroccans and the Marine had become separated from the company during the crossing of the ravine. The location of the platoon which had accompanied the tanks was unknown, although we had seen the tanks moving east across the Paris-Soissons road. I inspected the line of outposts and then went to Missy-aux-Bois where I found the remnants of the 1st Battalion, 16th Infantry, which had taken shelter from artillery fire in the ditches west of the Paris-Soissons road. This was the first time we had gained contact with our battalion since leaving the first objective. The battalion commander and staff had all been wounded shortly after the jump-off, and Major M. A. Wells, who had been in command of the regimental trains, had been sent forward to take command.

I reported to him and related the actions of the company and its present location. About an hour later the two platoons on outpost duty were relieved and reported to me in the battalion area. Major Wells assigned Company D to the left half of the regimental zone of action. Later the platoon which had accompanied the tanks across the ravine reported in, minus several squads. I placed three platoons on a line across our sector and one in support, about 100 yards east of Missy. The platoons were lined up along the trace of the trench to be dug and each squad instructed to dig a simple trench about 30 feet long and then connect up with adjoining squads. The entrenching progressed rapidly, even with our small tools. We were hampered, however, by a sniper in the trees along the Paris-Soissons road, who shot at any man not carrying a rifle. This sniper would fire only once every fifteen minutes and it was difficult to determine the exact direction from which the shots came. I gave orders that all runners and officers should carry rifles with fixed bayonets and I complied with this order myself. I sent out a patrol commanded by a lieutenant and although they searched along several hundred yards of road the sniper could not be found.

The entrenching went rapidly, even with our small tools.

German airplanes were circling around continuously, dropping bombs and firing at us with machine guns. Major Wells was fatally wounded by one of these bombs and the command of the battalion passed to the commander of Company B. One German aviator came down to within three hundred feet of us and was so bold that someone fired at him. Instantly the entire battalion stopped entrenching and began firing. We had been taught a complicated

system of leads to use in antiaircraft firing but it was all hazy in my mind and I doubted if many of the firers even remembered to aim ahead of the target. Everybody fired, however, even the officers with their pistols. The fire was apparently ineffective at first but suddenly the plane began to lose altitude and glided to the ground about a quarter of a mile to our rear. It was wrecked in the crash and the pilot was found dead with several bullet holes in him.

The trenches were completed about 6:00 p.m. By this time I was hungry, having eaten my two sandwiches during the morning, so I ordered the men to open one can of meat and two cans of hard bread (from the emergency rations) for each two men. It was barely dark when we settled down for a rest in our trenches—our first in over twenty-four hours.

Our rest was brief for the battalion commander issued oral orders for a night advance to start at 9:30 p.m. The company left the trenches and marched across the Paris-Soissons road and formed up as left assault company of the battalion. None of us, not even the battalion commander, had any details of the attack except the time of departure. It was a bright moonlight night and conditions were favorable for an advance without coming under the heavy machine-gun fire we had experienced during the morning. After the battalion waited in readiness for about one hour, however, an order was received cancelling the attack. Upon receipt of this the company moved back to its trenches and again made preparation for getting some much needed rest. The night air was cold and our raincoats were hardly enough to keep us warm.

The German bombing planes came over in relays all night long—dropping flares which lighted up the entire area and then dropping their bombs. Fortunately none of these landed in the trenches, but no one slept during that night.

Shortly after midnight the mess sergeant brought up sandwiches and coffee in the ration cart, and the hungry men ate their two sandwiches each, not thinking to save one for the morning. About the same time two ambulances came up and collected some of the seriously wounded men of the battalion. Many of these had been wounded twelve to fourteen hours previously but could not be moved because of the shortage of litters.

July 19. The Second Day

The battalion formed for attack at 4:30 a.m. with Company D the left assault company. As the orders arrived only a few minutes before 4:30, each platoon leader was instructed by runner to lead his platoon to the assembly position which we had used for the night attack (about 200 yards east of the Paris-Soissons road). One platoon was missing, as the battalion moved forward. The lieutenant in command had proved inefficient under fire on at least two previous occasions and I had urged the battalion and regimental commanders to relieve him and assign him to duty outside the combat zone. He was ex-

A churned up bog.

amined by the regimental surgeon when we were in a rest area, and, as might be expected, appeared perfectly normal. The battalion commander, who had been wounded early in the first day's advance, had never observed this lieutenant under fire, as he himself had made few if any inspection trips to the front-line companies during our trench warfare operations. This lieutenant was conscientious and, I am certain, was not lacking in courage, yet the first few shells which exploded near him set him shaking; his face became ashen and the pupils of his eyes dilated. When orders were given to him, in this condition, he would stare blankly and make no move to obey. If asked why he was not obeying he would shake his head and ask for the instructions to be repeated. Under such circumstances I had usually relieved him from command, placed him in company headquarters and instructed the platoon sergeant to carry out the orders. I had watched him during the first day's operations and apparently he was getting along better than usual. At least his platoon, which was in the support wave, was well directed, either by him or his platoon sergeant. I questioned the runner who had gone to this lieutenant with the order and found it had been delivered. However, some two hours later, when discovered by the commanding officer of the 3d Battalion, 16th Infantry, he claimed that he had never received any move orders. I resolved to prefer charges against him should both of us survive the engagement. This decision was prompted by a desire to have a reliable platoon commander and also to place this mentally unfit individual in the noncombatant zone. This action was never taken as the lieutenant was killed on July 21 while leading his platoon against an enemy machine-gun nest. At that time he was still irresponsible but always ready to risk his life when the advance was once started.

The 2d Battalion, 16th Infantry, having lost all its officers, was holding the advanced regimental line about 600 yards southeast of the Paris-Soissons road. Behind them, the company formed for the advance and was fired at by machine guns from two disabled French tanks a few hundred yards east of the Paris-Soissons road and to our left flank. There were remarks made to the effect that the "Frogs" were mixed up again, but this was found to be incorrect. A patrol, sent to silence the guns, found that two Germans had occupied the tanks during the night. As the patrols advanced they disappeared into the wheat fields. Long-range machine-gun fire and scattered artillery fire inflicted casualties but did not check the advance of the battalion. A halt was made on the line held by the outposts of the 2d Battalion, as we were now apparently visible to several machine gunners as well as to artillery observers. Casualties were numerous; yet we had not seen a single German during the day.

We found several seriously wounded men in this position—men from the 2d Battalion who had been wounded on the morning of the previous day and who had received no attention beyond first-aid bandages. I found out that no litters had been available and that if a man could not walk he remained there until the front line moved far enough ahead for the Medical Corps to reach him. In justice to the regimental medical personnel, it must be said that they had been busy every hour since the jump-off, and the breakdown in the evacuation system was the fault of the higher echelons.

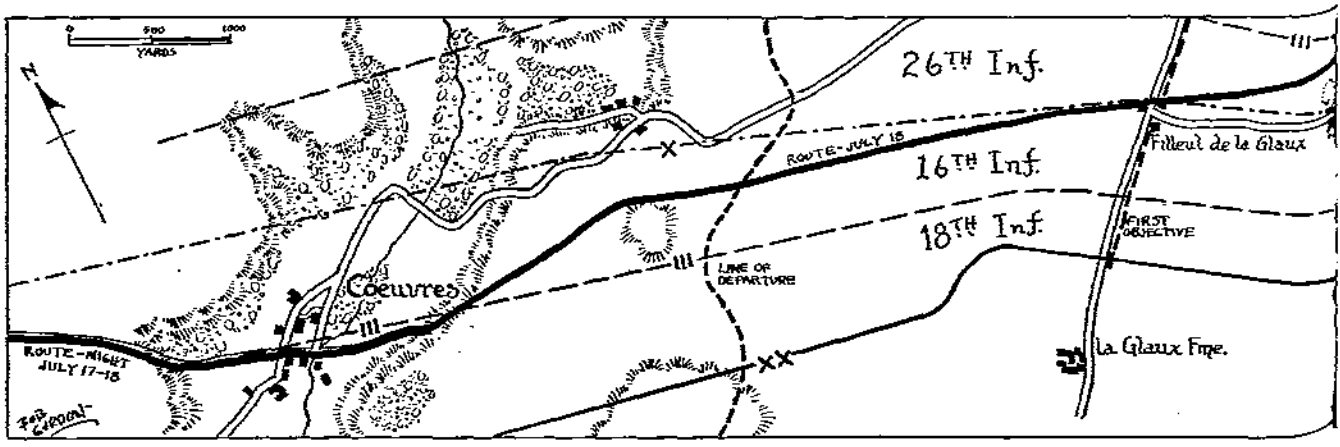
The battalion resumed the advance after a thirty-minute halt and immediately drew heavy machine-gun fire from both flanks and the front. Artillery shells dropped in the formation with such accuracy that our advance was slow. A slight rise about 1,200 yards northeast of Chaudun Farm offered some shelter from machine-gun fire, and the entire battalion closed up in the depression 200 yards west of this rise.

The machine-gun fire seemed to be coming from the wheat field crowning the rise, so I passed the word along the firing line that the leading platoons were to charge toward the top of the hill. This seemed to be in line with war fiction in which the brave captain led his company in a charge against the enemy and, while the enemy could not be seen, his machine-gun bullets could make his presence very real. These orders miscarried somewhat and, as I jumped up, the entire company advanced and not the leading platoons as ordered. The machine-gun fire did not vary in its intensity and few men fell. The support platoons, advancing in squad columns had the misfortune to have a shell land on a column in which the platoon leader was marching, and again the cries of the wounded were heard above the noise of the exploding shells and the "crack" of the passing bullets. The charge started at a run but soon slowed down to a jog, due to the difficulty in climbing the incline over slippery grass. The line was walking as the crest of the hill was reached and still we heard the machine guns firing, still further to our front. We were now under observation of the gunners and a few bursts in our ranks convinced me that our comic-opera charge had been premature. One platoon was instructed to dig in along the top of the rise while I took the other two about 100 yards to the rear.

I found that it was a great relief to be busy so I, with my striker, dug a shelter in a new shell-hole. There was a great demand for new shell-holes as there was a superstition in the company that two shells never landed on the same spot. I worked until I was wet with perspiration, then felt a passing of the extreme nervousness which had seized me after our "capture" of the hilltop.

A sergeant, with a platoon of Company G, 16th Infantry, reported to me and stated that the rest of his company was scattered or wounded. I assigned him a place in the rear of and to the right of the two support platoons, and instructed him to remain with the company until further orders. Shell fire continued on our position and casualties were numerous. There was a first-aid man with the platoon from Company G—the first we had met since the jump-off on July 18. The company was now dug in below the surface of the ground and I found, in my inspection trips, that the exercise had calmed the men to such an extent that they were joking about which platoon was due to have the next shell fall on it.

I made several reconnaissance trips to the top of the hill but could not locate the machine guns to our front.



The 18th Infantry had moved up on line with us on our right, but the 26th Infantry, on our left, was not visible. I had returned to the support position of the company when one of the captains of the battalion came running back from the top of the hill to our front, shouting that German tanks were coming. He was extremely excited and, in answer to my question, stated that he was positive that they were German tanks and that we had to get to the rear at once. He then went off at a run to warn Company B, which was to our left rear. The sight of an officer moving rapidly to the rear had a startling and disastrous effect upon the men. Before anything could be done to stop them all of Company B and part of Company D rose and ran to the rear.

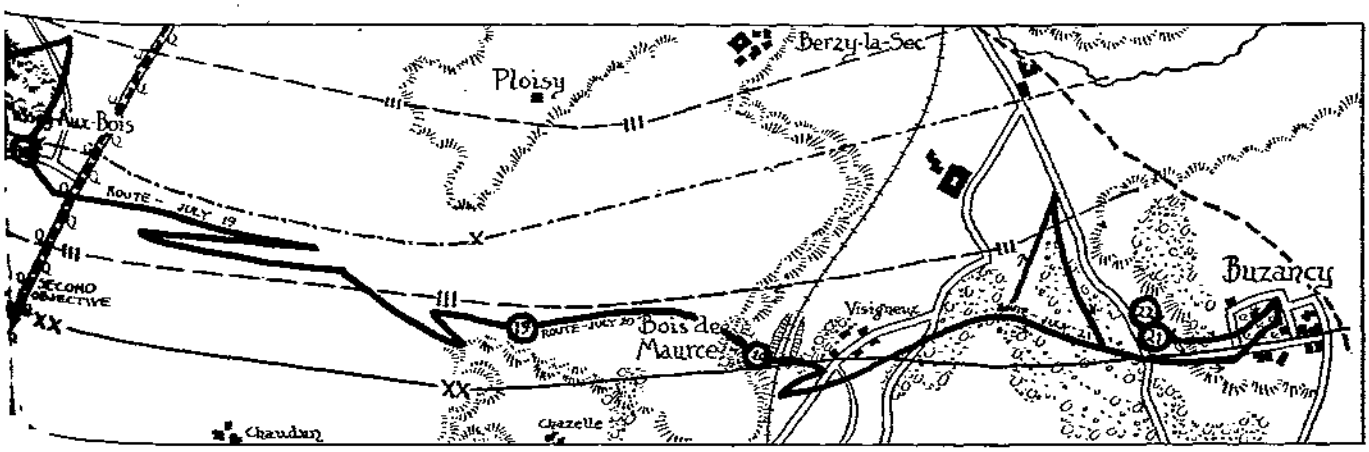
I considered what I should do. Should I stay with the remainder of my company and try to defend the position against the tanks? What could we do with rifles against them? Before I came to a decision the rear platoons got out of their shelters and joined the mass of men running to the rear. I shouted and blew on my inefficient whistle, but the men in flight either did not hear me, or hearing, paid no attention. A group of men near me began putting on their packs and climbing out of their pits. I noticed their frightened expressions and curtly ordered them back. Then I hurried toward the men who were starting to run, shouting to them to stop. As soon as the remaining men saw me run to the left rear everyone jumped up and fled. I stopped several men near me and as long as I remained within a few feet of them they stood fast, and I could feel the urge of flight pervading the atmosphere as definitely as though it were a cold wind. In a few minutes the area was clear except for my striker and me and our wounded. The battalion was running over the rise 300 yards to our rear and no effort was being made to stop them. The sense of impotence and shame that my company should break and run while I was there trying to stop it brought tears to my eyes. I realized that my striker and I could be of no use against two German tanks (and I did not doubt but that they were German tanks after the officers' actions) so I decided to rejoin my company. We fixed a raincoat shelter over the faces of the wounded men to shield them from the hot sun, told them that we would be back as soon as the company could be found, and walked back toward our jump-off position of that morning. My striker, an Austrian by birth, drafted from the coal fields of Pennsylvania, remarked, "Captain, what could we do? The devil himself couldn't have stopped them."

The two tanks appeared to the northeast and I wondered at their similarity to the French tanks. I was surprised that they did not follow the retreating battalion and that they did not fire on us. German machine guns opened fire on us as we reached the rise 300 yards in rear of our former position but the ground was too damp to indicate the strike of their bullets and we passed out of sight in safety.

I found that the company, with the rest of the battalion, had stopped in the trenches occupied by the 3d Battalion, 16th Infantry, which was in brigade reserve. The three platoon commanders were busy collecting their units from the jammed mass of soldiers in the trenches. The elements of Company D were moved to the left and grouped together. The battalion commander of the 3d Battalion, 16th Infantry, ordered me to place a line of men armed with Chauchat rifles in advance of the main line of trenches and to try and stop the tanks. This done and with nothing left to do but wait for the tanks, I crawled into a shell-hole on line with the automatic riflemen and ate a cake of chocolate and some hard bread. I was tired and depressed and worried about how we were to stop the tank attack with automatic rifles. These worries were of brief duration, for sleep—the first in some sixty hours—overtook me.

I was awakened by a runner and led to Lieutenant Colonel Craig, who was assembling the 1st Battalion for an advance over the ground we had just given up. I found that the missing platoon of the company was in the trenches with the 3d Battalion and listened to the lieutenant's incoherent explanation of his failure to join the company early in the morning.

One of the tanks, which had proven to be French, had been disabled about 500 yards to our left and, during our formation for the advance, shelled us with 37-mm. shells. I presumed that the French crew had quit the tank and



I hurried toward the men who were starting to run, shouting to them to stop.

that Germans had been quick to use it as a pill-box. This fire was very inaccurate and did not seriously interfere with the formation or the advance. Lieutenant Colonel Craig led the battalion and inspired all by his coolness under a variety of conditions.

The battalion moved to the south of the rise where we had halted during the morning and soon began to come under heavy, close-range machine-gun fire. The battalion was halted and Lieutenant Colonel Craig asked for volunteers to go with him to get the machine-guns. I was somewhat surprised to see most of Company D volunteer and found it hard to reconcile with their individual actions of a few hours before. The machine-guns were captured or chased away and the battalion resumed the advance until other guns began to inflict casualties, when the same procedure was repeated.

The head of the Chazelle ravine was reached in this manner and the entire battalion moved into it and welcomed the shade of its trees. Company D was ordered to move along the ravine and clear the way for the advance of the battalion. An advance guard formation was taken and the company moved forward, hoping to find something tangible to fight against. The point reached the opening of the north branch of the ravine into the ravine proper and drew machine-gun fire from a hedge about 300 yards to our front. Several men were killed and wounded by this fire and the company took shelter along the sides of the narrow depression while several observers assisted me in trying to find the location of the machine gun. I could not pick up any sign of it, even while it was firing, but saw several spots in the hedge where a gun might be concealed. One of the sergeants and I fired several shots at these points and were rewarded by an equal number of 37-mm. shells landing in the crowded ravine and which hit several more men. None of us were able to pick up the location of the 37-mm. gun.

Lieutenant Colonel Craig came up during this firing and was informed of our difficulties. He immediately called for volunteers and led a patrol of one lieutenant and ten men from Company D out into the draw. All crawled the first few yards until cover was reached, where the patrol divided and converged toward the sound of the machine-gun. The Germans, seeing two groups moving toward them, fled from their gun. Fire from this gun had wounded the lieutenant and one man of the patrol and they were brought in when the patrol returned. An occasional shell in the ravine added to the casualties and the wounded from the fields in the rear were brought in. It gave the draw the appearance of a combined morgue and dressing station. Every wounded man asked for water, though most of the men had empty canteens. We had had no opportunity to refill canteens since leaving Missy the previous night. The hot July sun, the exertion of the attack, and the excitement of the day had made the men use all the water in their canteens before noon.

The battalion withdrew from the ravine and formed for attack at 4:30 p.m. Company D was the left assault company and advanced along the north edge of the Chazelle ravine. The advance met no resistance until we had reached a point about 400 yards north of the town of Chazelle, when machine guns from our front halted the line. The 18th Infantry could now be seen advancing toward Chazelle, and Moroccan troops on their right were prolonging the line of advance. The 26th Infantry line was now abreast of us on our left and was receiving heavy machine-gun fire from its front.

Machine-gun fire from the Chazelle ravine attracted

"Captain, what could we do. The Devil himself couldn't have stopped them."

my attention and I discovered a stone emplacement with a gun crew in it, firing at the 18th Infantry. These gunners were below us and about 500 yards away and apparently had not noticed our approach. I borrowed a rifle and fired several shots at them. Some of the machine-gun crew hastily withdrew, leaving their gun in position. This incident is worthy of note as it was the only German machine gun I saw in operation throughout this engagement. We had been fired at by scores of them but in every case, excepting this one, their location was so well concealed that we could not fix their position even while they were firing.

Two squads of the Machine-Gun Company, 16th Infantry, rejoined us here, as we started our second advance. They kept up with us throughout the remainder of the day in spite of their heavy loads and the excessive heat. Lieutenant Colonel Craig ordered the battalion to halt for the night on its present line and to place outposts to the front. The machine guns were sited to fire along the road which was cut into the side of the Chazelle ravine. One platoon placed sentry squads across the front and connected with the 26th Infantry, which was about 400 yards north of this road. The remainder of the company was withdrawn along the side of the ravine, near two large caves, 200 yards from the outpost line.

No opportunity to fill canteens.

Waved a handkerchief to the machine gunners in hope they would stop firing.

Volunteer details were sent into Chazelle to fill canteens and the entire company wanted to go. The town was being shelled heavily but the thought of plenty of water appealed to every man. The danger element did not bother most of the men, as it was common belief that a shell must have a man's number on it before it could hit him; also, many seemed to hold to their expressed opinion that one might as well be wounded or killed early in the fight as later.

Just before dark several companies of Moroccans passed through our position, moving along the road paralleling the ravine. Attempts to find out their destination were fruitless, as neither unit possessed interpreters. The whole picture of war was rather jumbled, and the fact that the French were wandering about in our sector was a minor detail in the day's mistakes.

I authorized one can of meat and two boxes of hard bread, from the emergency ration, to be divided between each two men. This should have left each man with two boxes of bread but no canned meat. All had been cautioned to re-supply themselves from the packs of men who had been killed or wounded. It was interesting to note the alacrity with which a wounded man's pack was rifled, while those of dead men were left strictly alone—except by the most "hard boiled" members of the company.

(To be concluded)

The Castle of Rip Raps

By Wm. E. Beard

IN 1816, during the administration of James Madison, Congress, as a result of "the admonitions" of the War of 1812, made provision for the national defense by authorizing an increase in the navy and the construction of fortifications "throughout the whole extent of our maritime frontier."

That same year there arrived in Washington, Simon Bernard, late a lieutenant general in the French Army and before that an *aide-de-camp* on the staff of Napoleon. Military authorities recognized him as "one of the most distinguished military engineers of the age," and on November 16th, 1816, the government commissioned him "assistant in the Corps of Engineers of the United States," with the rank of brigadier general by brevet and the compensation allowed the chief of the Engineer Corps. He continued in the service of the United States until his resignation July 8, 1831, his duties then having been completed, and too, threatening conditions in Europe attracted his attention there. Associated with representatives of the army and navy General Bernard mapped out a complete program of coast defense for the United States, the works suggested extending from Mount Desert, Maine, to the southern coast of Louisiana.

Embodied in this vast coast defense program was a project for the fortification of Hampton Roads, an object of especial interest to American soldiers and seamen since the close of the War of 1812.

On January 24, 1818, a commission, army and navy, composed of Joseph G. Swift, Lewis Warrington, Walker K. Armistead, William McRae and Jesse D. Elliott, reported in favor of fortifying the roads, proposing companion works, one built on Old Point Comfort and the other on the shoals opposite. Six months later (July 25, 1818), General Joseph G. Swift, Chief of Engineers, on behalf of the War Department, entered into a contract with Elijah Mix for 150,000 perches of stone from the banks of the York River in Virginia, to be delivered at Old Point and the Rip Raps Shoals, deliveries to commence on September 15, 1818, and to continue at the rate of 3,000 perches per month; the compensation to be $3.00 per perch.

The defensive works, contemplated in the contract, to protect what was to become one of the country's great naval bases, included what has since become Fort Monroe, named for the President, occupying practically all of Old Point Comfort, and Fort Calhoun, named for the eminent South Carolinian, then Secretary of War, to be constructed 1,900 yards south of Old Point on Rip Rap Shoals, so-called from the continual ripple of the surface, the result of the action of the sea and the reaction of the bar upon the shoal water. The depth of water upon the shoals was 10 to 18 feet, and a site for the projected fort there had to be built up by dumping rocks into the water until a substantial island was formed. Fort Calhoun was designed to be an inclosed casemated work with four tiers of guns, three in casemate and one "en barbette." Because of its type of construction this fort was sometimes referred to as Castle Calhoun or the Castle of Rip Raps.

The estimated cost of Fort Monroe was a million and a quarter dollars. An armament of 371 cannons and mortars was planned for it. Its war time garrison was to be 2,625 men; that in peace times, 600. Completed Fort Calhoun was to cost $904,355 and provision was made in the plans for 216 guns, and for garrisons of 1,130 in war and 200 in peace.

Deliveries of stone under the contract made by General Swift with Mix did not begin until the following November. After the delivery of a few cargoes of stone it developed that the York River variety was not satisfactory, and Mix was required to get his stone elsewhere or give up the contract. The material subsequently delivered under his contract came from quarries on the Potomac River near Georgetown, and was granite. A reduction in shipping rates and labor cost about that time saved the contractor from utter ruin.

Progress upon the works at Hampton Roads was slow. In 1824 the island upon Rip Raps Shoals had become an accomplished fact, but more time was required for the stones underlying it to settle, so that it was not until 1826, eight years after Elijah Mix had contracted to deliver material for it, that the corner stone of the fort was laid.

The corner stone of Castle Calhoun, as the work was called in the accounts of the day, was laid by Major General Jacob Brown, commander-in-chief of the Army, then on a visit of inspection to Fort Monroe. By the general's order an "artillery corps for instruction," a composite regiment drawn from the four artillery regiments then existing, had been established at Fort Monroe two years before.

As a compliment to General Brown, the date selected for the corner stone laying at Castle Calhoun was September 17, the anniversary of his fierce sortie from Fort Erie in 1814. The program included a prayer, then music. In taking the tools required for the ceremony, the old soldier paid a tribute to those who had shared with him the sanguinary fighting in the vicinity of Fort Erie. With the last strokes of his hammer upon the great stone, just laid, cannon roared a salute and the Stars and Stripes rose majestically above the rugged island of rock. The salute was answered from Fort Monroe, and as the company assembled for the ceremony prepared to leave the Rip Raps a band played "Yankee Doodle."

In 1828, Captain Basil Hall of the British Navy, then on an extended American tour, visited Old Point Comfort and inspected the fortifications under construction at Hampton Roads. At the Rip Raps the masonry was six

or seven feet above the surface of the island, and everywhere bustle and progress were in evidence. Captain Hall anticipated that the cross-fire of the two forts would make it "rather hot for an intruder."

The accepted opinion among military men then, and for some years afterwards, was that six 24-pounders on shore, when properly directed, were superior to the broadside of a 44-gun frigate, and double that number of guns of large caliber were superior to the broadside of a 74-gun ship, provided the land batteries were so placed as not to admit the approach of vessels within the effective range of grape and case-shot.

Work upon the companion works at Hampton Roads was in progress during the administration of Andrew Jackson.

The old warrior took a personal interest in the project and during his occupancy of the White House he frequently journeyed to Old Point Comfort. Many of his letters bear the date line "Rip Raps," but they do not always make it clear whether the name as he used it referred specifically to Fort Calhoun or to Old Point Comfort. There are in existence receipted bills for a stay of himself and members of the White House circle at the "Hygeia Hotel, Fort Monroe," in the summer of 1833, and for a similar stay in 1835, the later being dated simply "Fortress Monroe." At least some of the old hero's days, however, were spent at the Castle of Rip Raps. From this grim retreat—shut in "upon these rocks," as he expressed it—in the summer of 1833, went his condolences to the family of his old companion in arms, General John Coffee, his unfaltering aid in other days in divers personal as well as military conflicts, pointing them with Presbyterian definiteness to the consolations of religion. Too, in 1835, a caller from Norfolk has recorded that he found the President in "the summer house" at Fort Calhoun, in company with Francis P. Blair and Andrew Jackson, Jr.

In 1831, Jackson was at the Rip Raps with his friend and adviser, Judge John Overton of Nashville. This was immediately following the disruption of his Cabinet, the result of the differences among the members' families regarding the social aspirations of Mrs. Eaton. John C. Calhoun was at the moment very much under the ban of the President's displeasure. It had come to light that Calhoun, as Monroe's Secretary of War, had favored disciplining him for the invasion of Florida in the first Seminole War; also the General regarded the South Carolinian as the leader in the "persecution" of Mrs. Eaton. The sight of the fort on Rip Raps and the realization of its name must have stirred his emotions just then!

And other circumstances to confirm the President's enmity toward Calhoun were to arise: his deciding vote against Martin Van Buren's confirmation as Minister to the Court of St. James; the nullification embroglio, tossed by South Carolina among the problems of the administration, and finally Calhoun's alignment with Henry Clay in the fight over the United States Bank.

The marvel is that after some visit to his favorite resort, Old Hickory did not dash off an executive order, giving a less detestable name than Fort Calhoun to the Castle of Rip Raps.

That transaction was reserved for another occasion.

Jackson was not the only President who sought the solitude of Fort Calhoun as a place of refuge. Another was John Tyler. On September 10, 1842, Mrs. Letitia Christian Tyler, the first wife of the tenth President, died at the White House after a long illness. On the ensuing Monday after a funeral service at the Executive Mansion, the remains were conveyed to New Kent County, Virginia, where they were interred. This ceremony over, the President boarded a steamer above Jamestown for Old Point Comfort. Fort Calhoun was the place he had selected for a brief period of retirement from social intercourse and from public duties. With him to console him were Henry A. Wise of Virginia, and Caleb Cushing.

While the party remained at Fort Calhoun, the President was waited upon by a delegation from Norfolk, tendering him the hospitalities of the borough. President Tyler of course excused himself, expressing a wish to avoid all public attentions.

Fort Monroe and Fort Calhoun were constructed with a view of a cross-fire from formidable batteries of cannon on an unfriendly vessel attempting to enter Hampton Roads from the open sea beyond the Virginia Capes. As is the case frequently with humanly conceived defenses, the menace when it did come came from an entirely different direction—from the waters of Virginia, as a result of the War Between the States.

The approach of that war found Fort Monroe in an excellent defensible condition, the work needing only a few minor repairs, so Brevet Brigadier General Joseph G. Totten reported to Joseph Holt, Secretary of War, on January 10, 1861.

On the other hand, Fort Calhoun was still under construction, and ready for neither armament nor garrison. Early in the year 1861, constructive operations there were stopped because of intersectional feeling, but they were resumed in June, preparations being made to mount guns there. The castle had then been carried up only one tier of casemates. The engineering department in November asked an appropriation of $200,000 for continuing construction there. Lieutenant Colonel R. E. DeRussy was the engineer in charge of the companion works at the outbreak of the war.

As late as October, 1861, accommodations had been provided at Fort Calhoun for less than 200 men, and rather indifferent accommodations at that. A company of volunteers was on duty there, and prisoners and convicts to the number of fifty or sixty made up the remainder of the castle's population. The proposition was considered of transferring the fort from the Army to the Navy, with general command, however, remaining in General John E. Wool, who commanded the department with headquarters at Fort Monroe. With this latter proposal Flag Officer L. M. Goldsborough, commanding the Atlantic

Squadron, found fault, though reporting to the Secretary of the Navy that the Rip Raps should by all means be put in good fighting condition at once. He announced his purpose to await further instructions from the Navy Department. These instructions were never given, and Castle Calhoun continued under the command of General Wool. Two companies of the 99th New York Infantry, a coast-guard regiment, were assigned to the work, under command of Lieutenant Colonel Gustave B. Helledey.

Meanwhile the Confederates at Norfolk went forward with the project of converting the frigate *Merrimac,* raised from a watery grave, into the floating fortress *Virginia,* and rumors of the conversion reached the ears of the senior naval officer at Hampton Roads.

On the ensuing March 8th came the attack of the *Merrimac* upon the U. S. ships off Newport News and the next day the hammer and tongs duel with the *Monitor,* furnishing Washington with some anxious hours, until the *Merrimac* was finally set on fire and blown up by her Confederate crew, following the evacuation of Norfolk.

It was in connection with the *Merrimac's* incursions into Hampton Roads that the Castle of Rip Raps fired her first shots at a hostile ship, so far as the Official Records of the Union and Confederate Navies disclose, but the official reports make no mention of any hits, either by the guns of the forts or by those of the ironclad.

The War Between the States developed but two possible menaces to the guardian works of Hampton Roads. One was the *Merrimac.* The other, which never reached an experimental stage, was a proposal emanating from Matthew Fontaine Maury. Before he was sent to Europe by the Richmond government that eminent naval scientist conceived the idea of arming a fleet of launches each with two long-range rifle guns, mounted fore and aft, these would out-range the smooth bores of the U. S. ships, therefore they could choose their own distance and sink the ships at their leisure—a masked battery of rifle guns on Willoughby Spit commanding the channel between Forts Monroe and Calhoun would prevent the ships from running away. Destruction of the ships would of course have isolated the two forts.

A few of these launches had been completed when the *Merrimac,* in her encounter with the *Cumberland* and the *Congress,* converted Richmond to a profound belief in ironclads.

Anxiety over the *Merrimac* in the earlier days of her brief but startling career proved too much for the uncertain temper of Mr. Lincoln's Secretary of War. Judging from the orders issued for his office the Secretary lost patience with all things Southern and acted accordingly. On March 11th, he sent an order to General Wool changing the name of a heavy gun at Fort Monroe from "Floyd" (presumably after John B. Floyd, Buchanan's War Secretary, then a Confederate brigadier general), to "Lincoln," in honor of the President. Just one week later another order was issued, which read:

Washington, D. C.,
March 18, 1862, 9:40 A.M.

Maj.-Gen. John E. Wool, Fort Monroe:

Ordered that, in recognition of faithful services by a distinguished and gallant officer, the name of the fort on the Rip Raps be changed from Fort Calhoun to Fort Wool, by which name it shall hereafter be known and designated.

EDWIN M. STANTON,
Secretary of War.

The aged veteran of three wars thus honored had been General Brown's Inspector General when the latter had laid the castle's corner stone.

This order of Stanton's, sweeping away the Calhoun designation, had an interesting echo. Seated in his favorite armchair in his library at "Wheatlands," in Lancaster, Pa., James Buchanan, the late President, read of the action and viewed it disparagingly.

"I am decidedly in favor of prosecuting the war with vigor to a successful termination," he wrote a friend, "but I still consider it bad policy unnecessarily to exasperate the Southern people. The insult offered to the memory of Mr. Calhoun, by changing the name of Fort Calhoun to Fort Wool, will sink deep into the hearts of the people of the cotton states—men, women, and children. It was my fortune to differ from this great and pure man on many important questions, but his character was so elevated that Clay and Webster and others pronounced eulogies upon him in the Senate and in the House after his decease. He died ten years before the commencement of the troubles, and even before the Compromise of 1850, I do not think the administration will derive much honor from having attainted his memory. But *de gustibus est disputandum.* Had he been living, I do not think we should be involved in our present difficulties."

While the War Between the States still raged Congress provided for the resumption of construction work at the Rip Raps. In 1864, a bill providing appropriations totalling between $4,000,000 and $5,000,000 for work on various fortifications or for guns for them was enacted, and one of the largest individual items was for Fort Wool—an appropriation of $200,000.

In 1879, the proposal was made to arm a part of the work with thirteen heavy guns (81-ton guns and 12-inch rifles) to be mounted in casemates behind iron shields, and with seventeen 8-inch rifles, but nothing was ever done about it.

In 1894, the construction of modern defenses there was begun and today the Castle of Rip Raps is reckoned an integral part of the Harbor Defenses of Chesapeake Bay, and is maintained as a defensive work. Its grim loneliness suggests to a lively imagination another Chateau-d'If from which Monte-Christo might experience some difficulty in escaping, rather than the imposing unit of coast defense it was once considered by Simon Bernard and his associate engineers.

Summary of Reports on the Joint Antiaircraft-Air Corps Exercises Held at Fort Knox

THE purpose of the exercise was to develop the tactics and technique of antiaircraft artillery defense against aerial attack, with and without the coöperation of pursuit aviation; to investigate the use of a distant intelligence net in coöperation with Air Corps units assigned defensive missions; to test and develop tactics, technique and equipment of the Air Corps; to test and develop tactics and technique of the use of smoke and other chemicals in the attack of ground installations by aircraft.

The defense forces consisted of an antiaircraft artillery regiment, aviation, a distant intelligence net and two armored cars.

The antiaircraft artillery regiment furnished an all around defense for Fort Knox which was assumed to be a regulating station. Its 4 gun batteries (one simulated) and 17 searchlights were disposed in a circle around the objective. The distance between gun batteries averaged 10,000 yards and between searchlights 6,000 to 8,000 yards. Machine gun platoons were disposed in acircle 4,000 yards from the objective and in addition, gun batteries were defended by machine guns (6 per battery) at about 1,000 yards distance. No machine gun protection was given to searchlights. The antiaircraft artillery regiment had its own intelligence net, extending out to searchlight observation posts at a distance of 19,000 yards; this regimental net, distinct from the distant intelligence net, was probably in itself sufficient to alert antiaircraft artillery units.

Air Corps units coöperating in the defense consisted of the 1st Pursuit Group (2 squadrons—40 planes) and the 325th Observation Squadron, operating from Bowman Field, Louisville, 30 miles from Fort Knox. Information of the approach of hostile planes was sent at once from observation stations to Fort Knox and Bowman Field (arriving at Bowman Field in from 2 - 4 minutes) so that by day the pursuit ships could take off and try to intercept attacking bombers; even when in the air a continual stream of information was sent to the pursuit by radiophone and on each day mission some of the bombers were intercepted. In order not to interfere with antiaircraft gun fire, an inner limit for pursuit operation was fixed.

Although interception was attempted at night on one or two occasions (in one case by pursuit operating independently of the net), it may be stated that in general there was no night coöperation between pursuit and ground forces. No searchlights were set aside to work with pursuit planes. On several nights, after completion of the tactical exercise, a bomber was specially detailed to fly in the searchlight beams so that pursuit ships could attack it, but no coördinated use of guns, searchlights and pursuit was attempted.

The distant intelligence net was similar in most respects to the net used in previous exercises. (For a description of this net see the July-August, 1933, issue of the JOURNAL). The principal difference being that less radio and more commercial wire lines were used in communicating between observation posts and defense headquarters. The net consisted of 69 observation posts, about 6 to 8 miles apart, disposed in three rings at distances of 50, 70 and 100 miles from Fort Knox. Based on the personnel actually used for a 120 degree sector (329), about 1,000 officers and enlisted men would have been required for a 360 degree net. Each observation post was connected by field wire to the nearest commercial telephone exchange and in a few cases to a military radio station; information was sent to Defense Headquarters at Fort Knox by commercial telegraph, commercial telephone or by military radio. The most efficient means of communication was found to be, in order, telegraph, telephone, radio. The latter means, although quicker when it worked, was the least reliable. Except for civilians operating commercial telephones and telegraph, the net was installed, maintained and operated by military personnel. About 300 miles of field wire was used in the distant net, requiring 5 to 6 days to lay; it is believed that commercial wire companies could have laid temporary lines in much less time. Observers, in spite of long and careful training previous to the exercises, made many mistakes, by day, in identifying planes, but this did not have any particular effect on the very satisfactory operation of the net.

The ground net was supplemented by observation aviation patrols and by two armored cars belonging to the 1st Cavalry (Mech.), both of these sources furnished valuable information. The armored cars were used in certain areas where there was a gap in the observation stations and on at least one occasion reported planes that had been missed by all other sources. On the last day of the exercises, patrols of observation planes were substituted for ground observation, with very satisfactory results, although it required 10 planes for the small sector used in the exercises.

The attacking forces (Blue) consisted of the 1st Provisional Wing, operating from Patterson Field, Dayton, and included one bombardment group (3 squadrons—21 planes), one attack group (2 squadrons—18 planes)

and one observation squadron of 9 planes. Characteristics of the *bombers* used were as follows:

	B-2	B-7	B-9
Speed (m.p.h.)	124	152	160
Ceiling (ft)	14,000	16,000	18,000

Day bombing attacks were usually preceded by attack planes which flew low and attempted either to blind antiaircraft guns and machine guns by smoke, neutralize them with gas or attack them with bombs and machine guns. Smoke and gas were actually used; the smoke was generally unsuccessful in blinding ground units for more than a few seconds.

At night, attack planes were used either to confuse the listeners at the sound locators or to attack searchlights as they went into action. Searchlights had no machine gun protection. The bombers, gliding from high altitude (up to 18,000 feet) with engines cut off were able on a number of occasions to pass through the searchlight area and release their bombs without detection by the sound locators or illumination by the lights. Although the work of the sound locators and searchlights improved (on the final night of the exercises one searchlight platoon picked up 8 bombers) it is apparent that the increase in speed and ceiling of modern bombers and the tactics adopted presented a problem for antiaircraft defense that was not successfully solved during these exercises. In this connection it appears that no steps were taken, during the exercises, to darken the defended area, thus making its location by the attacking bombers easier; also the actual results of bombing from high altitudes are conjectural.

Comments By the War Department

a. Bad weather greatly interfered with preliminary training on both sides and this probably had some effect on the operation of searchlights and sound locators during the first few nights of the exercises.

b. Operations of the attacking forces were carried out with great precision, in spite of the considerable handicap of having bombers of widely varying speeds, so that the older ships had to leave the airdrome well ahead of the fastest ships. The attackers were aided, however, by being able to follow the Ohio River and the highways and railways converging at Louisville and by the fact that no attempt was made, so far is known, to darken the lights at Fort Knox. War Department observers were particularly impressed with the systematic manner in which returning ships arriving over the airdrome at Dayton in large formations were brought down safely, one by one, by means of radio and light signals.

c. The success of the day bombing attacks was problematical, under conditions as they existed. Due to the efficient operation of the distant intelligence net, many of the bombing attacks were intercepted by the defending pursuit ships which, in some cases, were slower than the bombers they were attempting to intercept. On the other hand, interception was made much easier by the fact that the attacking forces, instead of having several objectives to choose from, as would normally be the case, were limited to one. This is the same condition that existed at the Aberdeen exercises. Attempts to blind antiaircraft artillery by smoke were in fact almost entirely unsuccessful, as they were at the Fort Humphrey exercises, and it is certainly open to question whether attack planes, on this and other low flying missions, could have survived in the face of actual machine gun fire. A number of cases were witnessed by War Department observers of attack planes circling for several minutes within easy range of *several* machine gun platoons; in neither case were the planes flying so low that they could have come anywhere near the machine gun positions unseen; in some cases they were seen for *miles* before arriving within range.

d. The most successful form of night attack was by individual bombers coming in at altitudes up to 18,000 feet and gliding down to lower elevations to drop their bombs. In addition, attack planes were used to confuse the sound locators. Very few bombers, and practically none of the newer faster ships, were illuminated during the first nights of the exercises, although the work of the sound locators improved later. It appears that with present equipment on both sides the advantage at night is strongly with the attacking bombers, especially if the newer faster types are used; however, the accuracy of bombing from high altitudes is conjectural as is the ability of bombers to locate unlighted objectives.

e. The increased speed and ceiling of modern bombers has affected the long used formation of an antiaircraft artillery regiment for all around defense, as shown by the increased distances between gun batteries and between searchlights. It is stated in one report that an antiaircraft artillery regiment, to defend a single objective, should have four instead of three gun batteries; considering our great shortage in antiaircraft guns, another solution might be, in order to increase the number of firing units, to reduce the number of guns per battery to three.

f. The antiaircraft artillery intelligence net (not to be confused with the *distant* net) extended out to searchlight observation stations at 19,000 yards, which appears to be about the extreme limit. It is believed the wire used in this net could be greatly reduced; for example, no need is seen for wire communications, such as were actually installed, between machine gun platoons nor even between these platoons and higher units. All they have to do is to shoot when a hostile plane comes within range.

g. The defending pursuit was most efficiently handled. It took the air promptly and in spite of its inferior speed (in some cases) was usually successful by day in intercepting some of the bombers. Only two attempts at interception were made at night, one with and one without the aid of the distant intelligence net. The task of the pursuit was much simplified as stated above, by the fact that all hostile attacks had to converge at one point, although during some phases of the exercises, the pursuit was not permitted to operate at less than 25 miles from Fort Knox.

h. The subject of coöperation between pursuit planes, antiaircraft guns and searchlights should be investigated at more length; in these exercises no coöperation was attempted at night and by day it was limited to setting an inner limit for pursuit operation that would keep it beyond the effective range of antiaircraft guns. If pursuit planes are to be used at night in the defense of a locality, not only must they be assigned zones where gun fire is prohibited, but searchlights must be assigned to work with them.

i. The distant intelligence net was installed and operated in a highly efficient manner, reflecting great credit on those connected with it. Its purpose in these exercises was to report hostile planes to defense headquarters and to the pursuit airdrome; although the antiaircraft artillery was also informed, it probably did not need the information as it had its own inner net (antiaircraft artillery intelligence service) which was sufficient. There was at Fort Knox (and there always will be) difficulty in *identifying* planes, although this did not interfere with the successful operation of the net. At night any kind of identification is practically impossible and even by day about the best information that can be expected from an observer is that so many planes, high or low, are going over, headed towards a designated locality.

j. Opinion was divided among officers consulted by War Department observers as to the probable effectiveness of civilian observers and as to what equipment is needed at observation posts. The report of the Net Commander, whose recommendations were concurred in by the Defense Commander and by the Director, states that military observers *only* should be used, with some kind of an intelligence unit included in the initial mobilization for this purpose. The majority of officers questioned at the exercises, including commanders of the Western Indiana, Eastern Indiana, and Kentucky Sectors of the net, stated that in their opinion civilian observers would be satisfactory and that field glasses, while useful for identification, were not necessary for picking up planes. One staff officer at Defense Headquarters stated that all that was needed was an observer out in an open field with a telephone.

k. It is believed that exercises of this kind should be given wide publicity, providing it is controlled and emanates from proper sources. What is desired above all else *is to interest civilians in antiaircraft defense,* which is largely for them and in which they must take an important part.

A Coast Artillery Trainer

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

THE sturdy, hairy-eared gunner may be pardoned if his first eager enthusiasm gives place to mild boredom after ten minutes or so of loading drill, and even the higher-ups in the hierarchy are not always able to maintain a lively interest in the progress of a fishing boat or a dummy target moving along the Armory wall. Give all hands something to shoot *at,* and something to shoot *with,* and the effect is startlingly different. Even the humble custodian of the sponge-tub feels that his team is *doing* something, and he wants to be in on it.

Nebulous indications of a gadget which would bring about the desired result, and incidentally be of some value in the training of gun pointers, took shape this summer in a "Subcaliber" attachment for the 155-mm. gun. The device consists of the barrel and firing mechanism of a Hamilton .22 caliber rifle secured to a cradle, the cradle being clipped to the sight shank just below the panoramic sight, and accordingly moving with the sight in elevation and direction.

Right and left side views of the trainer are shown in Figure 1, the clip for attaching the cradle to the sight shank being shown in the lower view.

The trainer is shown in place on the 155-mm. gun in Figure 2. The rifle may be fired by the gun pointer, or its trigger may be pulled by a wire connected to the breech mechanism of the 155-mm. When used in the Armory for training gun pointers, a switch in the circuit of the target-towing motor may be clipped to the trigger of the .22, causing the target to stop as the shot is fired, and permitting close inspection of the "splash" and measurement of the deviation if desired. The switch may also be used in simulated target practices; the circuit being closed at the expiration of the time of flight and the gun pointer then "jumping the 'splash.'" When the gun is rigged to be fired by the breech detail, a strong spring is necessary to bring the trigger forward against the pull of the mechanism. This is shown in Figure 2, below the cradle of the trainer.

The mechanism for firing the .22 by means of the lanyard is shown in Figure 3. The piano wire connecting the trigger and the breech mechanism is constrained in a copper tube led across the barrel of the 155-mm. This tube terminates about ten inches forward of the face of the breech, permitting the piano wire to bend as the breech

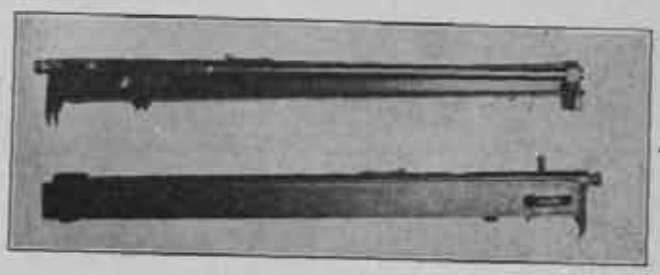


Figure 1—*Right and left side views of trainer.*

FIGURE 2—*Trainer in place on 155-mm. gun.*

is opened and closed. The entire mechanism—trainer and all—can be attached to the gun in five minutes, and stripped in three.

The target used in the Armory is a small red triangle supported by a vertical wire; this wire is secured to an endless cord running over two pulleys. Simulated changes in range (changes in elevation) may be brought about by raising or lowering one pulley; the target then travels in an inclined path. A steel back-stop, tilted forward to prevent ricochets, is painted white, the "splashes" showing up plainly. A manually operated target is used in the field.

The Hamilton is not chambered for the .22 long *rifle* cartridge, but the .22 long, the .22 short, and the B-B caps may be used, the last being preferable when a steel back-stop cannot be used or where there is danger from ricochets. The range and direction probable errors of the ammunition used being determined (this may be assigned as "laboratory work" for officers' schools), a complete simulated service practice may be held. In Case II firing, the .22 is brought "on" as the gun pointer "water lines" the target, consequently it need not be laid at the same elevation as the 155-mm. and service elevations may be set on the latter with the gunners' quadrant and corrections in mils of elevation, (based on the probable error of the .22) can be applied on the vertical scale of the panoramic sight.

Though the purist may grieve at the combination of Case I on the trainer and Case II on the 155-mm., his feelings might be assuaged by calling the net effect Case 1¾ (Case 1½ having been preëmpted by the star-shooters).

Case III training may be carried on as far as deflections are concerned, but the target must be level with the .22, and range deviations have to be pulled from the hit bag.

Twelve of the trainers were constructed for the 250th Coast Artillery and were used extensively in the Armory and at camp, many hours formerly wasted in waiting for the fog to clear and for the target to get on the course being put to good use in training gun pointers or holding subcaliber practice.

The trainer can be built with the tools in the mechanic's kit, and at a cost of about $8.00. The cost of ammunition is almost negligible; so that this device may be classed with the Fuller Brush as something no well regulated household need be without.

FIGURE 3—*Mechanism for firing with lanyard.*

★

WAR INVENTION *has produced much of the mechanical and chemical advance of the ages. We have learned from the necessities of our preservation much of what we know in medicine, engineering, and even in art.*—COLONEL CHARLES G. METTLER.

Reserve Policies and National Defense

By Lieutenant Colonel R. A. Hill
Infantry

The development of the O. R.C., R.O.T.C., and C.M.T.C., with suggestions for making these agencies more effective.

The Organized Reserve Corps

THE National Defense Act of 1916, as amended to 1933, legally sets up the foundation of the Army of the United States. It prescribes that that Army shall consist of:

The Regular Army
The National Guard of the United States
The National Guard while in the service of the United States
The Officers' Reserve Corps
The Enlisted Reserve Corps and
The Organized Reserves.

In the immediate execution of the provisions of Section 3, National Defense Act of 1920, procurement of Reserve officers was of primary importance and rightly so, because thousands of war-trained officers were reverting to civil life, taking with them an immeasurable store of valuable military experience essential to the establishment of a national reserve force.

Policies, and plans based thereon, were gradually formulated. These plans included, among other things, determination of the purposes for which the Organized Reserve was to be used, and the tools required to accomplish the purposes. These are prescribed in the General Mobilization Plan. The present Reserve policies largely went into effect prior to 1928, but since then considerable revamping of the Officers' Reserve Corps has been done, this for the purpose of making of that Corps the instrument contemplated by War Department plans. The Enlisted Reserve Corps, consisting of about 5,000 men, is practically a minus quantity. Since its establishment in 1920, little has been done to encourage its growth.

It will be appreciated that the Reserve is in fact an organized reserve of officers. The principal functions of this reserve are: (1) to furnish the additional officer personnel necessary to bring to war strength Regular Army organizations and activities now organized on a peace basis; (2) to officer and command war organizations. Its normal peace time activities are training, although it may and does assist the Regular Army in carrying out such missions as those pertaining to the C.C.C. and the Air Mail.

The War Department has set up approximately 120,000 officers as the peace time procurement objective for the Officers' Reserve Corps. Additional officers will be secured from officer-candidate training schools.

The sources of supply for the Officers' Reserve Corps through new appointments as of June 30, 1934, and for active officers only are:

a. Reserve Officers' Training Corps.
b. Citizens' Military Training Camps.
c. Flying cadets.
d. Warrant officers and enlisted men of the Regular Army.
e. Enlisted men of the Enlisted Reserve Corps.
f. World War veterans.
g. Former members of the Regular Army and National Guard.
h. Civilians.

The annual number of new appointments from all sources seems to be stabilized at about 10,500. Some of these sources are showing an increase, notably "*b*," and some are drying up entirely, particularly "*f*." The most important source of all, the R.O.T.C., is increasing somewhat and will continue to do so until reaching its present maximum authorized strength of approximately 7,000. With adequate support this source could be depended upon to provide ample personnel for the Officers' Reserve Corps. At present, a very serious loss of active officers derived from this source is suffered by the Officers' Reserve Corps at the expiration of their five-year commission, this loss being on the average only about 3,000 short of the total intake. It is probably due primarily to a loss of interest on the part of the individual officer. It is evident that there must be active coöperation between the War Department, all its agencies, and the Officers' Reserve Corps to reduce this loss to a minimum.

On June 30, 1934, the Officers' Reserve Corps reached a strength of 114,746 officers, 89,039 being on the active list and 25,707 on the inactive list. This leaves a shortage of approximately 30,961 active list officers. The officers in the inactive reserve are of indeterminate value.

A brief comparison of the Peace Time Procurement Objective which will probably approximate the actual requirements under the plan and the total number of active list officers available (89,039) shows that the Reserve Corps does not meet the requirements in aggregate numbers at the present time, and further that there is an unbalanced distribution of officers of the arms and services which must be adjusted before a balanced force can be had. As pointed out previously, there are some 25,707 officers on the inactive list, and in addition various other persons among the civil population who have had military training, and who would probably present themselves for service when needed. Large numbers of officers will be required for supply and other Zone of the Interior duty. From experience gained in the development of previous War Department Mobilization Plans, it is believed that the officer personnel requirements for the initial mobilization can be met.

There will be shortages in Corps Area Service Commands for the initial mobilization. However, this shortage will be met by employing a system of dual assignments. In this system, all available officers not specifically assigned to units or installations part of the initial mobilization, will be assigned to duties pertaining to the initial mobilization or preparation for subsequent periods of the mobilization until such time as it becomes necessary for them to report for duty in connection with their primary assignment. In addition Corps Area Commanders at present are authorized to recommend to The Adjutant General the transfer, with a few exceptions, of officers of the lowest grade from one section to another regardless of the possession of a certificate of capacity. If this authority is employed considerable can be done toward effecting a more equitable distribution in the several sections of the Reserve Corps. Ninety per cent of Reserve officers on the active list are lieutenants and captains and ninety per cent of the officers trained are of this class.

Control and Administration

The War Department decentralizes the administration and training of Reserve personnel by charging Corps Area and Department Commanders and Chiefs of Arms and Services with this mission, except for those officers specifically exempted by the War Department.

Two general systems exist in Corps Areas in the method of handling this assignment.

A majority of Corps Areas handle it through the tactical organizations that are assigned to them in the War Department Mobilization Plan. Several Corps Areas have instituted a combination of territorial and tactical organization, which while retaining most of the good features of the tactical method has the advantage of placing the responsibility for the inactive duty training of Reserve officers, not possible under the purely tactical organization. Briefly, this system divides the Corps Areas into sub-areas which are again sub-divided into districts. Theoretically, sufficient instructor personnel is placed in these districts to carry on the instruction of *all* Reserve officers of the district.

In the administration by the War Department of the Officers' Reserve Corps, it has been found necessary to set up a contact agency in the Department to represent the Reserves. This was provided by placing an officer on duty in the Office of the Chief of Staff known as the "Executive for Reserve Affairs," whose principal mission is to facilitate the business of Reserve officers and the Organized Reserves in the War Department and to provide liaison for them wherever found. He has no power but has a responsibility that Reserve matters move smoothly and that trends and drifts in Reserve sentiment are known to the War Department.

The six Reserve officers in the various Divisions of the War Department General Staff represent the Reserve and have a voice in the formulation of policies touching their component.

Training

In view of the dependence placed on it in case of a national emergency, training of the Reserve assumes great importance. Its effectiveness will depend upon the character of training conducted during peace time.

The training mission of the Reserve is:

a. To give Reserve officers assigned to units of the Regular Army training with the organization to which they are assigned.

b. To maintain in every unit of the Organized Reserves an efficient cadre of officers, noncommissioned officers and enlisted specialists that are individually and collectively competent to perform the duties required in mobilizing and training the unit at war strength.

c. To give Reserve officers not assigned to units of the Organized Reserves such individual training as is necessary to insure their functioning effectively in their war time assignment.

The objects of training the individual Reserve officer in time of peace are:

a. To prepare him to perform efficiently the duties of his mobilization assignment.

b. To prepare him for promotion to the next higher grade.

Individual inactive duty training is accomplished through Troop Schools, Extension Courses, and contact camps. Active duty training is accomplished through 14-day training, duty with troops, C.M.T.C., courses at Army Schools and other means. All of them offer an excellent means for the professional advancement of officers. The records indicate an average of twenty hours annually per active officer devoted to this work.

The enrollment in extension courses on March 31, 1934, included 46,770 Reserve officers—40.7 per cent of the personnel of the Officers' Reserve Corps on that date. It is of interest to note that during the last ten years of the project, the numbers of students taking extension courses have increased some 400 per cent.

Of the facilities offered for individual training on an active status, the records show that during the past three years the numbers that can be trained on an active status, due to limited funds, have practically stabilized at 11,900 (11,200 Arms, 700 Services). Appropriations have limited the active duty periods of training of reserve officers to an average of one 14-day period in three years for the arms and six years for the services. However, the limited funds provided for 1934 reduced the average for that year to one tour in about 5½ years for the arms and one tour in 40 years for the services.

The character of training conducted using any of the available means depends primarily on the unit commander, Regular Army instructors on duty with Reserve units and on inspections controlled by the Corps Area Commanders.

Of the facilities available, it is believed that duty with Citizens' Military Training Camps, when properly carried out, i.e. not over-supervised by Regular Army per-

sonnel, more nearly approaches the initial war time duties of Reserve units than any other available during peace time.

Classroom training is indispensable as a preparation for field training, but by itself it is not enough to justify the existence of the Officers' Reserve Corps. Only through field training, in which we can simulate war conditions, will the officer recognize reality when it confronts him. Field training is wholly dependent upon funds. Funds dictating such training once in four years bring it to the vanishing point of utility.

Finances

The budget for the fiscal year 1935 for the Organized Reserves was about $4,500,000. In addition approximately $17,500,000 will be expended for the pay and allowances of some 6,000 Reserve Officers on duty with the C.C.C.

Of the total amount appropriated, approximately 95% is devoted to training purposes and 5% to administration. Of the 95% that is expended on training, the Air Corps receives approximately 36% and its personnel is about 3½% of the active Reserve.

Disregarding the many intangible items that probably constitute a proper charge against the Officers' Reserve Corps, and considering only the funds actually appropriated for the Reserve, we find that for 1/50 of the annual appropriation for military purposes, the Reserve will furnish one-half the officers required for general mobilization. The average pay received for the two weeks' active training is $115.00, which with training each four years amounts to but $28.75 per year.

Desirable Modifications in Policies

So far as is apparent at this time, no changes of a fundamental character in O.R.C. policies are needed. There are, however, certain problems confronting the Officers' Reserve Corps, some of which will be presented very briefly.

One of the outstanding needs of the Reserve Corps today is the recognition by Congress of the fact that an untrained Reserve is no Reserve at all. When Congress grants that recognition, the possibilities of securing adequate appropriations for training will be considerably increased.

As has been pointed out heretofore, there exist in certain arms and services, notably the Field Artillery, Coast Artillery, Air Corps, Quartermaster Corps and Medical Corps, very considerable shortages in their Reserve officer personnel. Very definite and positive steps should be taken at once to reduce these shortages.

The yearly losses suffered by the Officers' Reserve Corps are entirely too great. Most of these losses are occurring among those officers who have recently come into the Reserves from the R.O.T.C. It is believed that a considerable part of this loss can be prevented by the maintenance of interest among new officers. This is a direct responsibility of the Regular Army personnel on R.O.T.C. and Organized Reserve duty.

In connection with procurement, the time is approaching when it will not only be desirable but practicable to concentrate on quality rather than quantity. As will be readily appreciated when that time comes, there will be many problems to solve in setting up the standards by which to measure quality.

Active duty training every year for every active officer of the arms and a somewhat less amount for officers of the services is highly desirable, but is entirely dependent on the annual funds provided. The provision of inadequate, much less adequate, funds will always be uncertain. Such being the case, it becomes essential that everything possible be done to bring to a high degree of efficiency all forms of inactive training.

The question of age among the members of the Officers' Reserve Corps is one that deserves considerable thought. It will undoubtedly assume greater importance in the not far distant future.

Reserve Officers' Training Corps

The mission of the Reserve Officers' Training Corps is to provide officers for the Organized Reserves. Sections 40-47 of the National Defense Act provide for the establishment of the Reserve Officers' Training Corps consisting of a senior division and a junior division. The senior division is composed, in general, of units established in colleges and universities. The junior division is composed, in general, of units established in preparatory and high schools.

The senior division units lend themselves to a further subdivision into:

Voluntary units and compulsory units.

The above may be subdivided further into:

Single units; where only one arm or service of the Army is established in one institution.

Multiple units; where several arms or services or both are established in the same institution.

There are a total of 228 senior and junior units scattered throughout the country and extending into the foreign possessions located off our east and west coast. Of the senior units 75 are single and 49 are multiple units.

Under the provisions of the National Defense Act and Army Regulations, no unit can be established in any institution until an officer of the Regular Army has been detailed as P.M.S.&T., nor until such unit shall maintain under military instruction at least 100 physically fit male students in the case of Infantry, Cavalry, and Artillery units; and 50 in the case of other units.

Except at a land grant college, where military instruction is compulsory in all except two cases, no unit is established or maintained in any educational institution until the authorities of the same agree to establish and maintain a two years' *elective or compulsory course* of instruction in military training as a minimum for its physically fit male students; this course to be a prerequisite for graduation. The *institution* makes a request for the unit and it, not the War Department, decides whether the unit shall be elective or compulsory.

The Secretary of War is authorized to prescribe stand-

ard courses of theoretical and practical military training for units of the R.O.T.C. These courses form a guide for P.M.S.&T's and standardize the instruction in all R.O.T.C. units. They are sufficiently flexible to meet conditions existing at each unit.

For the practical instruction of members of the R.O.T.C., a six weeks' camp is ordinarily maintained each year.

R.O.T.C. enrollment is limited due to lack of funds. This in turn has limited the number of R.O.T.C. graduates each year and consequently the number of Reserve officer replacements.

The number of graduates commissioned from the R.O.T.C. in all arms and services has steadily increased from about 200 in 1920 to about 6,500 in 1934.

How well the mission of the R.O.T.C. is being accomplished is demonstrated by the fact that over 40,000, or approximately one-half of the *active* Officers' Reserve Corps, are R.O.T.C. graduates. To this number some 6,000 newly commissioned candidates are added each year. It is clear that as time goes on and those officers who came into the Reserve Corps by virtue of World War service continue to drop out, this proportion will greatly increase.

The great value of the Junior units lies in their disciplinary and educational possibilities. These units produce less than 300 second lieutenants in the Reserve Corps each year. The senior units produce 95% of the R.O.T.C. supply of Reserve Corps.

Proportion Among the Arms

In view of the establishment of the R.O.T.C. before requirements of a mobilization plan had been formulated, it is not surprising that the product does not fit such requirements. The unbalanced condition in the Officers' Reserve Corps, as previously pointed out, is reflected somewhat in the R.O.T.C. An examination of the records shows very considerable shortages existing in the Field Artillery and the Coast Artillery (AA) quotas. The Infantry and Cavalry each have an excess of approximately 20%. Shortage in the Medical Corps is not thought to be serious, since many of the vacancies would exist in hospitals and convalescent camps where medical qualification alone is essential. The one Air Corps unit in the R.O.T.C., due to obvious limitations, cannot produce competent Reserve officers in any satisfactory quantity. The Engineer shortages can certainly be made up from civilian sources in a satisfactory manner, particularly in railroad and construction duty. The Signal Corps is in a similar condition. Other arms and services can be fairly satisfactorily filled up from technical civilian sources.

The most vital lack then, so far as the R.O.T.C. is concerned, is in the supply of Field Artillery and Coast Artillery (AA) officers. There are certain measures which might be taken to correct this, any one of which under existing appropriations, would draw material away from the other arms. The most obvious one is to increase in size those units already established. It is economical, since existing facilities would need relatively little expansion. If this measure is decided upon the question arises as to how to increase these units at the expense of others. There are fourteen units of Field Artillery, and thirteen of Coast Artillery combined, respectively, in multiple units. In some cases, it would be desirable for these Field Artillery and Coast Artillery units to absorb such associated units either totally or partially, depending on individual circumstances, and thus make up a part at least of the shortages in these two important arms. Still further additions to these arms can and are being made by dropping certain classes of units and by decreasing the allotment of others.

Geographical Distribution

The geographical distribution of the R.O.T.C. by corps areas shows very considerable inequalities. Naturally, this condition has aroused considerable thought and discussion as to the advisability of a reallocation of units so as to obtain equal distribution. Such an idea, while a natural one, places too great stress on the thought that location of the unit, the home of the student, his future business location and his Reserve assignment are going to be one and the same. Such is not necessarily the case. Again, it is of prime importance that the military scheme in this case fit the civil—for the quality and value of an institution is more vital than its geographical location. A change in the type of unit might be made to fill certain corps area requirements, but otherwise the geographical distribution while receiving consideration cannot be stressed at the expense of other more vital considerations.

General Considerations

The R.O.T.C. has certain characteristics that mark it potentially as one of the most valuable of the civilian components. College men, being selected by natural processes, should be the best available officer material in the country. The R.O.T.C. is practically free from politics, at least as concerns individuals within it. The likelihood of enrolling future directors of the country's policies is great, and should be made greater. The great majority of college presidents have lent their enthusiastic indorsement to the work. In the matter of expense, the R.O.T.C. by direct appropriation receives approximately one per cent of the annual War Department appropriation. On the other hand, to make the most of this, the Army's responsibility is great. The instruction in R.O.T.C. units and the officers who carry it on are subjected to an unusually critical appraisal on the part of both faculty and students; so that there should be unusual judgment and a good background of general knowledge as well as professional aptitude on the part of the officers on such duty if their task is to be done creditably. Moreover, the job of insuring progress or even the mere continuance of present standards is undoubtedly greater with the R.O.T.C. than is the case with the other components.

Full advantage should be taken of every opportunity for improvements in organization and in policies, but such improvements alone can never take the place of energetic and able personnel.

Modification of Policies

From the preceding discussion, it is apparent: (1) That the junior units should not be considered producers of Reserve officers.

(2) That multiple units are in general unsatisfactory. Where conditions make them necessary, the number of units should be kept to the minimum and they should be grouped about a single unit of one of the combat arms.

(3) That the proportions of graduates of the R.O.T.C. among the different arms do not properly fit the mobilization plan, the most serious shortage being in the Field Artillery and Coast Artillery (AA). Various measures should and are being taken to correct this deficiency.

Military Training Camps

The C.M.T.C. was originated by Major General Leonard Wood when Chief of Staff of the Army. General Wood, in a letter dated May 10, 1913, and addressed to a number of the presidents of universities and colleges of the country, urged them to use their influence in persuading the students in their institutions to join the summer military training camps he proposed to organize, and to spend a part of their summer vacations at those camps.

Camps so organized at Gettysburg in Pennsylvania, and at the Presidio of Monterey in California, were instituted in the summer of 1913 and proved to be very successful. The credit for this movement was, and is, wholly due to General Wood, whose foresight and good judgment proposed this resource four years before our nation entered into the Great War in the spring of 1917.

In the autumn of 1913, a number of university and college presidents organized an advisory committee to promote the camping project. The students of the Gettysburg Camp had, previous to this, organized The Society of the National Reserve Corps.

First Advisory Committee

The Committee, at first numbering nine university presidents, grew in later years to nineteen.

The summer camps in 1915, consisting of business men as well as students, numbered three thousand, four hundred and six, and in 1916, sixteen thousand, one hundred and thirty-nine. The largest and best known of these camps was one held at Plattsburg, New York.

In December, 1915, the present Military Training Camps Association of the United States was formed by the merger of the Students' Society of the National Reserve Corps with the older men's organization, which had been formed at the Plattsburg Camp. It has continued ever since, as a steady and important force in the nation. This organization, combining the college camps and the business men's movement, was thoroughly under way early in 1916. The representatives of the organization went to Congress and to President Wilson and asked that the "Plattsburg Movement" as it had then already come to be called, should be officially recognized. Legislative recognition was accorded, and administrative help secured from the War Department under Secretary Baker, who always warmly and effectively supported the movement. So in the summer of 1916, about sixteen thousand men were in camps of elementary training for officers, and the great foundation was laid.

The Training Camps plan was adopted by the Government as a war measure, and by May 10, 1917, five weeks after our declaration of war, about forty-five thousand men were assembled in sixteen officers' training camps throughout the country.

Following the war, since the Plattsburg Camp plan had worked so well as a war measure, the men who had been active in the organization of the summer camping movement suggested that the Government should continue the summer training camp plan. This suggestion was adopted.

Voluntary military training camps, to be conducted at Government expense under the War Department, were authorized in the revised National Defense Act of June, 1920. The first camps (twelve) were held in 1921 with ten thousand, two hundred and ninety-nine enrolled.

Training Camp Association

It is in the way of national education for preparedness that the training camps have, by their influence, done our country such great service. In them over 247,773 intelligent young men have learned the lesson that our country at large has not learned. Annually, the men who learn these truths at the camp go out as missionaries to our country. Their influence is far reaching and of incalculable value to our land in combating the ignorance of our people.

Since 1921 the attendance at these camps has grown until, in the fiscal year 1933, funds were appropriated for 51 camps and 37,500 trainees. Although funds were appropriated for the training of 37,500 during the fiscal year 1934, the amount made available for the C.M.T. Camps prohibited the training of approximately 63% of the original quota. Actually 14,007 received training. Funds were appropriated for the training of 14,250 during the fiscal year 1935.

The mission of the C.M.T. Camps as set forth in the National Defense Act is as follows:

> "The Secretary of War is hereby authorized to maintain, upon military reservations or elsewhere, schools or camps for the military instruction and training, with a view to their appointment as Reserve officers or noncommissioned officers, of such warrant officers, enlisted men, and civilians as may be selected upon their own application."

Considering the number of Reserve officers actually produced by the C.M.T. Camps the conclusion is inescapable that they have failed in fulfilling this mission.

Up to and including the year 1934 there were 22,823 Blue graduates, but only 4,630 of these graduates have been commissioned.

While not so stated in the National Defense Act, a broader conception of the mission has been held and put into effect. Army Regulations specify the object of the Basic and Red Courses to be:

"To develop closer national and social unity by bringing together young men of all types, both native and foreign born; to teach the privileges, duties, and responsibilities of American citizenship; to stimulate the interest of the youth of this country in the importance of military training as a benefit to the individual taking such training and as an asset vital in the problem of national defense."

In addition to instilling citizenship in this mass of trainees, from a military viewpoint we are building a potential reserve which will have definite value in case of a national emergency. From a publicity viewpoint the camps have done much to acquaint our people with the Army.

The trainees represent almost every county in the United States and are a body of future potential leaders in our national policies who have some conception of the problems of national defense, and through their training are sympathetic towards them.

Prior to the fiscal year 1934, the average appropriation for the ten preceding years was about $2,650,000 which limited the number that could be trained to approximately 37,500. Of the $2,500,000 appropriated for the fiscal year 1934 only $1,000,000 was made available for these camps, thus limiting the number that could be trained to approximately 14,000. The average cost per student attending the C.M.T. Camps last year (fiscal year 1934) amounted to approximately $71.00. $1,000,000 was appropriated for the fiscal year 1935 (summer of 1934), with which 14,851 received training.

It is believed that C.M.T. Camps are now so firmly established that it is very doubtful if the money appropriated for their support could be diverted to some other project, such as the R.O.T.C., even if it were considered advisable to do so. Even though the C.M.T. Camps are not profitable from a standpoint of number of Reserve officers procured, yet by instilling patriotism, combating Communism, and establishing a partially trained reserve, a valuable by-product is produced.

Trainees

The very striking advance in the popularity of the camps which has taken place in the past few years would seem to indicate that in order to receive the maximum benefit from the training given, one of two things should be done; either funds should be provided for the training of a greater number of young men, or the minimum standard for acceptance should be raised. The C.M.T.C. student should possess two outstanding qualifications. First, he should be material for future commission in the Reserve Corps, and second, he should be capable of creating favorable public impression toward military training in his home community.

With over 106,834 applicants for training and only 15,797 accepted for training in 1933, it is quite apparent that an opportunity for selection does exist. Army Regulations prescribe that "Candidates must have average general intelligence and must be of good moral character," but no educational qualifications are required for the Basic and Red courses. It would seem to be desirable to require at least one year of high school for qualification, but it is believed that that would work a hardship on some communities, particularly in rural districts where high schools are not readily available. At least a grammar school education should be a prerequisite for enrollment in the Basic and Red courses. The same situation exists as far as the physical standard is concerned.

Training

War Department policy now requires at least one-third of the C.M.T. Camps in each Corps Area to be trained for a minimum of 10 days by units of the Reserve Corps. An examination of the reports of the corps area commanders reveals a difference of opinion in regard to this method of training.

Using Reserve units for C.M.T.C. training gives these units valuable training in command and administration which they cannot obtain in any other manner. There is no doubt, however, that this method is detrimental to the efficiency of the C.M.T.C. training. It is an admitted fact, however, that the training accruing to the junior officers of the Reserve Corps through use of the C.M.T.C. is by far the best training which can be afforded them. Viewed from the larger aspect, that of the National Defense, it is believed that if the Reserve units are required to make definite preparation during the winter months and their work in camp is carefully supervised by Regular officers, training for the C.M.T.C. personnel will be adequate. It is well to note that the C.M.T.C. students may or may not become a definite part of the armed forces of the nation in any future war. They are under no obligations other than those which rest upon every citizen, whereas the Reserve officer is already definitely obligated to serve the nation in war if called upon to do so. It seems obvious that every facility for practical training of the Reserve officer should be utilized.

In conclusion, it can be stated that it appears to be desirable to give consideration to modifying the following C.M.T.C. policies:

A high standard to be required both from an educational and physical viewpoint.

Ways and means of increasing the number of trainees by more economical expenditure of available funds.

The elimination of all camps outside of the continental limits of the United States.

The full use of the C.M.T.C. as a facility for the practical training of the Reserves.

THE EXPERIENCE OF THESE MASSES *of Americans will have taught the United States for the future that the business of war cannot be learned in a few months, and that in a crisis this lack of experience costs streams of blood.*—VON HINDENBURG.

The Peace of North China

By Captain Elbridge Colby
Infantry

In the *Georgetown Law Journal* not very long ago, discussing the war-like situation in North China, I made the remark: "What is really necessary is to direct attention to what is *said* after the event rather than to what is *done* at the event." My object in that article was to seek an answer to the delicate and perhaps purely legal question as to whether or not a "war" had existed in the Far East. Did the current set of facts across the Pacific constitute a war? Neither nation involved had declared a war, although there was armed invasion, fighting, and loss of territory. The League of Nations hardly acted as though there were a war. It did not select any warlike aggressor for definite economic or military punishment, as we must assume it must have done had there been a war, since its Covenant so requires. No foreign nation had declared neutrality in the face of belligerent conditions, as we might have expected had a war been going on. The question I left unsettled, left it for the future determination of such judicial authorities as may have to consider it.

We shall then let that question pass. But a new question arises, and one actually more important for the general peace of the world. Let us drop the legal phase and turn to the political phase. Failing further to worry if a "war" *has* existed between the Far Eastern nations, let us consider if the disputed events *may bring on* a real war. If there has not been a "war" between China and Japan —in spite of all the fighting and the loss of territory—is there still a chance of the imbroglio eventually causing a war between either those nations or outside parties and powers?

It is a fair question, and an important one. And, while we consider it, let us remember the truth of the statement that what is *done* matters very little, and what is *said* matters much.

It is not an academic question, either, nor purely speculative. It reaches to the roots of our international thinking and involves the prospective peace of the whole world. Not what shall happen counts; what we shall think and say about it counts! Fighting has occurred in what may be termed "international" areas. It happened around Tientsin in November of 1931; around Shanghai in February of 1932; and in the spring of 1933 in the coal-mining and missionary areas between the Hai Ho and Pei Ho and the Great Wall. Here are foreign residents, foreign commercial interests, foreign missionaries, foreign garrisons, and foreign property. British, French, Italians, and Americans are here, as well as Japanese; civilians and soldiers too. Chinwangtao (the coaling port), and Tangshan and Lanchow (the mining towns) are predominantly British in their commerical importance. If damage is caused here, what is going to happen?

If a foreigner gets involved as an innocent and injured bystander in the midst of some local fracas, the newspapers headline it. Everyone gets excited and assumes that a war may start immediately. On the spot, you may take an overt act and so behave as to aggravate the trouble, yet there is no reason to get all excited and start hostilities. An American consular official was roughly handled in Manchuria. A commercial agent of our government was mauled in the Chapei district of Shanghai. Stray bullets fell in the small American army camp at Chinwangtao; airplane bombs burst within two hundred yards. Missionary property received damage at Miyun (north of Peiping) and at Changli (east of Peiping). Yet none of these incidents caused a war. Even the presence of American soldiers and marines in Chinwangtao, Tientsin, and Peiping could not aggravate the situation. Those troops are no more vital to the interests of the American nation than was the consular officer. Bullets falling in their neighborhood did not cause a war *simply because things like that do not cause wars.*

Strange as the phrase may sound, it is nevertheless true that armies do not make wars. Thirty-five years ago the French, by forced marches, dashed across Africa and occupied in the name of France a village famed by the name of Fashoda. British troops making for the same objective arrived to find the French flag flying. Major Moreau and the British commander may have been irritated at each other. They may have conducted extensive "negotiations" but they did not make war. Their home governments viewed the facts, considered their respective national policies, weighed the diplomatic needs of the decade. Delcassé bowed deeply in the direction of Britain and initiated that friendship which was to prove so valuable in 1914. There was no Franco-British war in Egypt.

A discussion of the possibilities of war in the East.

British

Armies do not make war. Peoples, governments, nations make war, and then call on their armies to do the fighting, to overcome the declared foe, and to restore by victory a state of peace. Thus Grant and Sherman restored peace in 1865; Haig and Foch and Pershing restored it in 1918. The sword makes peace. The pen makes war.

This view is essential, basic, and determining. In a democratic country—in any country except one ruled by a military oligarchy—the army is but a branch of the executive department of the government. The legislative branch must declare war. The executive then uses the army to restore peace.

Viewing the various armed forces in North China from this standpoint, we can scarcely consider it likely that any of them will start a war. All the more certain is this true, since these contingents in North China are pretty absolutely under the control of the diplomatic agents of their home governments. The nation decides; the minister or ambassador transmits the desire of his government to the local "foreign" commander; then, and only then, does the military act.

That is the reason for this additional significance of the remark that it is not what is *done* in North China that counts, only what is *said*. When belligerent sayings appear on the lips of the people, on the printed pages of the journals, in official pronouncements by Foreign Office, Chancellery, or State Department, then, and only then, does war come.

Two decades ago the world was full of talk of world peace. Arbitration treaties were being framed. Certain skeptics before 1914 objected to those treaties—not because they were pacific in tone, but because their pacifism would be palpably ineffective. The objection was aimed at a single clause. It used to be the fashion to state that such treaties were all very well, except for a single important defect. They excepted from the field of international arbitration all matters which might affect "national honor" and pacific-minded publicists declared that "national honor" was the cause of war—that it was the one thing which could *not* be arbitrated. They were wrong! National honor is the easiest thing in the world to satisfy. An official is manhandled or mauled. Property is damaged. A flag at an embassy is insulted. A simple apology follows through diplomatic channels, and sometimes with little or no publicity. Claims for damages are presented and paid. "National honor" is satisfied and there is no war.

If—and the IF is big because it speaks of the future and without prophecy—some incident should occur in North China by which troops of a "foreign" power are involved with stray bullets from one or another of the contending forces in a Sino-Japanese "affair," the thing can be settled very quickly by a simple apology. "It was a mistake." "The flag was not plain." "We are sorry." The incident is closed.

As long as "foreign" missionaries, "foreign" business men, and "foreign" troops are on the soil of China where trouble rages, incidents like this may occur, just as they have at times occurred during the various civil conflicts between Chinese "war lords" during the past twenty years. The great question is not what happens on the spot, but what is said about it in Tokyo, London, Paris, Rome, and Washington. Do *they* call it a war, a limited war, a mere "reprisal," successful insurrection, invasion, this episode in Manchuria, this shooting across barricades in Tientsin, this fracas near Shanghai, this stir in Jehol? Their "call" of the card is vital.

If the successive events which commenced in Mukden in September, 1931, were openly acknowledged by the contending parties and by the "neutral" nations as constituting a state of war, the matter might have been more clear, but not necessarily more simple. When there is a war openly acknowledged, "neutrals" have several rights. They are also subject to certain restrictions. During the American Civil War, the Union attempted to maintain the fiction that there had been no secession, that those states were never "out of the Union," and that the foe was merely a rebellious "military government of the Confederacy." In spite of this official attitude, the Supreme Court, in the famous decision of *The Prize Cases*, said that the blockade made a war. In spite of this the classic "Rules of Land Warfare" which have served as a model for all nations from that day to this (with additions, of course) was issued as General Order No. 100 to give the full rights of legal belligerents to those whom the executive department of the government considered mere "rebels." It was the very uncertainty of these facts and these attitudes which made it slow and difficult to settle the long-standing "Alabama" claims cases by arbitration. It was similar uncertainty over the exact character of what our Supreme Court called the "limited war" which we fought with France, which kept the French Spoilation Claims unsettled for seemingly endless decades.

Throughout North China today there is similar uncertainty. The uncertainty exists because "Manchukuo" is unrecognized by any major responsible independent state

accept Japan; because both Japan and China have refused to "declare" war; and because by the very localized character of every incident which is reported, one can never be sure if the act were committed by Japanese forces, by Chinese turned Manchukuan, or by Manchukuan forces, or by what. It exists because the great nations of the world, when incidents arose, when things have been *done*, have not *said* a warlike word.

Also throughout North China, in those treaty ports which are international oases in an area of unrest—an area that has seen the successive incursions of Chang Tso-lin, Wu Pei-fu, Yen Shi-shan, Feng Yu-shiang, and Chang Hsueh-liang—foreign troops and foreign folk are in places where they may be very liable to suffer such damage as often occurs to innocent bystanders. If there be no war, China as a sovereign state is responsible for their safety. If there be a rebellion beyond the control of the Chinese government, China is not responsible. If this rebellion be fostered, aided and managed by the Japanese, Japan is the nation to be looked to for compensation for damages done.

Here are only three contingencies. There are hosts of others. Most of them arise from the fact that the Powers do not want to admit that there has been war and conquest in Asia. That would be equivalent to admitting the impotence of the League of Nations. They would have had to take steps to uphold treaty obligations, and they did not want to take steps. China does not like to admit that the Manchukuo affair was merely a successful rebellion and secession of a province, because she desires to place the blame upon Japan. She does not wish to declare war on Japan, even when there has been forceful seizure of a Chinese province, for that would give Japan full "legal" right to wage war against all of China and to go as far as she likes. Japan does not desire to admit that she has waged a war, for that would be tantamount to admitting that she has violated no less than three treaties. The problems which arise from a situation of the sort that has disturbed North China for three years, cannot be settled in a few sentences. They will probably take at least a few decades and volumes of diplomatic correspondence. And this leads me to the phrase with which I began.

The incident itself matters very little. The remark after the event—whether it be demand or apology—matters a great deal. Foreign troops in China do not cause trouble. They keep the peace. Trouble will be caused and war brought on in the course of the many notes exchanged between Paris and London, Washington and Tokio, not from what commanders in China say or do, in the international areas, in the "neutral" zones, or in China proper. Nations do not fight over incidents, nor for that "national honor" we used to hear so much about. They fight for their interests. They fight because they want something, and use an incident as a frail excuse. Germany seized Kiautschou, not because two missionaries had been murdered, but because she wanted a naval base and an economic entry into Shantung.

What shall be the attitude of the United States, of the American republic with tremendous interests and influences in China, and close trade relations with both China and Japan? It is not for a military man like myself to say, but I can at least pose the problem by recounting an instance from the past. After the World War, Turkey insisted on abolishing certain special legal rights previously accorded American citizens in Turkey, and her insistence was successful, in spite of the fact that, as our Secretary of State said, we did not wish to acquiesce and to lose those rights. It was successful because no measure short of war would have maintained them and our people would not fight a war for that purpose.

Do the working people of America whose profitable employment depends directly or indirectly upon the sale of American-made products and manufacturers in the Far East, or the church-going folk who maintain missionaries across the Pacific, care enough to let their voices be heard in determining the international policy of our government? Upon their will and the will of similar people in Europe depends the answer to the fundamental question of war or peace in North China.

It is for them to determine, not for me to suggest or imagine. Only one military prophet has ever been really famous in history. It was at the siege of Troy. His name was Laocoon and he was strangled by snakes. If any of our political gentlemen desires to begin his prophecies, he may now commence. He will first have to find the real wants and desires of Western nations in the Far East. He will have to discover in those desires vital elements in national interest. He will have first to find Western nations willing to bear the expenses and hardships of a war in Asia, and to find them arming and preparing for just such a war. If they want it, they will have it. If they do not want it, any incidents which may occur in the "international" areas of North China will end in phrases, diplomatic discussions, and mutually satisfactory agreements. The ambassadors will be busy with words while soldiers continue to polish their buttons.

Japanese

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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SECTION I

Projects Completed Since Last Issue

Project No. 987—Luminous Paints for Guns.—After test and careful consideration of the possibilities of providing sufficient illumination to enable the gun crew to service the piece at seacoast guns by means of luminous paint, the Coast Artillery Board found that the intensity of illumination was barely adequate for the purpose, that luminous paint lacks durability, and that if used at all the luminous material required protection by inclosure under transparent plates of unbreakable glass. The principal advantage of the luminous material lies in the fact that no wiring or source of power is required, and consequently installation on mobile guns such as the 155-mm. gun would be facilitated. In view of the faintness of the illumination afforded by luminous paint, it seemed that the use of small electric lamps with suitably shielded reflectors would give much better illumination,—this was recommended for seacoast guns on fixed or railway mounts. The method of illumination for 155-mm. guns was left to be decided upon the basis of comparative cost of electric lights versus luminous paint.

Project No. 998—Range Dispersion, Seacoast Guns.—It is proposed that a compilation of the DAPE's for seacoast guns and mortars for the period 1928-1933 be published in CAM No. 15, which is to appear early in 1935. Every battery commander will then have an opportunity to see how the average performance of all batteries of a class compares with his battery. It is hoped that some enterprising battery commanders will investigate and write up, for the Coast Artillery Board, explanations for the extreme variations in DAPE that have occurred at some batteries. For example, one six inch DC battery developed only one-half the average armament error for the class and less than one-third the armament error of the poorest battery, although all guns had fired much fewer rounds than the expected accuracy life. The 155-mm. gun turned in by far the best performance in armament error.

Project No. 1008—Cleaning and Paint Stripping Devices.—The two devices tested, one a portable high-pressure steam cleaner, the other a low-pressure spray of cold liquid, were both found to have useful characteristics. The steam cleaner is of greatest value for such work as cleaning automobile and tractor engines and chassis. A drainage pit under the vehicle is almost a necessity for carrying off the sludge. The cold strip machine consists of a small pressure tank with the necessary hose connections. A thick mixture of chemicals is placed in the tank and subjected to about ten pounds of air pressure. The mixture is then sprayed on the gun or other surface from which paint is to be removed. After a wait of about twenty minutes the paint becomes soluble in cold water and is washed off by the stream from a hose. The chemicals used seem to have no harmful effect on unpainted parts of the gun or carriage, neither causing rust nor removing grease. The Coast Artillery Board recommended purchase of one cold strip unit for an extended service test.

SECTION II

Projects Under Consideration

Project No. 953—Radio-Controlled, High-Speed Target.—Work on the development of radio-control apparatus is continuing. The radio receiver has been set up, tested and found satisfactory for operation in controlling the engine throttle. Construction of waterproof set boxes for the receiver will be the next step. It was originally hoped to have the rudder control effected through a gyroscopic direction indicator. This now seems to be impracticable, hence an alternative form of rudder control is being constructed.

Project No. 964 — Rubber-Jacketed Submarine Mine Cable. —There has been no change in status of this material, which is under two-year service test at tropical stations.

Project No. 990—Test of Dulux, Non-Oxite and Other Paints.—A few days of snow and freezing weather emphasized the relative durabilities of the four paints under test. The varnish coated paint, although

still serviceable, has now an unsightly appearance, the varnish having discolored to a splotched brown. The Dulux presents the best appearance, although none of the paints are up to the standard of appearance demanded of the batteries in the local harbor defenses. Since this test was started about June 1, it appears that to keep guns looking snappy they should be painted every three or four months, even when the best of paint materials are used.

PROJECT NO. 1010—REPEATING AND LOADING COILS FOR FIELD WIRE LINES.—This project was described in the November-December issue of the COAST ARTILLERY JOURNAL. The materials for test have not yet arrived.

PROJECT NO. 1012—ANTIAIRCRAFT MACHINE GUN FIRE CONTROL, METHODS AND EQUIPMENT.—This project has occupied all the time of two members of the Coast Artillery Board and much of the time of all members since September. The actual firings were completed December 12th after the most extensive machine gun program attempted since the Aberdeen firings in the fall of 1930. It is believed that considerable progress in developing sights and fire control devices has been made. In addition, a large number of accessories recently developed by the Ordnance Department were tested, and it was found that some long-wanted improvements had been made. The confidential nature of certain types of machine gun matériel prevents further discussion here, but it is believed that some of the improved devices will be well received by the service.

PROJECT NO. 1015—SHOE-FITTING OUTFIT.—The new shoe-fitting device, developed by The Quartermaster General, has been received and is undergoing a service test in fitting shoes for recruits now being concentrated at Fort Monroe. The device is simplet and cheaper than the well-known Resco outfit, although operating on somewhat the same principle.

PROJECT NO. 1016—STOP-RUST COMPOUND.—Service test at a Class "C" Battery has commenced. The recent snow and cold weather failed to penetrate the Stop-Rust, although in several preliminary tests on tools and small parts, in warm weather, little success was obtained.

PROJECT NO. 1017—STERESCOPIC TRAINER T5.—This is a well constructed and compact, though somewhat complicated, instrument designed to fulfill all the military requirements for indoor season work with personnel for stereoscopic height finders. The T5 Trainer is said to:

test visual acuity,
test for hyperphoria,
test for astigmatism,
tests for stereopsis, (This seems to be the medical term for ability to judge relative distance by the stereoscopic effect)
train the eye muscles in stereometry, and
train and test the individual in following a simulated movement of a target.

The instrument is now under study at the Coast Artillery School and will shortly be assigned to an organization for service test.

PROECT NO. 1018—OPHTHALMIC TELEBINOCULARS (STEREOSCOPE).—This instrument, which is an elaboration of the stereoscope which occupied the parlor tables in the mauve decade, effects the same tests as the T5 Trainer, and to some extent can be employed for training purposes. It is much cheaper but perhaps not so effective as the T5 for training purposes.

PROJECT NO. 1019—SCOUT CAR T7.—This vehicle is a modernized version of the wartime reconnaissance car. It has a truck chassis equipped with a partly armored passenger body, and has attachments for mounting machine guns. The results of tests at Aberdeen Proving Ground were not particularly promising, especially from the Coast Artillery point of view.

PROJECT NO. 1022—TRAILER T7.—The test of this trailer, described in the November-December issue of the JOURNAL, has not begun, the antiaircraft battery being rather fully occupied with Project No. 1012.

PROJECT NO. 1023—PORTABLE KITCHEN, GASOLINE-BURNING.—The Coast Artillery Board is still awaiting shipment of this equipment.

PROJECT NO. 1024—COAST ARTILLERY MEMORANDUM NO. 15.—Preparation of the annual Coast Artillery Memorandum occupies a considerable part of the time of the Coast Artillery Board. The checking of scores, preparation of comments and tabulation of data are carried out as reports of target practice are received. The Regular Army practices for the past half year should be easier than usual to check because no rating need be considered.

PROJECT NO. 1025—SHIRTS, FLANNEL, OD.—Enlisted men should hail with enthusiasm the report that The Quartermaster General is nearly out of the wartime-manufactured flannel shirts. After testing a large number of wool and worsted fabrics, including serge, The Quartermaster has had made up a number of coat-type shirts which, at least when new, are far superior in material and tailoring to anything heretofore seen on the issue shelves. These shirts are to be given a one-year test to determine durability and shrinkage and the suitability of the coat-type pattern.

SECTION III

Miscellaneous

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

EMERGENCY SIGHTING EQUIPMENT FOR ANTIAIRCRAFT GUNS.—Two years ago the Coast Artillery Board proposed the restoration of sights on antiaircraft guns for the purpose of providing some means of emergency fire con-

trol for use if the director or data transmission systems are disabled. A proposed design for an emergency sighting system was submitted to the Coast Artillery Board. After study, it was recommended that consideration be given to the use of M1917 Data Computors as emergency directors for Case 1½ pointing, and that the sighting system be adapted primarily for such use.

METEOROLOGICAL DATA.—The present system of making pilot balloon soundings works well enough in daylight and fair weather, but in cloudy weather it is desirable to have some method for obtaining an approximation of the ballistic wind. Also, there are certain indications that the density gradient in the tropics is not necessarily the same as assumed in the ballistic density tables. Since airplanes are now available from which the density at high altitudes may be measured directly, it would seem that opportunity to check the density tables should be taken. The Coast Artillery Board is recommending that the possibilities for determining ballistic wind when ceilings are low be investigated and that the density tables be verified with particular reference to harbor defense conditions.

RETICLES IN TELESCOPIC SIGHTS.—There are four types of reticle in service in telescopic sights: crossed wires, clover leaf with vertical and horizontal pointers of equal length, clover leaf with shortened horizontal pointers, and clover leaf with crossed wires in addition to the pointers. The question as to relative desirability of the various types was recently brought up in a narrative report of target practice in which it was said that the horizontal pointers of the clover leaf reticle obscured splashes and at times the target. The Coast Artillery Board agreed to this contention and recommended that the clover leaf type with cross-wires and with shortened horizontal pointer be adopted in lieu of any of the other types. The simple crossed wires are undoubtedly the most effective, optically, of the several types, but are excessively fragile unless supported on the clover leaf pointers.

The New Coast Artillery Board Building.

ANTIAIRCRAFT SEARCHLIGHT PRACTICES.—Objections have been raised to the lack of realism of the present method of searchlight target practice wherein only a single airplane is within the defended area during the practice. The tactical doctrines of the Air Corps provide for several schemes of night attack, any of which would result in placing several airplanes simultaneously within the sector of a searchlight platoon. By directions of the Chief of Coast Artillery the Coast Artillery Board devised three methods for simulating such night attacks, each by use of only a few airplanes, and has recommended that in one of the practices of Regular Army antiaircraft searchlight batteries two special courses, each involving more than one airplane, be substituted for the two special courses of the type at present required. This, of course, is subject to the availability of the airplanes required. It is foreseen that, if this recommendation is approved, there will be numerous difficulties in obtaining data for target practice records, but it is believed that the importance of securing information in regard to the difficulties encountered in picking up one of several airplanes is well worth the additional complications involved.

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THE UNFAILING FORMULA *for production of morale is patriotism, self-respect, discipline and self-confidence within a military unit, joined with fair treatment and merited appreciation from without. It cannot be produced by pampering or coddling an army, and is not necessarily destroyed by hardship, danger, or even calamity. Though it can survive and develop in adversity that comes as an inescapable incident of service, it will quickly wither and die if soldiers come to believe themselves the victims of indifference or injustice on the part of their government, or of ignorance, personal ambition or ineptitude on the part of their military leaders.*—MACARTHUR.

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery

Executive
LIEUT. COL. HENRY T. BURGIN

Personnel Section
MAJOR R. T. PENDLETON

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

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

Plans and Projects Section
LIEUT. COL. G. A. WILDRICK
MAJOR C. M. S. SKENE

Hawaiian Separate Coast Artillery Brigade News Letter

BRIGADE COMMANDER, BRIGADIER GENERAL ROBERT S. ABERNETHY
CHIEF OF STAFF, LIEUT. COL. FULTON Q. C. GARDNER, C.A.C.

S-1, LIEUT. COL. W. V. CARTER, A.G.D.
S-2, CAPT. WILLIAM F. LAFRENZ, C.A.C.
S-3, LIEUT. COL. BENJAMIN H. L. WILLIAMS, C.A.C.
S-4, MAJOR BIRD S. DUBOIS, C.A.C.

HARBOR DEFENSES OF HONOLULU
COLONEL GEORGE L. WERTENBAKER, Commanding

HARBOR DEFENSES OF PEARL HARBOR
COLONEL AVERY J. COOPER, Commanding

SIXTY-FOURTH COAST ARTILLERY
COLONEL WILLIS G. PEACE, Commanding

By Lieutenant John R. Lovell, C.A.C.

Hawaiian Division Maneuvers

IN the Hawaiian Department is to be found the largest number of troops concentrated under one command in the United States Army, therefore, the principal advantage of a tour of duty in Hawaii is the opportunity to serve with, or witness the activities of the other arms. Each officer has a chance to form contacts among the officers of other branches and a splendid opportunity to become familiar with the tactical employment of the different arms.

Brigadier General Robert S. Abernethy was detailed by the Department Commander, Major General Halstead Dorey, to act as Chief Umpire of the Hawaiian Division Maneuvers, held on the north shore of the Island of Oahu, during the first two weeks of December, 1934. General Abernethy selected 51 officers and 24 noncommissioned officers to assist him. It was a splendid opportunity, and the detail was very much in demand by the officers in the Brigade.

Lieutenant Colonel B. H. L. Williams, C.A.C., was detailed as executive assistant to the chief umpire, and Lieutenant Colonel William E. Shedd and Major Nicholas Szilagyi, Inf., were detailed as Colonel Williams' assistants. These officers put in several weeks of hard work prior to the maneuvers, formulating a plan of control for the exercises. Twice all umpires were assembled for preliminary conferences. The situation, plan of operations, problems of supply, personnel and administration were explained in detail. The assistant umpires were required to study the staff manual and the combat principles pertaining to the particular arm or service to which they were assigned. The "war" was under control at all times.

The umpires were ordered into the field several days before the troops arrived at their camp sites; preliminary reconnaissances were conducted in order that they could become familiar with the terrain over which they were to operate. A number of them were forced to become mountaineers for several days, and one had his boots on for so long that it was necessary to cut the seams in order to remove them. The officers had to carry their own equipment, including water and rations. The only real complaint was that the mosquitoes were so bad at night that both armies had to declare a truce until dawn.

The terrain over which the troops maneuvered was very rough and mountainous, dominated by peaks and

Left to right: Captain Wm. G. Brey, commanding composite battery; Lieutenants Dean Luce, G. A. Chester, and Don Webber.

Colonel George Wertenbaker arrives in Honolulu, and is met off port by Colonel and Mrs. Wm. E. Shedd. *Left to right:* Mrs. Shedd, Colonel Wertenbaker, Colonel Shedd, and George Wertenbaker, Jr.

64th C.A. detachment, under command of Captain Edward W. Timberlake, takes part in Armistice Day Parade in Honolulu.

crests from which radiated many ridges and gullies. The inland locality where the heaviest "fighting" took place is heavily wooded, and marching off the trails was extremely difficult. It was remarkable how large bodies of troops were able to move so rapidly in this country. In a few instances, in order to execute flanking movements or to get to the rear of the enemy, patrols had to cut their way through the thick tropical undergrowth.

The "fighting" in the hills consisted mainly of skirmishes between small patrols, and it was in this guerrilla warfare that the noncommissioned officers of the division plainly showed their worth. Their leadership, initiative and spirit were outstanding. In fact, the work of the division as a whole was a great tribute to the training and leadership developed by the company officers. Every last buck private played the game, even in his weariest moments, when he had been in the hills for several days with insufficient food, and was so tired he could hardly walk another step.

The problem of supply was a serious one. Rations, water and ammunition were transported by trucks until motor transportation was no longer possible and then shifted to pack trains. Sometimes the pack mules could not reach the most inaccessible areas and it was necessary for the men to carry supplies on their backs. Many devices for transporting supplies were employed but apparently none were entirely successful. The officers and men are studying the problem and some special equipment will undoubtedly be devised before the next maneuver. It was the consensus of opinion that special equipment should be developed and issued for use of the troops stationed in the Hawaiian Department. Special packs for carrying food, supplies and water; special equipment for clearing trails; special training in construction of shelters in the mountains, and musketry practice in rough country are necessary. In fact, the Hawaiian Division infantry soldier should be a composite of a soldier, mountain goat and burro.

The problem of moving bodies of troops during the day when the enemy had complete control of the air, was a serious one. The commanders concerned finally met the situation by sending at five minute intervals, single high-speed trucks loaded with troops. The movement was unobserved by the "enemy" and caused considerable surprise later in the problem.

The soldiers of the Division camouflaged their positions very well. Bodies of troops immediately scattered when attack planes appeared, and local defense against aircraft was very well conducted. However, the troops had to be repeatedly warned about taking cover from innocent observation planes.

The 3rd Engineers did some very fine work during the operations. They constructed roads and built trails besides taking part in the fighting.

An interesting sidelight on the maneuver was the splendid system of communications for umpires provided by Major Henry J. Schroeder, the Hawaiian Division Signal Officer. Radio nets were used to transmit information pertaining to artillery fire and a complete telephone net *for umpires only* was in operation over the entire area. This enabled the chief umpire to maintain complete control over the situation at all times, and it also enabled the umpires on the ground to seek the advice of the chief umpire or executive assistants when important decisions were to be made.

Captain William G. Brey, assisted by Lieutenants Don Webber, Dean Luce and G. A. Chester, commanded a composite battery of antiaircraft artillery. According to

the reports they functioned very well during the maneuver. When the "enemy" spotted the location of the antiaircraft battery, Captain Brey changed the location during the night and erected a dummy in the old site. The next morning the "enemy" aircraft bombed and strafed the old position. In the meantime Captain Brey and his cohorts were "shooting the planes down" from his new position.

The Coast Artillery battery, with snappy new caps which are authorized for mobile units, was the envy of all the troops in the field. These caps are not available for issue as yet, but they were tailor-made for this occasion.

The following letter of commendation speaks for itself:

OFFICE OF THE COMMANDING GENERAL
Schofield Barracks, T.H.,
December 19, 1934.

Brigadier General Robert S. Abernethy,
Commanding Hawaiian Separate Coast Artillery Brigade,
Fort DeRussy, T.H.

My dear General Abernethy:

The recent Hawaiian Division Maneuver was, in the estimation of the members of the Division, unusually successful and constructive. The result was largely due to your generous coöperation and able assistance—combined with that of the officers and enlisted men you brought with you—in the strenuous and difficult task of operating the comprehensive umpire system which you devised.

All members of the Division want to join me in extending our sincere thanks to you and your officers and men. The close association in the field of members of the two commands can only add materially to the efficiency and close coöperation of the garrison in the Hawaiian Island. We hope all of you enjoyed the association as much as we did, and that there will be many occasions in the future when it will be possible for us to again enjoy this comradeship.

Sincerely yours,
(Signed) HALSTEAD DOREY,
Major General, U. S. Army,
Commanding.

DEPARTMENT COMMANDER'S COAST ARTILLERY CUP

The results of the Department Commander's competition in the use of arms for the Coast Artillery of the Hawaiian Department for the training year 1933-34 were very close. The 64th Coast Artillery managed to nose out the Harbor Defenses of Pearl Harbor by a small margin of 14 points. The Department Commander, Major General Halstead Dorey, expressed himself as being very much pleased with the excellent results obtained by the units of the Hawaiian Separate Coast Artillery Brigade. This competition includes gunners' instruction, the Brigade Commander's annual training inspection and the results of Coast Artillery target practices.

Following are the final scores:

64th Coast Artillery, Colonel W. G. Peace, Commanding ..... 1,020 points
Harbor Defenses of Pearl Harbor, Colonel Avery J. Cooper, Commanding ..... 1,006 points
Harbor Defenses of Honolulu, Colonel George L. Wertenbaker, Commanding.. 952 points

OVERS AND SHORTS

The organizations of the Brigade are all busily engaged in conducting gunner's instruction and examination. This is an important phase of the training in this Department, at the present time, because of the great turnover of personnel each year.

The 64th Coast Artillery participated in the Armistice Day parade in Honolulu. The detachment was commanded by Captain Edward W. Timberlake, and consisted of antiaircraft searchlight units, .50 caliber machine-guns mounted in trucks, and a battery of modern antiaircraft guns drawn by prime movers. The 64th Coast Artillery made a fine showing, and the ten thousand or more people in attendance evinced great interest in the demonstration.

The Harbor Defenses of Honolulu won the Honolulu Sector Tennis Championship again this year. Colonel Wm. E. Shedd was the team captain. Captain K. P. Flagg, Lieutenants Harry Cooper, Willis A. Perry and Wayne Barker were also members of the team. Lieutenant Cooper won the singles championship of the Sector, and Lieutenants Cooper and Barker won the doubles.

The interbattery boxing competitions have been completed in each of the posts of the Brigade. Battery F, 55th C.A., Captain Archibald D. Fisken, commanding, won the title in the Harbor Defenses of Honolulu. Battery K, 64th C.A., Lieutenant Sanford J. Goodman, commanding, won the championship at Fort Shafter, while Headquarters Detachment and Combat Train, First Battalion, 55th C.A., Lieutenant Howard J. Vandersluis, commanding, won the laurels in the Harbor Defenses of Pearl Harbor. The Sector Boxing Competitions commenced on Friday, January 4th, and will continue for seven Friday evenings thereafter. Considerable impetus has been added to the competition following the announcement of the Department Commander that the Department Champions are to be sent to China on the March transport, returning sometime in June. Judging from the amount of interest in the exhibitions, the whole Department would like to go.

Fort MacArthur Notes

BY LIEUTENANT EUGENE C. SMALLWOOD, 63RD C.A.

THE Holiday Season finds us all back at Fort MacArthur, after a prolonged absence of almost all of November, during target practice firing. Battery "B," commanded by 1st Lieut. Harry S. Aldrich and Battery "E," commanded by 1st Lieut. Lee A. Denson, left for Carlsbad, Calif., eighty-one miles distant, on November 1st, where they remained in camp until

November 24th. Target practice was witnessed by a group of about twenty officers of the U. S. Navy.

On November 12th, the Regiment returned to the Post and participated in the Armistice Day Parade in Los Angeles, terminating their march at the Coliseum, where they were guests at the annual football game between St. Marys and U.C.L.A.

November 17th, Major General John F. Preston, Inspector-general of the Army, made a brief visit at Fort MacArthur on his inspection swing of Pacific Coast defenses. Asked by newspaper reporters about prospective coastal defense plans, the General replied: "My office is supposed to be like the owl—sees all, hears all, knows all, but says nothing."

On Wednesday, November 28th, the officers and ladies of the Post were guests of Warner Brothers Studio at their Hollywood Theatre, for the premiere of "Flirtation Walk," the antiaircraft scenes of which were filmed at Fort MarArthur. If any of our readers should see this picture, watch carefully the action, and listen for the stenitorian tones of Captain Thomas R. Bartlett, as he supervises the firing in which Dick Powell so thoroughly fails to match pointers. At the premiere we were fortunate enough to see in person, Dick Powell, Ruby Keeler, Director Frank Borzage, Al Jolson, and numerous other film celebrities. Before the performance several prominent Military Academy graduates, including Major General Farnsworth, made their appearance on the stage.

The Post greenhouse aided the batteries in decorating their mess halls for Thanksgiving dinner, by supplying potted plants, shrubs and flowers. The officers and their families, and the families of enlisted men were all invited to share in the bountiful feasts.

In honor of the return of the Navy the city of San Pedro outdid itself in the matter of entertainment and decorations—a Spanish Fiesta, sponsored by the city, lasted for a week. In preparation for this, all the male citizens of San Pedro were requested to grow beards, any citizen found on the streets who had not made an attempt to produce a complete hirsute growth, such as was formerly found on the physiognomies of the Spanish Grandees, was summarily fined from one to ten dollars by kangaroo court. This induced our soldier personnel to shave more closely than before, to prevent being mistaken for an early settler, also caused them to appear in uniform when visiting the city, to obviate losing a month's pay for lack of facial adornment. The streets and stores were decorated with Spanish shawls and blankets, and local citizens went about their duties dressed in Spanish costume. Several parades were held, in which appeared many excellent floats depicting stages in San Pedro's growth from the days of the Spanish colonists to the present. The Post furnished wagons and mules, trucks and antiaircraft equipment for the main parade on December 1st. In addition to the military and naval officers, Governor Merriman, Mayor Shaw of Los Angeles, and local dignitaries participated in the festivities.

On Christmas Day, the officers and ladies, and the families of the married enlisted men, attended the Christmas dinners as guests of the several batteries.

The Officers' Club held a dance on December 29th attended by all of the officers and ladies not absent on leave. The club was gayly decorated in keeping with the holiday spirit. Music for the occasion was furnished by the Post orchestra, under the direction of Tech. Sgt. E. B. Gentile. Their splendid rendition of all the latest hits, caused our final party of 1934 to be voted the best of the year.

As an unusual departure from its normal military duties, Fort MacArthur entered an exhibit in the San Pedro Flower Show. This exhibit—composed of plants and flowers grown on the Post—won First Prize for artistic display. The Gold Ribbon won by this horticultural feat now reposes in state in the office of the Prison Officer, under whose direction the display was arranged.

The Post beautification scheme is now showing the fruits of the labor that has been expended. Poinsettia blossoms, twelve inches in diameter, are to be found in profusion. The thousands of shrubs and flowers that started out a few months ago as scrawny plants, have flourished giving Fort MacArthur the appearance of a well maintained city park. Colonel Oldfield and his assistants, having achieved a transformation in the appearance of the Post, are working hard to maintain it in its present condition.

The *Brooks*, a fifty-foot cabin launch, formerly the property of the Public Health Service, has been turned over to the Army, and is now tied up at the Fort MacArthur dock, where it will remain until May. At that time it will proceed under its own power to Chillcoot, Alaska, for use by the garrison, in a climate far different from that of southern California.

On October 30th, the Officers' Club held a reception and tea dance, in honor of three brides who recently joined the regiment. At this function the post welcomed Mrs. H. R. Oldfield, Mrs. L. W. Goeppert and Mrs. W. F. McKee. Major B. M. Booth and family, lately of Corregidor, and Captain and Mrs. D. M. Griggs, from Hawaii, have joined the garrison. Lt. H. B. Dierdorff, Dental Corps, has left us in favor of Carlisle Barracks, where he will become a student.

Captain Lloyd W. Goeppert and his bride of a few months will shortly leave us for a return engagement at Corregidor. Captain and Mrs. John E. Adamson, Quartermaster Corps, also will sail for the Philippines on the U.S.A.T. *Grant*.

PEACE, AS WELL AS WAR, HAS ITS HORRORS. *Mankind cannot be fooled into thinking otherwise. Man believes some wars to be better than some conditions of peace.* —STOCKTON.

Harbor Defenses of Manila and Subic Bays News Letter

BRIGADIER GENERAL STANLEY D. EMBICK,
Commanding.

MAJOR L. L. STUART, 59TH C.A. (HD)
LIEUT. COL. HOWARD K. LOUGHRY, 60TH C.A. (AA)
LIEUT. COL. H. LER. MULLER, 91ST C.A. (PS)
MAJOR REINOLD MELBÉRG, 92D C.A. (PS)

THE second training season of this calendar year progresses with unusual vigor in spite of storms and limited personnel. The three seacoast regiments have completed their additional assignments of antiaircraft machine gun practices. Time was limited but the results were very satisfactory. These organizations are now preparing for their regular seacoast firings. This season special emphasis is being placed on firings from secondary armament, with a considerable number of 155-mm. gun practices. The machine gun batteries of the 60th have completed their .30 caliber practices and are now preparing for the .50 caliber firings. The gun batteries of this regiment will fire later in the month. The demands on the Air Corps for all this activity has been heavy and the fine spirit of coöperation given by the organization at Nichols Field has come in for a large share of favorable comment.

The archipelago has passed through one of the longest and most devastating rainy seasons in the history of the local weather bureau. The rains started early in May and the latest typhoon signal was lowered on December 5th, thus the season lasted seven instead of the orthodox four months. During October and November, after the season usually is past, four violent typhoons swept Luzon and the Viscayes, the first crossed Northern Luzon and each in turn passed further to the south. As the second one approached, typhoon signal No. 7, (indicating that the center of the storm would pass over the locality), was raised in Manila and all the army posts in its vicinity. In Manila many houses were badly damaged or completely destroyed. At Fort McKinley the roofs were lifted from a dozen houses and about four hundred fine acacia trees were uprooted. By some quirk the full violence of this typhoon, as well as the others, missed Corregidor, although the winds were high and much rain fell. At this post a typhoon signal above No. 2 is very unusual; yet the newcomers from the October boat (who were assured that the rains were over) saw all signals from No. 1 to No. 7 in a very short time. By way of furnishing additional entertainment came the strongest earthquake that this section has experienced in 25 years.

The two-year law has greatly disrupted affairs in the Islands. During the present busy training season this garrison is short over one quarter of its artillery officers. Some batteries have but one officer and all activities are shorthanded. The U.S.A.T. *Grant* has speeded up her schedule and is now making each round trip in slightly over two months. Two more boats will see the post back to its usual strength.

The command was saddened by the untimely death of Colonel Clarence B. Ross, commanding the 91st C.A., (P.S.), of pneumonia after a very short illness. In honor of Colonel Ross the cove on which the new officers' swimming beach and club house is located has been officially named Ross Beach.

The final phase of the Philippine Department map maneuvers was played at Fort McKinley. This phase constituted a form of pursuit in exploitation of a breakthrough, and made a most interesting problem. General Embrick and his II Corps staff moved to Ft. McKinley, coincident with a severe typhoon. The water was so high between Manila and McKinley that the department staff officers were forced to effect a river crossing in a class "B" truck. So ended the maneuvers that did so much to detract the minds of the officers from the disagreeable rains.

The annual golf tournament has just been completed and furnished some fine play. Major L. P. Hartley, D. C., was medalist for the second time in three years with 125 for two rounds of the par 60 course. Bunched well behind him were Major Stuart; Captains White, Case, Herrick and Bullard. The finals of the championship flight was played by Lt. H. W. Mansfield and Captain L. A. White. Mansfield, a dark horse from the first, played more steadily than his seasoned opponent and won the championship handily. Major Maurice Morgan won the second flight and Lt. P. N. Strong, Jr., C.E., the third flight. A number of fine prizes donated by Manila and Corregidor merchants were awarded to the winners and the runners up of all flights.

The lady golfers are running a two months ringer match, with Mrs. Warren and Mrs. Hastings tied for low at this time. Capt. Hastings, not to be exceeded by his golfing wife, made a hole-in-one on the skyscraper second hole.

Fort Totten Goes to School

By Lieutenant R. H. Grinder, C.A.C.

NOW that the summer outdoor period is over there has been inaugurated at Fort Totten, a schedule of education and recreation that is considered a distinct innovation in Army circles. More than half the members of the garrison—officers, soldiers, ladies and children—are studiously pursuing education of some sort, and it is believed by those in charge of the program that this pioneer effort in education and recreation will revolutionize the social life of Coast Artillery posts.

The new program, arranged by coöperation of the CWA with the YMCA and Army authorities, offers subjects of interest to all members of the garrison, from children to senior officers.

Expert instructors have been selected by the CWA and allotted to Fort Totten under an "Educational Project" that has been in operation about two months, during which time the school has expanded from one room in the Fort Totten YMCA building, where only two instructors were engaged, to the greater part of three buildings with a staff of nine instructors, each of whom works 30 hours a week.

A "Board of Education and Recreation" consisting of Major Horace L. Whittaker, Q.M.C., chairman; Major Frank Hayes, C.C.; Major C. F. Davis, M. C.; Captain O. A. Nelson, 62d C. A.; 1st Lieutenant R. H. Grinder, 62d C. A., Educational, Recreational and Athletic Officer of the command; and Mr. A. G. Beck, executive secretary of the Fort Totten YMCA, who is Director of Instruction, exercises general supervision over the activities of the new program.

In addition to well attended classes in academic subjects taught in high schools, and classes in stenography and typewriting, the program includes:

A play school for children from three to six years of age, that is in session from 10:00 A.M., to 3:00 P.M. daily.

A course in public speaking intended to develop the voice, vocabulary and articulation.

Instruction in ball room, tap, chorus and acrobatic dancing.

A class in dramatics is now preparing for production of two groups of plays by officer personnel and one group by noncommissioned officer personnel of the garrison. The soldiers' group is working on a minstrel, while the children's group put on a Christmas play.

Commercial art is listed, with about fifteen soldiers showing special aptitude in that line.

A handicraft shop has been set up in the basement of the YMCA with classes of soldiers and boys to keep the wheels turning. This course teaches wood, metal and leather working.

Physical training classes are an important feature of the program, and it is expected that this division will assist in the development of a number of outstanding athletes.

All material and text books required by the program have been donated by members of the Fort Totten garrison or furnished by the YMCA and the Quartermaster Department of the Army. It is the first time the CWA has combined with the YMCA and the military authorities in a venture of this kind and its progress is being watched with keen interest by officials responsible for its inauguration.

Panama Canal Department News Letter

Department Artillery Officer
COLONEL FREDERIC H. SMITH, G.S.C.

Fort Amador
COLONEL EARLE D'A. PEARCE
4th C.A. (AA).

Fort Sherman
COLONEL WILLIAM L. COLVIN,
1st C.A.

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

IT remained for the Navy to add spice to life in the Panama Canal Department. It was known that they were returning from their summer outing in eastern waters but they failed to send us any advance notice of their arrival. The presence of the fleet is always a good excuse for a maneuver and their last visit was no exception. When the fleet suddenly arrived in Limon Bay on the night of October 23rd, the Army telephone exchanges went into action in a big way to notify everyone concerned that another "alert" was on. Things began to happen so suddenly that the local press had no time to get out an extra so that we could read what the "war" was to be all about. Even the Department Publicity experts did not know that a state of war existed until they arrived at their offices the following morning and found that hostilities had commenced eight hours earlier.

Battery "F," 1st C.A., had finished a mine practice, picked up all mines and returned to barracks for a well earned night's rest, when they were ordered out at 11:00 P.M. to proceed by boat and rail to reinforce the Pacific Sector troops. Together with some additional troops from the Atlantic Sector they hastily rolled packs, drew two days' rations, and started by special train for the Pacific side. At the same time various Engineer troops moved by special train to the Atlantic side. All troops were ordered to be at their assigned position by 5:30 A.M. or to be en route to stations at the opposite end of the Canal at that hour—and they were.

The first destroyer appeared at Balboa at 7:10 A.M., having made a rapid transit of the Canal, and for the next day and a half we furnished protection for the fleet during the transiting, from any and all hypothetical enemies on land, water and in the air, until once more the sailors and marines could land liberty parties in Balboa and "have the situation well in hand." Then, as no multicolored enemies had appeared, we returned home to learn of tales of heroism from the families whom we had so abruptly deserted. We remember in particular the case of the wife of a newly arrived officer who thought the "war" was real and who hastily moved to the basement until she was reassured by neighbors that this war was just "another Panamanian custom."

After a rest period during which we compared and prepared notes, a critique was held at Fort Amador for

the officers of the Pacific Sector. Cooper Foote, who had arrived just twenty-four hours prior to the declaration of war, and had assumed command of the seaward defenses of the Pacific side, presented a most interesting resumé of the work of the harbor defense troops. For the information of his former students in the service, it was "just another Monday morning conference" for Cooper. He had all of his charts and thumb tacks.

The rainy season, which now seems to have passed, reached its peak during November 17-18 while the *Republic* was in port. Those newcomers who disembarked at Cristobal are still undecided whether the water was coming from above or below, and there was plenty. The *Republic* was delayed eight hours in port because it was impossible to open the hatches during the downpour. Landslides were numerous, one delaying all traffic on the Panama Railroad for several hours and several smaller ones obstructed access to installations at Taboga. Battery "G," 4th C.A., was dispatched to the island with wheelbarrows, shovels and rations and after four days restored order.

On October 9, 1934, a review was held at Fort Amador for Brigadier General John W. Gulick, the Sector's new Commander. Following the review General Gulick met the officers of the Post and briefly outlined his plans. The General and "Art" Fuller spent the next three days dodging showers and taking reviews at the other posts in the Pacific Sector.

Armistice Day was the occasion of an impressive service at the Amador theatre with the Honorable C. P. Thomas, District Judge, as guest speaker. On Monday, Nov. 12th, a review was held at 11:00 A.M. with the now traditional minute of silence and the sounding of taps. Representatives of the Veterans' organizations, the Admiral Commanding the 15th Naval District, the Department Commander and the Pacific Sector Commander were in the reviewing stand with the Post Commander, Lieutenant Colonel J. S. Dusenbury, who took the review.

During October and November we had the annual visit of the Department Inspector, Major Reuben N. Perley, I.G.D. So far as is known everybody survived with a minimum number of "skins." The survivors are now turning their attention to training as field soldiers and are refreshing their memories concerning platoon frontages, battalion reserve lines and advance guard formation. Major John W. Crissy, Infantry, of the Pacific Sector Staff has been detailed to supervise this "doughboy" instruction.

Among the recent changes at Fort Amador are the arrival of Colonel Earle D'A. Pearce, Miss Pearce, and Lieutenant C. R. Longanecker. Colonel Pearce has assumed command of the post with Lieutenant Colonel Dusenbury becoming the Executive. Meade Wildrick has been promoted to Lieutenant Colonel and is now plans and training officer. Major Enrique Benitez has returned from a protracted sojourn in the rarified atmosphere of Quarry Heights and has resumed command of the 1st Battalion.

A reception and dance was held at the Post Gymnasium at Amador on the evening of November 24th for the newly arrived officers and their families, one family being that of Lieutenant George H. Crawford. George went on leave in September and returned in November with his bride.

Fort Sherman reports a number of changes in officer personnel at that Post. Captain Dorsey J. Rutherford has left for his new station and Lieutenant Thomas K. MacNair is on leave in the United States. Colonel William M. Colvin has arrived and has taken command of the Harbor Defenses of Cristobal and of the 1st Coast Artillery. Captain Arthur E. Wilson has reported from the University of Pittsburgh and Lieutenant Franklin K. Gurley has joined from Fort MacArthur. Both are assigned to Battery "C." Captain Linton Y. Hartman commands Headquarters Battery. Lieutenant Robert J. Lawlor has joined Battery "F," Lieutenant Kenneth M. Briggs is assigned to Headquarters Battery. Fort Sherman now has two medical officers, Major Joseph I. Martin and Captain Oliver H. Waltrip. Major Harry R. Pierce who has joined the 1st Coast Artillery has been assigned to Fort Randolph.

Fort Monroe News Letter

BRIGADIER GENERAL JOS. P. TRACY, U. S. ARMY,
Commanding.

COLONEL RUSSELL P. REEDER, 2d C.A.
Commanding Harbor Defenses of Chesapeake Bay

LIEUTENANT COLONEL JOS. F. COTTRELL,
Commanding 1st Bn., 2d C. A.

MAJOR FRANKLIN KEMBLE,
Commanding 3d Bn., 52d C. A.

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

COLONEL RUSSELL P. REEDER has assumed command of the Harbor Defenses of Chesapeake Bay and of the Second Coast Artillery, relieving Lieutenant Colonel Jos. F. Cottrell, who has been in command since the departure of Brigadier General Percy P. Bishop. On December 15th, at a reception held at the Casemate Club, the officers and ladies of Fort Monroe were presented to Colonel and Mrs. Reeder.

There have been many changes in officers at Fort Monroe during November and December. Lieutenant and Mrs. Patterson, Class of '33, left for the Philippine Islands, Lieutenant and Mrs. Congdon for the Canal Zone, and Captain W. W. Moore, Q.M.C., who has been in charge of rail and water transportation at Fort Monroe, departed for the QMC Office in Washington. R. J. "Bob" Van Buskirk received his Majority on November 1, but had all the joy taken out of the promotion by learning that he would have to leave the balmy climate of Fort Monroe for the chill weather of Portland, Maine, for Organized Reserve duty. We suspect that the present price of fur coats tended to accentuate the regret he felt at leaving. With commendable foresight he took three weeks leave, and went to Florida to store up enough sunshine to last him through the Maine winter.

Before departing, Major Van Buskirk was given a farewell review of the troops at Fort Monroe, and the Band, remembering his early Navy affiliations, played "Anchors Aweigh" in true nautical style. Major Creighton Kerr, who has been the very efficient Artillery Engineer in the Harbor Defenses for the past four years, volunteered for Hawaiian Service, we believe to escape the winter weather.

He is succeeded as Artillery Engineer by Lieutenant Simmons, who has been in charge of CCC affairs during the past several months. Lieutenant Niethamer took over the CCC Camp from Lieutenant Simmons, but was not allowed to keep it very long, as he had to take over Battery B, 51st C.A. from Captain Cassard, who is leaving the first of the year for Hawaii. Lieutenant Samuels, who has been in Post Headquarters, will take over the CCC Camp when he returns from his Christmas leave.

Among the recent arrivals at Fort Monroe, are Captain Chapman, QMC, who relieved Captain Moore as officer in charge of transportation; Lieutenant Skidmore, who arrived from Hawaii November 13th only to leave for Springfield Armory and a detail in the Ordnance Department on December 3d; Lieutenant Levin, who arrived from Hawaii and is now living in Quarters No 1, the next to oldest set on the post (No. 50 is the oldest); Lieutenant Piram, Class of '34, who arrived after some D. S. at Fort Scott, because he spent his graduation leave in Montana, and it was too far to come East by rail; and Lieutenant Jablonsky, also Class of '34, who has been coaching football at West Point during the past season.

On November 30th Master Sergeant John W. Page, the Post Sergeant Major, retired after 30 years service. At his request, no review or ceremonies were held in connection with his retirement, and the best wishes of the command follow him to West Virginia, his native State, where he will make his home.

We are making plans for the Training Camps and CCC activities of next summer. One of the departing battery commanders made out a list of suggestions for his successor. It is believed that they are of sufficient interest to warant extracting portions of them:

"Having been requested by the Battalion Commander to put in writing the methods I employed in carrying ou the heavy summer schedules imposed on this organ zation, I have the following suggestions to offer to thos who may be charged with similar duties in the future. I is my belief that organization and system must prevai not only in Battery X, but in all the summer activiti with which the organization is connected. For instance Battery X must be self sustaining in administration, ca of Barracks, grounds, and armament, without the leade ship of a single officer; because during the past thre summers every officer has been detailed on full time dut elsewhere.

"I have tried to keep trained men in the key position such as company clerk, mess sergeant, supply sergeant etc., so that during the summer I have not been caugh with inexperienced men who would require close super vision in these positions.

"The first sergeant, during the camps, has remaine with the organization and has been allowed considerabl latitude in running that part of the battery not connecte with the camps.

"The first round of arduous duty comes about the mid dle of May each year when the battery goes to Forty Stor to conduct target practice for the C. A. School. I advis a week's intensive artillery drill prior to departure, afte conferring with the Director of Artillery as to the meth ods they expect to use. Careful planning is essential wit regard to loading and unloading the tractors and guns o and off the barge. An inspection of the barge below th deck is considered important. Normally five guns ar taken by the Regiment. The organization must be traine to fire the battery, filling all necessary positions.

C. M. T. C.

"The last C.M.T. Camp held here comprised approxi mately 36 reserve officers and 111 candidates. The firs contingent of 18 officers arrived the day camp opene and stayed two weeks while the second stayed a lik period, arriving about three days after the first contingen departed and they left about three days before cam closed. Battery X furnished all enlisted men and tw regular officers necessary for the camp. Full responsibilit for this camp rested with Battery X. I was commandin Officer of the camp during the preparation and openin —during the interval when no reserve officers were pre ent and during the closing of the camp. At all othe times, I was "Liaison" Officer between the camp and th Commanding Officer of Summer Training Camps. A lieutenant from X battery was detailed as camp personne adjutant and it was found necessary to have him also ac as adjutant throughout the camp. The recreation, mes ing, publicity, etc., were handled by regular officers At the opening of camp a list should be furnished th new Reserve Commanding Officer showing the duties t be performed by his officers. He will make assignment He should be made to realize that, during his stay, he i camp commander and every effort on the part of th liaison officer should be kept in the background. He

should merely offer suggestions when things need correcting, and they are usually corrected. When care is exercised not to cramp the style of the commanding officer, his interest and efficiency jump right up. At first he has a tendency to depend on, and step aside for the liaison officer.

"A detailed schedule naming reserve officer instructors, with regular army N.C.O., assistant instructors, should be prepared for the entire period prior to opening camp. This includes gunners instruction, rotating classes, infantry and artillery drills, ceremonies, and recreation. Prior to opening camp about four general orders are issued covering the conduct of the camp in general. A box stored in Headquarters contains these orders for the past year and many other records that are helpful to one not familiar with the procedure.

"The candidates were housed in two 2-story cantonment buildings in Camp No. 3. For camp administration, each building was handled as a platoon, each floor as a section. For ceremonies, each building was handled as a battery and the camp as a battalion. This to train and utilize the excess number of officers present.

U. S. M. A. Cadets

"The Cadets last year were here about five days. After one day of intensive training they fired subcaliber and followed that immediately with 54 rounds of target practice ammunition. At this particular time, I was in command of the regiment and responsible for the state of training. The Cadets wanted to fire with very little training and it was up to me to decide whether Batteries X and Y were trained well enough. I decided they were O.K. and both fired, but I would advise against any such procedure in the future. No untoward event happened, but it was evident that coördination between guns, plotting room and B.C. was poor, due to limited training. In the future Cadets should remain here longer if they expect to fire using a horizontal base system, if for no other reason than safety's sake. It is advisable to have an experienced gun pointer and gun commander at each gun as well as an experienced plotter (all Regular Army) in the plotting room. The base ends were entirely manned by personnel from the regular battery. The Cadet instructors decide the kind of practice to be fired, etc., and train the Cadets both for shooting and in all other activities while here."

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The Coast Artillery Board has been conducting extensive tests on AA machine gun firing. Ever since the maneuvering target has been permitted in service practices, we have all felt that a better method of AA machine gun fire control was needed than the individual gunner with tracers. There is no doubt that this system of firing is an art, and while an occasional gunner may be able to secure hits, the whole tendency of modern military training is to make each operation a definite technique that can be taught the average soldier, with the assurance that a certain reasonable percentage of his shots will reach the target. These tests started while the Fleet Marine Force was at Fort Monroe, but as usual, the fishing boats filled the entire field of fire. It was decided that better results would be obtained at Fort Story, and on the first day there all the fishing boats from Chesapeake Bay seemed to be out in the Atlantic right where we wanted to shoot. However, the test was finished before Christmas, and the results are being worked up by the Board.

In general, the tests were divided into three main parts; those of communication, material, and fire control. Under ammunition were the tests of two-color tracer, two-range tracer, and standard tracer. Under matériel were the tests of the suitability of various types of machine guns, machine gun mounts, and miscellaneous equipment. Under Fire Control were the tests of the relative efficiency of various methods of fire control and various methods of training. Some of these were individual tracer control with and without sights, remote tracer control, stereoscopic fire director, C.A.B. sight controller used with C.A.B. sight, and the Holcomb computing sight.

As an innovation this fall, all the Coast Artillery Instructors of the Organized Reserve in the Third Coast Artillery District were ordered to Fort Monroe for a week's conference and general "get together." Lieutenant Colonel Gray, and Majors Carswell, Frick, and Turner, were among those who attended. They observed the firing which was in progress, and renewed acquaintances, and were able to discuss questions of instruction with the District Staff and the officers of the Coast Artillery School.

The million dollar seawall at last is completed, and we feel safe from any northeast storm, even such as flooded the post a year ago. To celebrate the conclusion of a very successful construction program, Mr. and Mrs. Coblentz, representing the contractors, the Merritt, McLean, and Chapman Co., gave a dinner to General Tracy and his staff, and to officers from the office of the District Engineer, at which the hope was expressed that the seawall might be extended so as to surround the post completely, protecting it from storms on all sides.

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The German Army *since the war exalts mobility, not only because Germany's army is limited in numbers and especially in heavy artillery, but probably more because it experienced the possibilities of warfare of movement on its eastern front against the Russians and has come to believe that the next war will not necessarily be a trench war.*—Colonel Robert R. McCormick.

COAST ARTILLERY ORDERS

(Covering the period November 1 to December 31, 1934)

Colonel R. I. McKenney, from Panama, to Org. Res., 2d Corps Area, New York.

Colonel Lewis Turtle, from 2d C.A. District, New York, to Panama, sailing New York, March 12.

Lieutenant Colonel L. P. Horsfall, from 5th, Fort Wadsworth, to 62d, Fort Totten.

Major C. A. Chapman, promoted Lieutenant Colonel, November 1.

Major E. B. Dennis, from Org. Res., 1st C.A. District, Providence, to 7th, Fort Hancock.

Major Frank Drake, promoted Lieutenant Colonel, November 1.

Major E. B. Gray, promoted Lieutenant Colonel, November 1.

Major Charles Hines, promoted Lieutenant Colonel, December 5.

Major F. A. Holmer, promoted Lieutenant Colonel, November 1.

Major W. K. Richards, retired, physical disability, November 30.

Major F. C. Scofield, from 2d C.A., Fort Monroe, to Org. Res., 1st Corps Area, Providence.

Major Fred Seydel, retired, physical disability, November 30.

Major R. J. VanBuskirk, from 2d, Fort Monroe, to Org. Res., Portland, December 15.

Major Meade Wildrick, promoted, Lieutenant Colonel, November 1.

Captain P. F. Biehl, from 6th, Fort Winfield Scott, to the Philippines, sailing San Francisco, February 26.

Captain K. C. Bonney, from Hawaii, to 14th, Fort Worden.

Captain J. W. Burke, retired, physical disability, November 30.

Captain H. D. Cassard, from 51st, Fort Monroe, to Hawaii, sailing New York, February 19.

Captain W. D. Evans, promoted Major, November 1.

Captain R. T. George, promoted Major, November 1.

Captain M. B. Gibson, from 9th, Fort Banks, to the Philippines, sailing New York, January 9.

Captain W. E. Griffin, from 3d, Fort Rosecrans, to the Philippines, sailing San Francisco, February 26.

Captain J. L. Hogan, to Walter Reed Hospital, for observation and treatment.

Captain R. J. Imperatori, from 52d, Fort Tilden, to recruiting duty, Fort Slocum.

Captain W. W. Irvine, promoted Major, November 1.

Captain A. M. Jackson, promoted Major, November 1.

Captain E. P. Jolls, from 7th, Fort DuPont, to the Philippines, sailing New York, January 9.

Captain J. P. Kohn, promoted Major, November 1.

Captain E. B. McCarthy, from the Philippines, to 6th, Fort Winfield Scott.

Captain J. B. Muir, Jr., from the Philippines, to 14th, Fort Worden.

Captain G. F. Nichols, from the Philippines, to 7th, Fort DuPont.

Captain G. R. Owens, promoted Major, November 1.

Captain J. F. Pichel, report President, Army retiring board, Presidio of San Francisco.

Captain C. G. Riggs, from 62d, Fort Hancock, to 5th, Fort Wadsworth.

Captain H. H. Slicer, promoted Major, October 1.

Captain L. E. Spencer, promoted Major, October 1.

Captain F. L. Topping, promoted Major, December 1.

Captain H. W. Ulmo, to Walter Reed Hospital, for observation and treatment.

Captain R. J. VanBuskirk, promoted Major, November 1.

Captain I. H. Wilson, from Hawaii, to 62d, Fort Totten.

First Lieutenant E. E. Count, Jr., from 62d, Fort Totten, to Hawaii, sailing New York, February 19.

First Lieutenant J. C. Delaney, to 9th Corps Area, Presidio of San Francisco, upon completion of foreign service. Previous orders amended.

First Lieutenant P. B. Denson, from 6th, Fort Winfield Scott, to Hawaii, sailing San Francisco, March 12.

First Lieutenant R. A. Ericson, promoted Captain, November 1.

First Lieutenant P. B. Kelly, promoted Captain, December 1.

First Lieutenant J. C. Kilbourne, promoted Captain, December 1, and retired, physical disability, December 31.

First Lieutenant O. H. Kyster, from the Philippines, to 51st, Fort Monroe.

First Lieutenant W. L. McCulla, from 61st, Fort Sheridan, to Ordnance Department, Rock Island Arsenal, Rock Island, November 21.

First Lieutenant F. F. Miter, from 52d, Fort Hancock, to Hawaii, sailing New York, February 19.

First Lieutenant J. M. Moore, promoted Captain, November 1.

First Lieutenant P. D. Perry, from Hawaii, to 6th, Fort Winfield Scott.

First Lieutenant P. H. Raymond, to 2d Corps Area, Governors Island, upon completion of present tour. Previous orders amended.

First Lieutenant Lloyd Shepard, from the Philippines, to 14th, Fort Worden.

First Lieutenant C. E. Shepherd, from Hawaii, to 62d, Fort Hancock.

First Lieutenant T. B. White, from 14th, Fort Worden, to the Philippines, sailing San Francisco, February 26.

Second Lieutenant R. L. Anderson, promoted First Lieutenant, November 1.

Second Lieutenant C. L. Andrews, from 6th, Fort Winfield Scott, to the Philippines, sailing San Francisco, February 26.

Second Lieutenant L. K. Beazley, from 6th, Fort Winfield Scott, to the Philippines, sailing San Francisco, February 26.

Second Lieutenant K. M. Briggs, promoted First Lieutenant, November 1.

Second Lieutenant L. H. Brownlee, promoted First Lieutenant, October 1.

Second Lieutenant C. G. Calloway, promoted First Lieutenant, November 1.

Second Lieutenant G. R. Carey, promoted First Lieutenant, October 1.

Second Lieutenant N. A. Congdon, promoted First Lieutenant, October 1.

Second Lieutenant I. W. Cory, from 52d, Fort Hancock, to Panama, sailing New York, March 12.

Second Lieutenant W. H. Francis promoted First Lieutenant, November 1.

Second Lieutenant O. H. Gilbert, promoted First Lieutenant, October 1.

Second Lieutenant P. N. Gillon, from 2d, Fort Monroe, to Hawaii, sailing New York, February 19.

Second Lieutenant S. I. Gilman, from 6th, Fort Winfield Scott, to the Philippines, sailing San Francisco, February 26.

Second Lieutenant E. G. Griffith, promoted First Lieutenant, October 1.

Second Lieutenant W. H. Harris, from Panama, to 52d, Fort Hancock.

Second Lieutenant E. F. Heidland, promoted First Lieutenant, November 1.

Second Lieutenant E. B. Hempstead, promoted First Lieutenant, November 1.

Second Lieutenant G. E. Keeler, Jr., promoted First Lieutenant, November 1.

Second Lieutenant F. A. Liwski, from 13th, Fort Barrancas, to 62d, Fort Totten.

Second Lieutenant W. L. McCulla, promoted First Lieutenant, October 1.

Second Lieutenant W. F. McKee, promoted First Lieutenant, November 1.

Second Lieutenant H. R. McKenzie, promoted First Lieutenant, October 5.

Second Lieutenant H. W. Mansfield, from the Philippines, to 63d, Fort MacArthur.

Second Lieutenant R. F. Moore, from Hawaii, to 6th, Fort Winfield Scott.

Second Lieutenant H. C. Parks, promoted First Lieutenant, November 13.

Second Lieutenant C. L. Partin, promoted First Lieutenant, November 1.

Second Lieutenant W. A. Perry, from Hawaii, to 63d, Fort MacArthur.

Second Lieutenant K. E. Rasmussen, promoted First Lieutenant, November 1.

Second Lieutenant J. G. Reynolds, promoted First Lieutenant, October 1.

Second Lieutenant J. R. Seward, promoted First Lieutenant, November 1.

Second Lieutenant W. M. Skidmore, from 52d, Fort Monroe, to Ordnance Department, Springfield, Mass., December 6.

Second Lieutenant P. W. Steinbeck, Jr., promoted First Lieutenant, November 1.

Second Lieutenant W. M. Talbot, promoted First Lieutenant, November 1.

Second Lieutenant W. M. Vestal, promoted First Lieutenant, October 1.

Second Lieutenant K. J. Woodbury, promoted First Lieutenant, October 1.

Master Sergeant A. W. Bishop, 59th, Fort Mills, retired, December 31.

Master Sergeant J. H. Daniels, 64th, Fort Shafter, retired, December 31.

Master Sergeant J. W. Page, 52d, Fort Monroe, retired, November 30.

Master Sergeant E. B. Teal, 14th, Fort Worden, retired, December 31.

First Sergeant Clarence Ahl, 14th Fort Worden, retired, November 30.

First Sergeant F. R. Carpenter, 59th, Fort Mills, retired, November 30.

First Sergeant Clay Chapman, 52d, Fort Hancock, retired, December 31.

First Sergeant H. T. Reese, 13th, Key West Barracks, retired, December 31.

NEWS AND COMMENT

What Is the Answer?

WHEN the Executive Council of the Coast Artillery Association decided to make an annual award of a trophy to the organized reserve regiment that accumulated the greatest number of credit hours by means of extension course work, it could not be foreseen that this innocent and handsome child would within a few years grow up to plague its foster father and like Banquo's ghost refuse to be pacified. Such is life. Unfortunately no one could gaze into the crystal and predict what the future had in store. In this particular instance, clairvoyant powers on the part of the Executive Council probably would have resulted in a very different course of action. It now seems that the trouble is brought about largely because of the fact that once an organization gets all pepped up and starts out to make a record it very soon gets out of hand and devours all of the extension school courses in sight. It is then completely up in the air. It cannot go backward and there is no way of going forward. To stand still eliminates it from subsequent competitions and puts the unit instructor on the spot because he cannot keep the regiment profitably employed. Also it has another serious disadvantage brought about by the fact that, in order to establish the record, the junior officers have progressed far beyond what was contemplated in the War Department directive. It seems that in addition to the work required for promotion to the next higher grade, or for a certificate of capacity, many of the junior officers do the work intended for the field grades; this becomes outlawed long before they can be promoted because of insufficient length of service. Officers having once completed a particular course or sub-course feel that they should not again be required to do this work; also, in order to hang up a record and compete for the individual trophy they want to take the work of the 40 series or of the Command and General Staff School courses; this, figuratively speaking, puts them ahead of themselves.

What to do, that's the question. Go on as we are and let nature take its course or attempt to set up a plan which will meet the changed conditions? Many different schemes have been proposed. None of them are free from objectionable features. It should be kept in mind that the Executive Council does not wish to cause the introduction of a complicated system of keeping records and rendering reports, therefore, any plan should take into consideration the fact that it is necessary to obtain the required data from the reports now required to be submitted by War Department regulations, otherwise we will have much trouble in obtaining statistical data. Therefore, it naturally follows that any plan adopted should be simple, direct, equitable and the data easily obtainable. It should apply with equal justice to all reserve organizations regardless of strength, location, concentration or any other factors over which neither the unit instructor nor the regimental commander have any control.

This question is receiving careful consideration but as yet the right answer has not been found. Many helpful suggestions have been received. We are hopeful that other officers will be induced to submit their recommendations. In the furtherance of this idea we take the liberty of quoting extracts from a letter submitted by the unit instructor of a regiment whose record of performance during the past three years has been almost phenomenal. His comments may cause new ideas to sprout in the minds of others; if so please reduce them to writing and send them to the JOURNAL.

"I have a number of reserve officers who are likely to exceed logical requirements in Extension School, that is if they continue, their work will be outlawed before they can get their certificates of capacity. I must watch some of these officers to keep them from getting ahead of themselves and I don't want to steer them into anything for which they will not get recognition. They can always take seacoast courses, but many of them feel that they are just putting in time when they do that. I believe the trophy idea is OK if certain dangers in it are avoided. The tendency now is just to grind and work at maximum speed when a regiment gets the bug. This should be controlled. I believe the trophy award should be on the basis of *per cent of certificates of capacity* earned or held at the end of the year. Some allowance probably should be made for an officer promoted within 6 months of the end. I do not agree with your writer (see page 448, November-December issue of JOURNAL) who says the award ought to be based on more hours per officer not holding a certificate of capacity. After they have earned a certificate you are very likely to lose them if you do not give them work to do. They should be required to take some work to keep their interest up—other courses, read military history and turn in short theses on the subject, anything to keep them in touch. Or set up a training standard for the regiments and award the trophy to the outfit coming nearest to, or exceeding it, but penalize any outfit that allows a 2nd Lieutenant to take the 40 series for example.

"You know there are only 450 hours of school work C.A., R.O.T.C. graduates can take. One of my regimental commanders has a standing re-

quirement of 100 hours per year so his outfit would go over in four and a half years. I proposed a scheme like this to him: An officer earns his C. of C. the first year and enough other work to give him 100 hours. For the next four years he does ¼ the requirement for Captain (total about 200 hours) and 50 hours of Seacoast work each year. He then gets his certificate of capacity after a year as a 1st Lieutenant. Here he does at least one year of Seacoast work only. This because I do not believe any officer should start the 40 series before he has been a 1st Lieutenant at least two years, partly because he is too young and he is too far ahead of himself and may not reach the grade of Captain in time to prevent this early work being outlawed. But suppose he starts two years after being a 1st Lieutenant. He takes four years to do the 40 series and does allied courses as long as they last. When he finishes he will have been two years a captain and can start on the C. & G. S. courses (with some changes). I do not propose that 100 hours be set as a standard because it is too much for the general run but I do think a standard should be set up and regiments graded in it. For example again; require that 1st year officers complete enough work to earn their C. of C. Second year, ¼ of the next C. of C. Third year, ½ etc. Give as a bonus, for work done in addition to C. of C. work. Thus rate the regiments as the per cent who have attained these standards plus bonuses, or might you have to depend too much on the honesty of the Unit Instructors for some of the dope? Anyway it is an idea and the holding of C. of C.'s is the main thing I am trying to develop in my regiments."

No Knox Trophy

DUE to the fact that all Coast Artillery target practice was suspended during the fiscal year ending June 30, 1934, and that during the last half of the past year practices were held with reduced ammunition allowance, it naturally follows that no battery can be designated as the winner of the Knox trophy. The next award of the trophy will be based upon the results of target practice during the calendar year 1935.

The donor of the Knox trophy, the Sons of the Revolution in the Commonwealth of Massachusetts, also annually award a medal to an enlisted man of the Coast Artillery Corps who establishes the best record while a student at the Enlisted Specialists' School, Ft. Monroe. We are pleased to announce that the award for the year 1934 has been made to Private Paul E. Craddock, 14th C.A., Ft. Worden, Wash. Private Craddock completed the course at the School in June, 1934, with an outstanding record of performance. The award was made by the President of the Society at a dinner held in Boston on January 17, 1935. Unfortunately Private Craddock could not be present but Brigadier General Alston Hamilton received the medal and forwarded it to him.

Coast Artillery Association Adopts Emblem

THE Executive Council of the Coast Artillery Association has approved a design for an emblem to be worn with civilian clothes. Many different plans were proposed and carefully considered. Some of these were elaborate and consequently relatively expensive. For example one proposal contemplated the issuance of a combination set consisting of rosette, enameled bar pin and narrow lapel ribbon. This would provide a very attractive combination, but it was felt that the cost should be kept to the minimum. With this in mind the Council decided to adopt only the enameled bar. The bar is made of bronze, gold plated. The center is enameled in red; at each end of this are narrow-panel bands of black and gold, the color scheme used in officers' hat cords. The bar is equipped with a gold plated shank button easily inserted in the lapel button hole, therefore the bar is the only part that shows.

This subject has been under consideration ever since the organization of the Coast Artillery Association. If the demand for the enameled bar is sufficient a rosette and service ribbon later will be placed on the market. The same color scheme will be observed; red for artillery, black and gold designating officer personnel.

Election of Officers

AS a result of the election which terminated on January 5, 1935, the Secretary of the Association takes great pleasure in announcing that the following named officers have been elected to the Executive Council for the period 1937-37:

Brig. Gen. J. J. Byrne, N.Y.N.G. vice Brig. Gen. J. J. Byrne.

Lieut. Col. Harold E. Pride, 507 C.A.-Res., vice Lieut. Col. F. S. Tenney, 955th C.A.-Res.

Lieut. Col. Sanderford Jarman, C.A.C., vice Lieut. Col. E. B. Gray, C.A.C.

General Byrne was elected to succeed himself. He needs no introduction to the Coast Artillery personnel. For a number of years he has been in command of the Coast Artillery Brigade, New York National Guard; in this capacity he has rendered distinguished and meritorious service. Since becoming a member of the Council he has been untiring in promoting the best interests of the Association. As president of the Metropolitan Chapter, to him belongs much of the credit for making this one of the most active chapters in the Association.

Lieut. Col. Harold E. Pride is the commanding officer of the 507th C.A. (AA), the regiment which won the trophy in 1934 and was the "runner-up" in the contest for 1933. He has consistently manifested a great amount of interest in the Association and all that affects its wel-

fare; his enthusiasm, energy and devotion to the cause of national defense eminently qualifies him to perform the functions of councilor and guide in shaping the policies of the Association.

Lieut. Col. Sanderford Jarman, C.A.C., is well known to the officers of the Corps. At present he is a member of the G-1 section of the General Staff. Colonel Jarman brings to the Executive Council a wealth of experience in all questions affecting the Coast Artillery. His vision and thorough understanding of the aims and purposes of the Association makes his selection particularly appropriate.

The outgoing officers have earned the thanks and gratitude of the members. We are sorry to lose them from the official family, but conditions are bound to develop which render a change advisable. Also, reasonable rotation in offices is necessary to obtain new life, new thought, and new action. While they are no longer active members of the Executive Council we are sure that they will be ready and willing to give of their time and talents for the advancement of the best interests of the Association and the Corps.

Extension Course Record

THE attainments of Reserve regiments in extension course work have been noted from time to time in the JOURNAL, and the 250th Coast Artillery now comes forward on behalf of recognition of the achievements of National Coast Artillery units.

The 250th stood second in hours of work per student and total hours among the National Guard regiments in the Ninth Corps Area in 1931-32; the 148th Field Artillery being first. It led the corps area in 1932-33; and was again second in 1933-34, the 146th Field Artillery having done more hours per student and the 159th Infantry having a higher total number of hours.

The figures for the past three years are as follows:

School Year	Number of Students	Hours of Work Per Student (Completed Sub-Courses)	Total Hours (Completed Sub-Courses)
1931-32	66	45	2,962
1932-33	79	85	6,739
1933-34	81	72	5,841

Of the 59 officers now in the regiment 35 have completed the series required for the grade held and 11 have completed the subcourses required for the next higher grade.

The usual group of speed demons has been in evidence, but partial credit for the showing made is due to the regimental policy requiring each officer to do 75 hours per year until he has completed the subcourses required for the grade held; 50 hours per year until the next higher series is completed; and 25 hours per year thereafter. No officer is considered for promotion until he has completed the subcourses required for the new grade, and enlisted men who are candidates for commissions must complete the ten series within two years from enrollment.

Officers and men do this work "on their own time," in addition to weekly drills, small arms and other field work, regimental and battery schools, and the routine of forms 100, payrolls, enlistment records, and the other ingenious devices prescribed in regulations to keep them from feeling that time is hanging heavily on their heads—not to mention the ever present struggle to keep the wolf a reasonable distance away from the door-mat.

The 250th is by no means ashamed of its three year record of one first and two seconds among National Guard regiments of all branches in the Ninth Corps Area. The regiment also points out that it led all Reserve Coast Artillery regiments in hours per student and total hours in 1932-33, led again in total hours in 1933-34, and its record of hours per student in that year was only beaten by two Reserve units, the 507th and the 976th.

Manhattan Chapter Doings

THE Manhattan Chapter, U. S. Coast Artillery Association, held its anual meeting and dinner dance on Saturday, December 29th, at the Building Trades Club, 2 Park Avenue. The attendance was almost equally divided between the National Guard and the Reserves, with a substantial representation from the Regular Army. The dinner was preceded by a community cocktail party in which each component visited the headquarters of the others. The Clef Club, an outstanding colored orchestra, furnished the entertainment and the music. The success of the party is fully attested by the fact that most of the guests remained until the close at 2:00 A.M.

The Regular Army was represented by General and Mrs. Cole, who were the guests of honor, Colonel and Mrs. Fergusson, Colonel and Mrs. Holmer, Major and Mrs. J. P. Hogan and Major and Mrs. Ben Bowering.

General Byrne, President of the Chapter called a five minute halt to the festivities and appointed Colonel Robert Starr Allyn as temporary chairman to conduct the election of officers for 1935. The following were nominated from the floor and elected by acclamation:

President, Brigadier General John J. Byrne, Commanding General, Coast Artillery, N.Y.N.G.

Vice-President, Colonel Frank K. Fergusson, Commanding 62nd, Coast Artillery, U.S.A.

Vice-President, Colonel William Ottmann, Commanding 212th Coast Artillery, N.Y.N.G.

Vice-President, Colonel Azel Ames, Commanding 602nd Coast Artillery, Reserve.

Secretary and Treasurer, Major Charles I. Clark, Executive 910th Coast Artillery, Reserve.

It was resolved to hold a similar affair annually and to supplement the annual meeting by a series of parties at appropriate times during the year.

Activities of the New York Coast Artillery Brigade

THE review on December 28, 1934, in honor of Brigadier General William Haskell was unusually well done even for the crack 245th C.A. A dinner and Christ-

mas party followed the review. The Armory was gay with a large Christmas tree and other appropriate decorations. The 245th held a review and parade on February 1, 1935, in honor of Mr. Frank N. Belgrano, Jr., National Commander, American Legion.

The Federal Armory Inspection of the 245th was held during the week of January 14-17, Major Ben Bowering, C.A.C., making the inspection. At the same time the 244th was inspected by Major James P. Hogan. The 212th will be inspected during the early part of February by the unit instructor, Lieutenant Colonel Oscar Warner, C.A.C. This year witnesses an innovation in the matter of annual armory inspections in that all regiments of the Brigade were required to solve a map problem as a part of the federal inspection.

Colonel Mills Miller received his appointment and succeeded to the command of the 244th to fill the vacancy caused by the untimely death of Colonel Thiery, who had so ably commanded this regiment for many years. The 212th C.A. (AA) has made excellent progress with the training activities for the year 1934-35. Individual instruction has been completed and all units are now busily engaged in organization training. Instruction in gas defense was accentuated with 517 men completing the course, including passage through the gas chamber. It is believed that it is a new record among National Guard regiments.

On January 15 General Haskell presented the Colonel Frank H. Hines attendance trophy to the 212th C.A. (AA). This trophy is awarded annually to the organization in the National Guard of New York State for highest attendance during the past training year; the attendance of the 212th was 96.07%. The members of the regiment have every reason to take justifiable pride in this unusual record.

San Francisco Chapter Very Active

By Lieutenant G. M. Mauer, 250th C.A. (AA)

THE activities of the San Francisco Chapter, Coast Artillery Association, have been hampered by the strike situation, postponed camps, etc. These difficulties have been definitely overcome and more frequent meetings are promised for the future.

On September 19th a special meeting of the Board of Directors was called by the President, Colonel Mund, at this time plans for renewed activities for this association were developed and placed in operation.

On October 25th a regular meeting with ninety officers in attendance was held at Fort Scott under the auspices of the Regular Army. In addition to this being a regular meeting of the association the occasion was made one of hearty welcome to Colonel H. E. Cloke, the new Harbor Defense Commander, and numerous acquaintances were renewed at that time.

The meeting began at 7:00 P.M., with an excellent dinner prepared by Headquarters Battery, 6th C.A. Lieutenant Colonel L. L. Pendleton acted as master of ceremonies assisted by Captain W. W. Scott, host.

Nomination and election of officers for 1935 resulted as follows:

President	Col. C. J. Mund (OR)
Vice-Pres.	Lt. Col. D. P. Hardy (NG)
Directors (3)	Maj. J. L. Farley (NG)
	Capt. J. C. Bates (RA)
	Capt. J. F. Dunworth (OR)
Secty-Treas.	1st Lt. M. G. Mauer (NG)

Highlights of the occasion were Colonel Cloke's words of greeting and interesting remarks regarding the doings at Monroe.

Lieutenant Colonel Allen Kimberly until recently senior instructor C.A. of the New York National Guard gave a very enlightening outline of the normal training activities of that organization stressing the importance of continual effort on correspondence work.

Colonel C. J. Mund (OR) reported on the National meeting held at Fort Totten in June which he attended and expressed the hope that this chapter might be represented at all national chapter meetings.

Official presentation of the C. A. Association saber was made to Lieutenant Reese (OR) for the greatest amount of extension school work completed during 1933-'34, a total of 858 hours.

During the coming year the San Francisco chapter of the Association hopes to devise some method to assist newly commissioned reserve C. A. officers, also the establishment of a trophy for which the three components may compete on an equal basis.

Doings of the 621st C. A. (AA)

By Major W. M. Cravens, C.A.C.

REGIMENTAL troop schools are progressing satisfactorily and have been well attended. New subcourses to be taken up in school will be, Property, Emergency Procurement and Funds for 2nd Lieutenants; Field Fortifications for Seacoast Artillery for 1st Lieutenants; Staff and Logistics for the Division for Captains and Field Officers.

A large number of 621st Coast Artillery officers attended the monthly meetings of the Reserve Officers Association of the Department of Delaware. At the meeting on November 13th, Captain F. Webster Cook C.A.C., gave an interesting and instructive talk on the history and evolution of a Harbor Defense. At the meeting on December 11th, Dr. J. H. Sachs talked on the Battle of Gettysburg. The Department of Delaware is making plans to organize a rifle and pistol team for outdoor competition. They are also making plans for a dance during the month of February. The Department of Delaware passed a resolution favoring the establishment of the C.C.C. as a permanent organization under the guidance jurisdiction, and command of the Army.

NATIONAL GUARD NOTES

251st C.A. Calif. N.G. Makes Fine Record

THREE of the four firing batteries of the 251st C.A. (AA) have been recommended to be rated "Excellent" by the IX Corps Area. Battery "A" has received this award for two consecutive years. Battery "B" also won the recommendation, as did Battery "F." The 251st wants more of these awards and is working hard to make the desire an accomplished fact.

The San Diego national guard units are planning wholehearted coöperation with the California Pacific International Exposition. The exposition has already set aside a day to be known as National Guard Day, the program will be arranged by Herbert F. Sammis of the guard public relations bureau and promises to be one of the highlight features of the year-long exposition. The special day will be but a small part of the National Guard participation in the international affair, Lieutenant Colonel H. H. Morehead commands the 251st.

A Comparison of National Guard and Regular Army Score

By Lieutenant Colonel Oscar C. Warner, C.A.C.

THE National Guard target practice score adopted for the calendar year 1932, and continued since, has the merit of requiring less time for computations and giving about 10% higher score. The higher score is somewhat offset by the smaller number of record shots allowed—making accurate fire adjustment more difficult for the National Guard.

The 12 target practices of the 245th C.A. (HD) N.Y. N.G. for the calendar year 1934 have been taken as a test of the relative merits of the new scoring system. The Regular Army score for each of the 12 practices was care fully computed. The tabulation shows the comparison:

These practices developed large probable errors and had average range deviations for all record shots of more than 200 yards.

When the gun pointing is poor in direction, the National Guard score is higher. (See practices No. 4, 6, 8 and 10.)

The large difference between the Regular Army score and the National Guard score in the fifth practice is due to a smaller proportion of hits on the battleship target than is normal for an excellent practice.

When the National Guard score is smaller (see practice Nos. 9, 11 and 12) the hitting component is above the normal of 30 set for the Regular Army score. This is not true for practices 1, 2 and 4 (mortars) where the scores are very similar, but the hitting component is well above 30 in each case.

The average National Guard battery commander does not have time to prepare the Regular Army score (tabular and graphical anaylses). But for those who have time to compute the Regular Army score, considerable information is gained about the practice, namely the developed probable error, the developed velocity and the wild shots.

From this information one can draw conclusions as to the suitability of the ammunition for target practice and the amount of erosion; this knowledge is of value for future practices. A battery commander of a Guard battery will be well repaid for the time and trouble involved in comparing his own score with the corresponding Regular Army score. Instructors will find it profitable to compute the scores under the two systems.

In 1933 and 1934, the 12" gun batteries fired the 870-pound projectile with very erratic results in certain guns. Practices 7 and 8 resulted in no battleship hits with this projectile.

			Regular Army Score							National Guard Score				
Gun & Proj.	Ser. No.	Hits B.R.	B.O.	A	B	C	D	R	Total	A	B	R	Total	Diff.
Mortar 1,046 lbs.	1	20.0	14.2	34.2	30.0	20.3	0	+ 7.5	92.0	20.3	57.5	14.4	92.2	+ 0.2
	2	10.2	13.1	23.3	22.9	12.7	0	+ 7.8	71.3	12.7	45.0	12.6	74.9	+ 3.6
	3	18.4	24.8	43.2	43.9	21.7	0	+10.9	119.7	21.7	80.0	19.8	121.5	+ 1.8
	4	15.2	25.4	40.6	32.3	20.0	1.0	+ 6.0	97.9	20.0	77.5	14.5	112.0	+14.1
10" Gun 510 lbs.	5	12.1	12.6	24.7	36.5	20.0	0	+ 1.5	82.7	20.0	80.0	3.3	103.3	+20.6
	6	0	0	0	25.4	21.6	2.1	+ 2.5	47.4	21.6	45.0	4.5	71.1	+23.7
12" Gun 870 lbs.	7	0	0	0	44.6	23.1	0	+ 2.1	69.8	23.1	86.7	8.6	118.4	+48.6
	8	0	0	0	20.0	22.9	1.7	+ 3.6	44.8	22.9	36.7	6.5	66.1	+21.3
155-mm. 95 lbs.	9	18.8	28.7	47.5	50.8	9.2	0	— 0.2	100.8	9.2	83.2	— 0.4	92.0	— 8.8
	10	0	23.3	23.3	43.2	19.3	2.2	+ 2.4	86.0	19.3	71.0	+ 4.6	94.9	+ 8.9
6" Gun 90 lbs.	11	18.5	20.6	39.1	50.9	16.3	0	— 1.5	104.7	16.3	75.0	— 2.3	89.0	—15.7
	12	22.5	15.3	37.8	40.1	17.2	0	+ 4.5	99.6	17.2	61.7	+ 6.9	85.8	—13.8
Aver.									85.0				93.4	+ 8.4

When there are no hits on the naval target (see practice Nos. 6, 7 and 8 above) the National Guard score is much larger.

250th Coast Artillery Activities

1934 Camp

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

A DISTINGUISHED Coast Artilleryman once made the statement that "the Coast Artillery is the Marine Corps of the Army" being ready at all times to handle any task with which it may be entrusted and then to do a good job in its own specialty.

"San Francisco's big gun regiment" has proved the truth of this statement in the past by excelling in small arms marksmanship—leading the teams from units in the Bay region — capturing the famous "Doughboy Trophy" from the Infantry, holding the McQuaide plaque against all comers, and bringing home practically all the other bacon to be had and in making a creditable showing in ceremonies, street parades, and demonstrations.

Labor troubles on the San Francisco water front in July resulted in the calling out of the majority of the California National Guard, and the 250th was given an opportunity to exhibit its prowess in still another branch of the military art. The first unit to reach the wharves, and the last to leave, it was an important element in the San Francisco Port Command, and under Colonel R. E. Mittelstaedt (Port Commander during the major period of the occupation, and a brigade commander for the week during which the garrison consisted of a "reinforced division"—40th Division Headquarters and Special Troops, the 159th, 160th, 184th and 185th Infantry, the 143d Field Artillery, and the 250th Coast Artillery), gave an excellent account of itself and was warmly praised by the civil authorities, observers from the Regular Army and the Navy, and prominent business men and labor officials.

The 22 days of strike duty included the period scheduled for field training, therefore the camp was necessarily postponed until September, the earliest time officers and men could arrange to attend, equipment could be cleaned and repaired, and artillery training brought once more to the desired standard. The Armory buzzed with activity during August, the four plotting rooms and all available guns being used nights and Sundays. Two of the 155-mm. guns were equipped with .22 caliber attachments clipped to the sight standards, for the training of gun pointers. Even the old 3" gun, a relic of the harbor defense days, was dragged out of its honorable retirement, and with a .22 rifle strapped to its barrel, chased a moving target over the Armory floor.

All preparations were completed by the last of August, and at 5:00 A.M., September 1st, the first column of spick-and-span ancient trucks rumbled away from the San Francisco Armory on the first leg of the 81 mile journey. Other elements followed in rapid succession, and the delayed field training period was under way. The four headquarters batteries made a long march to Camp McQuaide; Los Gatos (52.5 miles from San Francisco by the Plans and Training Officer's march table) was the goal of the remainder of the regiment. Shelter tents were pitched as each column arrived in bivouac, and an excellent meal, featuring "slum a la Espangnole" was served from the rolling kitchens.

The entire regiment was in camp by 10:00 A.M. Sunday; guns were emplaced, tents pitched, communications details frantically laid wire in all directions, and by noon every one was settled down for what proved to be the most successful camp in the 250th's history.

The first week was given over to progressive training, more work with the battalion and regimental commanders' tests of readiness for service practice. Subcaliber practices, and battalion and regimental parades were held late in the afternoons. A recreation program of baseball, swimming, boxing and wrestling, and a selected series of talkies from the pre-censorship era was instituted.

Saturday morning was devoted to the necessary evils of camp inspection and muster, after which the traditional Artillery Field Day was held, consisting of truck and tractor races, tugs of war, obstacle races and—an innovation this year—a very successful game of musical chairs and a battery commander's race staged by the equitation enthusiasts. Though there were no casualties in this race, several battery commanders had cause to congratulate themselves on their choice of the Coast Artillery arm rather than the Cavalry.

Monday was spent in a final smoothing out of details and technique, and in the making of "big medicine" for good visibility on the days of firing. This was one of the most important preparations for the practices, for local conditions are such that only the northern end of Monterey Bay is clear of fog in the summer time, and as a rule visibility does not exceed seven or eight thousand yards. Last year, the weather being even worse than usual, none of the batteries were able to fire and had to go home after making faces at the fog for two weeks. Conditions were better this year, but par was not exceeded—possibly the "big medicine" was counteracted by the regimental dinner Monday evening at the Rio del Mar Country Club. Details of this affair were difficult to obtain the next morning, but all agreed that the general effect was very satisfactory.

The six practices conducted on the next three days, though fired at disappointingly short ranges, were quite satisfactory in general as far as accuracy and time were concerned; the scores were as follows:

Battery	Accuracy and Time	Range Penalty	Net Score
F	101.0	26.4	74.6
E	95.8	26.2	69.6
C	86.6	18.3	68.3
B	80.8	17.7	63.1
D	70.5	22.0	48.5
A	56.2	10.9	45.3
Regimental Average	81.8	20.3	61.5

As the short ranges were due to Old Man Weather, cancellation of the range penalties has been requested.

The regimental average of 81.8 for accuracy and time is the highest reached so far; it is 7.3 points higher than the 1932 average, which in turn was 8.5 points higher than the average of any preceding year. The greatest improvement this year was in the "dog house score," the low score this year being 23.7 points above the low score for 1932.

Battery F's practice was fired with but a single correction, made during trial fire. (The center of impact of all record shots was eight yards from the target.) The first trial salvos of five batteries fell close to the target, and three batteries had straddles on the first and second trial salvos. Corrections made on trial and record fire were in general very close to the corrections which would have been made under the magnitude method—another good word for the bracketing method.

The accuracy of gun pointing was improved this year, the average lateral deviation being six yards (one mil) this year against 10 yards in 1932. This improvement was due partly to the methods of training adopted and partly to the arousing of competitive interest by the provision of cash prizes for the best gun pointers. The three highest gun pointers had averages of .240 mil, .390 mil, and .425 mil, it being necessary to go to three decimal places to award third place.

Camp was broken on Friday morning, the tents coming down in unison at the last note of the "General." By 1:00 P.M. tentage and property to be left at camp had been stored, tent floors piled, guns and tractors convoyed 17 miles to the Watsonville "railhead," and leaving the final manicuring to a special detachment, the regiment shoved off for Los Gatos. The clear starry night and warm dry air of this resort was a welcome change from the cool fogs of the seacoast, and after a concert by the regiment's excellent band, all hands turned in for the last night of the camp period.

Bright and early Saturday morning the march to San Francisco was resumed. All elements were in the Armory by 2:00 P.M., property was checked, the men were paid, and, proud of the record hung up in spite of the handicaps of the "shotless, hitless, errorless" camp in 1933 and the set back in its artillery training caused by the three weeks of riot duty in July, the 250th closed the book of the 1934 field training period and filed it in the archives.

* * *

Book Review

EXPLORING THE UPPER ATMOSPHERE. By Dorothy Fisk. Oxford University Press. New York. 1934. 166 pp. $1.75.

By Captain J. J. Johnson, C.A.C.

Of particular interest to Artillerymen in this entertaining book on the stratospheric is the chapter "Sound as an Explorer." In addition to the main facts concerning the nature and behavior of sound-waves ascertained before the war the author indicates that three others of consider-

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able importance have now been definitely established, namely:

(1) The existence of a definite zone of silence, the occasional presence of a second zone of silence, and of two possible zones of abnormal audibility.

(2) The fact that the distance of the first zone of silence from the origin varies with the season, this seasonal variation emphasizing the fact that because sound-waves ascend into the rare atmosphere they are enabled to travel such great distances from their source without being absorbed.

(3) The variation in the time of reception of the sound-waves indicates that their path is not always uniform. They may make one long flight or two shorter flights coming down to the surface between the flights; and since in each case they must rise as high as the region of higher temperature before coming down again to the surface, the important fact hitherto unknown and now definitely established is, the rise in temperature in the upper stratosphere.

In our old texts on Meteorology we were taught to believe that in the region beyond the clouds the density and temperature became less and less until the atmosphere was finally lost in space. But with each such contribution as the above we are coming to realize that the stratosphere is the real turbulent layer.

Other subjects considered by the author are ultra-violet rays and their discovery of the ozone layer; the path of radio-waves; projectiles (meteors and meteorites) in space; polar lights; and cosmic rays.

In the chapter on Projectiles in Space the author in passing refers to "Big Bertha" the shells from which reached a height of about 34 miles—more than 10 miles higher than the highest altitude reached by a sounding balloon. It is of historical interest to note that our own ballistician, General Alston Hamilton, described just such a cannon in an article in *Scientific American* away back in 1916.

A meteorologist recently suggested that the artillery might fire guns of the "Big Bertha" type, the projectiles being loaded with recording instruments instead of high explosives, thus adding to our knowledge of the upper air.

This work of 166 pages is not intended as a text on meteorology, rather an enlightening account of what has thus far been learned of the upper atmosphere. If one wishes a text book on Meteorology the writer would recommend Humphreys' "Physics of the Air." But for those who do not care to go so far afield Redway's "Handbook of Meteorology" is one of a group of suitable texts.

If, however, one has a flair for what in the future will be known as Stratospheric Physics, apart from any mathematics that may be involved, then Dorothy Fisk's popular account of stratospheric exploration will afford much enjoyment. It is a survey of the present state of our knowledge of the upper air and at the same time an introduction to such scientific facts of this most interesting subject, as have only lately been established.