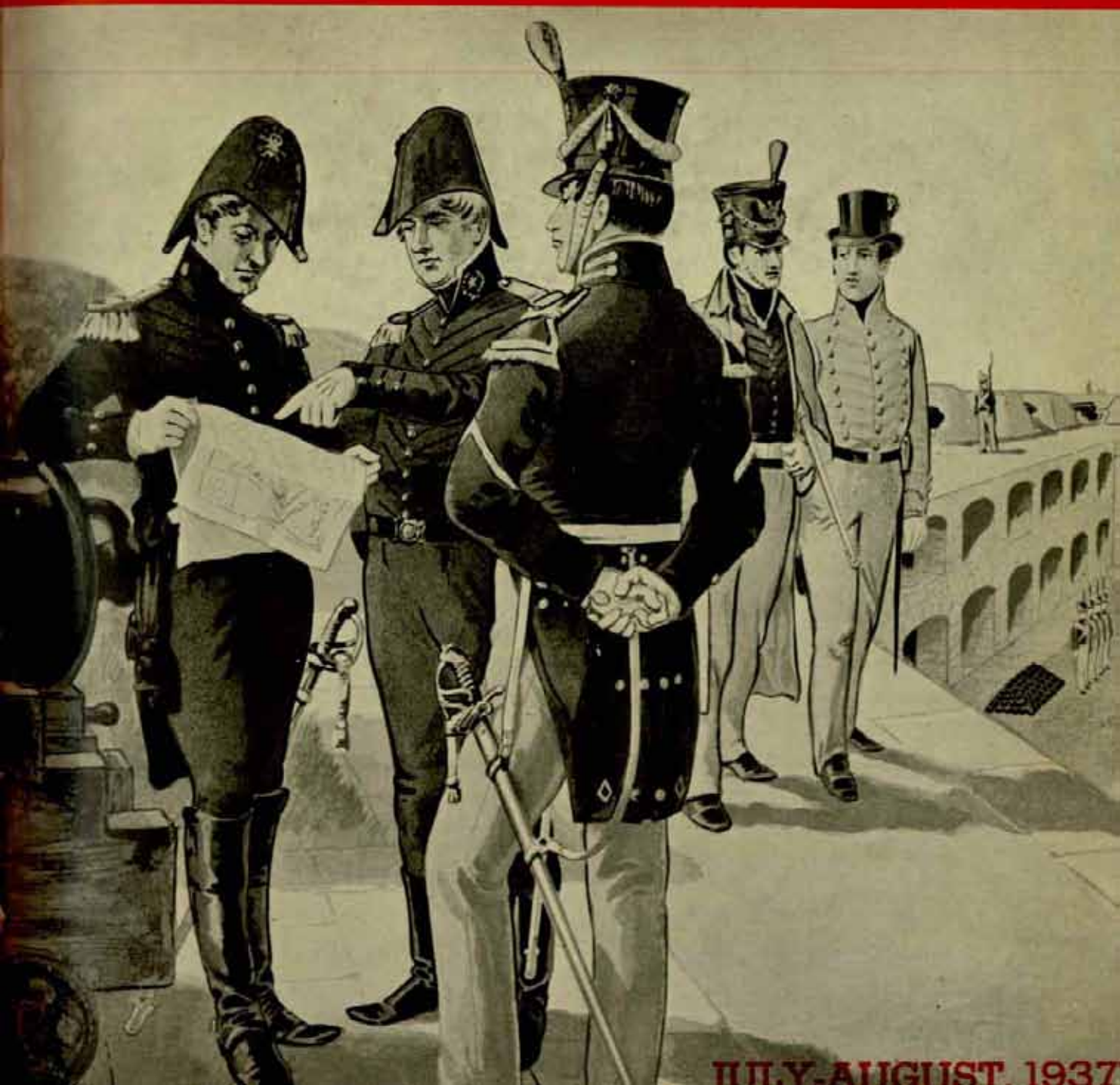
THE COAST ARTILLERY JOURNAL



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CONTENTS

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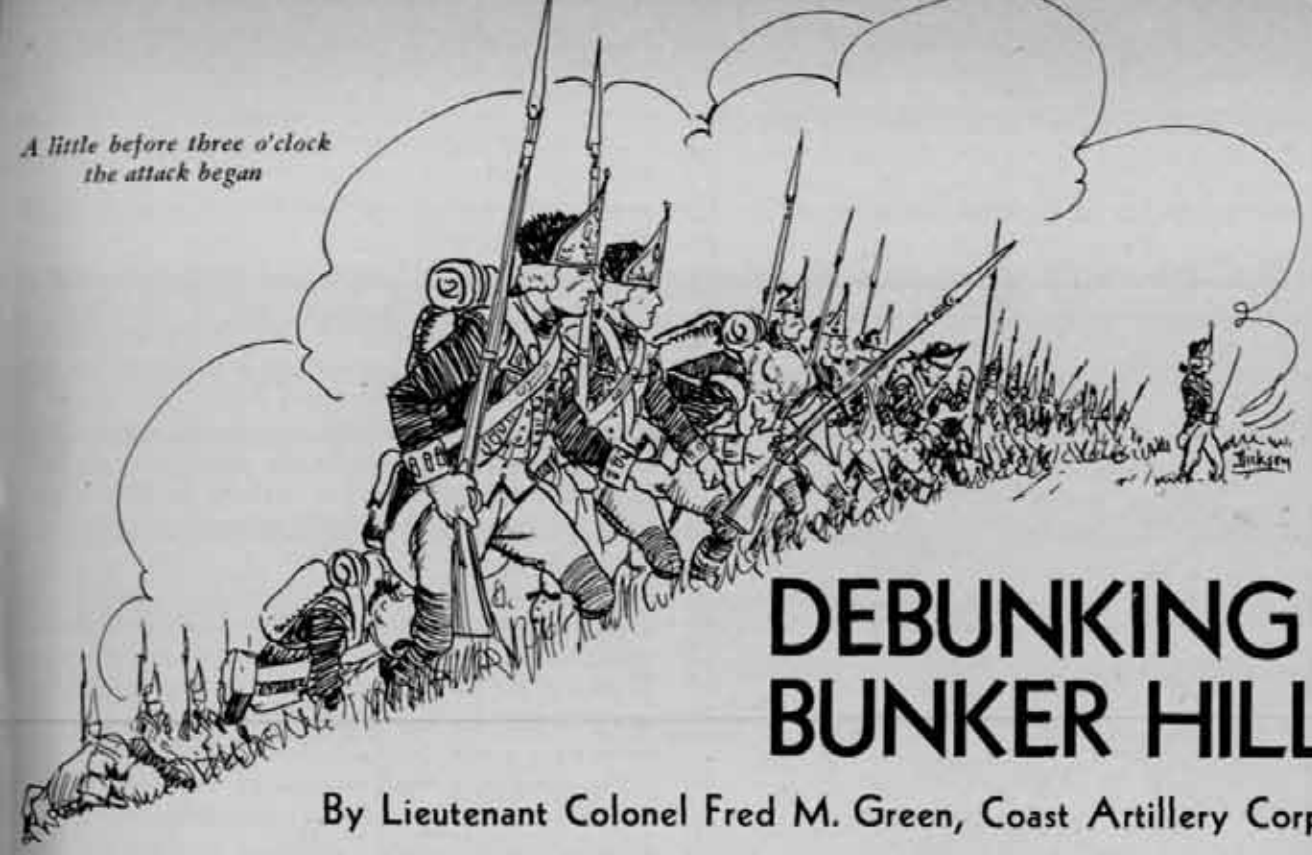
The Golden Gate Bridge

Courtesy San Francisco Chron

A new link between
Fort Baker and Fort Sco



A little before three o'clock the attack began

DEBUNKING BUNKER HILL

By Lieutenant Colonel Fred M. Green, Coast Artillery Corps

IT'S a beautiful legend, our popularly accepted story of Bunker Hill. But some skeptical historians have investigated it recently—especially since the discovery of the Gage papers in England in 1927—and their unbiased analysis of contemporary evidence has taken the gilt edge off another powerful American tradition.

On April 19, 1775, a British expedition to Concord encountered the armed resistance that marked the beginning of our American Revolution. At that time, the King's garrison of Boston numbered about 4,000 men. Only half of these participated in the action of April 19. That evening when the harassed British column retreated through Cambridge to Charlestown (See Fig. 1), the Provincial pursuit stopped at Charlestown Neck. To cover the exhausted fugitives until they could be ferried across to Boston, General Gage sent fresh units to Charlestown: these outposted Charlestown Neck, fortified Bunker's Hill,[1] and secured the peninsula overnight. But Gage feared an uprising within the city, where his shaken troops were greatly outnumbered. He dared not spare a force to hold Bunker's Hill and abandoned it on April 20.

News of the fighting spread rapidly through New England, and armed Provincials hurriedly converged on Boston. Within a few days, they had completely surrounded the city. Some were unarmed and many were without ammunition. There was neither a common government to support them, nor a supreme commander to lead them. To be sure, some deference was paid to the bewildered and infirm Major General Artemus Ward of Massachusetts, but the leaders of the New Hampshire, Rhode Island, and Connecticut contingents felt that their real allegiance was to their own Provincial governments.

For nearly two months nothing of importance took place. Individuals and even units drifted in and out of the line at their pleasure. Many went home to plant their crops; of these, some returned and others sent substitutes. Those who remained were poorly equipped. Many of the muskets were in bad order, ammunition was scarce, there were few bayonets, and there was practically no serviceable artillery. Little was done to intrench the position. Many contracted camp diseases; the others grew frowsy, idle, and disorderly. The atmosphere of the camp began to be that of a county fair. The better class of Provincial citizens became alarmed at the conduct of this armed mob, which was fast becoming infected with a spirit of anarchy.

Fortunately, the British gave little trouble. They were busy fortifying Boston Neck, disarming the inhabitants within their lines, tightening up on military discipline, reorganizing the units handled so roughly on April 19, and awaiting reinforcements from overseas. By June 16 the British force had grown to about 6,425 as against the Colonists' 14,000.

For the Provincials, aggressive action was both un-

[1] EDITOR'S NOTE: The terrain feature from which this battle derives its name was called Bunker's Hill. As all historians know, the position which the Colonists fortified and defended was on Breed's Hill.

Putnam afterwards confessed to the use of impulsive language

Figure 1
BOSTON—General Gage feared an uprising within the city

desirable and impracticable. They awaited the reaction of England to the events of April 19; many still hoped for a reconciliation. Even the hotheads were restrained by their consciousness of poor training and discipline, the lack of artillery, and the shortage of ammunition. Ward had but one desire—to keep the British penned up in Boston.

The only exit from the city by land was across Boston Neck, but anxiety was felt about the neighboring peninsulas of Dorchester and Charlestown. British control of either would provide an additional route for a sortie. Of the two, Charlestown offered a more direct route for a British attack on Cambridge. As early as May 12, therefore, the Colonists resolved on "a strong redoubt raised on Bunker's Hill, with cannon," but dropped the scheme for lack of proper artillery.

On June 13, the Colonists received intelligence of an impending hostile movement. Gage planned to land troops and seize Dorchester Heights on June 18, and then to crush the Provincial right by simultaneous attacks across Boston Neck and Charlestown Neck. Afterwards, he intended to ferry troops to Charlestown, strike the Provincial north flank, and roll up their line until he captured Cambridge and the Provincial stores.

The Committee of Safety resolved to forestall Gage's plan by seizing Bunker's Hill. That the Provincial leaders were so obsessed by this terrain feature is eloquent of their tactical limitations. True, Bunker's Hill dominated Charlestown Neck, a slender isthmus never over 100 yards wide and narrowing to 10 yards or less at high tide. But unfortunately, Charlestown Neck was exposed to point-blank fire from any ship the British might anchor in the Mystic River. If the British used their ample naval forces with ordinary enterprise, no force on the peninsula could be supplied, reinforced, relieved, or withdrawn. Furthermore, apart from its liability to bloodless capture through starvation, the position could be turned by landing parties moving up the Mystic. Thus, since the hill could be encircled, isolated, or avoided entirely at the pleasure of the enemy, it constituted no key position from which to oppose a British sortie. And protection from a sortie was precisely what the Provincials desired.

Nevertheless, at dusk on June 16, 800 Massachusetts and 200 Connecticut infantry commanded by Colonel Prescott marched from Cambridge to seize and hold the heights above Charlestown. The men carried blankets, intrenching tools, and one day's rations.

Colonel Prescott was a man of resolution and well-qualified to execute a bold mission. Like many of the other senior officers present, he had served in the French and Indian Wars and participated in the Louisburg campaign. He found himself handicapped, however, by the presence of Brigadier General Putnam of Connecticut, whose status with regard to the expedition has never been established. Whether he shared Prescott's responsibility, or had merely attached himself to the expedition, is unknown. In any case, his presence led to divided command. As General Charles Lee aptly pointed out, the expedition was "half armed, with no practice or discipline, commanded without order, and God knows by whom."

It was expected that Prescott would fortify Bunker's Hill, pursuant to the Committee of Safety resolutions of May 12 and June 15. Actually, for reasons unknown, he occupied and fortified Breed's Hill, which so menaced the harbor as to make British reaction to the move virtually inevitable (Fig. 2). In the face of an enemy six times as numerous and far better armed and disciplined, such audacity was perilous. Remembering the vulnerability of the peninsula to isolation by British ships, we must regard both Prescott's original mission and his unexplained change from Bunker's Hill to Breed's Hill as tactically unsound.

By morning Prescott had a redoubt (Fig. 2 A) partly completed. Its parapet was six or seven feet high and thick enough to withstand the British bombardment at dawn. The work was about 45 yards long and a little less in width; thus, while it was large enough to shelter his entire command from artillery fire, not a tenth of his men could have found room to occupy its firestep at one

time. But Prescott soon discovered that his position had even greater disadvantages. On the Charlestown side, it could be turned by a force moving along the southwest shore, which was out of musket range and sheltered by houses. The Mystic side offered an even better opportunity for a turning movement, since much of the ground was defiladed. To meet this danger, Prescott constructed a breastwork (BB') about a hundred yards long, extending from the redoubt to a spur which overlooked the valley at L. These works were completed about noon. To close the gap west of the redoubt, he sent detachments to occupy houses along the edge of the village (FF').

Early in the afternoon, as the first wave of the British was approaching the beach at point G, Colonel Prescott ordered Captain Knowlton with 200 Connecticut infantry to "delay or oppose" the hostile landing. Instead, Knowlton took up a position along the southwest part of the line DD', just across the swamp from the redoubt. Here there was a low stone wall, surmounted by a two-rail fence, which the men strengthened with rails from nearby fences. By stuffing the chinks with earth and draping hay over the exposed face, they made a screen which hid the exact position of individuals and suggested to the enemy the existence of a solid breastwork.

It is difficult to establish the distribution of the Provincial troops at the begining of the action. From the dimensions of the breastwork BB', perhaps 150 men took position there. Captain Knowlton had 200 at the rail fence. After the British landed, Prescott sent out two groups (strength not stated but each under a field officer) "to flank the enemy." Estimating the combined strength of the two groups at 150 men, these several detachments alone would have drawn half the men from the redoubt.

But there was also another reason for the rapid depletion of the force within the main work. A charge of

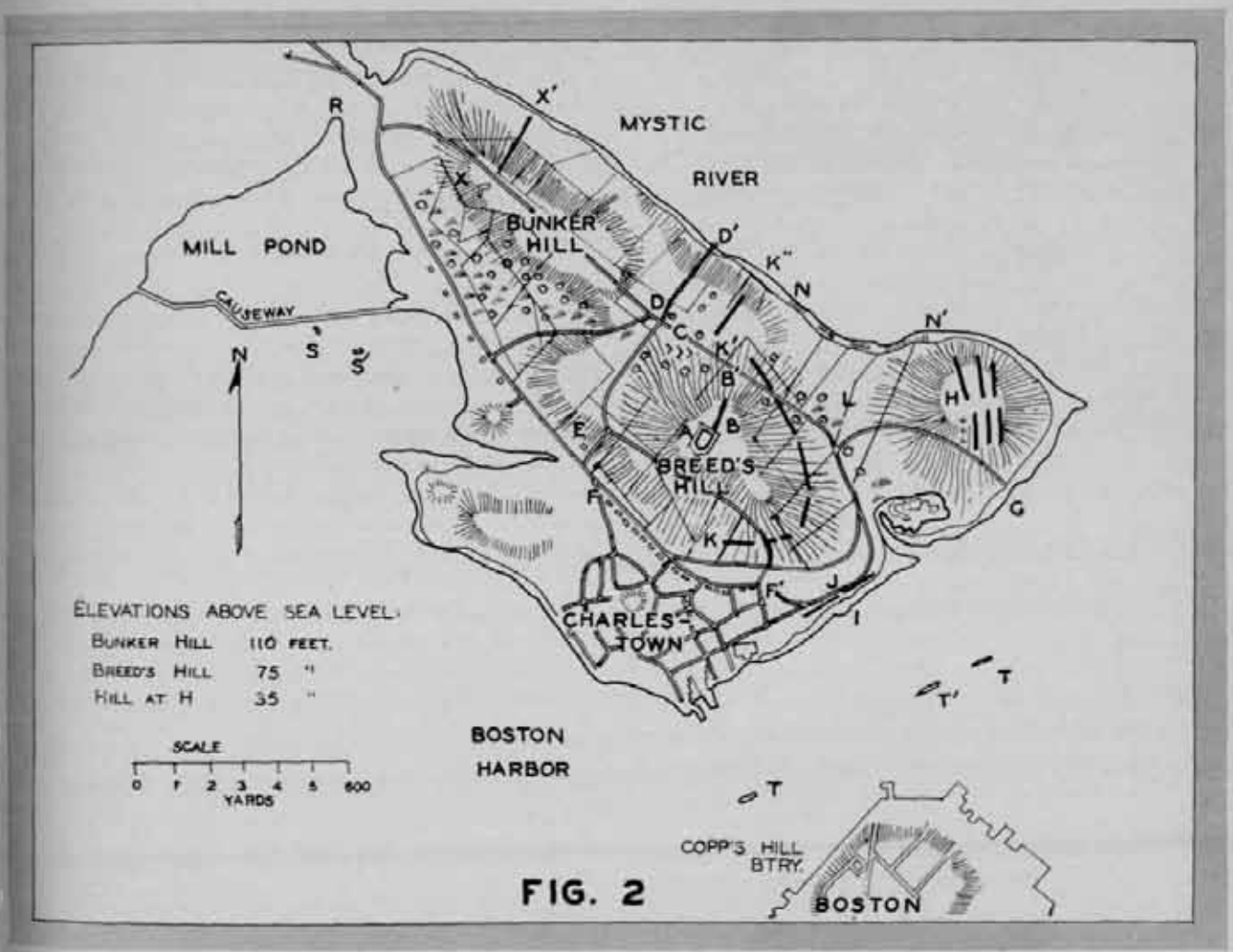


FIG. 2

Military history affords few examples of raw levies who behaved so well

A—Prescott's redoubt; BB'—Breastwork (of earth); C—Small individual shelters; DD'—Rail fence; E—Barn, occupied by flanking groups after Charlestown had been set on fire; FF'—Position of skirmishers in houses along the edge of Charlestown early in the action; G—Landing place for the first echelon of the British force; H—Assembly position for troops landed at G; I—Landing beach for the second echelon; J—Assembly position for the second echelon, before it joined left wing; K, K', K"—British line of departure; K', K"—Line of departure for the Grenadiers in the first assault, and for the Light Infantry in the final assault; L—First position taken by the British 6-pounders; NN'—Column of Light Infantry, moving up the Mystic shore under cover of the high bank, to turn the Provincial left; R—Charlestown Neck; SS'—Small British gunboats, firing over the causeway to interdict Charlestown Neck at R; T, T', T—British ships of war, firing to support the landing; X—Small redan, built by the British on night, April 19-20; XX'—Breastwork built by the British on night, June 17-18.

Men and entrenching tools went to the rear.

cowardice or treachery at Bunker Hill must be made perforce in defiance of tradition; yet Prescott himself claims that two of his field officers deserted their posts shortly before the engagement, and that most of their commands forsook him soon afterwards. And three days after the battle, the Provincial Congress appointed a committee "to inquire into the grounds of a report which has prevailed in the army, that there has been treachery in some of the officers."[2] Even the handful of private soldiers left in the redoubt had become increasingly distrustful. Many must have felt like Private Peter Brown, who wrote home: "The Danger we were in made us think there was Treachery, & that we were brot there to be all slain, and I must and will say that there was Treachery, Oversight, or Presumption in the Conduct of our Officers." Prescott's force was caught in a trap, and the men were beginning to realize it.

At this critical moment, General Putnam arrived at the works and demanded the use of the intrenching tools, now idle, for preparing a second position on Bunker's Hill. Prescott protested that he could not afford to lose the men necessary to carry the tools to the rear, but he was overruled by Putnam, who assured him that the carrying party would be sent back to the redoubt. Accordingly, men and intrenching tools went to the rear—and neither returned. By such processes was the early congestion within the work relieved; soon only 150 men remained in the redoubt. Less than a third of the original force was now in touch with its commander.

Meanwhile, the ferriage of the British troops went on in plain sight. As the strength and imminence of the impending attack became evident, Prescott sent repeated calls to Cambridge for help. At first, Ward was reluctant to reinforce him, fearing that the enemy might attempt to force their way out elsewhere. But after a consultation with the Committee of Safety, he sent forward two New Hampshire regiments under Colonel Stark. This reinforcement arrived just as the British attack was forming in its assembly area (H). There was no time, therefore, for Prescott and Stark to coordinate the defense of their respective sectors; each had to fight his own battle. Stark's troops reinforced Knowlton at the rail fence, extending the line to the shore of the Mystic River. Here the ground fell off sharply for 8 or 9 feet to a shingle beach, up which an enemy could advance unseen. Stark ordered rocks to be brought from adjacent stone walls and piled across the beach to form a barricade.

The American line now extended from the outskirts of Charlestown to the Mystic River, but portions of it were not occupied. There was a lateral opening of some 300 yards between the redoubt and the edge of the town, and a vertical gap nearly as great between the northern end of the breastwork and the inshore end of the rail fence.

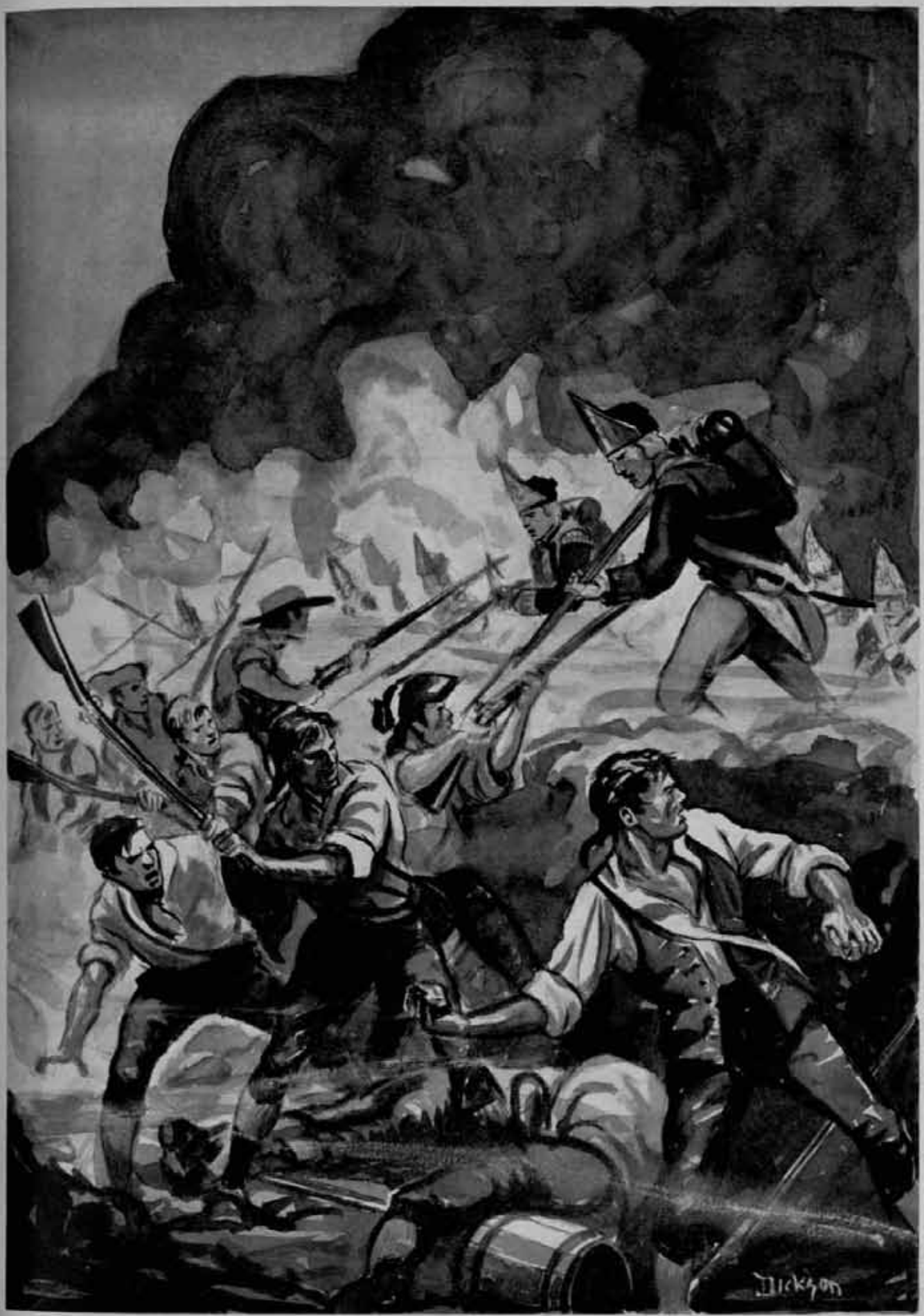
Fairly extensive natural cover existed in this gap. Many either found concealment or dug in here, and flanked with great effect the attacks launched against the rail fence. Some of these men were casuals—volunteers who had run the gauntlet of long-range (SS') British fire across Charlestown Neck. All through the day such piecemeal reinforcements drifted onto the battlefield.

In spite of a month's warning, Gage had taken no steps to secure Bunker's Hill against seizure, nor had he formulated plans for recovering it. At daybreak on June 17, he was caught wholly unprepared. In the flurry of the moment, he foolishly overloked his naval resources and neglected to use them, either to isolate Prescott's force or to support his attack by fire from the Mystic. Instead of springing the trap, he undertook to drive Prescott out of it. In furtherance of this brilliant plan, he sent a force of some 2,350 officers and men to storm the position. He ordered the troops to carry blankets and three days' rations: not again would he lightly abandon Bunker's Hill!

The preparations for the attack proceeded leisurely. Rations could not be issued until the bread and meat were cooked. Furthermore, the troops had to await a tide favorable for a landing upon the beach at Charlestown. It was about 1:00 P.M. before the small boats of the fleet started across the harbor. During this seven-hour delay, the strength of the Provincial army was doubled by reinforcements, and its defenses strengthened.

The British generals, other than Gage and Howe, favored landing in rear of the position. Howe contended that to land troops near the Neck would place them between two hostile forces. He had his way and chose the tip of the peninsula for the landing.

[2]Only during the last ten years has it been proved that Dr. Benjamin Church, a leading member of the Committee of Safety, was actually a spy. Because of the offices he held, all Provincial plans and military secrets were open to him; these he reported to the British. On May 13, more than a month before the battle, Church notified Gage of the Provincial intention to seize Bunker Hill.



Ammunition gone, the men fought on

Prescott threatened death to the next man who fired without orders

The first echelon of the storming party included about 1,100 officers and men. Seven hundred of these came ashore near point G, and while the boats went back for the remaining 400, all ate dinner. During this wait, Howe, noting that the Provincial line had extended to the northeast, directed that his second echelon (some 750 officers and men, standing by ready to embark) be sent across.

Howe had formed two provisional battalions of "shock troops" for the principal attack. One was composed of ten Light Infantry companies, and the other of ten Grenadier companies.[8] Having decided to make his main effort on the right, he ordered the Grenadiers, supported by two line regiments, to attack the rail fence, and directed the Light Infantry battalion to move up the Mystic River to turn the hostile left flank. All other units were to attack the redoubt and breastwork.

About 2:00 or 2:30 the troops moved to their line of departure (K.K.K.'). That this line was not over 200 yards from the Provincial position is eloquent of the limitations of 18th Century musketry.

A little before 3:00 P.M. the attack began. It was delivered in double rank, a departure from the normal British three-rank formation. In each wing a support line followed the assault wave but, except in rear of the Grenadiers, the attack had no greater depth. Other than the second echelon now being rowed across from Boston, there was no reserve.

[8]Each British infantry regiment then included two so-called "flank companies"— one of Grenadiers and one of Light Infantry —which drew selected men from the other eight (battalion) companies. Big burly men were picked for the Grenadiers, and small active men for the Light Infantry. These companies differed little from the others except in constituting a *corps d'elite*.

The initial advance on the redoubt was only a holding attack. The left wing did not even fix bayonets but advanced in the orthodox manner, halting occasionally to fire a perfunctory volley. Since the plan called for the flank companies to start rolling up the Provincial left before the frontal attack was driven home, the troops attacking the redoubt were unhurried. But the advance would have been leisurely in any case. Numerous rail fences and stone walls, knee-high meadow grass, and the 125 pounds of equipment with which each man was burdened, made a rapid advance impossible.

While the holding attack was in progress, the Light Infantry of the right wing advanced stealthily up the beach in what we would call a column of squads. The bank on the left and the river on the right gave them no room to deploy. As they approached the left flank of the American line, a triple row of Stark's men, sheltered behind their barricade of rocks, opened fire on the column. This fire, sweeping the defile, was extraordinarily destructive. Of the leading elements, only three or four men per company escaped. Successive units were hurled back when they tried to rush the barrier. It was too much. The Light Infantry broke and fled in disorder down the beach almost to the landing point. This retreat, seen from the opposite bank of the Mystic River and widely reported, probably gave rise to the legend that the entire British force, when driven back from the redoubt, fled each time to its boats on the beach.

The Grenadiers launched their attack squarely against the rail fence. The ten companies formed abreast in the assault wave; the two supporting regiments followed in column. The orders were not to fire but to drive home the attack with the bayonet. However, in crossing a rail fence, the Grenadiers bunched up, fell into disorder, and commenced firing. The support battalions crowded into the assault wave and mingled with it. Heavy frontal fire from the rail fence and enfilade fire from point C increased the confusion, and the advance came to a standstill. Thus, both elements in the main blow of Howe's attack had failed.

The experience of the holding attack was no less disconcerting. There had been no signs of life in the redoubt until the British were less than 100 yards away. Then a few eager faces peered over the parapet and an excited sputter of shots followed. A moment later Prescott and other officers ran around the crest, kicking up the muzzles of the pieces and threatening death to the next man who fired without orders.

Prescott claimed that no fire was permitted until the enemy were within 50 yards. But when the word was given, the British were subjected to a fire such as few European troops had ever experienced. It was not a single volley, as tradition has it, but a sustained fire at will. Between men in the open and men who expose only their heads and shoulders, a fire fight is necessarily unequal. Howe, watching the assault, saw that it was useless to press further, and ordered a general retirement. How far he withdrew is not known, but probably no farther than

the jump-off position, which was beyond effective range.

American tradition insists that the British launched three distinct, successive, and coördinated attacks across the entire front. In the official reports, private letters, and personal diaries of the period, however, there is little evidence to substantiate this. It is clear that the British met with one repulse, and some portions of the attacking line may have recoiled a second time. But the entire action lasted only about an hour. In that time it would have been difficult to deliver three coördinated assaults. Had the men twice fled down to the beach, the action must have lasted much longer.

Prescott recounts that "the enemy advanced and fired very hotly . . . there was a very smart firing on both sides. After a considerable time, finding our ammunition was almost spent, I commanded a cessation till the enemy advanced within thirty yards, when we gave them such a hot fire that they were obliged to retire nearly one hundred and fifty yards before they could rally." An unknown British writer, who evidently attacked on the right wing, states that "As we approached, an incessant stream of fire poured from the rebel lines; it seemed a continued sheet of fire for near thirty minutes."

In the face of this and similar evidence, we can no longer credit the legend of the three crashing volleys, the three distinct attacks across the entire front, and the panic-stricken flight to the boats after each of the first two assaults. The reliable testimony points much more strongly to only two attacks, of which the second was marked by local waverings and checks but in general showed an intermittent, irregular, sometimes disorderly, but always persistent surging forward of the assault wave, with which the support finally became merged.

While the initial operation against the redoubt was merely a feint to divert attention from the intended turning of the Mystic flank, in the final advance the situation was reversed; the British made their decisive assault with their left. All units except the Light Infantry, which had returned to the attack on the rail fence, converged on the redoubt and the adjacent breastwork. The second echelon, having arrived on the field, took part in this last phase. Bayonets were fixed, and many of the men threw off their packs and coats. The death-grapple was approaching.

In the redoubt the situation was far from encouraging. The garrison was nearly out of ammunition, although presumably it had entered the action with about 30 rounds. Less than half of the men had bayonets; the rest could only club their muskets, or, as a last resort, throw stones. Also most of the long-awaited reinforcements from Cambridge had failed to arrive.

General Ward had tardily ordered 5,000 men to reinforce the defense. The story of their non-arrival is a shameful one. One colonel led his regiment first to Lechmere Point and then to Cobble Hill (Fig. 1), whence a messenger plodded forward to inquire whether aid was needed on the field; consequently, this unit arrived only in time to witness the pursuit. Other regiments, accidentally or intentionally, became "lost" along the way from Cambridge. Those who reached Charlestown Neck found its mainland end jammed with hesitating groups and individual stragglers, intimidated by long-range naval fire sweeping the isthmus. A few pushed forward bravely; some arrived in time to oppose the final assault; others were of use only in covering the retreat.

Among the last to join before the crisis was Captain John Chester of Connecticut, who observed events in the rear area with exceptional coolness. He testifies: "When we arrived, there was not a company with us in any kind of order, although, when we first set out, perhaps three regiments were by our side." He speaks of many Colonists hiding "behind rocks and haycocks, and thirty men, perhaps, behind an apple tree, frequently twenty around a wounded man, retreating, when not more than three or four could touch him to advantage. Others were retreating, seemingly without any excuse, and some said they had left the fort with leave of the officers, because they had been all night and all day on fatigue, without sleep, victuals, or drink; and some said they had no officers to lead them, which, indeed, seemed to be the case. At last I met with a considerable company, who was going off rank and file. I called to the officer who led them, and asked why he retreated? He made me no answer, I halted my men, and told him if he went on it should be at his peril. He seemed regardless of me. I then ordered my men to make ready. They immediately cocked, and declared if I ordered they would fire. Upon that they . . . stopped short, and tried to excuse themselves; but I could not tarry to hear him, but ordered him forward, and he complied." Captain Chester marched his men over and down Bunker Hill, and at the rail fence "fought standing about six minutes," covering the retreat from the redoubt.

The Provincial collapse had started when some 6-pounders enfiladed part of the breastwork with grapeshot, driving away its garrison. The Grenadiers then poured over the parapet and began to mop up with the bayonet. The capture of the breastwork enabled the British to attack the redoubt on three sides. Furthermore, the powder of the defenders was exhausted. But it was not until the attack was surging over the south wall of the redoubt that Colonel Prescott reluctantly gave the order to retreat. Some did not or would not hear him and, with clubbed muskets or rocks, stayed until they died on the British bayonets. A grenadier officer wrote home: "There are few instances of regular troops defending a redoubt till the enemy were in the very ditch of it, and (yet) I can assure you that I myself saw several pop their heads up and fire even after some of our men were upon the berm."

The retreat was screened by a dense cloud of dust, kicked up by feet scuffling in the upturned, sun-dried gravel. As the converging attack had almost surrounded the redoubt, the British hesitated to fire into the dust and smoke, fearing that they might hit one another. Hence the losses attending the abandonment of the work were not severe. Prescott, scorning to run, is described

as leaving the redoubt with dignity; he "stepped along, with his sword up." Bayonet thrusts tore his clothing, but he came off unhurt.

Retirement from the redoubts was well covered by fire from the stone walls in rear of it and from the rail fence. Soon, however, withdrawal became general. But it was not precipitate. Most of the wounded were carried off by comrades, and wherever the Colonists had ammunition left, they contested the ground, falling back individually from one stone wall to the next. Although unorganized, the retirement was conducted with courage and resolution.

The British were too exhausted to make a vigorous pursuit. This was fortunate, for Putnam's "second position" on Bunker's Hill turned out to be hardly more than a good intention. He had accomplished little toward its fortification, and it was now overrun by fugitives. These Putnam begged in vain to halt, rally, and "give them one shot more." Afterwards, he penitently confessed before his Puritan church to the use of impulsive language on this occasion. It would appear that he was among the first of the Revolutionary generals to express himself to the effect (as Rupert Hughes wrote) that the "Sons of Liberty" were also sons of something else.

Within two hours after the capture of the redoubt, the British had cleared and outposted the peninsula. To the end of the siege, the Provincials never again attempted to regain it.

The defeat of the colonists is generally attributed to exhaustion of ammunition. Actually, if the distribution of the available powder had been handled more efficiently, there would have been no shortage. Sufficient ammunition was reserved at Cambridge to have issued over 100 additional rounds to each man of Prescott's command. Furthermore, many rounds had been allocated to reinforcements which were never engaged. Thus, it appears that faulty distribution, rather than inadequacy of supply, was responsible for the shortage of ammunition on the firing-line.

But poor conservation of the available powder in the redoubt was also a factor in the shortage. It will be recalled that the men at the rail fence under Stark had borne the brunt of the initial attack; yet fire from the rail fence was well sustained until some time after Prescott abandoned the redoubt. Prescott's men, with about 30 rounds apiece, had twice as much ammunition as Stark's detachment. The inescapable conclusion is that there must have been considerable powder wasted, in spite of Prescott's efforts to control the fire.

Of the 150 men in the redoubt, only about 50 had bayonets. This contributed materially to the loss of the work, as is evidenced by the anxious haste with which the Provincials went to work the next day to equip their men for close combat.[4]

Yet even had Prescott's men been provided with adequate ammunition and proper bayonets, it is doubtful whether the redoubt could have been held more than a few minutes longer. For the capture of the breastwork exposed the main work not only to attack on three sides, but to easy entry through its open sally-port. Against a converging attack, there was no remedy but counterattack by a strong reserve. And no reserve had been held out.

In evaluating the American leadership, there is little to commend save personal courage and the measures taken to minimize firing at ineffective ranges. The smoothbore muskets of that day, even when in good order and provided with proper ammunition, were deadly only to 60 yards. Prescott's strenuous efforts to prevent his men from opening fire before the British came within that range is praiseworthy.

Of the 2,350 British who saw action, 10% were killed and 35% wounded. If we assume that 2,000 Colonists fought, these figures indicate a British casualty for every two Colonists. In few modern battles has the percentage of casualties been so high. Tradition has always ascribed these heavy British losses to the marksmanship of the Provincials, but this legend does not stand up under analysis. Appalling as the British losses were, they would have been much greater had unerring marksmanship been among the military attributes of the Colonists. The mass formation in which the British attacked and the close range at which the critical action was fought account to a large degree for the destructiveness of the fire. Moreover, owing to the lack of lead balls, many of the Provincials loaded with nails, bolts, and bits of jagged iron, thus unconsciously anticipating the riot gun of today. To this circumstance must be attributed the devastating effect of their close-range fire.

Another tradition has it that the Provincials sniped the British officers with deadly effect. The figures, however, disprove this. Officer casualties were by 37% as compared with 45% for the command as a whole. It would therefore seem that, however earnestly our forefathers tried to "hit the birds in the gay coats," their bullets more often took effect on someone else.

That Bunker Hill was not a triumph in military science must be conceded. The tactical blunders, the errors in strategy, the lack of coördination, the divided command, the failure of separate units to coöperate, are not the hallmarks of skillful leadership. Nor were all those who went forth to battle heroes.

Stripped of its legend, the saga of Bunker Hill loses much of its epic quality. But even after the amateur or professional debunker has done his best—or worst—in the name of historic accuracy, the glory of the man who stuck to the last in the redoubt, the breastwork and behind the rail fence, is not dimmed. Military history affords few examples of raw levies who behaved so well in the face of a trained and disciplined foe.

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[4]For close-in defense, the large-scale production of spears was undertaken. Manufacture of bayonets was impracticable; (a) because of the inherent difficulty of their fabrication; (b) because of the scarcity of steel; and (c) because the muskets were not of uniform pattern, each bayonet would have to be fitted individually. So urgent was the demand for spears that the blacksmiths who made them were expressly authorized "to work on the Sabbath." Issues in quantity began within two weeks of the battle.

AN AIRCRAFT WARNING SERVICE

Its Uses and Its Organization

By Colonel James H. Cunningham, C.A.C.

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An airplane warning service manned by civilians is practicable

THREE excellent articles appeared during 1933 and 1934, two in The COAST ARTILLERY JOURNAL and one in the *Signal Corps Bulletin*, on the distant intelligence net used at the Fort Knox joint air corps-antiaircraft artillery exercise in 1933. Based on this net, the authors of the articles made certain recommendations covering a net, or nets, that they visualize as being set up, in this country, in time of war, as part of our defense against air attacks. In both cases straight or circular nets are advocated, of approximately the density of the Fort Knox net and, like that net, operated by military personnel.

In order to avoid any confusion of terms, it should be understood that an aircraft warning service, or distant intelligence net, as referred to in the following article, is not the same as the antiaircraft intelligence service but will extend far beyond the latter and will probably be used for quite different purposes. It is not, like the antiaircraft intelligence service, a direct responsibility of antiaircraft artillery units.

Most of our experience in this subject is based on the Aberdeen joint air corps-antiaircraft artillery exercises held in 1930 and on the Fort Knox exercises held in 1933. Both exercises involved one particular phase of antiaircraft defense, that is, joint air corps-antiaircraft artillery protection of a single small locality. The aircraft warning service, or distant intelligence net, was set up solely for military purposes, to alert air corps and antiaircraft artillery units and defense headquarters. Its primary function was in connection with attempted daytime interception, by friendly pursuit planes, of attacking bombers.

At Aberdeen the distant intelligence net (so called to distinguish it from the close-in net, furnished by antiaircraft artillery units) consisted of three rings of observation posts at 45, 70, and 100 miles from Aberdeen, the two outer rings reporting by field telephone and Army radio and the inner ring by leased commercial circuits, which were found quicker and more effective than radio. Personnel to operate the net was furnished in large part by a provisional antiaircraft artillery brigade intelligence battery, but also included five amateur radio operators at Fort Howard, Quantico, St. John's (Annapolis), Falls Church, and Clarendon. These amateur radio operators, according to the report of the commanding officer of the Intelligence Battery, sent in 138 out of a total of 853 messages received. Following are several of the more important conclusions taken from various reports covering the Aberdeen exercises:

a. That an all-around net of the type actually used will seldom be required, except in special situations for the defense of isolated or particularly important localities.

b. That at night observers can only be expected to estimate the location, number, course, and altitude of planes; that definite identification and distinction between friendly and enemy planes is virtually impossible unless the opposing units are equipped with motors with distinctive sound.

c. That communications should be by commercial telephone and that no radio should be used.

d. That it is a question whether the exclusive use of military observers (1,500 for a 360° net) can be justified and that profitable use can probably be made of civilians, with a few military units as cadres.

Volume II, Coast Artillery Field Manual, published in 1933, contains certain provisions regarding an aircraft warning service, or distant intelligence net. It states (paragraph 68) that—

a. In addition to the close-in antiaircraft artillery net, a distant net will be established—when pursuit aviation is assigned a defensive mission in coöperation with antiaircraft artillery.

b. There should be three rings of OP's, at distances of 30 40, and 80 and 100 miles, respectively. OP's to be 5-10 miles apart and connected by telephone or radio, preferably the former, to an intelligence officer in the combined antiaircraft artillery pursuit headquarters. (A layout chart is shown of the net used at Aberdeen.)

c. Full advantage to be taken of commercial telephone systems in establishing the communications.

d. It is not probable that troops could be used as observers as it would require approximately 1,500 men to man one 360° net and such a use of manpower would appear to be wasteful. However, civilians, members of the civil service, and men unable to meet the physical requirements of soldiers, could be used as observers if a few trained key individuals formed a part of the system.

The joint exercise, held at Fort Knox in May, 1933, has been described at length in the articles referred to above and also in a summary of reports on this exercise issued by the War Department and published in The JOURNAL. The distant intelligence net was in fact very carefully planned and efficiently operated. It was similar in most respects to the net used at Aberdeen, the principal difference being that less radio and more commercial wire lines were used in communicating between observation posts, defense headquarters and the pursuit airdromes.

No civilians were used as observers, but Reserve officers and members of the American Legion assisted in selecting

sites for observation posts and in carrying on negotiations with civilians. The entire population of southern Indiana and northern Kentucky seemed intensely interested in the exercises; farmers, crossing tenders, filling station employees and many others, when questioned, stated they had seen the planes going over and, judging from their answers, could have sent in by telephone sufficiently accurate information.

Opinion among officers taking part in the exercise as to the suitability of civilian observers was divided, although many of those questioned on this subject stated that in their opinion civilian observers would be satisfactory. Conversation with Reserve officers who were familiar with the local communication system or who were employees of the Southern Indiana Bell Telephone Company, elicited the opinion that with existing organization and facilities, commercial telephone companies could organize and operate an effective aircraft warning service, using properly instructed civilian observers.

Due to their greater exposure to sudden air attacks, foreign countries appear to have gone further than we have in developing an aircraft warning service and in planning for passive antiaircraft defense measures for civilians. In a number of cases, however, little has actually been accomplished due to the confusion and lack of coördination resulting from entrusting various measures of antiaircraft defense to several different government departments.

Great Britain has had, during the World War and since that time, a very complete plan for the antiaircraft defense of the London area, which has been fully described in the press. Along the Channel coast are a number of listening posts with special sound locators reported capable of hearing planes at distances up to 20 miles. Between the coast and London, over an area about 150 x 50 miles, is a network of observation posts, about 6-8 miles apart, manned by volunteer civilian observers (Civilian Observers' Corps) who are enrolled as special constables. Each observer is equipped with a simple homemade instrument, costing approximately $2.50, for measuring height and speed of planes. Observers are connected by commercial telephone (Post Office Department) to information centrals, also manned by civilians, at which courses of planes are plotted and reported to Air Defense Headquarters. Information centrals have 9 plotters, each covering 3 observation stations. Around London are several rings of searchlights, sound locators, and antiaircraft guns, and over London itself is a zone reserved for the operation of pursuit planes, working with searchlights specially set aside for this purpose. The entire system is under the Royal Air Corps, is given frequent test and is considered satisfactory.

Other foreign countries have set up aircraft warning services as part of the antiaircraft defense of the zone of the interior. In Germany, Japan and Denmark this service is almost entirely operated by civilians, in Italy, partly so (civilians and Black Shirt Militia), and in France by active military personnel, reservists and men beyond military age.

The most recent aircraft warning service reported is that recently set up in Denmark. According to press reports the Danish Army has recently completed the organization of a nation-wide "civilian airplane observation service" for use in the event of war. Several hundred observation posts have been designated, to be manned by volunteers—men or women—of the neighborhood. Each post is to have 12 observers, so that weather permitting, a 24-hour watch may be obtained. Observers have been organized into the "Volunteer Aviation Information Service" which has been recognized as an official institution by the Danish Defense Minister.

What we should plan for, in time of peace, is an aircraft warning service that will meet the situation that, so far as can be foreseen, will confront us in case of an emergency in which an intensive air attack is a possibility. Certain facts are apparent—

First, that a considerable number of localities will require antiaircraft defense.

Second, that our means of active antiaircraft defense will at first be limited, a condition apparently faced by every other country.

Third, that whether we have much active defense or not, passive measures for civilian protection, and an aircraft warning service must be provided at once.

The purpose of the aircraft warning service will be to alert antiaircraft artillery and air corps units, if any of either are present, to inform various defense headquarters and, in all cases to warn civilian communities and industrial plants of the approach of an air raid, in order that passive defense measures may be put into operation.

The best type of net or warning service is of course that used at the Aberdeen and Knox exercises, with concentric rings of observation stations and highly trained military personnel. Let us consider, however, whether such a type of net is either necessary or practicable.

The principal reason advanced for a military manned net of the type and density used at Aberdeen and Fort Knox, is to furnish accurate identification for use of friendly pursuit to intercept hostile bombers. At the Knox exercises, such identification was seldom possible, even with well trained military observers and their high-power field glasses. Nor does identification appear so important when we consider that many air raids will be at night, when any identification at all is practically impossible and interception by pursuit planes very difficult, to say the least. It is one thing for pursuit planes to intercept bombers by day and when the bombers have only one objective, as was the case at Fort Knox. It is another thing to intercept bombers that have a choice of several objectives and flying at night at heights of 15,000 feet or more, as will usually be the case. It will be recalled that, in general, no night interception was even attempted at the Knox exercises. Considering the above and the most likely uses to which an aircraft warning service will be put (to warn civilians), the all around type of net, with military observers, does not appear necessary.

Is it practicable? The Fort Knox net, covering only

120°, required about 400 observers. To extend this net to cover 360° would therefore require about 1,200 observers, not counting additional personnel to operate information centers and for necessary supervision. If we should set up only four or five such nets, circular or semicircular, the personnel required would very soon exceed 5,000. Where would we get 5,000 military observers at once? Even if the necessary personnel was mobilized immediately, displacing personnel needed for combat units, it would not be available for a considerable period. It appears that some other solution must be found.

Based on our own experience, which is somewhat limited, on consideration of the uses to which an aircraft warning service will probably be put, and on the experience of foreign countries, there appears to be every reason to believe that civilian observers, with a limited amount of military supervision, will be entirely satisfactory and that for the most part, commercial wire communications or those installed by commercial companies, can and should be used.

Observation stations should cover the principal lines of approach to critical areas, and the outer stations should be at least 100 miles from each locality or establishment where the alarm is to be given. Observers must be connected by wire circuits, which in general have been found more reliable than radio, to properly located information centers, where the courses of approaching planes can be plotted and from which the alarm can be promptly distributed, in first priority to airdromes, antiaircraft artillery units, civilian communities, and industrial plants, and in second priority to various G-2's and defense headquarters, where, in fact, little actual use of the information can be made after an air raid has started.

Certain measures of coordination will be necessary to insure that all probable lines of approach to an important locality are covered; this can be done easily and effectively by care in selecting the location of information centers and in providing the necessary communications between centers.

The aircraft warning service must, of course, be tied in with and must utilize the antiaircraft intelligence service of harbor defenses and of mobile antiaircraft artillery regiments and the intelligence service of other units and other government agencies, especially those along the coast. For example, the entire coast from Cape Henry to Cape Hatteras could be covered by connecting each Coast Guard Station (one every six miles) with an information center at Elizabeth City or Norfolk. Tie-in with aviation units can be made by connecting information centers to airdromes.

The aircraft warning service is primarily to warn civilian communities and industrial plants, which may or may not have some form of active defense. It will serve also to alert air corps and antiaircraft artillery units in the zone of the interior. Ordinarily it should operate only in the zone of the interior, but if already established in a theater of operations it might be suitable for continued use, in some situations, to supplement the regular intelligence agencies. In any case the necessary information centers of the aircraft warning service in the zone of the interior will be connected to the various intelligence agencies in adjacent theaters of operations.

Before **After**

A demonstration of skill in camouflage at Corregidor.

HELIGOLAND: *The Gibraltar of the North Sea*

By MAJOR BERNARD SMITH, Corps of Engineers

MAY 31, 1937, marked the 15th anniversary of the destruction of the fortress of Heligoland under the provisions of the Treaty of Versailles.

At the time of the final inspection of the work of demolition, all of the harbor installations and military works on the island had been destroyed with the exception of 500 meters of the Northeast Mole, 350 meters of the West Mole, and the bomb-proof power stations of the Unterland and the north and south groups on the Oberland.

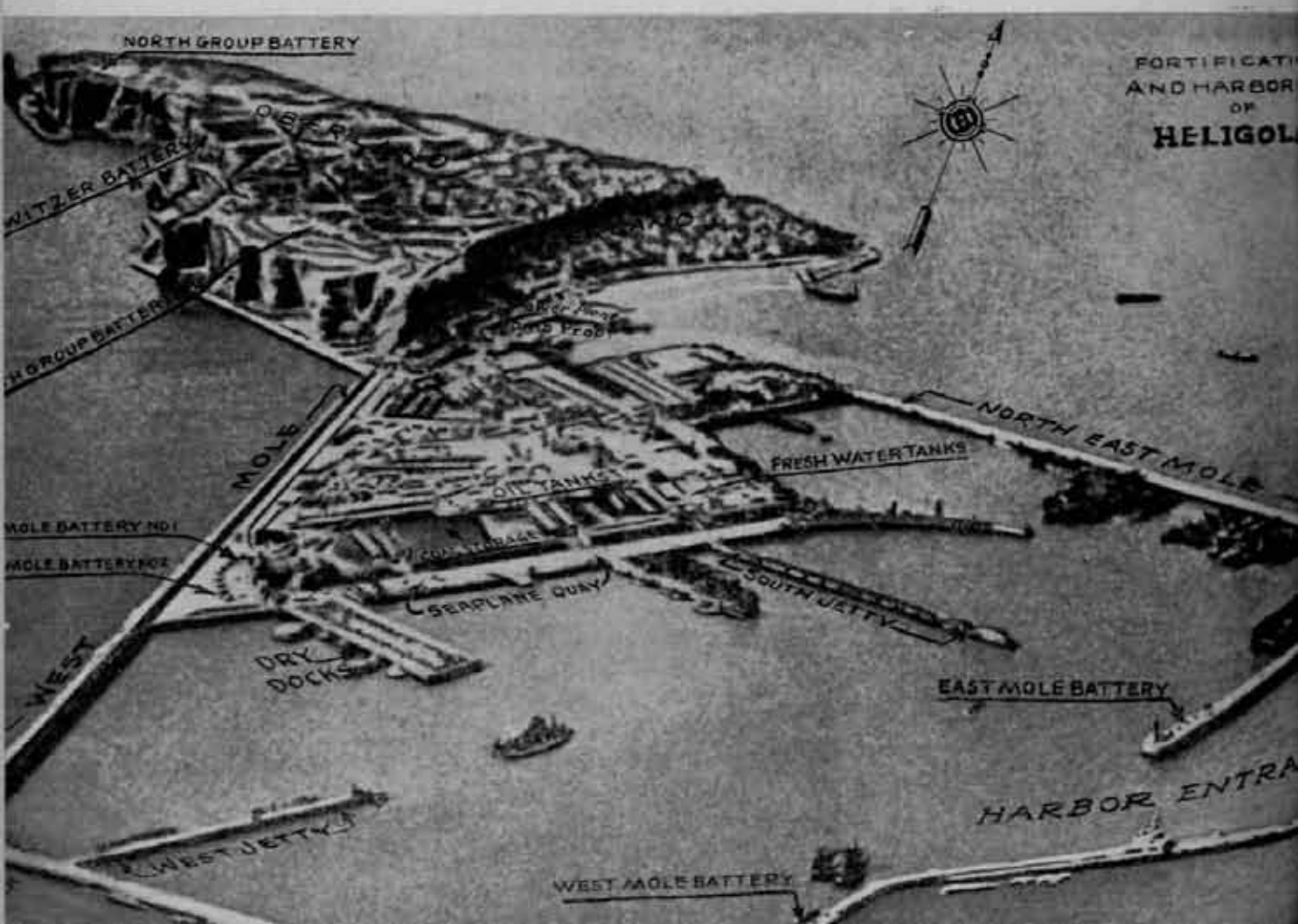
The fortification of Heligoland reputedly cost the Imperial German Government thirty-five million pounds sterling. During the extreme cold of December, 1916 and January, 1917, when ice made it impossible to operate from the Weser or the Elbe, submarines based on Heligoland destroyed allied shipping to a value of thirty million pounds sterling, or over 85 per cent of the cost of the base.

During that same period there were at one time 69 submarines in the harbor, as shown by a contemporary photograph. A further value of the base is illustrated by the photographs of the cargo submarine *Deutschland* returning from one of her trips to America prior to our entry into the war.

Heligoland was definitely a "bon secteur" during the late unpleasantness—it was virtually unmolested and was only approached by submarines and small craft which from time to time ran in under the lee of its cliffs and could not be reached by the guns.

Heligoland lies in a bight of the North Sea formed by the west coast of Schleswig-Holstein and the north coast of Hanover. The Friesian Islands form a loop across the angle of these coasts, the nearest being 28 miles south of Heligoland, which is thus a sort of bastion of the German coast defense. The island is 40 miles from Cuxhaven at the mouth of the Elbe in the angle of the bight, and 57 miles from the entrance to the Kiel Canal. Norfolk, the nearest point on the coast of England is 280 miles distant.

The island proper is about 1,700 yards long by about 600 yards wide at the southern end, where the harbor is constructed. At the northern end it tapers to a point. The island of Dune, considered a part of Heligoland, was armed with antiaircraft batteries. It lies about a mile to



the east of the main island. Heligoland is more or less handicapped by the fact that the longest horizontal base available is about 2,900 yards.

The island was formerly a Danish possession. It was taken by the British in 1807 and retained by them until 1890, when it was turned over to Germany in exchange for Zanzibar, off the east coast of Africa. Lord Salisbury thus exchanged an island of less than one square mile area for one of 640 square miles, but that bargain was later to cost some 30 million pounds in shipping.

When the island was transferred to Germany in 1890, all the Heligolanders who wished to remain British were allowed to do so, but all born on the island afterward had to become German. During the war the entire civil population was transferred to Germany.

The fortifications of Heligoland, except for secondary batteries added later, were completed in 1914, which date also marked the completion of the widening of the Kiel Canal. The first scheme for fortification contemplated about a 9-inch maximum for guns and numerous big howitzers. This project was modified to increase the power of the armament, and at the outbreak of the war the major batteries included eight 30.5 cm. guns, four 21.5 cm. guns, and a battery of eight 28 cm. howitzers.

The guns were arranged in a north and south group, each consisting of two turrets with two 30.5 cm. guns in each and two 21.5 cm. guns mounted in cupolas. The howitzer battery was emplaced along the south side of the Oberland between the two gun groups. The turrets were protected by 40 cm. armor and the cupolas consisted of 5 cm. armor.

The secondary armament included one 15 cm. and four 8.8 cm. guns on each flank of the line of emplacements on the Oberland. Direct protection of the harbor was provided by one East Mole and three West Mole batteries mounting together four 15 cm. guns and twelve 10.5 cm. guns. There were also antiaircraft batteries, both on Heligoland proper and on the Dune.

Another important feature of the fortress was a troop tunnel which extended generally along the south edge of the Oberland and connected the batteries with each other and with underground barracks and hospital and command posts. This tunnel was paralleled by a service tunnel which carried piping and cables for the operation of the batteries.

The harbor was connected with the Oberland by the main incline tunnel, and other tunnels provided access from the harbor level to the mine storage, bomb-proof power stations, and magazines.

The garrison of the island, exclusive of naval units temporarily based there, numbered about 4,300 men.

The harbor works were as vital to the island as was the armament; in fact it might be said that the principal purpose of the island was to provide a gun platform for the armament protecting the harbor, which was entirely artificial.

The harbor was enclosed by the West Mole, about 1,600 meters long, and by the East Mole, about 1,000 meters long. These moles enclosed an outer and inner harbor and provided protection for the reclaimed land on which were located the necessary facilities for a naval base.

There was also a dry dock capable of docking a cruiser and a number of submarines. A seaplane quay provided for the needs of aircraft. Water was transported from the mainland and stored in large tanks.

It has been mentioned that within the period of a few months, submarines operating from the security of the Heligoland base managed to destroy Allied shipping to the value of thirty million pounds sterling—almost 85% of the original cost of the fortifications.

Such figures are indeed impressive, but are actually negligible when compared to the true worth of the island fortress to the German Empire for the four hard years of the World War. The concrete coast defenses, manned by a handful of men, denied the British Grand Fleet access to the German seaboard for the entire period of the conflict. When the German High Seas Fleet withdrew behind Heligoland immediately after Jutland there was no great attempt at pursuit by the British—they knew the risk of an attempt to force the island's defenses. Moreover, during the last two years of the war, when the combined Allied fleets numbered what was probably the world's greatest armada, the coast defenses of Heligoland still held the battleships at bay. The Allied war vessels never made a serious attempt to tackle the fortress. That the Allies realized the worth of Heligoland is shown by the fact that its destruction was provided for in the Treaty of Versailles.

That such defenses are as valuable today as they were twenty years ago is a proved fact. There is still no fleet afloat that can stand off-shore and trade punches with a modern coast defense with any hope of success.

(For a pictorial description of Heligoland, please turn the page)

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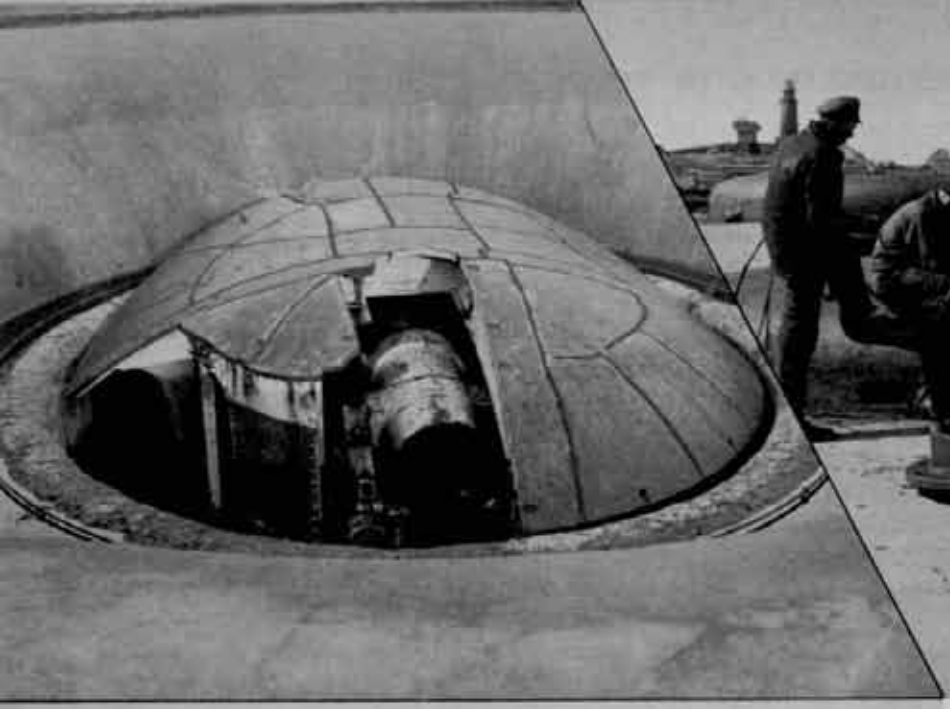
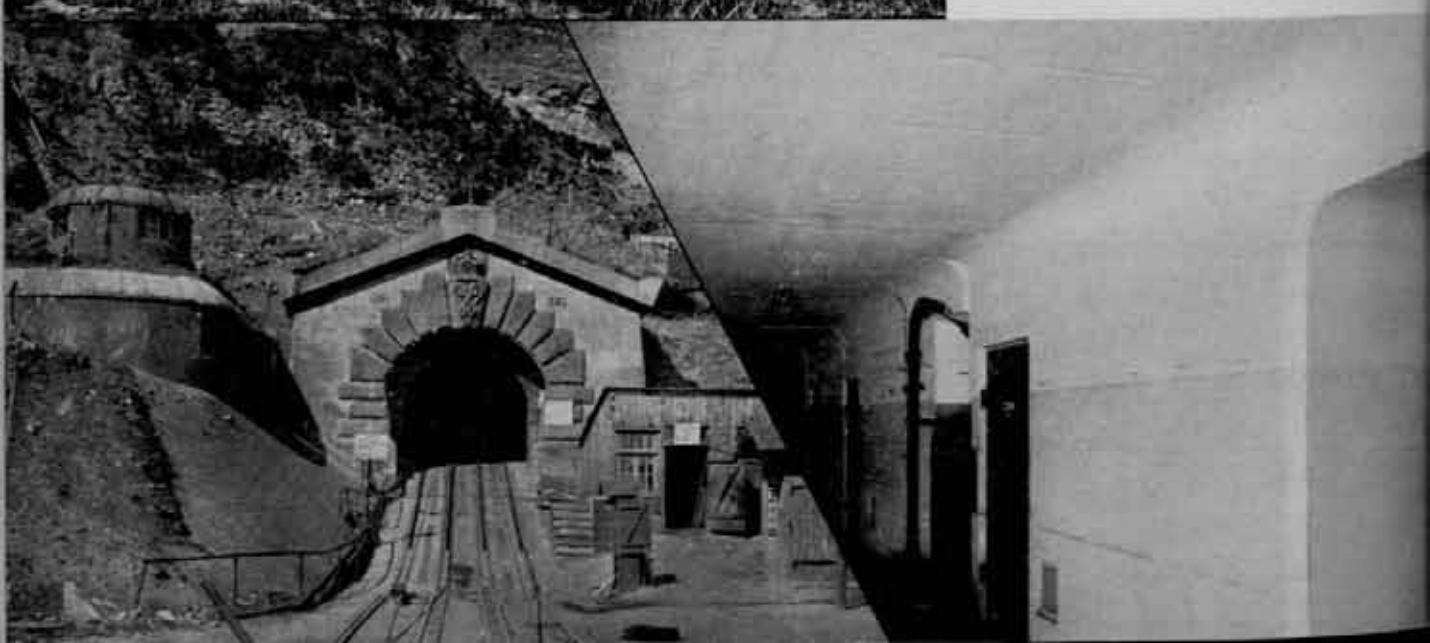
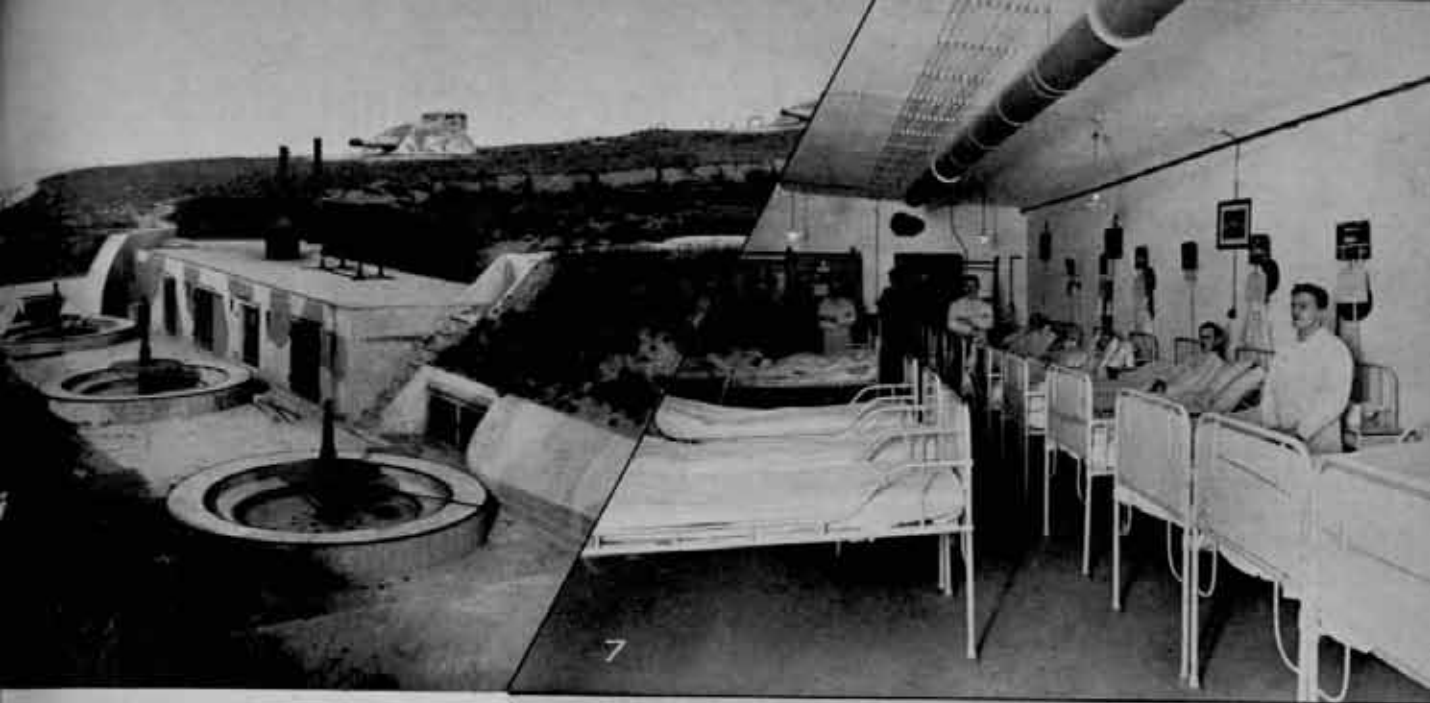


STRONGHOLD C

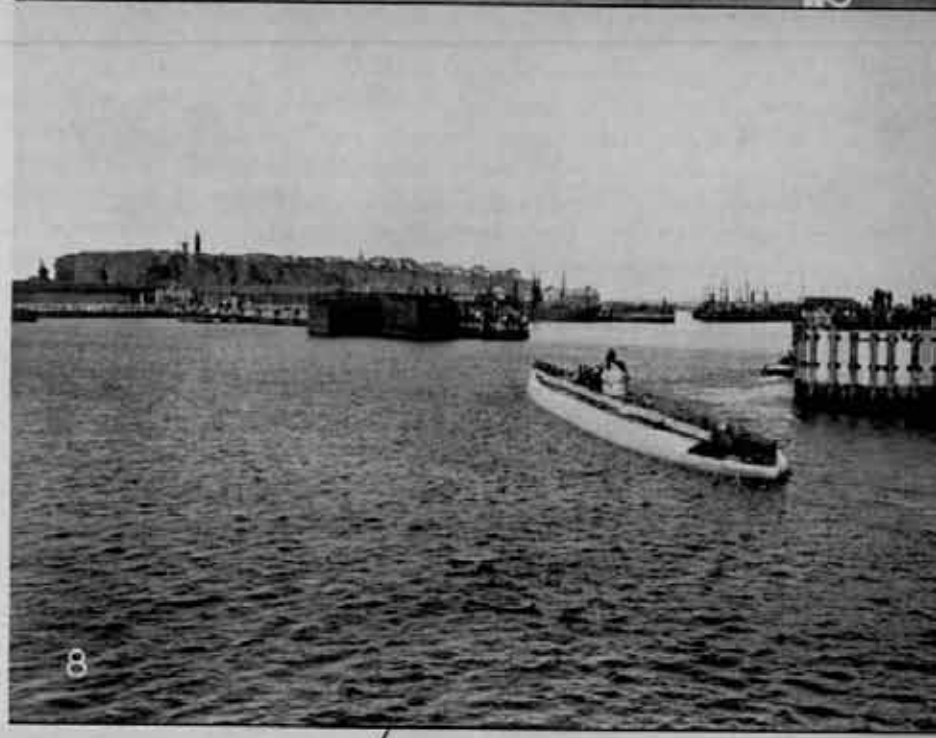
1. *One of a battery of eight 28 cm. h*
itzers. Demolition partially complete
2. *Observation post for 30.5 cm. batter*
process of demolition.
3. *Two of the four 30.5 cm. gun turr*
They were named, respectively, Au
Bertha, Caesar and Dora.
4. *Entrance to the incline tunnel,*
necting the harbor with the Oberlan
5. *The troop tunnel, which connected*
Oberland batteries with the harbor
with the underground hospital, barra
etc.

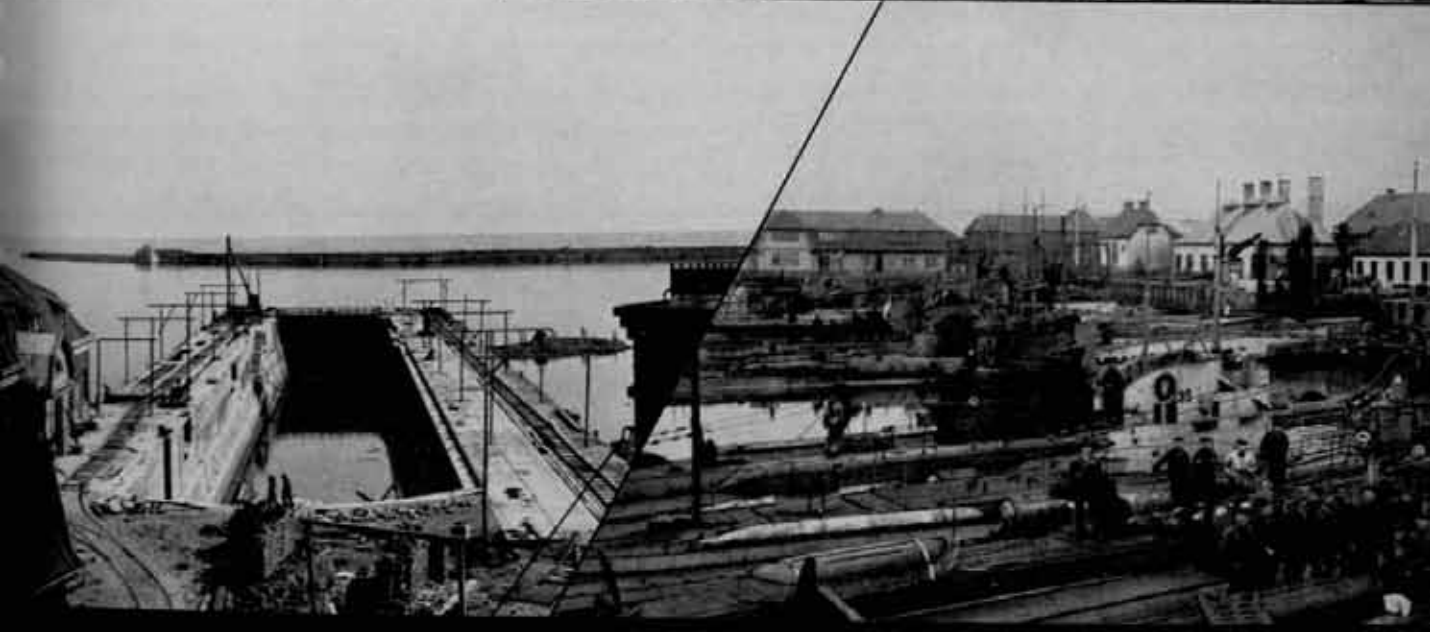




HE NORTH SEA

An antiaircraft emplacement, showing two of the 21.5 cm. gun cupolas.
Underground hospital.
Cargo submarine Deutschland *returning from America.*
The dry dock was 600 feet long by bout 53 feet wide and was intended to ke cruisers or smaller vessels. The demolition work has just begun.
Submarines based on Heligoland during the winter of 1916-1917.





Turrets and Casemates for Seacoast Batteries

By COLONEL MATTHEW A. CROSS, C.A.C.

THE national policy of the United States is to possess a Navy second to none and a highly trained small Army capable of orderly, quick expansion to the degree necessary in time of emergency. Thus the Navy, assisted by such Army contingents as may be necessary, will cover the mobilization of the Army.

Consistent with this national policy, the duty of the Army to safeguard naval bases in the United States and its possessions is of paramount importance. These bases are the New York-Narragansett Bay area, the Chesapeake Bay-Norfolk area, the Puget Sound area, the San Francisco Bay area, the San Pedro-San Diego area, Hawaii and Canal Zone. These bases should be made secure at all times for use of the Navy.

A naval base is of such importance in connection with naval operation that an enemy in many instances would be justified in attempting to seize it to hamper the operations of our Navy or to facilitate his own operations. Such an attack would be made in great force with control of the sea and air at time and place of the attack. Also sudden raids in considerable force to effect damage might be expected under certain circumstances. In either case the crisis of the action may come within a few hours of the initiation of the attack. It is of the utmost importance in such cases that the harbor defense artillery be in position to fire at the beginning and throughout the attack. This requires artillery in position prior to the attack.

Tactical studies, joint exercises with the Navy, and historical examples indicate that an effort to neutralize seacoast batteries may be expected at the critical stage of the attack or earlier. It is apparent that a seacoast battery established for the defense of a naval base should be of such type that it cannot be neutralized.

Experience in the World War indicated that a field battery could be neutralized by the fire of one platoon of 75 mm. guns. It is not unreasonable to assume that a seacoast battery in the open with certain protection for personnel and usually covering a larger area than a field battery could be neutralized by a battery of 75 mm. guns or equivalent.

The fire of naval high-velocity guns is not well adapted for neutralization fire against seacoast batteries but a serious effort is being made in the various navies of the world to overcome this deficiency. It would be an error to ignore the possibility of such action in future operations.

The development of attack aviation is such that a determined enemy would attempt to neutralize the shore batteries at the critical time by that means. Open seacoast batteries invite attack by fragmentation bombs and gas. It is unjustified optimism on the part of the defense to assume that the antiaircraft machine guns could inflict such losses to the enemy as to nullify the attack.

For many years persistent and extensive efforts have been made to camouflage seacoast batteries. The results are inconsequential. Similar efforts have been made to provide protection against gas with results but little more encouraging than with camouflage.

It should be apparent from the foregoing that we should reconsider the types of emplacements for fixed artillery with a view to eliminating the weaknesses and deficiencies now existing. This can be done by providing protection against bullets, shell and bomb fragments, and gas and, in certain instances, against direct hits by armor-piercing shells. One battery that cannot be neutralized except by a direct hit would be of more value than several open batteries of the kind now in existence. Similar advantages appertain to casemated batteries but the field of fire would be limited to about one hundred and twenty degrees.

With the turret or casemate type of emplacement, the entire crew, including ammunition service, would be protected to the extent that the fire of guns and the explosion of shells nearby would not disturb them. They should be able to function with peacetime accuracy. By maintaining a pressure within the turret, magazine, etc., above atmospheric pressure, no gas will enter the emplacement and gas masks would be unnecessary. By placing a camouflage on the turret so that it would rotate with the turret, a better concealment would be possible than is the case with an open emplacement. With a turret type of emplacement a battery can have all-around fire without introducing the difficulties of loading that are incident to the open type. In a turret type, much more freedom may be had in the use of lights favoring accuracy and with consequent diminution of danger of accident.

From the standpoint of camouflage, the casemate type of emplacement is superior to any other due to the fact that the normal topography need not be disturbed greatly. During the last two years of the World War, there was a casemate battery of 75 mm. guns in the northeast section of Rheims within fifteen hundred yards of the German lines and in plain sight of the enemy. This battery was at the base of a small hill, with a burlap curtain which covered the casemate opening during the day. The battery fired only at night. Apparently its location had been determined by the Germans by sound ranging for, at the time the writer visited it, the hill itself was so much torn up by shell fire that it had the appearance of a great pile of dirt. The dirty burlap curtain blended so nearly perfectly with the dirt that, at a distance of two hundred yards, it was practically unnoticeable.

We should reconsider the types of emplacements to eliminate their weaknesses and deficiencies.

While the cost of installing a battery in turrets as compared with open positions is not a primary consideration, it should be examined. A study which was made some years ago indicated that for a six-inch battery of two guns, the turret mount with one-gun splinter-proof turrets the cost would not greatly exceed that with the guns in open emplacements. Of course, if heavy armor were used, the cost would be greatly increased but, on the other hand, additional security would be provided. It would be not unreasonable to provide splinter-proof turrets for the six-inch guns. Considering the small number of large-caliber guns that would be emplaced, the importance of their function and the time and cost for their emplacement, they should be placed in heavily armored turrets capable of resisting the direct impact of any but the heaviest projectiles at short range.

It would be a serious error, to allow cost to be the governing factor in determining the types of emplacement. A suitably turreted battery, due to the fact that only destruction will result in its neutralization, is worth a much greater number of guns in open batteries in fixed positions which could be neutralized by the fire of light artillery or by airplane attack with fragmentation bombs or gas.

Briefly the advantages and disadvantages of turret or casemate mounts are as follows:

Advantages as compared with open emplacements—

1. Freedom from neutralization by light artillery or by any except direct hits of major caliber artillery.
2. Freedom from neutralization by attack aviation.
3. Better accuracy of fire due to absence of disturbing factors such as discharge of nearby guns, shell bursts, etc.
4. Effective gas proofing.
5. Better camouflage.
6. Protected ammunition service.
7. Greater facility for all-around fire, in the case of turrets.

Disadvantages as compared with open emplacement—

1. Greater cost for heavy turrets (probably about the same for splinter-proof turrets and casements).
2. With casemates, usually smaller field of fire.

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The Employment of the Air Corps

By Brigadier General H. H. Arnold, Air Corps, U.S.A., before R.O.A. Convention, Hazleton, Pa., May 7, 1937.

THE conception of the employment of the GHQ Air Force is to have an Air Force ready, at all times, to perform combat operations immediately upon the outbreak of war, and its operations in National Defense will be of more importance and more decisive during the early phases of an attempted invasion than at any later time.

During the early phases of a threatened invasion the operations of the GHQ Air Force will be beyond the sphere of influence of the ground forces and will be concentrated on the destruction of the enemy air forces on the ground and in the air, aircraft and munitions factories, naval and supply vessels, and other essential hostile installations as well as troop concentrations. If and when enemy troops actually set foot on our soil, the GHQ Air Force, in addition to continuing many of the functions mentioned, will exert the maximum possible effort as a member of the Army team.

Even as the Infantry is "Queen of Battle" with all operations of the other branches concentrated on furthering its mission, so is bombardment the "backbone of the Air Force," with all other types of aviation coöperating to push the bombardment missions through to the objectives. This will be especially true when the Air Force is operating beyond the sphere of influence of the ground forces.

The manner in which this aerial teamwork will be carried out may, in general, be described as follows: The long range reconnaissance airplanes, the "eyes" of the Air Force, take off with the mission of locating the objective, the destruction of which will most seriously affect the operational efficiency of the enemy. As this objective will no doubt be heavily defended by antiaircraft installations, whether ashore or afloat, attack aviation, the low flying, so-called "hedge-hoppers" of the Air Force, would be assigned the task of silencing these enemy installations by the use of light bombs and machine guns, smoke and chemicals. In addition, attack aviation would be given the mission of striking the enemy air force on the ground, which would greatly add to the probability of success of the bombardment mission by reducing the resistance which his air force might exert against our bombardment attack.

Under the present conception of the use of single-seater pursuit aviation, this member of the Air Force team would be employed to protect the air bases of our air force in a purely Air Force operation, and to ward off attacks on other important installations.

It is possible that in the future a multi-engined, multi-seater fighter will be adopted, which in general appearance will resemble the bombardment airplane, but will carry more and larger caliber flexible guns. This airplane will, of necessity, be faster than the bombardment airplane to allow it to maneuver around the bombardment formation while accompanying, in order to interpose itself between hostile fighter aircraft and the bombardment formation, or it may be interspersed through the bombardment formation to increase the defensive fire power.

PANIC*

By Captain C. T. Lanham, Infantry

"Sauve qui peut" has been echoed in every tongue and dialect known to man

Fie, my Lord, Fie! A soldier and afeard?—*Shakespeare*

August 15, 1866. The 34th Infantry, part of the Austrian rear guard, is falling back after the catastrophe at Königgrätz. The men are exhausted and frightened. Again and again they have been forced to form squares to withstand the harassing action of hostile cavalry. Late in the afternoon a dust cloud is seen whirling toward the regiment. The cry goes up, "The German cavalry is charging!" The order is given to form squares, but panic suddenly sweeps through the command. Formations disintegrate. Units open fire on each other. Men run in all directions. Even after it is discovered that the dust cloud was caused by the movement of a herd of frightened pigs, and not by German cavalry, order is restored only with the utmost difficulty.

1918. An American battalion holds a reserve position in a shell-torn wood. Enemy artillery has been intermittently strafing the position since dusk. The Americans in their fox-holes are getting what sleep they can. At 11:00 P.M. the battalion commander, accompanied by his adjutant, starts an inspection of his lines. A runner dashes up and hands him a message. The major reads it. He calls to his adjutant, who is a short distance away, "Come on, let's beat it." The two start to the rear at a dead run. Before they have covered two hundred yards the entire battalion is in wild flight behind them. It races more than ten kilometers before it can be stopped. The message to the major had directed him to report to the regimental command post as fast as he could get there. He was complying with the order.

Summer maneuvers are in progress. A Blue infantry company is hidden in a field of tall grass. They are watching an unsuspecting Red battalion move straight toward them. When the battalion is within fifty yards the company commander gives the signal to open fire. The Blue soldiers, grinning broadly, cut loose with a volley of blanks. A strange thing happens. The battalion freezes in its tracks for an instant and then breaks. Men fling away their rifles and packs and race to the rear in insane flight. Leaders are powerless to stop them. Equipment is scattered all over the landscape. The umpires shake their heads.

These three incidents are not products of a lively imagination; they are based on hard fact. They may appear fantastic but they are nevertheless commonplace; for wherever men congregate this group madness is not far off. A word, a gesture, even a shadow, may be sufficient to transform men into stampeding cattle.

To military leaders, who must habitually deal with man in the mass, this strange psychological phenomenon is an ever-present contingency. No unit is panic-proof. Not even Napoleon's Old Guards were immune; their cry at Waterloo, "*Sauve qui peut,*" has been echoed in every tongue and dialect known to man.

There is no miraculous formula by which panic may be averted. There is no science by which it may be predicted. A leader can not say, "My troops are veterans; they are well-equipped; they are well-fed; they are fresh. There will be no panic." They may bolt before a shot has been fired. Nor can a leader say, "My men are worn out; they have not been properly fed; their equipment is inferior; the enemy outnumbers them. Panic will overtake them." They may perform prodigies of courage in the face of insuperable odds.

Is there, then, anything the leader can do that will act as a deterrent to this mass madness? Are there any provisions he can make that will tend to steady his command? From the negative viewpoint, is there anything he should avoid? And, finally, are there any particular conditions which render a unit panic-ripe? Before trying to answer these questions let us analyze a few historical instances of panic and attempt to arrive at some common denominator.

EXAMPLE I

The rhinoceros is the bravest of animals—it has no imagination.—H. G. WELLS

In spite of its victory over the Prussian I Corps near Trautenau on June 27, 1866, the Austrian X Corps was forced to begin a retirement early the next morning in order to meet a threat to its communications. The Brigade Grivicic marched as the left flank column of the corps. Cavalry and artillery that had been ordered to report to the brigade failed to appear.

The march was difficult. It led first across the previous

day's battlefield, which had not yet been cleared of the dead and wounded. The day was hot, roads were dusty and drinking water scarce.

In the early stages of the march the brigade commander informed his subordinate leaders that it was probable the Prussians had gotten across the line of retreat. He also told them that he feared the brigade might be cut off from the corps. The general's fears and apprehensions soon spread among the troops.

At the end of a twelve-mile march the brigade ran head on into a detachment of the Prussian Second Army near Rudersdorf. A desperate frontal fight immediately developed. For three hours the Austrian brigade fought magnificiently. Suddenly a few shots rang out on the right flank . . . the flank that was supposed to be covered by the remainder of the corps. Immediately some one cried, "We're cut off from the Corps!" The cry spread like a prairie fire. In a few minutes the entire right regiment broke in panic. Men threw away their rifles and fled to the rear.

Despite the heroic efforts of its officers, the left regiment, which had not even been touched by this fire, also broke. Neither orders, pleas nor threats could stem the tide of panic.

The remnants of the brigade continued their flight throughout the night. Morning found them some fifteen miles from the scene of the disaster. In this encounter the brigade lost 94 officers and 2,700 men, 65% of its strength.

Discussion

From a study of this action, it appears that the two principal psychological factors which contributed to the panic of this Austrian brigade could have been avoided. It is most unlikely that tactical considerations precluded a detour around the previous day's battlefield. The sickening picture of the untended wounded and the unburied dead must have gone a long way toward counteracting the buoyant effect of the victory won the day before. The brigade commander committed his gravest error, however, when he expressed the fear that the brigade would probably be cut off from the corps. His subordinates completed the damage by discussing their commander's apprehensions before the men.

It is not difficult to imagine the reaction of the rank and file. In the first place they probably felt that there was little use winning battles if the blunders of the high command required a retreat even after a victorious action. Rumors that the enemy had cut the line of retreat and word that the brigade commander feared he would be cut off from the corps contributed to the soldiers' loss of faith in their leaders. To the man in the ranks the depressing picture of the uncleared battlefield and the scarcity of drinking water added the finishing touches to the incompetence of the high command. The brigade was definitely panic-ripe.

It is unquestionably a testimonial to the valor of the troops that they fought at Rudersdorf so well and so long. But the tinder of panic was ready for the first igniting spark. That spark came on the dreaded flank in the form of a few inconsequential rifle shots which could not possibly have influenced the course of the action. Nevertheless everyone immediately leapt to the conclusion that the brigade commander's fears had been realized, and panic swept the entire command.

EXAMPLE II

Dangers bring fears, and fears more dangers bring.—BAXTER

In 1896 Italy invaded Abyssinia with an army of 15,000 men, equipped and trained according to the best standards of the day. Abyssinia, a negro state, without any army as we understand that term, opposed this formidable modern force with a savage horde of spearmen about 100,000 strong.

A poorly conducted night march prefaced the battle of Adowa. All night the Italian army struggled through the wild mountain passes of Abyssinia. Men straggled—columns drifted apart. Dawn found the Italians divided into three groups, separated by precipitous ravines and out of effective supporting distance. Before them swarmed the savage hordes of Abyssinia. The Italian commander of the left group expressed in the presence of some of his men his apprehensions about being separated from the main army.

With a wild shout the Abyssinians advanced to the assault. The Italian artillery immediately went into action, but owing to the badly accidented terrain it was unable to determine the correct range. Its fire was altogether ineffective and the hostile charge continued uninterrupted. As the tribesmen swept up the slope panic struck the left Italian group. The men flung away their rifles and raced toward the center. Officers who attempted to halt the mad flight were clubbed down or shot. The center was swept away in the insane rush. Only the right group stood fast. At nightfall it retired in relatively good order.

Of the 15,000 men in this European army, 3,500 escaped.

Discussion

On the surface it appears that there is no psychological background for this disastrous panic. It seems to have been merely one more instance of that blind and unpredictable terror to which man in the mass is subject. However, if we go beyond the more obvious aspects of this appalling disaster, we begin to see the underlying cause. We find, for instance, that this Italian force was made up of small detachments detailed from various home regiments. These driblets of men were fitted together in much the same manner as the pieces of a jig-saw puzzle; and the completed unit had about the same relative degree

of stability as the completed puzzle. Officers, noncommissioned officers, and soldiers were comparative strangers. The artillery had never worked with the infantry. With such a state of affairs, mutual trust, confidence, and understanding were definitely out of the question. In short, despite the equipment and the training of the individual soldier, this Italian force lacked from its inception those moral attributes which differentiate an army from a crowd.

Coupled with this we find another powerful psychological influence—the widely known cruelty of the Abyssinians who were reported to torture their prisoners. What tales of horror circulated through the Italian ranks we can only surmise; but knowing the mercurial Latin temperament we can feel certain that the stories were ample, gory, and replete with anatomical detail.

Picture this force, then, on the morning of November 1, 1896. The men were exhausted from a long and poorly conducted night march. When dawn broke they found themselves confronted by the milling hordes of the dreaded Abyssinians and at the same time discovered that their own force had been split into three parts. They lacked faith in their officers and faith in themselves. When their artillery failed to stop or even punish the charging tribesmen, panic swept the infantry; and what should have been an easy victory over a savage horde of spearmen became one of the most terrible disasters ever suffered by a comparable modern force.

The startling thing is that practically every factor that contributed to this shambles could have been avoided.

EXAMPLE III

Fear rushed in like an assaulting army.—BENTLY

On August 1, 1904, the Russian 140th Infantry Regiment and a rifle brigade were encamped near Haitshong some miles from the front. Both units were in army reserve. Between them and the Japanese lay the main Russian armies. Local outposts provided still further security. Surprise was virtually impossible. The troops were fully rested. Both units were well trained for the Russian Army of that day and both had had combat experience.

Shortly after dusk on August 1 several Russian soldiers from the rifle brigade went into a nearby rice field to relieve themselves. One of these men, while in an awkward position, apparently saw something that frightened him. He leapt up and rushed back to camp shouting, "The Japanese are coming!" Panic was instantaneous in the rifle brigade. Men grabbed their rifles and fired in all directions. In a few minutes the entire brigade was racing to the rear in two streams; one toward the camp of the corps trains near Haitshong, the other toward the camp of the 140th Infantry Regiment.

Panic struck the corps trains even before the screaming wave of terror-stricken soldiers rolled over them. A fighting, milling mob of men and animals swept back to the north through Haitshong. Not even the personal intervention of General Kuropatkin, who happened to be in the village, could stem the tide of terror. This portion of the brigade was not rallied for days.

The part of the brigade that fled toward the camp of the 140th Infantry met with a different reception. The colonel of this regiment heard the firing and the screaming and promptly ordered his buglers to sound the call to arms. The men fell into ranks quietly and without disorder. They ignored the panic-stricken members of the brigade who were streaming past them. The sight of this regiment, calm and unperturbed, served to allay the imaginary fears of this part of the brigade, which at once became quiet and orderly.

Discussion

At the beginning of this article the statement was made that "even a shadow may be sufficient to transform men into stampeding cattle." The affair at Haitshong bears out that statement. The personal panic of one soldier who had been frightened by some phantom in the dark stampeded an entire brigade, which in turn stampeded the rear echelon on an army corps. The whole story sounds like some incredible adventure of Alice in that strange land beyond the Looking Glass, and not the sober recital of eyewitnesses duly chronicled in the annals of Russian military history.

However, as in all cases of panic, we must probe beneath the surface for the real causes. In this particular instance a comparison between the rifle brigade and the 140th Infantry proves illuminating. Outwardly both units were the same. They were well fed, well equipped, and well trained. They had both had combat experience. They were thoroughly rested. Further, and in common with the rest of the Russian Army, they were both imbued with a deep sense of pessimism as a result of repeated Japanese victories. But there the similarity stops, for we learn that in spite of its pessimism the morale of the 140th was high; the colonel, loved and respected; and the other officers, competent and coöperative. The picture of the rifle brigade is different. It appears that this unit was noted for the dissension and petty feuds among its officers; dissatisfaction was constantly in evidence. *Esprit de corps* was non-existent.

Thus while the 140th had a solidarity and high morale to counteract the disheartening defeats, the internal dissensions of the rifle brigade only plunged that unit further into despair. The phlegmatic calm with which the 140th Infantry met this panic graphically demonstrates the stabilizing effect of the confidence that this regiment had in its leaders. It is probable that every man in this unit actually believed that the Japanese had surprised their bivouac, but despite that discouraging thought they responded as one man to the well-timed call to arms and

calmly awaited their colonel's orders.

Contrast this with the instant panic that overwhelmed the rifle brigade. In that unit there was no officer who thought of the steadying effect of the call to arms. From the first cry of "The Japanese are coming!" the brigade appears to have been transformed into a wild mob in which each soldier and each officer thought only in terms of himself. When this brigade was finally rallied some days later, it was found that more than 150 men had been killed or wounded.

EXAMPLE IV

Fear is sharp-sighted, and can see under ground, and much more in the skies.—CERVANTES

On November 9, 1870, the French First Army of the Loire attacked the I Bavarian Corps at Coulmiers where it obtained a success which might well have been decisive, had it not been for the following incident:

Early on the morning of the 9th the Rayau Cavalry Division was ordered to turn the right flank of the Bavarian Corps and cut its line of retreat to Paris. This division was informed that its left flank would be protected during the turning movement by several groups of francs-tireurs (French irregulars).

The cavalry had scarcely gotten under way before all contact was lost with the francs-tireurs. The division moved slowly; every shot resulted in a long delay. By noon, however, it had gained a position which seriously threatened the enemy's communications.

About this time the division became involved in a fire fight for possession of a village. German artillery intervened and the French suffered a few casualties. Suddenly a reconnaissance patrol galloped up at break-neck speed. It reported that Germans were driving in toward the left flank. This report spread like wildfire. No one thought of investigating it. Within a few minutes all nine of the cavalry regiments that composed this division had raced to the rear in panic. The flight continued until they reached the bivouac area they had left that morning.

The Bavarians retreated to Paris without difficulty.

It was subsequently learned that the "Germans" seen on the division's left flank were only the francs-tireurs who had been altogether forgotten in the excitement.

Discussion

The First Army of the Loire, like all the hastily organized volunteer armies after Sedan, was poorly trained and poorly disciplined. In common with the Russians in the previous example, the French, as the result of an unending string of defeats, were sunk deep in the slough of despair. Despondency and pessimism haunted their bivouacs by night and marched with their columns by day. With such a background it is remarkable that this volunteer army achieved even a partial success at Coulmiers, although it vastly outnumbered the Bavarian Corps. So great was this demoralization to become that by January, 1871, the sight of a few Prussian helmets was sufficient to cause whole units to flee the field.

The incident of the Rayau Cavalry Division is typical of the unit that has lost confidence in itself. When such a condition obtains, panics occur with increasing frequency. Insane rumors and wild reports honeycomb the military structure. Chronic pessimism and a sense of inferiority combine to destroy all sense of proportion. The enemy gradually comes to appear omniscient; he is seen everywhere; his strength is magnified a thousand times; his skill becomes legendary; his leaders assume the proportions of a Bonaparte; his battalions become an invincible combination of Cæsar's X Legion and Napoleon's Old Guard. When the armed forces of a nation visualize their opponent as the French armies visualized von Moltke's military machine, it is high time to conclude a peace.

EXAMPLE V

You tremble, body! You would tremble more if you knew where I am going to take you.—HENRI OF NAVARRE

In 1743 a Bavarian Corps, under the command of Count von Torring, made an unsuccessful attempt to capture an Austrian fort. Following this failure the corps began a retirement toward Branau. The attack on the fort had lasted ten hours. The men, for the greater part newly-raised troops, were very tired and had been without food throughout the entire day. Despite these various demoralizing factors, the corps maintained its discipline. The retirement began shortly after nightfall with all units well in hand. At first the movement was unhindered, but later the Austrians launched a vigorous pursuit.

Late that night the tired Bavarians were startled by the sound of heavy firing from the rear guard. Instantly rumors started. The report flew up and down the column that the Austrians had charged over a bridge that was supposed to have been destroyed, had broken through the rear guard, and were now driving forward to attack the main body. As this rumor spread through the command several units in the main body began to run.

Count von Torring rode up and down the column trying to reassure his troops. He told them that he had not blown up the bridge, because he intended to turn about and destroy the Austrians and did not want to be thwarted in this project by an unfordable river. The men were beginning to take heart. Here and there a cheer broke out along the column. While von Torring was still engaged in quieting his men a subordinate general gal-

loped up and shouted that the Austrians had encircled the right flank. The result was practically instantaneous—a complete panic of the 10,000 men comprising this corps. All that Count von Torring could assemble in Branau the next morning were a few officers, a handful of cavalry, and 200 infantrymen. (Discussion follows Example VI.)

EXAMPLE VI

For this, surely, is the very meaning of a panic—a fear that feeds upon itself.—H. S. HOLLAND

On October 11, 1806, the Prussian Army of Hohenlohe was assembled in and around Jena. Although their formidable French foe was still at a great distance, discouraging reports had been pouring in. Observers reported that a profound psychological depression reigned throughout the entire army.

Late that afternoon a solitary rider galloped down the road from the front. As he neared an artillery column that was drawn up alongside the road he signalled frantically with his hands and shouted, "Back! Back!" He then disappeared in the direction of Weimar at a dead gallop. Much later it was discovered that this excited officer had merely been directed to clear the road for other traffic. However, his spectacular dash from the direction of the enemy, coupled with his frantic shouts, immediately caused a wild flight of the artillery into the town of Weimar. As the artillery careened through the little town all the troops billeted there ran out of their quarters and the cry arose, "The enemy is only a half hour from town!"

Panic rolled down the valley of the Salle like water from a broken dam. Even in Jena many miles away, the trains of the Prussian Army fled terror-stricken into the gathering night.

Order was not restored for many hours, and then not until officer patrols had definitely determined that the vicinity of Weimar was free of the enemy.

Discussion

The panics at Branau and at Weimar are similar in that they both resulted from the careless and thoughtless action of an excited officer. Of course, in each case the troops were panic-ripe, but at Branau the catastrophe might well have been averted but for the blundering general who shouted his bad news for the benefit of the entire command. Quick-thinking Count von Torring had just about succeeded in calming his tense troops, and it is altogether probable that there would have been no panic but for the tragic psychological error of his subordinate.

At Weimar, however, the same profound pessimism that we have noted elsewhere was universal. It appears likely that panic would have occurred sooner or later from some equally remote cause. The main point is that the immediate cause in both instances was the ill-advised action of a subordinate officer.

As battle approaches men become as tense as coiled springs. The prospect of death looms large to the soldier. Instinctively he turns to his officers for guidance and for reassurance. If at these critical times an officer betrays confusion, excitement, fear, or loss of confidence, that impression, be it real or imaginary, is instantly spread among his men with disastrous results.

Calmness, confidence, aggressiveness, determination, and a deep appreciation of the psychological reactions of the ordinary man are the characteristics of great leadership. Joffre's monumental calm at the Marne rallied his terribly defeated armies and inspired them to an almost miraculous victory. Through most of the war the German armies drew strength and courage from the unshaken and unshakeable calm of their beloved Hindenburg. Of such is the stuff of leadership.

EXAMPLE VII

To the youth it was an onslaught of redoubtable dragons. . . . Destruction threatened him from all points. . . . He ran like a blind man.—STEPHEN CRANE

On June 24, 1866, the commanding general of the Italian 1st Division directed his 1st Brigade to attack the Mangalia Ridge. The 2d Brigade was ordered to move forward in support of the 1st. A platoon of artillery was directed to go into position on Mount Cricole to protect the flank of the attacking brigade.

The prescribed movements got under way. The skirmish lines of the 1st Brigade advanced against the disputed ridge. The 2d Brigade, with the division and brigade commanders at the head, moved forward in double column in support of the 1st. The 2d Brigade had made no provision for local security. Its advance was extremely slow. Every few minutes there were short, irritating halts. An air of uncertainty seemed to pervade the entire movement.

Suddenly a squadron of Austrian cavalry appeared near the crest of Mount Cricole. With a loud cheer this squadron charged. When the platoon of artillery which was moving toward Mount Cricole saw this cavalry it wheeled about and, at a dead run, raced toward the 2d Brigade. The Austrian cavalry followed the retreating artillery at a break-neck gallop. It did not draw rein when it encountered the dense columns of the 2d Brigade but, with sabers flashing, rode down the leading battalion, scattered the division and brigade staffs, and killed the division and brigade commanders.

Panic instantly swept the brigade. Five battalions flung away their packs and rifles and, in complete and utter rout, raced toward Valeggio. But now an unusual thing occurred—a startling thing in view of the panic

that had seized the rest of the brigade. The battalion that had been ridden down was rallied by it officers and, facing about, attacked and destroyed the daredevil squadron.

The charge of the Austrian cavalry had nevertheless proved decisive. The 1st Brigade, finding itself unsupported, abandoned its attack on the Mangalia Ridge and withdrew on Valeggio.

The 2d Brigade was not rallied until late the next day.

DISCUSSION

This is an interesting study of psychological values. One hundred cavalrymen sow panic in practically an entire infantry brigade and, though eventually destroyed, determine the outcome of a division fight. How can it be accounted for? By two things: Surprise and the inherent fear of the man on foot for the man on horseback. The moral effect of a surprise cavalry charge on the dismounted man caught in the open is terrific. Regardless of the often proved superiority of infantry to cavalry, that moral effect still exists.

Today, owing to the tremendous fire power of automatic weapons, the horse has been ruled off the battlefield. In its place, however, a far more fearful agency has appeared—the tank. The moral effect of tanks on infantry was repeatedly demonstrated in the last war. Only those individuals who have actually been confronted by one of these modern juggernauts can fully realize the terror, the despair, the sense of impotence, that they inspire.

It is generally agreed that in the next war the tank will play an important rôle. While we seek to enhance our knowledge of the tactics and technique of this weapon let us not lose sight of its moral implications. The unarmored infantryman who must confront this armored monster must be accorded more than a casual consideration. His is a real and a vital problem. Unless it is solved we may find our next major engagement characterized by an unending series of panics engendered by the mere appearance of the formidable and terror-breeding tank.

EXAMPLE VIII

***The courage of one and the same body of men is all or nothing according to circumstances.*—GUSTAVE LeBON**

On November 25, 1863, the Confederate Army of Tennessee occupied a position on Missionary Ridge that, to all intents and purposes, appeared impregnable. The troops of this army were not half-baked recruits but veterans with two and a half years of service behind them. Their great victory at Chickamauga was scarcely two months old. True, they were numerically inferior to the Federals who opposed them, but despite this it seemed a physical impossibility for any enemy, no matter how great his numerical superiority, to drive them from this magnificent position.

But the moral tone of this Confederate army was an altogether different matter. Shortly after their splendid victory at Chickamauga violent quarrels had broken out between Bragg, the army commander, and many of his subordinates. He had relieved Polk, one of his most popular corps commanders, and had preferred charges against him. Hindman, a division commander well-beloved by his troops, had also been relieved of command and his division had been broken up. General Longstreet, another popular corps commander, was openly resentful and, apparently, secretly disloyal. From this officer's correspondence it appears that he was actively engaged in undermining his army commander with the authorities in Richmond. As a result of these various dissensions the entire army was in a state of latent hostility toward its commander-in-chief.

The prelude to the battle was the marshalling of the Union forces in the great plain between the Ridge and Chattanooga. This massing of the Union troops took place in plain view of the Confederates. According to all observers this display of the enormous Union forces massed for the attack made a tremendous impression on the defenders of the Ridge. Added to this was the fact that the Union Army was now commanded by General Grant, who had just successfully concluded the siege of Vicksburg, and whose reputation was far greater than that of any other Union general. The final factor that must be considered in this battle was Bragg's serious tactical error in dividing his troops. Some were placed in trenches at the foot of the ridge, others in trenches on the military crest.

When the Union attack finally came, the Confederate trenches at the foot of the hill were quickly overrun. In complete disregard of General Grant's explicit instructions, the Union troops immediately charged up the Ridge on the heels of the withdrawing Confederates. The fire of the defenders located on the military crest was partially masked by the withdrawal of their own troops from the foot of the ridge, with the result that they were unable to bring the full volume of their fire to bear on the charging Union lines.

It was an exhausting charge for Grant's men. Terrain, absence of fatigue, trenches, in fact every factor favored the Confederates. And yet when a single Union flag appeared on the crest of the ridge something snapped in Bragg's army. Panic overwhelmed one Confederate division after another. What actually occurred is described by Bragg's official report written at Dalton, Georgia, on November 30, 1863.

> A panic, which I had never before witnessed, seemed to have seized upon officers and men; and each seemed to be struggling for his personal safety, regardless of his duty or his character. . . .
>
> The position was one which ought to have been held by a line of skirmishers against any assaulting column, and whenever resistance was made the enemy fled in disorder after suffering heavy losses.
>
> Had all parts of the line been maintained with equal

> gallantry and persistence, no enemy could ever have dislodged us, and but one possible reason presents itself to my mind in explanation of this bad conduct in veteran troops who had never before failed in any duty assigned them, however difficult and hazardous. They had for two days confronted the enemy marshalling his immense forces in plain view and exhibiting to their sight such a superiority in numbers, as may well have intimidated weak-minded and untried soldiers, but our veterans had so often encountered similar hosts when the strength of position was against us, and with perfect success, that not a doubt crossed my mind.

Discussion

It is quite obvious that General Bragg was not altogether fair to his men in this report. As disheartening as the sight of the huge Union forces may have been to these war-weary Confederates, this was nevertheless insufficient to account for the wild panic, as Bragg himself implies. What General Bragg failed to see was the universal disloyalty, dissatisfaction, and resentment against his own régime. He had relieved one corps commander and one division commander for alleged disobedience of orders; both were exceptionally loved and respected. He had broken up one division for trivial reasons. Dissension was everywhere rampant. No one was satisfied with Bragg's leadership. This state of affairs had even undermined the buoyant effect of the great victory at Chickamauga that was only two months behind this army. By November 25 these demoralizing factors had transformed the veteran Army of the Tennessee into a potential mob. The result of the battle was not surprising.

CONCLUSION

Panic seems to split logically into two separate phases. The first consists of the gradual building up of a tense psychological state of mind. Outwardly this is characterized by excessive nervousness, a marked growth in wild and pessimistic rumors, and a heightened sensitivity to all external stimuli. More recondite symptoms include a loss of faith in leaders, a hostile and questioning attitude toward orders, a quickened imagination, and a profound pessimism.

The causes that induce this mental state in a military unit are many and varied. Of those considered in the historical illustrations cited in this paper, some were avoidable, others were not. Defeat, for instance, is one of the unavoidable fortunes of war; when two armies clash one must lose. Unfortunately, defeat carries with it more than lost terrain and long casualty lists; it sows the seed of distrust in the fertile soil of the private soldier's brain; it implants the idea that the enemy may be physically superior to him and mentally superior to his leaders. With every battle lost, these doubts and questionings increase until finally they are fixed in irrevocable certainty. It is easy to lead victorious troops to fresh victories but only great leaders can carry a defeated force through to triumph. Let us hope, then, that when we are engulfed in the next war we shall be able to give our armies a taste of victory early in the fight.

A second powerful psychological factor that attacks the morale of a command occurs when there is a mutual lack of faith and confidence. This condition is frequently found in raw, untrained troops. Unless men have lived and worked and played together—in short, been forged into one collective personality—confidence and trust, in the military sense, will be lacking. Instead of an army functioning as the expression of a single will, there will be a hundred thousand individual wills each striving to solve its own small but all-important problem. In such cases each individual sees his own questionable reactions in his neighbor. Suspicion, fear, jealousy, and cowardice, grow in these dark places of the mind. We will have troops in the next war as untrained as those in the last. Let us hope we have as much time to whip them into shape. But whatever amount of time we do have, let us expend part of it in the endeavor to foster that mutual faith and understanding which differentiates an army from a crowd.

While we consider this first—or, we might say, preparatory—phase of panic, let us not overlook the part the unthinking officer may play. One of the most definitely controllable factors is loose talk by officers in the presence of their men. In war, the officer occupies a place that to his men is close to godhead. They feel that their safety and their well-being rest in his hands. His influence can be all powerful for good or for bad. If he shows confidence, cheerfulness, determination, calmness, those sterling virtues will usually be reflected in his command. If, on the other hand, he evinces nervousness, irritability, worry, fear, doubt in his superiors, uncertainty in himself, his state of mind will be quickly transmitted to his men. By controlling himself the leader will find he has solved many of the psychological problems of command.

Soldiers have been noted since antiquity for their peculiar susceptibility to rumor. In war most of the unending rumors that race through armies seem to be of a dismal nature. Owing to some pessimistic quirk in the average soldier's psychology, the darker the whispered story, the more quickly it is believed. This wild and depressing talk that runs back and forth through the ranks does no unit any good. Leaders should use every device possible to discover the vicious rumor and then lay it with the most deadly psychological weapons at their command—laughter and ridicule.

Fatigue, hunger, thirst, poorly conducted marches, counter-marches, grumbling at orders, criticism of superiors, are but a few of the many factors that irritate and depress a command. And irritation and depression are two of the outstanding psychological elements that make for that tense mental state which precedes panic.

So much for the first phase of this strange mass phe-

nomenon. The second phase occurs when some sudden shock or surprise, either real or imaginary, touches off the actual panic.

In the foregoing examples we have seen some of the ridiculously trivial incidents which stampeded troops who were ready for panic—at Haitshong, one soldier frightened by a shadow; at Coulmiers, a false report; at Weimar, two words from an excited officer; at Missionary Ridge, the appearance of one Union flag on the crest; in the retreat from Königgrätz, a herd of frightened pigs. So it usually goes when troops become supercharged with nerves. The phenomenon might be likened to the electric tension in a condenser—when the tension reaches its maximum the condenser "breaks down."

Once panic has started it is almost impossible to stop it. Leaders are powerless. When the German XVII Corps broke in panic at Gumbinnen on August 20, 1914, not even the personal intervention of General von Mackensen, their respected and feared corps commander, could stem the wild rush. Indeed, history records few instances of panics that were stopped before they ran their full course.

The time to stop this group madness that feeds on fear, is before it begins. The astute leader, even in the face of repeated disaster, will find ways and means of retaining the confidence and trust of his men. Joffre found a way at the Marne. At Haitshong the Russian 140th Infantry stood like a rock while panic surged about it. Its commander had also found a way.

The problem is delicate and difficult. The leader's path is beset with a thousand pitfalls. There are few rules to guide him. Common sense, a sympathetic understanding of his fellow man, and a calm, cheerful, confident demeanor will prove his staunchest allies.

Japanese 6th Heavy Field Artillery in Action.

Optical Glass And Fire Control Instruments

By Everett W. Melson

LATE in March, 1917, a small group of men were gathered around a table in Washington. The European war had been going on for nearly three terrible years. The entry of the United States was imminent. Across the table, these men faced each other with gravity. The Naval Consulting Board had just disclosed a critical situation in one important war material which they were asked to solve.

American firms have met the challenge of foreign producers

America's stock of imported optical glass was at the vanishing point and the three countries able to make it could hardly meet their own requirements. This product, the total commercial value of which is ordinarily insignificant, suddenly became of the highest importance.

Big guns, with long ranges, require accurate instruments for fire control. Accurate instruments require fine optical glass. This glass, the most refined product of the glassmaker's art, is inherently a secret process. In Germany the industry was concentrated in one firm; in France it was a government monopoly, and practically so in England. Indeed, when the French Liaison Commission visited the United States on our entry into the war, it was not permitted to divulge a single detail regarding the manufacture of optical glass, on the grounds that the integrity of the glass monopoly in France had always been respected by the French Government. England observed the same secrecy.

It is only necessary to consider the great changes in ordnance since the Civil War to understand the nature of the exigency. In the Civil War none of the present day equipment for determining the range of distant objects was even imagined. The range was rarely over 3,000 yards. In these days big naval guns easily toss a 1,400-pound shell a distance of ten miles.

With the great range of the guns, instruments for fire control call for the highest precision. The complicated mechanisms involved must be capable of adjustments for many kinds of weather and service, since they are exposed to extremes of temperature and to the chemical attacks of smoke, fog, dust, sea air and moisture. Further, these instruments must afford images of the highest quality in respect to definition and brilliance. These qualities can only be secured by the use of the finest optical glass. The problem, therefore, of securing optical glass in sufficient quantity and of the necessary perfection was one of the most serious confronting the government from the moment of our entry into the war.

When a committee of the Naval Board began to investigate the optical glass resources of the country, it was decided to place this matter in the hands of the Bureau of Standards since this bureau had erected a small furnace in Pittsburgh and made a number of attempts to produce optical glass in 1915.

One of the greatest difficulties experienced by the Bureau was to secure a melting pot which would not contaminate the glass. The ordinary commercial pots were found to contain about one hundred times as much iron per cubic centimeter as could safely be allowed in the finished glass—something like 2.0 per cent, as compared with 0.02 per cent. As a consequence, however pure the sand, potash and lead might be, the contact surface of the pot was likely to dissolve in the mixture and contaminate it beyond the limits of tolerance.

Removing pot of glass from furnace.

Inspecting polished lens surfaced on a shell, or form, of specified curvature

The most critical inspection known to optical science — testing prisms by means of Newton's rings and light rays—accurate to millionths of an inch.

Shortly after the declaration of war, in 1917, the National Research Council assigned Dr. Arthur L. Day, director of the Geophysical Laboratory of the Carnegie Institute, to canvass the country's resources, and to visit all who were known to have a knowledge of the manufacture of optical glass.

This inquiry disclosed one very encouraging evidence of forethought on the part of an American manufacturer. As early as 1912 William Bausch, of the Bausch & Lomb Optical Company, had recognized as a matter of business expediency that the optical industry in the United States could not safely rely upon foreign sources for its most necessary raw material. He had, therefore, erected a small glass plant and with the aid of a Belgian expert made a number of attempts to produce optical glass. This plant burned, however, before any significant success had been achieved.

In the spring of 1914, however, with the outbreak of hostilities in Europe, further experiments were begun in a new plant containing two gas-fired furnaces. Creditable samples of optical glass resulted. In June, 1915, after repeated experiments, both light crown and dense flint glasses were produced successfully. And by the summer of 1916, Bausch & Lomb was able to exhibit several types of optical glass at the annual convention of the American Medical Association and the American Optometric Association, thus allaying fears of the professions and trades due to sharply reduced supplies of imported optical glass. When the United States was finally involved in the war, this plant was making certain varieties of glass acceptably but its capacity was no more than 2,000 pounds per month.

Four other small plants, including that of the Bureau of Standards, were experimenting in the making of optical glass, but had never been able to produce any glass of strictly optical quality and encountered innumerable difficulties.

When the General Munitions Board placed the optical glass requirements of the Army and Navy at roughly 2,000 pounds per day, earnest conferences took place in the National Research Council. It was decided to ask the Carnegie Institution to allow the resources of the Geophysical Laboratory to be applied to this stupendous task of production. And while no optical glass had been made at the Geophysical Laboratory it contained probably the most experienced group of silicate chemists in the country.

There immediately followed a canvass to discover sources of pure sand; a survey of chemical manufacturing establishments to find a source of potash equal to that formerly imported; the delegation of a group to analyze typical foreign glasses with a view to determining the ingredients used and the relation between chemical composition and optical properties, and a canvass of melting

pot makers to discover whether any pots available were uncontaminated by iron.

As the survey progressed it was quickly evident that all the sources of optical glass in America at that time could not produce half of the quantity required, even though all the glass proved acceptable in quality.

At this time, May, 1917, the Bausch & Lomb plant alone was producing glass of this quality. A study of this company's facilities indicated that with considerable expansion it could carry about one-half of the war load. To secure the other half it appeared that in some manner the Charleroi plant would have to be utilized and someone placed in charge with sufficient knowledge of the requirements and technique to raise the quality to the government standard.

Difficulty was experienced in getting this plant into production. While there were sixteen furnaces available they were all of an old type without regeneration or any means for controlling the temperature in individual furnaces within 100° C, although it was well established by experience in the Bausch & Lomb plant that a control as close as 5° must be continuously maintained in each individual furnace to insure success. Therefore, at the close of the year, 1917, Bausch & Lomb was producing at Rochester at the rate of about 40,000 pounds per month, while the Charleroi plant had not been able in the eight months interval to provide any glass that would pass the government inspection standards.

"Of the results of all these efforts," said Dr. Day, "it need only be said that within a period of four months after the entry of the United States into the war the production of optical glass within this country had been doubled, the methods made more effective, the number and types of glass had been increased, and a degree of confidence established indispensable for the time and the task."

For the optical instruments required by the government in April, 1917, to control its gun-fire on the sea and at the front, nine different varieties of optical glass were necessary, and but two of these had ever been successfully made in this country at any time. The seven others remained shrouded in mystery, however, experimental work was pursued at such a rate that when our troops were engaged in the crucial fighting of 1918 all demands were met. And, indeed, certain types of optical glass were demanded because of new developments during the war.

Airplane activity had become so highly developed and so indispensable that photographic mapping over enemy lines had become an extremely important aid to the army staff in the field. This meant airplane cameras of wide sweep and very high precision—in truth of a quality beyond anything of the kind ever attempted. The necessary requirements for such lenses had been determined but it was not then known whether glass could be made to meet such exacting requirements.

Dr. Day brought this situation to the attention of William and Edward Bausch. The task proved to be the hardest yet encountered. The glass was a barium type, thin as water when melted, and totally different in its behavior from any glass hitherto attempted. It soaked into the melting pots like coffee into a lump of sugar and ran out through the sides. In every detail it required totally different treatment from the glasses thus far developed. Nevertheless, within four weeks it was successfully made and actually saw service at the front.

At the conclusion of the war, having produced more than 70% of the requirements of the government, Bausch & Lomb continued the manufacture of optical glass, launching into a program of research and development which has resulted in producing many kinds of optical glass, the chemical compositions of which bear definite relationships to the optical constants prescribed. With all this research, however, it is difficult to produce glass in successive melts with the desired degree of constancy in optical properties, or consistency in the yield of physically good glass. The average yield per pot of good glass is still low and involves the destruction of the pot in the process.

The qualities sought in optical glass are homogeneity, freedom from color, a constant refractive index and a constant dispersion ratio, high transparency, durability under exposure, and freedom from internal stresses and strains due to poor annealing. If glass is cooled rapidly it freezes into a body that is enormously strained. When this condition is too bad it will break when an attempt is made to grind it. In less severe strain, it is impossible to form or to maintain geometrically accurate surfaces on it.

Optical glasses suitable for the manufacture of fire-control instruments have constants lying between the following limits of refractivity and dispersion:

	Mean Refractive Index	*Dispersion*
Ordinary Crown	1,511	60.6
Extra Dense Crown	1,648	33.8

The optical engineer in designing his refractive elements is forced to choose glasses lying within these limits, and while there are several of them, distinct limitations are imposed upon him. His task is to choose glasses that will endow his instrument with the properties of greatest desirability.

When the optical engineer prescribes one of the types of glasses to be used he must usually have its refractive index held to one unit in the third place and its dispersion coefficient held to one-tenth. These tolerances are met only by the most painstaking effort in the selection of materials and by extremely accurate manufacturing processes.

The variations in refractive index and dispersion are produced by variations in the fundamental batch proportions and the addition of metallic oxides. The addition of lead increases mean refractive index and dispersion. It also tinges the glass a light yellow. Lead glasses are known as flint glasses. Crown glasses are in general those from which lead is omitted.

It is essential that fire-control instruments operate

effectively under conditions of poor illumination. This requires that all light entering the instrument shall contribute as much as possible to the brightness of the image. The glass, therefore, must have a high degree of transparency. It should absorb no more than 0.3 to 0.6 per cent of the light per centimeter, depending on the type of glass used. It should be colorless, otherwise selective absorption takes place, some wavelengths being absorbed more than others. And in the case of glass for prisms in range finders and periscopes, where the glass is often from four to six inches thick, the slightest color will intensify the deficiency of the glass.

Raw materials used in glass formerly came from many parts of the world, the sources of supply being selected on the basis of purity. Today, however, most of the ingredients are available in the United States. Sand, the chief ingredient, is found in abundance in many countries. And yet, only a few known deposits furnish a suitable quality for optical glass. One of the best occurs in parts of Pennsylvania and West Virginia in the sandstone rock beds, known as Oriskany quartzite.

The type of pot used today requires as many as thirteen clays from five states and their combination, with other ingredients, to form a semi-porcelain crucible of unusual freedom from iron and other impurities that might affect the melt. Screens control the size of the ground materials entering the pot and a magnetic separator is used to guard against the presence of iron.

Optical glass was recently listed in dispatches as one of the twenty-three raw materials for which provision must be made to render us free from imports in case of war. Actually we are not dependent on imports of this product or for the ingredients that compose it.

However, there is every reason to build up a stock of certain types while no emergency exists. In an emergency fire-control instruments are immediately necessary, but the constantly changing methods of warfare make it impractical to have on hand a large stock of completed instruments. Progress in the mechanics of war would render them obsolete. However, a relatively small investment would permit a group of optical and military engineers to keep abreast of developments and to have available consummated designs of the most necessary and effective instruments.

The supply of optical glass above the current demands of industry is extremely small. To make a supply available instantaneously would be impossible since it takes a minimum of six weeks to carry one pot of glass through processing, assuming pots to be ready. Pots ordinarily require six months to "cure."

A partial solution of the problem would seem to lie in the accumulation of an adequate supply of the most commonly used types. Carefully stored and catalogued in accordance with optical properties, physical condition and size, this store could be placed in the hands of competent supply officers acquainted with the practices of the optical engineer and the glass maker.

The greatest assurance, however, against a lack of necessary material in another war is a firmly established domestic industry with a technology equalling or surpassing that of any foreign country. The greatest threat to our domestic industry is the encroachment upon our markets of subsidized industries from abroad.

As far back as 1921, the U. S. Tariff Commission said:

> The domestic industry is now producing or can produce practically every grade of optical glass. All grades were produced during 1918, but since that time large importations of foreign glass have discouraged domestic production in all but the grades which command a large stable market.
>
> During the war the optical industries of Germany, France and England were driven to a high state of industrial activity in the scientific precision essential in the production of perfect optical glass. The strength of the German, French and British positions in the optical glass field can be traced to the large home markets for the product. All these nations are important manufacturers of optical instruments and this provides a market for considerable quantities of all grades of glass. The small production units necessary in the industry increase the hand labor requirements and the producing country with the cheapest labor has a considerable advantage in costs.

It is in the production of binoculars and telescopes that foreign competition bears most heavily against the domestic producer. Experience has shown that in order for a domestic producer to secure the business of the government, by far the largest user of binoculars, it is necessary to disregard costs. The table below shows a comparison of importations with domestic production of prism binoculars for periods during the years 1930-1932.

NUMBER OF BINOCULARS

	Imported	*Produced in U. S.*
1930 (6½ months)	13,655	1,181
1931	21,652	1,153
1932 (6 months)	13,145	356

That American firms have met the challenge of foreign producers by definite superiority in design and workmanship is evidenced by the figures of the Department of Commerce for the first eight months of 1936. This report shows that only 243 prism binoculars, having a magnification greater than five diameters and valued at more than $12.00, were imported.

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AN ALL-TIME COMMAND TEAM

By Lieutenant Colonel George L. Simpson, Field Artillery, N.G.U.S.

THE sound of the last cheer has scarcely died away before the football experts are feverishly at work compiling lists of All-Star teams. The critical equipment of many of these "experts" consists largely of enthusiasm and enjoyment of the game. A like urge impels me to hand-pick an All-Time corps command and staff. To those who object to my selections the answer is: I still like 'em.

My commanding general is Frederick the Great. Though self-assured, he was no egotist. He welcomed advice, but, unlike many another great soldier, he readily recognized the difference between good and bad counsel. Frederick never kidded himself into believing that he could conquer Russia, as did Napoleon. He was a strong disciplinarian and without Lee's weakness of excessive gentleness. In keeping the politicians lined up at home he went Hannibal one better. His strategy was of the best. He was a winner.

The berth as chief of staff goes to Generalfeldmarschall Alfred, Graf von Schlieffen. While the Count's battle record is not so imposing as that of some of the others, I believe he would be able to work more harmoniously with the great Frederick than any other All-Timer.

Since Moltke the First was the best personnel procurement agent of them all, and a great soldier as well, he becomes G-1. He could be depended upon to give good advice.

His unexcelled ability for collecting enemy information and his superlative deductions make Lee my G-2. His capacity for winning the coöperation of others—especially subordinates—clinches the selection. The South will send no orchids for this choice, for to them Lee is the greatest general of all time, and should have been nominated for the post of head man. But Lee's too-great intellect, his lack of ruthlessness, his inclination to listen to longwinded opinions of lesser lights with established weaknesses—these lovable shortcomings let him out.

In addition to many other qualifications a G-3 must own a disciplined, creative mind, one that can adapt itself to the ideas of others while it improves them in detail. This single capacity is rarer than skyscrapers on an Army post. But there is one man who had it. On this staff Bourcet is G-3.

Comes William Tecumseh Sherman as G-4. If you do not believe that this soldier's every movement showed his first consideration was logistics, take a trip to Georgia and speak with the Oldtimers.

For his statesmanlike qualities and his masterful use of the third person, Julius Caesar is awarded the position of adjutant general.

Our inspector must be a soldier who is tactful and understanding, an inspiration to those inspected rather than an arouser of red wrath in the breasts of the underlings. Meet de Guibert, inspector of the All-Star corps.

Caulaincourt has proved that he can plead a cause. Hands down, he becomes judge advocate.

A careful, conscientious man who looked after the interests of his clients and who could, in addition, procure money, was Alcibiades, the ward of Pericles, first choice for finance officer.

For reasons that are obvious Clausewitz has been given the berth of chemical officer.

While I duck the flying missiles and avoid as best I may the wrath to come, I give you as our fightingest parson and chaplain: Mohammed.

Stonewall Jackson used artillery to better advantage than any other great military leader. He is nominated as chief of artillery.

Picking an air officer is not at all difficult. Baron von Richthofen wins the post without a struggle.

In the last war the Germans were the cleverest in the operation of railways, the canny use of mines and demolitions, and the regulation of traffic. For this and other reasons the engineer officer on this twin-six staff is Ludendorff.

There was a soldier who had good communications several centuries before the telegraph, the telephone and the radio. His name was Scipio, called Africanus, and he is the signal officer.

Our own dapper, highly-polished and hardboiled Winfield Scott is provost marshal. No leadfooted Doughboys with unbuttoned blouses would wander about for long with old Fuss and Feathers on the job. And after the first day or so, traffic would move expeditiously on white sidewalled tires, come rain, come snow.

Our record for feeding our soldiers during the World War may be largely credited to Harbord. He gets the job of quartermaster.

During the World War the British excelled in their evacuation system, hospital trains, and hospitals. Whoever ran their Medical Department during the last fracas is my surgeon.

Ordnance officer is Gustavus Adolphus. It would be hard to gainsay his ability to recognize the value of new weapons at once and to change his tactics to suit them without a backward glance.

I'm attaching to my corps a cavalry division reinforced by a mechanized regiment. The commander of the cavalry is Oliver Cromwell, for he above all others was unhampered by tradition and had initiative and capability to spare. For subordinate commanders of the horsed regiments I allot Ashby, T. E. Lawrence and Forrest; the mechanized regiment goes to Jeb Stuart.

They tell us at Leavenworth that a good tank commander has qualifications similar to those of a good leader of cavalry. To those who remember the fine job of crashing-through and mopping-up that was done at Cannae, my choice of the hook-nosed Hasdrubal, brother of Han-

nibal, as commander of the attached tank regiment, will come as no surprise.

I shall announce my division commanders and then I am through. All-Timer Napoleon Bonaparte gets the 1st Division, Wellington the 2d, and Hannibal the 3d. These three fall just a little short of the qualifications I require of corps commanders. But I am the first to admit that they missed the three-star job by merely a hair.

* * * *

To those who disagree I can only say: Trot out *your* corps, and name your ground. If, at the conclusion of hostilities my politicians are not showing your politicians where to sign on the dotted line, I'll buy a round of drinks.

An All-Time Corps Command and Staff

Commanding General	Frederick the Great
Chief of Staff	Alfred, Graf von Schlieffen
G-1	Helmuth Carl Bernhard, Graf von Moltke
G-2	Robert Edward Lee
G-3	Pierre de Bourcet
G-4	William Tecumseh Sherman
Adjutant General	Gaius Julius Cæsar
Inspector	Jacques Antoine Hippolyte, Comte de Guibert
Judge Advocate	Armand Augustin Louis, Marquis de Caulaincourt
Finance Officer	Alcibiades
Chemical Officer	Karl von Clausewitz
Chaplain	Mohammed
Chief of Artillery	Thomas Jefferson Jackson
Air Officer	Mannfred, Baron von Richthofen
Engineer	Erich von Ludendorff
Signal Officer	Publius Cornelius Scipio Africanus Major
Provost Marshal	Winfield Scott
Quartermaster	James Guthrie Harbord
Surgeon	Surgeon, British Expeditionary Forces
Ordnance Officer	Gustavus Adolphus
CG, Attached Cavalry Division	Oliver Cromwell
CG, 1st Division	Napoleon Bonaparte
CG, 2d Division	Arthur Wellesley, Duke of Wellington
CG, 3d Division	Hannibal

The Early Literature of Artillery

By COLONEL THOMAS M. SPAULDING, USA, Retired

In the early days of artillery the gunner's status was that of a teamster in our own time

THE term "artillery" may be applied to all missile weapons discharged from mounts, as distinguished from those held by the soldier, and in this sense the ancients made extensive use of artillery, and very heavy artillery at that. So the literature of artillery may be considered as beginning at least as far back as the third century B.C. Or the term may be restricted to weapons which discharge their projectiles by means of explosive compounds—gunpowder of some sort or other—and it is with artillery in this narrower sense that this paper deals.

Just when firearms first appeared on a European battlefield is a disputed question. The familiar story that Edward III had cannon at the battle of Crecy in 1346 is now generally discredited, but there is evidence which satisfies no less an authority than Sir Charles Oman that they were used even earlier, at the siege of Metz in 1324, and were in common use all over Europe within a few years after. Yet they are neglected in literature, not only in the manuscript period, but also for nearly a hundred years after the invention of printing. Perhaps this was due in part to a certain contempt on the part of true soldiers for a base, mechanical pursuit. In the early years of artillery, guns were served by civilians employed under contract, and the gunner's status was somewhat like that of the hired civilian teamster in our own time. Another reason was the reluctance of every state and potentate to have useful information disseminated among possible rivals or enemies. Anyone who had possession of a valuable "mystery" in gunnery, fortification or other department of the military art, would try to keep exclusive control of it, and would use appropriate measures in the case of a subject whose loyalty was not sufficient to make him coöperate. But it was a sense of loyalty, not to an individual state but to the whole of Christendom, that led to the first publication of results of scientific research in gunnery and ballistics, as will be mentioned hereinafter.

This paper will not attempt to list all books on artillery published in the period with which it deals—the years prior to 1700—but will mention several of those which were important on account of their treatment of the subject, especially when they marked an advance in the science or art; and several of those which were influential on account of their wide circulation. It will include an undue proportion of English books, partly in consideration for the reader, who may not be able to make use of a book in another language and partly for the writer, whose information on continental books is considerably more sketchy than it is on the English ones.

Italian was far the most important military language of the sixteenth century and one of the important ones of the seventeenth. One may estimate, without making an actual count, that in the former period military books in Italian outnumber those in Latin, French, German, Spanish, and English, taken all together. The number in other languages is negligible.

Military literature of the period which we are examining is closely interwoven with that of mathematics. A great many books treat partly of the art of war and partly of arithmetic or geometry. It is not exceptional that the first military text published in the New World is combined with an arithmetic in one thin little book printed in the city of Mexico by the widow of Bernado Calderon in 1675. It is not only of what we call the technical arms that this is true, but naturally mathematics figures more largely in connection with artillery and fortification than with other matters.

A distinguished Italian mathematician, Niccolo Tartaglia, was the first who published anything on the subject of ballistics, and apparently he was very nearly the first who had applied his brain to the subject at all. One gets the impression that the early gunner pointed the piece in the general direction of the target, applied the match, and waited with innocent curiosity to see the result. This may do the gunner some injustice, but if he did have any mental process, no indication of it appears in print. Tartaglia undertook ballistic studies as a mathematical recreation, discovered that the trajectory was a curve and not a straight line as theretofore supposed, decided that an elevation of forty-five degrees gave the maximum range, and then was led on to further studies as to the action of powder and projectiles. Finally he invented the gunner's quadrant. He kept his knowledge to himself, however, being unwilling to contribute to the art of man-killing, until the general fear of a Moslem attack on the Christian world induced him to include the results of his ordnance studies in the *Nuova Scientia* which he published in 1537. Later editions appeared in 1550, 1558, 1562, 1583, and 1606. Another work, the *Quesiti e Inventioni Diverse*, contains further studies on gunnery. It was first published in 1546. An English translation of a portion of the *Quesiti* was published in 1588 by Cyprian Lucar, along with *A Treatise Named Lucar Appendix,*

which went quite exhaustively (for that time) into the whole subject of artillery.

Tartaglia dealt only with technical aspects and said nothing of organization or tactics, nothing of the matters that we cover in drill regulations or field service regulations. Girolamo Ruscelli supplied the lack. His *Precetti della Militia Moderna* covered a great variety of subjects, some not obviously military, as, for example, the description of a pneumatic life preserver, accompanied by an illustration. Ruscelli's mind always ranged over a wide field. He wrote many books, on subjects as widely separated as poetry and medicine. What the *Precetti* had to say on artillery was so good, or at least so popular, that for the next seventy years Ruscelli was constantly cited as an artillery authority. It is believed that the book's first appearance was in Venice in 1568, and there were also editions of 1572, 1583, 1595, 1630, and 1641. A German translation was printed in Frankfort in 1620.

Two English works of the Elizabethan period entangle mathematics, physics and the military art as thoroughly as Tartaglia could have done. They were the product of two members of the distinguished Digges family, a branch of which, by the way, was soon afterward transplanted to America. The name, Dudley Digges, may refer to a Kentishman of the seventeenth century or a Marylander of the nineteenth. Chilham Castle reappears in the form of Chillum in the outskirts of Washington. Leonard Digges and his son Thomas were both eminent mathematicians. Leonard left many valuable studies in manuscript on his death, about 1571, which were published by Thomas with additions of his own. The output of Thomas Digges was large, and would have been larger, he tells us, "had not the infernall furies, envying such his felicitie and happie societie with his mathematical muses, for many yeares so tormented him with lawebrables, that he hath bene enforced to discontinue those his delectable studies." The delectable studies were to have led to treatises on navigation, naval architecture, artillery, fortification, and several others which never saw the light. The two printed works with which we are concerned are called, for short the *Pantometria* and the *Stratioticos*. The former was published in 1571 under the title, "A Geometrical Practise, named Pantometria, divided into three Bookes, Longimetra, Planometra and Stereometria, containing Rules manifolde for mensuration of all lines, Superficies and Solides: with sundry straunge conclusions both by instrument and without, and also by Perspective glasses, to set forth the true description or exact plat of an whole Region: framed by Leonard Digges Gentleman, lately finished by Thomas Digges his sonne. Who hath thereunto adjoined a Mathematicall treatise." The first edition contained a full description of the gunner's quadrant, but little else relating to artillery. Further mention will be made of the second edition. The "perspective glasses," by the way, foreshadowed the invention of the telescope.

In 1579 appeared the first edition of An Arithmeticall Militare Treatise, named *Stratioticos:* "Compendiously teaching the Science of Numbers, as well in Fractions as Integers, and so much of the Rules and Aequations Algebraicall and Arte of Numbers Cossicall, as are requisite for the Profession of a Soldiour. Together with the Moderne Militare Discipline, offices, Lawes and Deuties in every wel governed Campe and Armie to be observed: Long since attempted by Leonard Digges Gentleman, Augmented, digested, and lately finished, by Thomas Digges, his sonne. Whereto he hath also adjoined certaine Questions of great Ordinaunce, resolved in his other Treatize of Pyrotechny and great Artillerie, hereafter to bee published. Vivet Post Funera Virtus." As promised on the title-page, the "questions of great ordinaunce" are propounded, and they are duly answered in the second edition of *Pantometria,* published in 1591, with still further artillery matter added. Meanwhile, a second edition of *Stratioticos* had appeared (1590). These two books, in both editions, must be considered together, as they conduct a kind of responsive reading. Between them they contain a great amount of good material, expressed, however, in highly untechnical language, for Digges was a mathematician and not a gunner. He criticises Ruscelli for ignorance of mathematics and Tartaglia for lack of practical experience, neither of which can be dispensed with in gunnery.

The first man to subject Tartaglia's theories to experimental tests was a Spaniard, Luis Collado. He first published his results, however, in the Italian language. The *Pratica Manuale di Arteglieria* was printed at Venice in 1586. His experiments did not end there and in 1592 he brought out a greatly enlarged treatise, using all the original woodcuts and adding more. This time, although the book was printed in Milan, he wrote in his own language: *Platica Manual de Artilleria.* Italian translations of this edition appeared in 1606 and 1641.

The first English book devoted solely to artillery was *The Arte of Shooting in Great Ordnaunce:* "Contayning very necessary matters for all sortes of Servitoures eyther by Sea or by Lande," written by William Bourne, an able mathematician, otherwise known as the compiler of several almanacs. *The Arte of Shooting* was written at least as early as 1578 but for some reason was not published until 1587. An earlier book of Bourne's deserves passing mention, for in his *Inventions or Devises* (Very necessary for all Generalles and Captaines, or Leaders of Men, as wel by Sea as by Land.) printed in 1578, is found what seems to be the first mention of the elevating screw, whose invention is attributed to one John Skinner. Originally, elevation was given by digging a hole for the trail, and later, wedges were used.

Alessandro Capobianco is the next writer for us to notice. His *Corona e palma militare di artiglieria* deals to some extent with fortification as well as artillery, and describes a new instrument for measuring distance, invented by himself. From the standpoint of illustration the book is interesting on account of its nearly one hundred woodcuts, including a full page showing the author surrounded by cannon, large and small, instruments of

various types, and plans of fortification. If this portrayal may be taken as accurate, Capobianco was a small, precise-looking gentleman, with a sharply pointed beard, and of a figure that we shall politely describe as stout. The book first appeared in 1598 and editions of 1602, 1618 and 1647 followed, testifying to its continued popularity. The book is noteworthy as being the first to recommend the use of cartridges in cannon. The old method was to pour in loose powder, dangerous for the cannoneer and bad for accuracy of shooting.

In 1600 Thomas Smith "of Barwicke upon Tweed Souldier" published *The Art of Gunnery:* "Wherein is set forth a number of serviceable secrets, and practicall conclusions, belonging to the Art of Gunnerie, by Arithmeticke skill to be accomplished: both pretie, pleasant, and profitable for all such as are professors of the same facultie." In 1601 he published *Certain Additions to the Booke of Gunnery,* "with a supply of Fire-workes." The title page of the latter declares itself to be "both pleasant and profitable"; it does not claim to be "pretie." The second was reprinted in 1627, and the two together in 1628 under the title *The Complete Souldier,* and again in 1643 as *The Art of Gunnery.*

A standard authority was the Spaniard Diego Ufano. His *Tratado de Artilleria* was published at Brussels in the then Spanish Netherlands in 1613 and republished in 1617. Translations into French and German were brought out by Theodore de Bry at Frankfort in 1614. DeBry was primarily an engraver, perhaps the most famous of his time, and was interested in books of any description that would lend themselves to extensive illustration. His most famous productions are the long series of *Grands Voyages* and *Petits Voyages*—so called on account of the size of the volumes, not because of the length or importance of the journeys. The former series consists of narratives of voyages to America and the latter of voyages to the Orient. They provide the expensive material for book collecting of the most impassioned sort. So Ufano's book is valued for its illustrations as well as for its subject matter. The de Bry engravings appear again in French editions printed at Zutphen in 1621 and at Rouen in 1628, and also in a Polish translation of 1643.

Johann Jacobi von Wallhausen was an authority on the whole field of military science, and is further notable as the founder of the first military college known to history. He was a practical soldier as well as writer and served impartially on both sides in the Thirty Years' War. His books on infantry and cavalry are of the highest importance. His artillery treatise was not so well known, one edition only—Hanua, 1617—being published, illustrated like Ufano's book by de Bry.

The best known of all the English writers is Robert Norton. His first book, *Of the Art of Great Artillery,* published in 1624, forms a part of the *Pantometria-Stratioticos* series for it is largely devoted to "the explanation of the most excellent and necessary definitions, and questions, propounded by that rare souldier and mathematician, Thomas Digges Esquire." Norton turns Digges' propositions into technical language and enters into explanations where Digges had merely recorded his conclusions. Norton had conducted experiments of his own and notes that he found the maximum range to be attained at an elevation of a little over forty degrees. This book he dedicates to John Reinolds, then master gunner of England, in which office Norton succeeded him. I know of no copy in this country. In 1628 he published *The Gunner's Shewing the Whole Practise of Artillerie:* "With all the Appurtenances thereunto belonging. Together with the making of Extraordinary Artificial Fireworkes, as well for Pleasure and Triumphes, as for Warre and Service." In this he used the de Bry plates from Ufano's work, but takes pains to explain that his book is not a mere translation, as might be inferred.

The Gunner Dialogue "with the Art of Great Artillery" appeared in 1643 as a supplement to Bourne's *Arte of Shooting.*

In 1639 was brought out *The Compleat Cannoniere:* "Or, The Gunners Guide. Wherein are set forth exactly the Chiefe grounds and principals of the whole Art, in a very briefe and Compendious forme, never by any set forth in the like nature before. With divers excellent Conclusions, both Arithmetricall and Geometricall belonging thereunto: As also sundry serviceable Fire-workes, both for Sea and Land service. A Study delightfull and very usefull for men of the best Quality, and imbrac'd by the greatest Princes. Victus Gloriam Paret. Written by John Roberts of Weston neere Bathe, Gentleman, Practitioner and Professor in the Arte thereof." The subject is covered in much the same way as by Smith and Norton. Roberts, however, gives forty-two degrees as the elevation for the maximum range. It is a point on which the writers seem unable to agree. A military encyclopedia of great value grew out of *The Principles of The Art Militarie,* published in 1637 by Henry Hexham, who was "Quarter-Master to the Regiment of the Honourable Coronell Goring" in the Dutch service. This is the disreputable Goring who was afterwards distinguished as a cavalry general on the royalist side in the English civil wars; a man who, Clarendon says, "would without hesitation have broken any trust or done any act of treachery." Hexham wrote the book for the use of Englishmen entering the service of the Netherlands, and later translated it into Dutch. The outbreak of the civil wars in England of course created a great demand for military manuals. So in 1642 Hexham republished his book as *The First Part Of The Principles Of The Art Military,* and followed it in 1642 and 1643 with the second and third parts. The third deals almost entirely with ordnance and artillery, being especially full on the manufacture of guns and carriages.

Turning to the continent, we find a valuable treatise in German by Joseph Furtenbach (or Furttenbach), printed at Augsburg in 1643 under the title *Buchsen-meistereyschul* containing full descriptions of contemporary artillery and instruments, and finely illustrated.

Nathaniel Nye, master gunner of the city of Worcester, published *The Art of Gunnery* in 1647 and

another edition appeared in 1670. It was intended for those "not well versed in Arithmetick and Geometry: all the rules and directions in this Book being framed both with and without the help of Arithmeticke." It is not limited to the subject of gunnery, but deals also with topography and fireworks, and even explains how "to cure all such Wounds that are curable, which may chance to happen by Gunpowder or Fire-works." It is one of the rarest English books on gunnery.

Another rare book is *A Light to the Art of Gunnery* by Thomas Binning, who had been a royalist gunner in the civil wars. The first edition was published in 1676—some copies dated 1677—and another in 1689.

In 1675 the marechal de camp (above equivalent to brigadier general) Francois Blondel, sieur des Croisettes, presented to Louis XIV the manuscript of a treatise which the king deemed of such great importance that he forbade its publication during the continuance of the war then being waged against the Dutch, lest the enemy should make use of the information in it. He did not have it published and issued to all officers as a confidential document, as would have been our way. After the conclusion of peace Blondel's book was released for publication, and appeared in Paris in 1683 under the title *L'Art de Jetter les Bombes*, a finely printed and finely illustrated book. King Louis seems to have been right as to Dutch interest in the subject, for a second edition was printed at the Hague in 1685 and a third at Amsterdam in 1699.

An important German work, unfortunately very rare, is Michael Mieth's *Artilleriae Recentior Praxis*, printed in 1683. The text is German, notwithstanding the Latin title. The author was the first to suggest iron wheels for artillery and percussion fuzes for shells and hand grenades.

A text which held its authority for the best part of a century was written by Casimir Simienowicz, lieutenant general of artillery in Poland, called by an English admirer "the father of sound and intelligent pyrobolists." (See dictionary.) It was published at Amsterdam in 1650 in Latin; in a French translation at Amsterdam in 1651; in German at Frankfort in 1676; and finally in English at London in 1726, under the title *The Great Art of Artillery*.

No mention has been made here of the works of the Italian Biringucci, the English Malthus, and others who perhaps deserve notice as much as some of those listed. It is hard to make a selection. A collection that included all of those described, however, would certainly cover the subject thoroughly. The British Museum, which is especially rich in old military books, must come very close to this ideal, but there is no institution in this country which possesses anywhere near all. Not more than half a dozen of our great libraries have made any serious attempt to build up adequate collections of early military literature, for which, after all, there is not much public demand.

WHILE WE ALL *rejoice in the recent improvements made in our land defenses, we must bear in mind this progress must be continuous. New developments in transportation and communication create new problems and involve radical changes in methods of warfare. Our army must be equipped to meet these changes. It is probable that we will always be well behind what we consider to be the most desirable in our defense forces. Right now we feel the need of additional commissioned personnel, of new and better artillery,* particularly antiaircraft guns, *and of better housing at our military posts.*—HONORABLE HARRY H. WOODRING, SECRETARY OF WAR.

BOF

GREAT BRITAIN INVESTS $35,000,000

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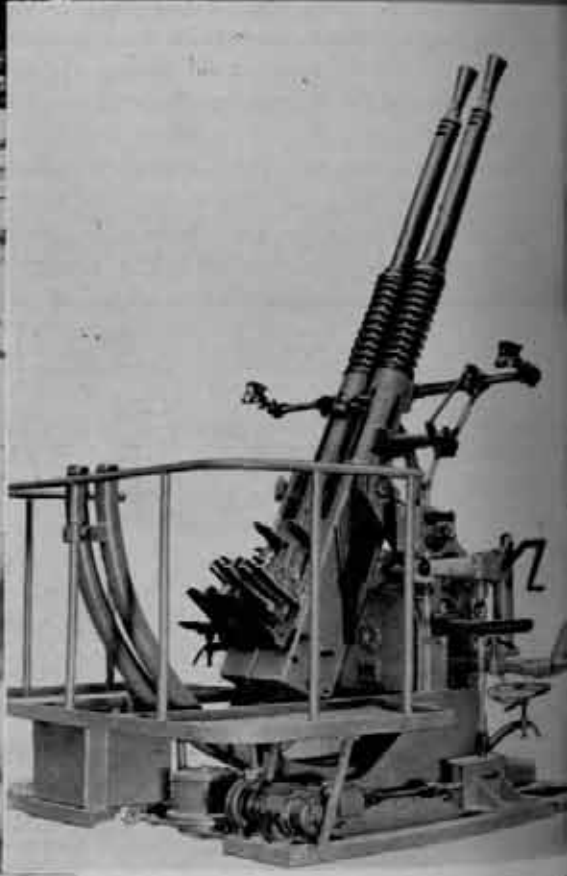

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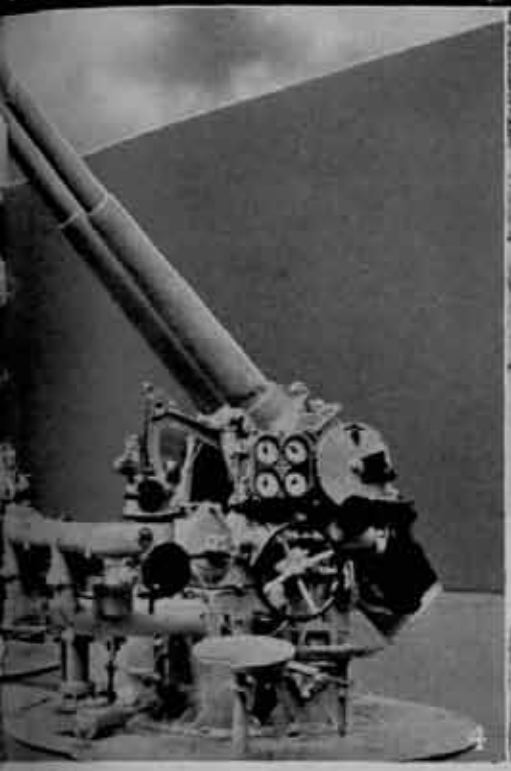
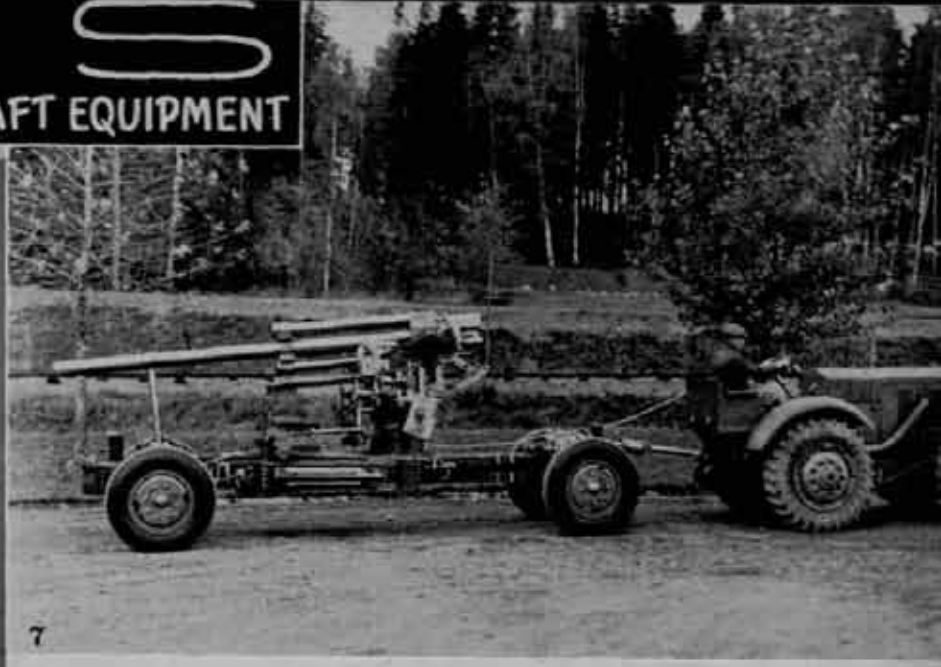
1. *25 mm. AA Gun.* Full automatic: elevates from —5° to +90°.
2. *40 mm. AA. Gun.* Claimed to be champion result-getter in Spain.
3. *Sighting Gear, 40 mm. AA Gun.* Target tracked by reflection sights with luminous reticule. Contains provision for diving targets.
4. *75 mm. AA Gun, Twin Mount.* Both guns can be fired simultaneously or separately.
5. *40 mm. AA Gun, Twin Mount.* Doubly effective; a superior automatic weapon.

ORS

THIS MODERN ANTIAIRCRAFT EQUIPMENT





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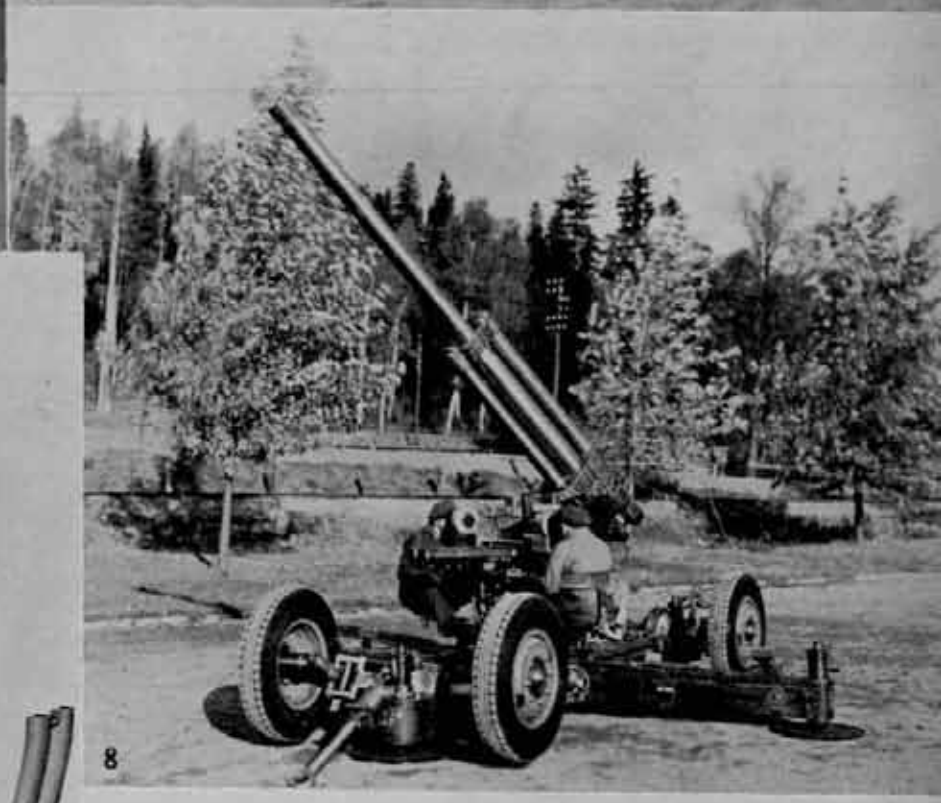

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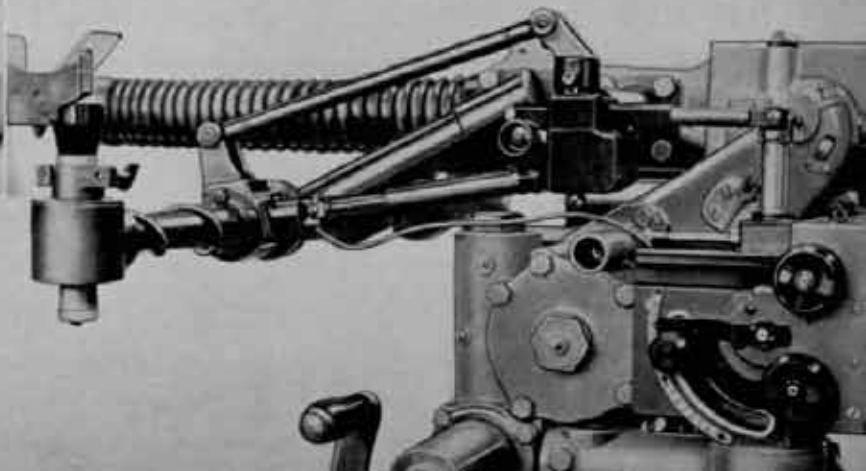


6. *25 mm. AA Gun, Twin Mount.* Rate of fire: 360 rds. per minute.

7. *25 mm. AA Gun-Travelling Position.* This gun can go into firing position in less than 30 seconds.

8. *25 mm. AA Gun-Firing Position.* Equipped with both direct and indirect sighting systems.

9. *Sighting Gear, 25 mm. AA Gun.* Corrector joined to two reflex sights; range, speed and angle of course are set on corrector; sights automatically give correct positions for firing.

HEA

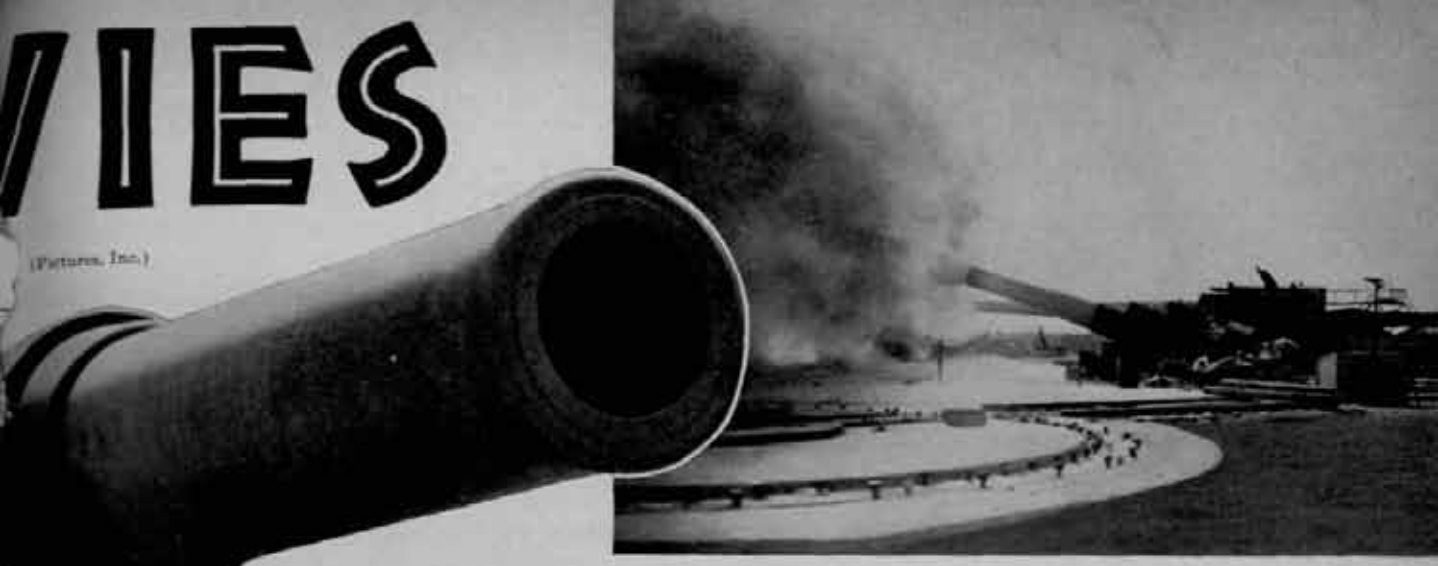
This 38-centimeter Austrian gun fired its last round almost twenty years ago. It is now a museum piece in the former Imperial Castle at Vienna.

This 16-inch gun is part of the harbor defenses of New York. It fires a 2,340-pound projectile a distance of 25 miles.

Below: Railway guns defend the west coast.

IES

(Pictures, Inc.)



A 16-inch howitzer is tested at Aberdeen Proving Ground.

Below: A close-up of a giant. One of the Coast Artillery Corps' 14-inch railway guns.

The New Standard Antiaircraft Mobile Searchlight Unit

By MAJOR CHARLES W. BUNDY, C.A.C.

THE Chief of Coast Artillery and the Chief of Engineers have been greatly concerned for some time over the initial cost, and increased difficulty and expense of maintenance of the mobile antiaircraft searchlights now in service.

In the 1936 procurement program it was found that the initial cost had risen so much that funds available were insufficient to purchase the number of units originally contemplated. As a result, only the searchlights were purchased; the provision for mobility and illuminating power being deferred to future fiscal years.

In addition to the initial cost problem, reports from the field indicated that the searchlight units of our mobile regiments, so far as the dual-purpose power plant was concerned, were literally falling apart. Under analysis the cost of repair of this equipment reached rather staggering figures in view of the very limited maintenance funds available. In fact, complete repair was found to be impossible because of the dearth of funds.

Commanders of antiaircraft regiments realized this situation. In the spring of 1936, the 61st Coast Artillery was called upon to send its searchlight battery to Fort Belvoir, Virginia, for joint Air Corps-Antiaircraft exercises. On the march from Fort Sheridan to Fort Belvoir, the searchlight trucks were towed by cargo trucks to save the motors of the searchlight trucks for illumination purposes.

Beside the initial and maintenance cost, the current mobile searchlight truck introduced an unfavorable emergency procurement problem. A sound policy of using commercial types of equipment, wherever possible, has been adopted by the War Department. The current mobile searchlight truck with its dual purpose of providing both motive power and generating power for illumination found no counterpart in commercial practice.

In order to start the ball rolling for the correction of the situation, the Chief of Coast Artillery initiated, on July 14, 1936, a letter to the Chief of Engineers (the supply agency) proposing the substitution for the current mobile searchlight unit of a new unit to consist of the searchlight proper with accessories, a portable power plant, and two commercial type trucks to carry this equipment.

The advantages of this proposal were outlined as follows:

1. There is a considerable saving in cost.
2. Commercial units are used for motive power, instead of a specially manufactured vehicle, thus eliminating a procurement bottleneck.
3. The searchlight unit will be fully as mobile as the present self-contained unit.
4. The local maneuverability of the searchlight unit will be greater. At the present time the location of a unit is limited by the locations possible to be reached by the searchlight truck. Under the proposed arrangement the power plant could be manhandled anywhere the searchlight could be.
5. The power plant for the searchlight would operate only for searchlight power, instead of both for searchlight and motive power as at present. This will insure much longer life for both truck motor and the searchlight power plant.
6. The existing costly adjustment of truck unit to generator to searchlight unit will be eliminated.
7. Separate proposals for searchlight unit, truck unit, and power plants will be possible, with consequent savings.
8. Searchlight procurement will be greatly simplified, since with a specially designed truck for motive and generating power eliminated, it will be possible to standardize the power unit separately from the searchlight unit; thus the distinction between mobile units and portable units will be done away with, the only difference being that mobile searchlights will be supplied with commercial trucks for mobility.

The following disadvantages were listed:

1. Greater road space in the searchlight battery will result. Since in the combat zone searchlight platoons will usually move as separate units and at times when the roads are least congested, this disadvantage is not serious.
2. The trucks carrying the light and power plant can be diverted to other use.
3. Maintenance will be required for three power units instead of one, and the possibility of motor failure on the march will be increased since the number of vehicles will be doubled. This disadvantage is more apparent than real.

As with any new proposal, considerable discussion ensued, and rightly so, for such an important change should not be made without all factors being considered with deliberation. Both the Coast Artillery Board and the Engineer Board furnished comment and recommendations.

Before proceeding as far as recommending the change, a test was necessary. This test took place during the week of February 8, 1937, at Fort Belvoir. Representatives of the using arm, the supply service, the Coast Artillery Board, the Engineer Board, and the War Department General Staff were present. An experienced searchlight section from the 2nd Coast Artillery, Fort Monroe, Virginia, furnished trained personnel.

Left—Standard 2½-ton cargo truck carrying searchlight.

Right—Loading power plant into standard cargo truck.

The purpose of this test was to determine the best method of transporting the matériel and the personnel of the antiaircraft searchlight section, with a view to:

a. Increasing the tactical mobility of the section.

b. Effecting greater economy and simplicity in the procurement of the matériel of the section.

Five methods of transportation were compared to determine which method was most suitable.

Method No. 1. The current standard mobile searchlight truck and sound locator.

Method No. 2. One standard cargo truck to carry the searchlight and another to carry the portable power plant; the sound locator trailer to be towed by one of the trucks.

Method No. 3. One standard truck to carry the portable power plant and tow the searchlight on a special trailer; one truck to carry equipment and tow sound locator.

Method No. 4. All loads assumed to be portable and carried in three identical commercial trucks with low bodies, one each for searchlight, power plant, and sound locator.

Method No. 5. Three short-coupled commercial trucks with semitrailers, each carrying a part, as in Method No. 4.

Various other combinations were tried out during the test; stability and roadability tests were made, and ease of loading and unloading the searchlight were demonstrated by the searchlight section.

As a result of the test, the Coast Artillery Board and the Engineer Board both recommended in substance, as follows:

a. The searchlight and its auxiliary equipment will be carried in two identical trucks, each truck to have:

(1) Two-and-one-half-ton pay load capacity.
(2) Heavy chassis.
(3) Two-wheel drive.
(4) Dual tires on rear axle, capable of using traction devices.
(5) A cargo body with inside dimensions of twelve feet by seven feet, and with a floor height not more than forty inches above the ground when the truck is not loaded.

b. Two sets of loading accessories will be furnished with each mobile searchlight. Each set, which will be capable of being installed in the trucks in the field by antiaircraft searchlight battery personnel, will consist of the following:

(1) Loading ramps.
(2) Means to secure the upper ends of the ramps to the truck in the loading position.
(3) Means to secure the ramps within the truck in the traveling position.
(4) Means to center and to secure the load in the truck.
(5) Blocks and tackle or other means for use in hauling the power plant and the searchlight into the trucks by hand.
(6) An adjustable canvas cover for the truck.
(7) Seats for four men.

On April 10, 1937, the Secretary of War approved as standard the new mobile antiaircraft searchlight unit, to be composed of:

One antiaircraft searchlight including control station, cable reels, and cable.

One portable power plant.

Two trucks, medium, 2½-ton (LC) 4x2 (2dt), cargo body.

WE BEST SERVE *ourselves when we think only of serving others. An officer should make it a cardinal principle of life that by no act of commission or of omission on his part will he permit his immediate superior to make a mistake.*—MAJOR GENERAL MALIN CRAIG.

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery
MAJOR GENERAL A. H. SUNDERLAND

Executive
COLONEL JOSEPH A. GREEN

Personnel Section
MAJOR CLARE H. ARMSTRONG

Matériel and Finance Section
MAJOR C. W. BUNDY
MAJOR H. B. HOLMES, JR.
MAJOR S. L. MCCROSKEY

Organization and Training Section
LIEUT. COL. C. M. S. SKENE
MAJOR AARON BRADSHAW, JR.
MAJOR W. H. WARREN

Plans and Projects Section
LIEUT. COL. JOHN L. HOMER

Fort Monroe

BRIGADIER GENERAL JOHN W. GULICK, U.S. Army, *Commanding*

COLONEL HORACE F. SPURGIN
Commanding Harbor Defenses of Chesapeake Bay and 2d C.A.

LIEUTENANT COLONEL EUGENE B. WALKER
Commanding 51st C.A.

LIEUTENANT COLONEL FREDERIC A. PRICE
Commanding 52d C.A.

By 2d Lieutenant H. Bennett Whipple

AT this season Fort Monroe is one of the busiest posts in the country. Student officers are coming and going—packing and unpacking; Reserve officers on active duty for one year come and go; C.M.T.C., O.R.C., R.O.T.C., U.S.M.A., and National Guard Camps are being prepared; battery commanders are trying to get off their annual target practices; the Coast Artillery Board is so feverish with new ideas during this season that harbor defense troops are more than ever in demand for tests; and finally the quartermaster is scurrying about trying to clean up projects before the new fiscal year. In short, Fort Monroe has an industrious atmosphere and every officer has several assignments and many worries.

TRAINING

During May and June the 51st and 52nd Coast Artillery trained at Fort Story. The Coast Artillery student officers, commanded by Colonel Fulton Q. C. Gardner, assistant commandant, took over the batteries from the regular officers for several days. After much preparation and a day's delay because of poor visibility, a battle practice was fired. Two tugs, towed two targets each, at 10,000 and 14,000 yards respectively. The 155's and 8" railway guns fired on the various targets. At the direction of the groupment commander changes from one target to another by batteries were made with a precision beautiful to witness. Airplane spotting was employed. The Langley planes were very successful in their mission and aided in a most spectacular practice. Major R. N. Mackin, C.A.C. was planted before the microphone in front of the guest bleachers all during the practice, and explained the various phases of the shoot. The two-way radio service from tug and plane to shore was broadcast through loudspeakers so all could keep in contact with events. The outstanding point of interest was the accuracy of the 8" railway guns with the new modified projectile. Battery "D," 52nd C.A. commanded by Captain V. M. Kimm fired a target practice a few days after battle practice and airplane spotters called every shot a hit. The fact that all the shots were even spotted as hits signifies that the modified projectile is a success.

"A" and "B" Batteries, 51st Coast Artillery, commanded by Captains M. W. Tracy and R. E. Dingeman, respectively, fired remarkable practices at Fort Story, if spotting is any indication. Battery "D," 52nd Coast Artillery, commanded by Captain W. L. Wright, had to return to Monroe to fire its practice on railway mortars after firing railway guns at Story for several weeks.

1. Spotting record of battle practice.

2. Spectators witness spectacular firing.

3. Admiral Brumby and General Gulick awaiting the firing.

4. A 155 mm. gun fires.

5. A railway gun fires.

The Chief inspects his escort. Right to left: *Col. Price, Gen. Sunderland, Col. Spurgin, Col. Gardner, Gen. Gulick, Lt. Whipple.*

Fort Monroe Officers' Beach Club.

Nevertheless excellent results are anticipated. During the remainder of the summer, all troops will be employed in training the civilian components. However, "A," 2nd C.A. will fire several mine practices under Captain J. D. Moss.

The West Point Cadets will be at Monroe from August 14 to 21 inclusive, the identical arrival and departure dates of the Midshipmen in and out of Hampton Roads. The cadets will have four days of intensive artillery training and one day of an Air Corps bombing demonstration at Langley Field. The balance of the time will be spent in recreation for those who are not too exhausted from their strenuous work. Dances at the Beach Club, moonlight sails, fishing trips, sight-seeing tours, Midshipman and Cadet Ball at the Chamberlin, tennis, golf, riding, swimming and boating are among tentative plans for the entertainment of the first classmen. Randolph Hall is already filled to capacity with friends of the Corps for the period of the Cadets' visit.

Coast Artillery School Notes

June 26th is Graduation Day for the Coast Artillery School student officers. Thirty-six regular officers, one Marine Corps officer and six advanced technical school officers will receive diplomas from Major General A. H. Sunderland, Chief of Coast Artillery who will also give the graduation address. General Sunderland, will be welcomed by an escort of honor from the 52nd Coast Artillery, commanded by Lieutenant Colonel F. A. Price. Post Chaplain Bodel and the 2nd Coast Artillery Band under the direction of W. O. M. A. Quinto will participate in the ceremony. Many of the school officers are spending the summer at the Edgewood Arsenal Chemical Warfare course. Six of the students, Lieutenants Spurgin, Gough, Schmick, Peterson, Hiddleston and Corbin are remaining at Monroe for duty with the harbor defense.

Miscellaneous Notes

The Officers' Beach Club—one of the swank clubs of the Army—opened on May 20th. Parties and dances are in full swing at the club, and officers' families spend the daylight hours in the cold pool. Over a score of Langley Field families have joined the club this season and enjoy the hot days at our beach.

The Fort Monroe horse show was held on June 19th. Among those invited were Brigadier General John W. Gulick, General Andrews, Chief of G.H.Q. Air Force and General Brant, Wing Commander. The horse show committee included Lt. Col. G. F. Moore, Major O. B. Trigg, (Cav.), Major P. P. Lowry and Major O. B. Bucher. Judges—Major J. R. Finley, Captain F. G. Frazer, (Cavalry), Master of the Ring—Major E. L. Poland, Infantry, Master of the Paddock—Major F. E. Edgecomb. Announcer—Major R. N. Mackin. In Class I (Junior Riding) the winners included: 1st Helen Mickelson; 2nd Robert Dingeman; 3rd Mildred George; 4th Patsy Mickelson. In Class II (Children's Jumping) the winners were: 1st Jeanne Jackson; 2nd Mary Waters; 3rd Helen Holbrook; 4th Mary Jane Campbell. In Class III (Mixed Pairs Jumping), Major Jackson and Miss Jeanne Jackson placed 1st. Captain Thompson and Bobby Thompson placed 2nd. Lieutenant Cloud and Miss Batten placed 3rd, and Captain Chester and Mrs. McMillan placed 4th. In Class IV (Ladies Class), the winners were: 1st Mrs. Jackson; 2nd Miss Dye; 3rd Mrs. McMillan; 4th Mrs. Stryker. In Class V (Modified Olympia) Miss Shirley Gardner and Major Benitez jumped off a draw to place 1st and 2nd respectively. Lieutenant Weber ran 3rd and Captain Chester brought down a 4th. In Class VI (Children's Jumping) Bobby Thompson put on a wonderful exhibition of horsemanship for a first, 2nd Sammy Grier; 3rd Sonny Cochran; 4th Henry Benitez. In Class VII (Junior Horsemanship) the winners were: 1st Billy Lynch; 2nd Jimmie Dingeman; 3rd Maurice Benitez; 4th Dorothy Replogle.

Fort Monroe is going ever so slightly nautical. Lieutenant Colonel and Mrs. F. S. Clark bring with them on June 28 a new Richardson Cruiser which will occupy a berth near the Q.M. boathouse. Major W. C. Mahoney, Q.M. has a newly acquired 40-foot cabin cruiser. The Chamberlin Hotel has a new 55-foot cruiser which is used as a party boat. Lieutenant Colonel W. R. Nichols is often seen in his new 18-foot sloop, *Dixie* (Hampton designed), which he keeps at the Hampton Yacht Club.

It will be of interest to former residents of the post to learn that the main gate is being cut to give 18 inches more clearance for vehicles. No longer will loaded vans pass through the gate, unload their cargo and discover that the load taken off the springs makes the van too high to pass out through the gate. Many trucks have been trapped in this manner. The alterations to the gate will not mar its beauty.

Work has been in progress filling the southeastern portion of Mill Creek near the junction of Arsenal Road and Fenwick. A dredge has been pumping fill from Mill Creek bottom for months and has reclaimed much land. The fill is being top-soiled as rapidly as possible with the limited facilities available.

Southwest of this fill at the edge of Mill Creek a sewage disposal plant is under construction. Work has recently been accelerated in an attempt to bring the project to an early completion. Railroad tracks have been placed across Arsenal Road to make it possible for the railroad derrick to remove earth for the foundation. It is hoped the plant will soon be in operation.

The quarters situation at Monroe is reaching its elastic limit. The Tuilleries have been assigned to student officers and even the top floor of the Old 100 Building, usually reserved for the latest West Point graduates and their brides has been partially assigned to student officers. Where the new lieutenants and their brides will be housed this year is a problem.

Arrivals and Departures

General Gulick and Lt. A. L. Fuller, A.D.C. spent several days at West Point and at Jackson, Maine, during June.

Major Clare Armstrong while visiting Monroe decided to witness a target practice at Fort Story while the Coast Artillery student officers were there. Just previous to his visit the 43 student officers received their orders for change of station. Needless to say—Major Armstrong saw very little of the practice and very much of the 43.

General Sunderland visited Fort Monroe for a few days about June 5. The Sunderlands will spend the summer at Monroe together with many other officers of rank who have reservations at Randolph Hall.

Major O. B. Bucher, who has become practically a permanent resident of Virginia is finally ordered away. He, together with Major E. M. Benitez, Captain A. M. Wilson, Major E. T. Conway, Major D. W. Hickey and Captain W. L. McPherson, soon depart for the C.&G.S.S. at Leavenworth. Major Benitez will take up duties as librarian at Leavenworth similar to those he once performed at the War College.

The garrison is happy to hear that Captain Charles M. Wolff has been ordered to take over the Mine Planter *Schofield* in the middle of August. Captain Wolff spent several weeks here with the *Ord* last winter.

Major A. H. Campbell has been relieved from the 3rd Coast Artillery District and has taken over Colonel Colladay's duty at West Point as senior instructor of Coast Artillery.

Lieutenants R. L. Williams, C. G. Patterson and D. B. Johnson reported for duty during June. Lieutenants Patterson and Johnson go to the school in August.

Captain H. H. Newman will leave Monroe July 1 and will proceed to Georgia Tech where he will take over duties as R.O.T.C. instructor. His son will enter Georgia Tech in the fall.

The post has four new captains, a new major and a new full colonel. Lieutenants Kyster, Chamberlain, Kimm and Lovell were promoted to captains, Captain R. E. McGarraugh was promoted to major and Lieutenant Colonel E. B. Walker to a full colonel.

For the benefit of those interested in the Old 100 Building note in the last issue, a 100 Club has been formed with many of its members residing without the 100 building. Membership is restricted.

Hawaiian Separate Coast Artillery Brigade

BRIGADE COMMANDER, BRIGADIER GENERAL JAMES A. WOODRUFF

CHIEF OF STAFF, COLONEL ROBERT ARTHUR, C.A.C.

S-1, MAJOR M. S. DANIELS, A.G.D.
S-2, CAPTAIN WILLIAM H. DUNHAM, C.A.C.
S-3, LIEUTENANT COLONEL RALPH E. HAINES, C.A.C.
S-4, LIEUTENANT COLONEL ARTHUR E. ROWLAND, C.A.C.

LIEUTENANT COLONEL HENRY C. DAVIS, JR., C.A.C.
Com. and Engineer Officer

COLONEL RALPH M. MITCHELL
Sixty-fourth Coast Artillery (AA)

Harbor Defenses of Pearl Harbor
COLONEL EARL BISCOE
15th C.A.

Harbor Defenses of Honolulu
COLONEL G. A. WILDRICK
16th C.A.

By Lieutenant John J. Stark, A.D.C.

GENERAL DRUM INSPECTS

NO sooner had the last echoes of the long-to-be-remembered concurrent Hawaiian Department-United States Fleet exercises of 1937 died away than General Drum began his annual administrative inspections of the Hawaiian Separate Coast Artillery Brigade. The 64th Coast Artillery (AA), at Fort Shafter, was the first to be inspected. The antiaircraft artillerymen put on a fine display with their largest fleet of motor vehicles in the United States Army. Fort Kam was the next to be inspected and, at that post, the men and matériel looked particularly good. At Forts Ruger and DeRussy there was much favorable comment on the fine appearance of the command and the new improvements throughout these posts. The department commander was accompanied throughout the inspections by General Woodruff. The brigade came through with flying colors and was complimented by General Drum who is soon to leave this command.

THE FLEET'S IN

The United States Fleet, over a hundred ships strong, came during the middle part of May for a stay of ten days. From Fort DeRussy the two aircraft carriers, *Saratoga* and *Lexington*, made a beautiful sight as they lay at

General Drum inspects 64th Coast Artillery, accompanied by General Woodruff and Colonel Biscoe.

anchor off Waikiki Beach. Naturally, the whole downtown section of Honolulu took on a Navy atmosphere, and many social affairs were held throughout the brigade in honor of the visiting officers and men of the fleet. A highlight of the fleet's visit was a spectacular night searchlight parade held at Fort Shafter in honor of Admiral Hepburn and the other visiting flag officers. The entire 64th Coast Artillery participated in the review under some twenty-billion candlepower of antiaircraft searchlights. The visiting naval officers were much impressed, and many favorable comments were heard about the display.

Summer Brings Target Practices

The ten-day visit of the fleet was quickly over, and the brigade units settled down to a season of summer target practice. On May 25th Battery Closson, Captain Carl W. Holcomb commanding, fired its annual target practice of 10-inch guns, with what looked like excellent results. The antiaircraft machine guns have just completed their target practices for the year. These practices were held at Bellows Field, and the results are not yet in. Captain Fred Hayden was the battery commander. The antiaircraft searchlights, Batteries A and E of the 64th Coast Artillery, are at present engaged in target practices out Pearl City way. They should finish any day now. On the Fort Weaver lot, the two 16-inch Batteries A and C of the 15th Coast Artillery have been pouring out 155 ex-caliber at high-speed target drawn by a navy destroyer, Captain Harris commanding Battery A, and Captain Jaccard commanding Battery C. Considerable difficulty was experienced in keeping the target in tow but, with the aid of a steel cable, a satisfactory target was finally produced. It was a spray type target which showed up remarkably well in the blue Hawaiian waters. Twice it broke the big hawser but the special steel cable finally did the trick.

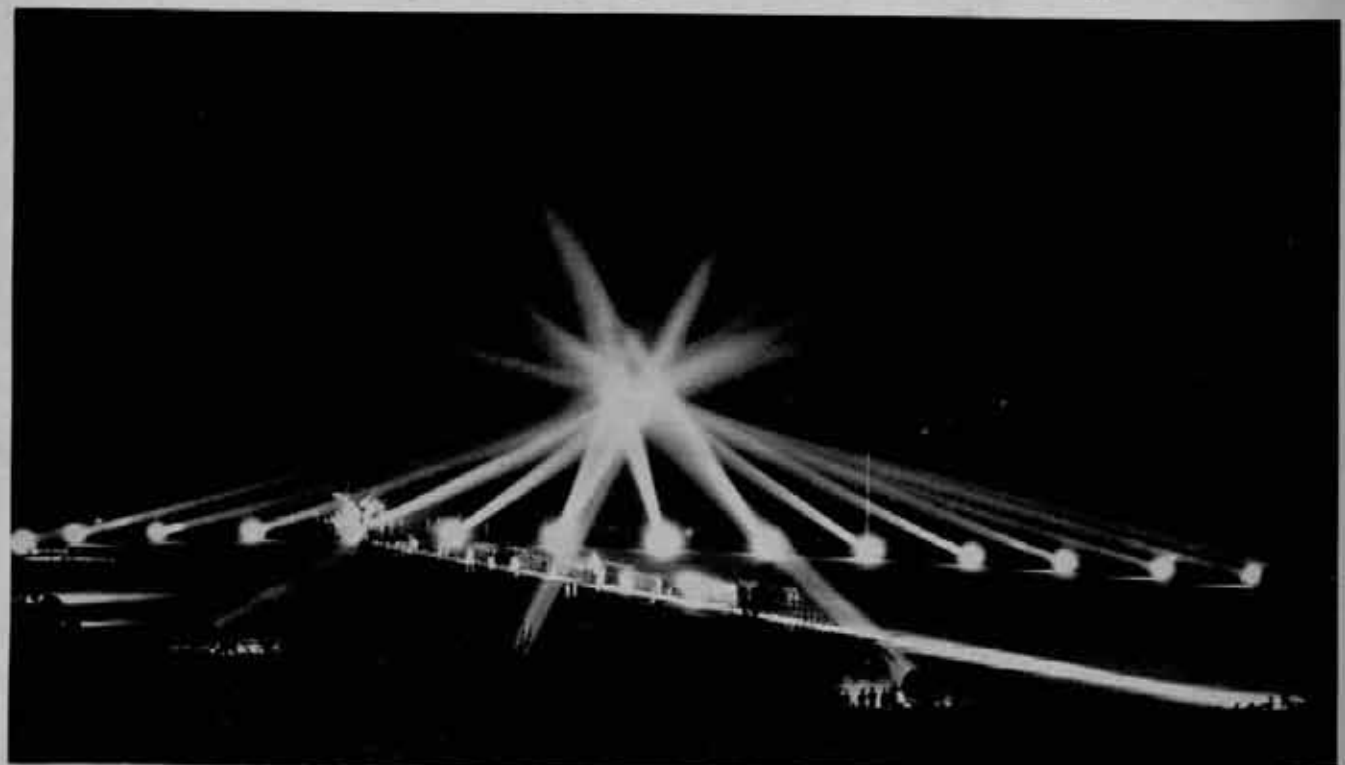
Holiday Routine

Memorial Day saw all the officers and ladies of the brigade at Fort Weaver where the Hawaiian Separate Coast Artillery Brigade picnic is held yearly. This is one of the best bathing beaches on Oahu, and, with the Hawaiian sun much in evidence, a jolly time was had by all. It was estimated that over a thousand sandwiches were devoured, and there is no telling how many pickles. On Kamehameha Day, which is a territorial holiday over here in Hawaii, the first battalion of the 55th put on a fine show in the mammoth parade which is annually staged on this day.

The Order Changeth

The old familiar heading on this H.S.C.A.B. news letter is rapidly changing. Colonel Arthur has taken Colonel Williams' place as chief of staff. Colonel Williams goes to Fort Barrancas after a fine tour of duty with Headquarters Hawaiian Separate Coast Artillery Brigade. Colonel Desobry, the adjutant general, has left for Washington, and is being replaced by Major Daniels. Major Lewis has left for the War College, and Captain Dunham has come over from Fort Kam to take his place. Colonel Rowland and Colonel Smith have traded posts—the latter going to Fort Ruger. We extend to all our heartiest Aloha.

We also welcome the following new officers at the



Searchlight parade at Fort Shafter, honoring Admiral Hepburn.

various posts: At Fort Shafter, Captain Rothgeb and Lieutenants Murrin, Boys, and Walter. At Fort Kamehameha, Captain Willard and Lieutenants Root, Weld, and Howell. At Fort Ruger, Captain Franklin.

The *St. Mihiel* took away many familiar faces: Captains Read and Dodge and Lieutenant Ashworth. Lieutenant Colonel Cook has left commercially and two officers sailed away with the fleet, Lieutenants Logan and Lipscomb to Monroe.

Notes on Sports

1937 turned out to be one of the finest years in many, for the athletes competing in the track and field events in the sector. On May 8th the individual track meet was held at Schofield Barracks. Sixty-six men from the sector went to the big post to bring back 5 first places, 5 second places and 2 third positions.

Lieutenant Kenerick, Ft. Shafter, took a third in the broad jump; Ben Karpinski, Ft. Shafter, took third place in the javelin throw; Andy Nations, Ft. Shafter, won the discus throw; Lieutenant Richard Moorman, Ft. Kamehameha, who holds the Department shot-put record, came within four and a half inches of his own record to win the event; Larry Hummell, Honolulu, won the high jump; and Charley Scott, Honolulu, won second position in the 440-yard dash. George Monlux, Ft. Shafter, took second place in the half-mile track event; Baldy Townsend, Ft. Kam, won the two-mile race; and Joe King, Ft. Shafter, took second in both the 120 high hurdles and the 220 low hurdles. The mile relay team composed of Lieutenant Kenerick, Ft. Shafter, Tommy Eberle, Honolulu, Ritter, Honolulu and Charley Scott, Honolulu, broke the old Department record and hung up a new one; the winning time was 3 minutes 30.3 seconds.

The regular sector track and field season got under way at Ft. DeRussy on May the 15th. There were three dual meets, two at Ft. DeRussy and one at Ft. Kam. Running true to form and carrying out early season predictions, the sector tracksters set new sector marks in five events. Lieutenant Kenneth Kenerick, Ft. Shafter, ran a great race, when he established a new mark in the 220 yard dash. Larry Hummell, Honolulu, set a new sector record in the high jump. Ben Karpinski, Ft. Shafter, tossed the javelin for a new sector mark. Joe King, Ft. Shafter, was the outstanding competitor of the year, hanging up two new sector standings in the 120 high hurdles and the 220 low hurdles.

On Saturday afternoon, May 29th, all eight baseball nines, which make up the Sector-Navy league went into action. Ft. Kam and Ft. Shafter gave the fans a sample of the type of competition they may expect for the balance of the year. It took 12 innings to decide the encounter, with Ft. Kam taking the long end of the score, defeating Ft. Shafter 5 to 2. Another outstanding game in the first round was the no-hit and no-run victory of Swede Elvestad of the Marines. Ft. Shafter again was on the losing end of the 11 to 0 score.

The Subron Four, present holder of the Island Service baseball title have waded through all competition, winning six games and losing none. Ft. Kam has one defeat chalked up against them. The Subron Four handed Ft. Kam their single loss. The Marines, Honolulu, Ft. Shafter, Fleet Air Base, Luke Field and Staff follow in order. The Marines proved to be the dark horse. Aloha.

Corregidor

Brigadier General P. P. Bishop, *Commanding*

Colonel T. A. Terry, C.A.C., *Executive*

59th Coast Artillery
Lieutenant Colonel R. A. Turner

60th Coast Artillery
Colonel J. H. Cunningham

91st Coast Artillery (PS)
Lieutenant Colonel R. S. Dodson

92d Coast Artillery (PS)
Lieutenant Colonel Albert H. Warren

By Major R. E. Phillips, C.A.C.

AS BEFITS this time of year, training efforts have been less strenuous and trips to Baguio more common. The May transport brought a consignment of field officers which the harbor defense staff is trying to assimilate. Colonel Henry C. Michie, Medical Corps, is our new post surgeon. Major Robert E. Phillips is at the plans and training officer's desk and Major W. R. Stewart has relieved Major William Hesketh at the artillery engineer's office. Major Francis S. Swett was announced as harbor defense supply officer but has encountered misfortune in the form of a bad case of bronchial pneumonia. He is improving and all join in wishing him a speedy recovery. The assignment of Major John H. Harrington as post exchange officer assures efficient and effective service by that institution, thanks to his experience there on a former tour. The Ciné, the post schools and harbor defense athletics have been entrusted to Major Morris E. Conable. Other realignments outside the regiments have affected several old timers. Lieutenant Colonel J. H. Hood, while functioning as executive for beach defense pinch hits as supply officer, and Major Marvel H. Parsons is now assigned as harbor defense inspector.

Coincident with the rainy season, comes the opening of troop schools for the command. This year special efforts have been made to enhance the value of this form of training. Regimental troop schools are to be preceded by a coast defense school for all battery officers. More than ever, the applicatory method will be employed. Officers

who will train and supervise gun crews, position finding, and spotting-fire adjustment details, will be organized into teams to learn by actual performance, the work to be done by the individuals they will train later. Students will be encouraged to propose improvements in technique, and promising ideas will be carefully tested.

Similar principles will be extended to problems involving adjustments of guns, carriages, and observing instruments. The school slogan will be "Learn by Doing." Under this plan the best thought of artillery officers based on practical experience becomes available to the entire command.

It is expected that methods and procedures will be perfected, a higher degree of team work achieved and finally, there will be forthcoming, the most effective instruction of the individuals who will function in our target practices next year.

The reactions of the officers returning here after an absence of six or eight years are rather interesting. The noticeable improvement in the physical appearance of the entire command is probably due to the weekly "Butts Manual" exercises put on by each regiment immediately after its weekly parade. This takes stamina. The improvements in roads and trails come in for comment as do the additions to Corregidor Club facilities.

The staff assembled May 27th to make known its best wishes to the commanding general on the occasion of his sixtieth birthday.

The staff's greatest need just now is someone who can "Winchell" around and dig up news. However, the regiments are ready with items enough to fill our space quota so we retire in their favor.

Fifty-Ninth Coast Artillery

By Major E. R. Barrows

The months of April and May were devoted to small-arms training and firing and to the preparation of artillery matériel and police areas for the approaching typhoon season.

The Fifty-Niners won the post regimental baseball series by defeating the 60th, three games out of five. The 60th took the first two games of the series; the first one requiring fourteen innings for a decision. Then we really started to play baseball and took the last three games of the series. The squad, under the leadership of Lieutenant Reybold, then proceeded to Manila and won the department championship in the American Division. The regiment won the American post tennis championship by taking eight out of nine matches.

Regimental softball, volleyball, and ten-pin tournaments are now in full swing. The officers are engaged in the post ten-pin series.

The regiment held its short-timers' parade on May 4th. Lieutenant Colonel O. C. Warner, Major W. H. Steward (ex-Fifty-Niners), Captain W. E. Griffin, and seventy-seven enlisted men joined the reviewing officer. Lieutenant and Mrs. Deichelmann have left for leave in China and Japan prior to catching the July transport for the States and school at Monroe.

Captain and Mrs. Burgo Gill, and Lieutenant Frith joined the regiment from the May transport.

The regimental strength was increased by one on May 20th when James Clark Woods, son of Captain and Mrs. Fred J. Woods, arrived.

Major Morgan is just back from a month in Baguio which he devoted to the study of golf ball ballistics. He was able to equal the course record on two occasions.

Lieutenant Peter S. Peca spent three weeks on detached service in Baguio.

Mrs. Franklin B. Reybold has returned from an eight-week trip to China.

Sixtieth Coast Artillery

By Lieutenant C. W. Hill

Since the last news letter two boats have come and gone, taking away many old friends and bringing in many new ones. On the March boat we lost Colonel and Mrs. Allen Kimberly, and Captain and Mrs. T. B. White. At about the same time, Captain and Mrs. J. F. Howell and Lieutenant Bob Turner departed for China where they will see the sights for two months and catch the May transport for the States. Newcomers to the regiment from the March boat were 2d Lieutenants Waterman, Hale, and Ashman with their wives. Lieutenant Colonel Franklin Kemble took command of the regiment and Captain F. J. French came up from the Guard Battalion to augment our feeble numbers. Several weeks later Lieutenant and Mrs. L. K. Tarrant joined us after coming east from New York.

Several old timers left us on the May transport and we were very sorry to see them go. Lieutenant Bob Turner went up to China in February and caught the *Grant* up there. Lieutenants A. A. McCrary, C. L. Andrews, and S. I. Gilman stayed here till the last but finally departed on May 8th amid our tears and their cheers. At the same time, we lost our esteemed CO, Lieutenant Colonel Kemble, who departed for the Orient on a two-month leave whence he will board the July transport for the States. In return for these losses, we have received Lieutenant Ray Wilkins from off the May boat and he promises to do his best to fill up the vacancies.

Our new regimental commander, Colonel J. H. Cunningham, moved over from the 91st Coast Artillery (PS) on the 1st of May and we are a high ranking regiment once more. On May 5th Colonel and Mrs. Cunningham went up to Baguio where they were joined on the 17th by Captain W. L. Richardson, the regimental adjutant. On the 21st, the CO and his wife returned and we will have our competent adjutant back with us on the 1st of June.

With the approach of heavy rains and typhoons, the training begins to move indoors. Gunners' instruction will be imparted to all men and vocational schools will open up for those who desire to specialize. Troop schools and post schools of all descriptions open wide their doors

to the officers who merrily catch up their books and flock to attend.

Outdoor sports will also have to seek shelter for the next two or three months, so we turn to bowling and basketball primarily. Bowling is already under way and will continue on into July, with basketball following close on its heels. The batteries fight it out among themselves at first and then the pick of the regiment is organized to defeat the 59th CA for the post championship.

Ninety-First Coast Artillery (PS)

By Lieutenant R. M. Miner

On May 1st, Colonel James H. Cunningham turned over command of the 91st to Lieutenant Colonel Richard S. Dodson. This change was one of many which have recently caused a rather substantial turn-over of the officer personnel of the 91st. Lieutenant Colonel Gooding Packard, Lieutenants I. D. Roth, Preston Steele, and Franklin Kemble, Jr., have left for the States, and Major Frederic W. Cook leaves in June. Officers who recently joined the regiment are Captain John M. England, Lieutenants Allison R. Hartman, Russell M. Miner, Pennock H. Wallaston, and Norman A. Skinrood.

The artillery target practice season is over and all concerned are prepared for a bit of wet weather. Batteries C, D, E, and F completed record service practices; D's (firing 14-inch DC) perhaps being the most outstanding in that the target was demolished by the third and fourth shots. After a five-hour delay, caused by fog, and obtaining a new target, the Battery was able to continue, rolling up a score of 188. E Battery, firing "Grubbs"—10-inch DC—made a score of 131, the highest in years for that battery. Batteries A and G held mine service practice for the first time under the test-phase requirements and made scores of 137 and 134, respectively.

The 91st continued its success in athletics by dominating tennis play during May in the Scout Division, capturing the individual championships in singles and doubles and defeating the 92d in the inter-regimental tournament. Inter-battery bowling is well under way, the games being hotly contested for the individual prizes offered. The regimental baseball team, under the guidance of Lieutenant Pennock H. Wallaston, athletic officer, is entered in the Philippine Department baseball tournament and has won its first game, defeating the 57th Infantry (PS) (post champions for 1937 at Fort McKinley) by a score of 3 to 2.

Ninety-Second Coast Artillery (PS)

By Lieutenant R. M. Hardy

The *Grant* arrived on May 1st but brought no officers for duty with the 92d Coast Artillery (PS). As there have been no departures for several months and none are scheduled for many more, the regiment will probably remain "as is" until the fall transport arrives.

The regiment has had an intensive and successful outdoor training period and is now awaiting the indoor or garrison period. On June 1st officers and enlisted men will heed the bell of school days. Within the regiment there will be a motor transportation course, a general education course, and a battery clerks' course, as well as gunners' instruction and examination.

On April 28th, a regimental track meet was held at Topside parade ground; Battery "C" won with 70 points and Battery "B" came in second with 42 points.

At present an inter-regimental ten-pin tournament is in progress. The Guard Battalion was prevailed upon to enter a team and immediately proceeded to upset the other organizations. This is to be followed by a series between regiments and the latter by duck-pin toutnaments.

Camp John Hay has seen a large quota of 92d visitors. Captain and Mrs. Pamplin, Lieutenant and Mrs. Weitzel, Lieutenant and Mrs. Hardy, Lieutenant and Mrs. McReynolds, Captain and Mrs. McKinney, and Lieutenant and Mrs. McKee spent two weeks or more at the mountain rest camp during April and May.

During the first part of April Captain and Mrs. Pamplin, Mrs. Young and Lieutenant and Mrs. Thomas spent several days cruising the Southern Islands on the S.S. *Mayon*.

San Francisco

Colonel H. T. Burgin, 6th Coast Artillery, *Commanding*

By Major Willard Irvine

THE new Harbor Defense Commander, Colonel H. T. Burgin, assumed command June 17.

Battery K, Captain Dean Luce, commanding, fired its annual service practice June 9 with 12-inch BC guns. Fourteen shots fired at a range of 20,000 yards resulted in eight hits and a score of 146. Battery E expects to better this score in the fall using 12-inch DC guns.

"When bigger guns are built the Coast Artillery will clean them," said a sergeant of Battery E as he supervised a detail scraping, cleaning, and painting two 16-inch long range guns now being installed at Fort Funston.

No longer will the Harbor Defenses of San Francisco be without its own mine planter, needed for towing targets as well as planting mines. Officially assigned and now under construction, the U.S.A.M.P. *Lieutenant Colonel Ellery W. Niles* is expected to arrive at the end of the year. A warrant officer and a detachment of thirty men, now at Fort Baker, await the arrival of the last word in mine planters. Her new berth, a modern reinforced concrete dock, is being built at Fort Baker under the direction of the district engineer. This dock is 200 feet long and 113 feet wide located on the end of an approach 238 feet long and 29 feet wide.

Mayor Angelo J. Rossi of San Francisco, Chief Engineer Joseph B. Strauss, and Colonel Cloke, representing the Army, before 200 invited guests and over a sectional radio hookup, announced to the public the official completion on April 27th of the Golden Gate Bridge. The

driving of the final rivet, made of California gold, was one of the colorful events of this ceremony. The $35,000,000 world's largest suspension bridge, connects Forts Scott and Baker and greatly facilitates communication between the two posts. The 6th Coast Artillery and Band, under the command of Major Willard Irvine, led the procession of officials and invited guests in a march to the south tower where the "rite of the last rivet" was held.

Last year a San Francisco unit, the 57th Coast Artillery, won the Coast Artillery Association Trophy for the outstanding work of its Reserve officers. This year the 6th Coast Artillery appears in the race for similar honors. According to the Ninth Coast Artillery District *Bulletin* this regiment stands first of over thirty units with a total of over 5,000 hours extension courses or an average of 70 hours for each of its 70 Reserve officers. Over sixty-five per cent have completed 40 hours or more, and eighty-five per cent have completed one or more sub-courses. Thirty-five of these officers will be called to active duty and charged with the training of 140 CMTC candidates at Fort Scott from July 1 to 31.

Improvements at Fort Scott include the widening and repairing of roads, painting and repairing quarters and all barracks, and the planting and trimming of shrubbery. A new main entrance to the post has been completed. Concerning the latter, the *San Francisco Chronicle* states:

> The entrance to Fort Scott has been completely redesigned during the past month, the road widened and dangerous curves eliminated. In addition, two old smooth bore cannons, relics of the Civil War, found in the old Fort Point, will be mounted at the gate entrance to the post. They will be aimed in the general direction of Alcatraz, not for any particular reason but by sheer coincidence.

May 12 witnessed a series of events to commemorate the sixty-fourth birthday of Colonel Harold E. Cloke. The first was a review of all troops of the Harbor Defenses of San Francisco under the command of Lieutenant Colonel Stuart with Captain Scott as Adjutant. This was a special ceremony in which the battery commanders and 1st Sergeants, after "Officers Front and Center," formed a part of the reviewing party. Besides the officers and ladies of Fort Scott and Fort Baker, many civilians were present.

In the afternoon a mammoth Inter Post-City boxing card, first of a series designed to promote athletic rivalry between San Francisco Bay area military posts, drew a large crowd to the ball diamond where a ring had been set up and seats had been provided. Under the direction of First Lieutenant William S. Coit, post athletic officer, and his assistant, Technical Sergeant Paul O. Schlicher, sixteen bouts were run off for the entertainment of an enthusiastic audience. Fort McDowell and Letterman General Hospital furnished four fighters each and three professionals came from Oakland. Colonel Cloke opened the bill with a short talk and Andre Lenglet, French heavyweight champion, refereed the final event. Admission was free and refreshments were available. The Fort Scott-Baker stable is being trained by Corporal William D. Murray, Battery "E," 6th Coast Artillery, former service welterweight champion and one of the trainers of Army contestants for Olympic Games trials.

From 5:00 to 7:00 in the afternoon the officers and ladies of Fort Scott and Fort Baker complimented Colonel and Mrs. Cloke with a tea at the Fort Scott Officers' Club. Present, also, were other friends of the guests of honor. Around a huge lighted birthday cake all gathered while General Joseph P. Tracy, the district commander, presented Colonel and Mrs. Cloke, on behalf of their many friends, a token of their esteem and friendship.

The Noncommissioned Staff Officers' Club gave a dinner in honor of Colonel and Mrs. Cloke at their recently opened home overloking the Golden Gate. Master Sergeant Joseph Kramer, QMC, assisted by Master Sergeant Edwin Savacool, Technical Sergeants Leslie Norton, Malcolm Stallings, and Paul Schlicher, CAC, composed the entertainment committee. Colonel Cloke was presented with a large birthday cake decorated with the Coast Artillery insignia, prepared by the Cooks and Bakers School, Presidio of San Francisco. Other guests of the club were the Corps Area Commander and Mrs. George S. Simonds, Colonel John T. Geary, Colonel William H. Tobin (Retired), Colonel J. C. Johnson (Retired), the Executive and Mrs. LaRhett L. Stuart, the Surgeon and Mrs. Albert J. Treichler, the Adjutant and Mrs. Willard W. Scott, and the Plans and Training Officer and Mrs. Thomas B. White.

The city of Berkeley celebrated the opening of a new $2,000,000 aquatic park and yacht harbor on May 8th with a night parade. A battalion of the 6th Coast Artillery, Major Irvine commanding, headed the military division. Major General David P. Barrows, California National Guard, and city officials reviewed the parade. An enthusiastic crowd lined the two miles of march.

Not since 1915 have San Franciscans staged so spectacular a fiesta as celebrated the opening of the Golden Gate Bridge. On May 27, 200,000 paid to walk across the bridge. For three days the holiday spirit ruled, and parades and pageants were part of the daily program. The 6th Coast Artillery was represented by 150 men in the pageants. Six officers and 75 men were required for a week to join with others from the 30th Infantry to regulate traffic. The remainder of the regiment led parades which for hours passed the reviewing stand, located on Crissy Field, facing a grandstand built for the occasion.

To the Harbor Defense Commander, the Corps Area Commander, Major General George S. Simonds wrote:

> No one realizes more keenly than I the difficult traffic and other problems which arose during the Golden Gate Bridge Fiesta. The excellent coöperation tendered by the 6th Coast Artillery, which consisted of parade and pageant participation and traffic control, and the cheerfulness and willing devotion to duty shown by the members of the regiment who participated, are, to my mind, fine examples of military deportment.
>
> The excellent appearance of marching units and of those assisting in traffic control was particularly marked.
>
> I request that my sincere appreciation be transmitted

through you, to the commissioned and enlisted personnel who participated in the Fiesta.

Major Willard Irvine has been relieved as commanding officer of Fort Baker and Fort Barry and has resumed his duties at Fort Scott. Major Manly Gibson, recently arrived with family from the Philippines, is now stationed at Fort Baker as post commander. Lt. Colonel Henry C. Davis, Jr., Captain Frederick R. Keeler, Lieutenants George R. Carey and Erskine Clark now on duty in Hawaii, and Major Maurice Morgan, Philippine Department, have recently been assigned to the 6th Coast Artillery.

Colonel Earl D'A. Pearce, recently with the 4th Coast Artillery, has arrived in San Francisco where he has charge of recruiting activities. Major and Mrs. William C. Braley of Berkeley, California, recently visited friends at Fort Scott. The President of the University of California has announced the award of the James Monroe McDonald Scholarship, carrying $270, to Chas. D. Y. Ostrom, Jr. of the Junior Class. Miss Jane Porter Whitesides and Lt. William Henry Kinard, Jr. were married at the new Presidio Chapel June 8 by Chaplain Thomas L. McKenna.

* * *

Galveston

COLONEL ALLEN KIMBERLY, *Commanding*

By Captain Frank A. Hollingshead

MAY was an active month for the 69th. President Roosevelt's visit to Galveston after his fishing trip in May called out the regiment for guard, security, and escort.

General Brees, commanding the 8th Corps Area and Captain Byers, A.D.C. greeted the President at the wharf on his arrival. General Brees and Colonel Donovan had been guests of Colonel Kimberly the previous evening at the Beach Club.

Colonel Kimberly assumed command on May 1 relieving Colonel Donovan.

Quarters are being renovated and painted by WPA labor which is also increasing Quartermaster activities and improving the post to a marked degree.

The active summer season with civilian components began in May, with Reserves assigned to 69th taking their two-week training as part of the regiment. The ROTC camp from Texas Agricultural and Mechanical College opened June 7th for six weeks. Majors Ralph E. Hill and Maitland Bottoms are the unit instructors.

Colonel Donovan was honored with a parade and serenade before his departure for Fort Sam Houston on May 31st. He is now G-4 of the 8th Corps Area.

General Brees, accompanied by Major Hinman, made an inspection of the ROTC activities here on June 19th, flying back to Fort Sam Houston the same day.

Fort Crockett has been favored with many visits from personnel of Headquarters 8th Corps Area, among them the chief of staff, Colonel Jay L. Benedict, the corps area ordnance officer, Colonel J. K. Crain, who is at home with us, Colonel Gustave R. Lukesh, the corps area engineer, and Lieutenant Colonel Otis K. Sadtler, corps area signal officer. Colonel Edward A. Keyes and Major Robert O. Poage were in Galveston on May 20, 1937, to inspect the ROTC unit at Ball High School.

The Oleander Festival between May 21st and 23d, one of Galveston's yearly high points, was honored by the attendance of the 69th at the Oleander parade. The Grand Oleander Ball at Hollywood was attended by most of the garrison.

The Hostess House is being renovated in anticipation of the next contingent of Thomason Act lieutenants.

Lieutenant Doyle leaves for the Coast Artillery School July 1st. Anticipated early arrivals are Major Charles Harris and Captain Harry F. Meyers.

Over half the regiment and all the motor transportation will go to Fort Sam Houston in September to function as an antiaircraft machine-gun battalion in the coming test for the new division organization.

Friday afternoon parade, recently started, attracts many Galvestonians and summer visitors.

The regiment made its annual march between June 28th and July 7th—about 1,400 miles. First stop was at Camp Bullis (Leon Springs) where General Brees inspected the regiment. Fort Clark was the next halt where the cavalry brigade under General Kenyon Joyce gave a demonstration of cavalry activities including a mounted parade. A searchlight demonstration was given at night. En route to Fort Clark the regiment passed through Uvalde, home of Vice President Garner. Mr. Garner was serenaded by the band. Several bridges between San Antonio and Fort Clark were incapable of carrying the weight of the guns which added the problem of detours and fording. The 69th and the cavalry brigade clashed bats on the baseball diamond July 1st at Fort Clark, the artillerymen winning, 5-1. Just before the game General Joyce announced that he would present a cup to the victors.

July 2d the regiment camped in Austin, the state capital. On July 3d the regiment was quartered at Dallas, in the Agricultural Building inside the Pan-American Exposition grounds. July 4th being Galveston Day at the Exposition, parade was held followed by a concert and

Parade in honor of Colonel Donovan, retiring commanding officer, Fort Crockett.

searchlight demonstration. At midnight, July 5th, the march was resumed for Galveston. A two-hour halt was made for breakfast at Bryan (Texas A & M). Galveston was reached the same day after a night of forced marching. Every vehicle assigned rolled, and every member of the regiment and the ROTC unit made the march. The march was very interesting and beneficial to training but the sea breezes of Galveston were most welcome after the heat of the interior.

Galveston Island has been without rain of any consequence for over 3 months and vegetation is kept alive with difficulty.

Panama Canal Department

Department Artillery Officer
COLONEL LEWIS TURTLE, C.A.C.

Fort Amador
COLONEL FORREST E. WILLIFORD
4th C.A. (AA)

Fort Sherman
COLONEL WILLIAM T. CARPENTER
1st C.A.

Fort Randolph
COLONEL CHARLES B. MEYER
1st C.A.

FORT AMADOR

By Lieutenant Charles J. Bondley, Jr.

THE department maneuvers are over and the garrison has settled down to the well known cleaning-up process, in preparation for seacoast artillery firing for the current year, and for small-arms firing. Colonel Pearce, former commanding officer, departed for DOL duty in San Francisco, on May 7th, and was succeeded by Colonel Forrest E. Williford, who had been executive officer for several months. Major J. C. Hutson, who came to this department from Fort Sheridan, during maneuvers, is the new post adjutant. He succeeds Major Harry R. Pierce, who, you will remember, wrote the Fort Amador news letter until his departure. We wish both Colonel Pearce and Major Pierce the best of everything in their present assignments and in the years to come.

Major General Stone succeeds the late Major General Butner as the department commander. His arrival heralded many reviews and receptions, among which was a Pacific Sector review at Fort Clayton on April 24th. All troops of this sector took part and gave the General a good idea of just what troops he has on this side of the canal. An aerial review was held at Albrook Field on April 30th, in honor of the new commanding general; and the entire wing, commanded by Brigadier General Brett, took part. This event proved to be quite a show, and many officers and their families turned out to see it.

The Pacific Sector also tendered the Governor of the Panama Canal a review at Fort Clayton on April 10th. A farewell review for Colonel Pearce was held at Fort Amador on May 1st, and all troops stationed at Amador participated. General Halstead, commanding general, Pacific Sector, received a review at Fort Amador on May 20th, and this ended the reviews up to date.

TRAINING

As already noted, the regiment plunged into small-arms firing and seacoast artillery drill immediately after maneuvers. "D" Battery, started work on mine practice which was held last month and resulted in the fine score of 146.9 out of a possible 150. The battery established what we believe to be a remarkable time record, completing the practice in 94½ minutes. Captain Toftoy commanded this battery, with Lieutenant Holst as his property officer.

Batteries "I" and "G" commenced drill on the 16-inch and 14-inch railway batteries, respectively. Battery "G" commanded by Captain Grinder, expects to fire its shoot on June 22d.

Battery "I" is at present engaged in sub-caliber work preparatory to their 16-inch shoot, which will be held on June 24th. The guns have been thoroughly gone over and we expect no trouble with the matériel when the shoot comes off. It will be held at a range of about 42,000 yards and the battery expects to knock the target, which will be towed by a fast destroyer, out of the water on the first shot. We hope to report the accomplishment of this feat in the next issue of the JOURNAL. Captain Miller commands this battery.

Battery "D," now that it has completed its mine practice, is preparing for a 6-inch disappearing gun shoot which is scheduled for June 18th. All targets for these practices are being towed by a Navy destroyer, and will be high-speed.

The antiaircraft batteries are taking time out, having completed the 1937 practice. "F" Battery got off only a night shoot, still has two daytime practices to complete. These will be held in the early fall.

The work is, of course, paramount, but liberal sprinklings of infantry drill, reviews, seacoast and antiaircraft alerts, and general maintenance of the many installations keeps the work from being monotonous and the garrison more than busy.

ATHLETICS

Athletics are going on as usual, with all organizations in the department putting forth excellent competition

and showing high qualities of sportsmanship and skill in all events. Fort Amador is copping its share of winnings, which is highly gratifying to us all.

The department golf tournament was held at Fort Amador on April 27th. Lieutenant B. A. Schriever, Air Corps Reserve, Albrook Field, took the meet, as far as the officers' end goes, without trouble. Lieutenant Schriever is easily the best golfer the department has seen for some time and he has broken the record on every course he has played in the Zone. He also broke the Panama Country Club record the second time he played the course. Lieutenant Schriever ended up with a gross score of 282, followed by Captain McQuarry, Fort Clayton, who turned in a score of 306. Lieutenant Samuels and Major Holmes, Infantry, both of Fort Amador, tied for low net score with 262. Lieutenant Flynn, also of Amador, came in third in this division with a net score of 266. In the enlisted men's end of the tourney, Private Riley of Amador was runner-up with a score of 310, while Corporal Arch of Fort Davis, Atlantic Sector, won this division with 295.

The Pacific Sector track and field meet was held at Fort Clayton on May 14th and 15th. Fort Clayton took first place, with Amador a close second. Amador men took the 880, shot-put, discus, and javelin, and tied for first place in the pole vault. Lieutenant Jablonsky won the javelin throw, with a toss of 166 feet, 1 inch.

The Fort Amador baseball team, coached by Lieutenant Jablonsky, took the sector's series without much trouble. Members of this team together with players from other Pacific Sector posts formed the Pacific Sector team, which journeyed to Fort Davis for the first two games of the department series on May 29th and 30th. Pacific Sector won the second game, 6-2, having dropped the first, 4-1, in favor of the Atlantic Sector. The Atlantic Sector then came to Fort Amador on June 5th and 6th for the second two games of the series of five and dropped both games to Pacific Sector with scores of 4-3 and 8-3, thus giving the Pacific Sector baseball team the title of Department Champions, 1937. The third game was tightly contested and ended only after an extra inning. Maddox starred in the box for the Atlantic men, playing in all four games, with only one relief.

"G" battery having won all the three Fort Amador track and field meets, contributed much to the Pacific Sector victory in the department meet, which was held at Fort Clayton on June 5th. Here again Lieutenant Jablonsky won the javelin throw, and Pacific Sector had little trouble winning the meet. The Atlantic Sector tug-of-war team was disqualified and this cinched the meet for the Pacific lads.

The Fort Amador basketball league is in full swing, with three games almost every day, and standings changing so fast that we cannot keep them up to date. The Pacific Sector Headquarters Company won the first half and is favored to win the second half, but with the other teams improving every day, the winning team will not be known until the last whistle.

"C" battery won the Fort Amador horseshoe pitching series, with the searchlight men looping the pegs with surprising regularity. Captain Smith is in command of this battery and it is rumored that he had some method of sound detection rigged up to enable his horseshoe team to get the exact range to the peg. Captain Smith vigorously denies this.

Social

The usual run of social activities had a slight up-turn during the last few days of Colonel Pearce's command. There were no parties during the maneuvers, and the first hop since February was held on April 17th. It proved to be quite popular, and was well attended by all on the Post, and had many visitors. The orchestra seemed better than ever before and the crowd appeared gayer.

On May 1st, a costume dance was held at the club in honor of those scheduled to leave within a month, including Colonel and Miss Jennie Gray Pearce. Prizes were awarded for the best, funniest and most original costumes, with the Grinder family well out in front in the final analysis. Mrs. Holst was generally conceded as having the most original dress, coming as a "lady of many, many affairs." Or something like that. Major Jackson had on nothing other than the conventional evening attire, yet it wasn't on in the right places and, needless to say, he caused considerable comment, none of which was adverse, however.

On May 6th a reception was held for Colonel and Miss Pearce, to which were invited many officers from the department. This reception was well attended and proved to be a fitting farewell for the colonel.

This was the last party scheduled until June 5th, on which date the June hop was held in honor of our new commanding officer, Colonel Williford, and his charming wife. This dance was an improvement over the former ones from all standpoints, and, indeed, all our hops seem to be improvements over former ones.

The entire club is improving under the able guidance of Captain Grinder, the manager, who succeeded and is continuing the good work of the former manager, Major Craig. Major Craig recently left this station for the States.

This ends the social record for this issue. Next time we hope to report the results of the 6-inch, 14-inch, and 16-inch practices; the final results in the basketball league, the finals of the department tennis tourney.

Fort Barrancas

LT. COL. G. F. HUMBERT, *Commanding*

By Captain M. A. Hatch

THE Corps Area Commander, Major General George Van Horn Moseley, accompanied by his aide-de-camp Major Ernest C. Bomar, visited the post June 26th. After a review of the 13th Coast Artillery and the ROTC the troops were marched to the band stand. There an inspiring address by General Moseley was amplified by a public address system and was broadcast over WCOA. An

inspection of the post and the activities of District "G," CCC, was followed by a stag luncheon at the Naval Air Station Officers' Club given by all the officers of the post and District "G." The guests were General Moseley, Admiral Blackely, commandant of the Air Station, Captain G. S. Burrell, USN, Commander G. F. Bogan, Lieutenant Colonel H. A. Lurton, QMC (Res), Major L. Passmore, USMC, Mayor L. C. Hagler of Pensacola, Captain R. C. Mills, commander of the local National Guard battery, and Captain R. C. Ally, president of the Pensacola Chapter Reserve Officers' Association. Before returning to Atlanta General Moseley expressed his pleasure at the fine appearance of the troops and the post in general.

Other visitors during the month were Colonel William M. Colvin, C.A.C., commanding the Fourth Coast Artillery District, Colonel Charles Martin, I.G.D., Colonel Robert H. Dunlop, G-2, and Lieutenant Colonel Ira T. Wyche, G-4 Headquarters Fourth Corps Area.

It is worthy of note that a larger number of trainees (excluding National Guard) come to Barrancas during the summer than to any other Coast Artillery post in the United States. Officers here now for duty with the ROTC are Major Edgar H. Underwood, Major William D. Evans, Major George Patrick, Major William W. Wertz, Captain William R. Carleson, and Captain Ralph Russell. Losses during July and August, including Lieutenants Hunter and Julian to the Coast Artillery School and Captain Hatch to Panama, will leave only twelve Coast Artillery officers of the regular garrison to carry out the most active part of the summer training.

Fort Barrancas is doing its full share in the drive for recruits for the Army. Of all posts in the corps area only Fort Benning enlisted more men during April, while for May Barrancas was first. At the rate we are going there is small doubt but that we will lead again for June. We are indebted to Captain Henry W. McMillan, 124th Infantry, Florida National Guard, in charge of the National Guard Armory at Tallahassee for his splendid cooperation in providing housing and cooking facilities for many of our groups of canvassers.

The installation of natural gas is an accomplished fact. All our newly-painted green and white buildings will now remain fresh much longer than was possible with the old coal stoves. The new theatre is practically completed and it is expected to open about July 15th.

With the arrival of summer weather (which is much cooler than that of most northern stations) and the completion of three new beach bath houses the stock of our fine bathing beaches has soared to new heights.

Post beach suppers both at the Barrancas officers' beach and at Fort Pickens have been popular.

A post tennis tournament was won by Cadet Standley, ROTC, with Cadet Smith, ROTC, runner-up.

According to press dispatches three of our seven Thomason Act Officers have won well-deserved appointments in the regular army. They are 2d Lieutenants George W. Croker, Jabus W. Rawls, Jr., and Edward W. McLain. Since there are only five for the whole Coast Artillery (96 competing), we feel that our young men have done exceptionally well and special credit is due to Captain Joseph B. Hafer who has been their instructor in theoretical subjects for the period of their year's active duty.

Fort Hancock

COLONEL L. B. MAGRUDER, *Commanding*

By Lieutenant Colonel Edward B. Dennis, C.A.C.

FORT HANCOCK took on renewed activity, with the arrival of the officers of the 1st Battalion of the 502d C.A. (AA) (RAI) under Major William H. Warren, of Whitestone, Long Island. These officers will have charge of the instruction at the CMTC Camp this year. They were busy with physical examinations, the assignment of quarters and other duties soon after their arrival. Later they received final instructions for the reception of the CMTC candidates.

The CMTC candidates this year were agreeably surprised to find that instead of the usual training on the fixed seacoast guns they will receive their training on antiaircraft artillery. The man responsible for initiating this interesting change is Colonel C. H. E. Scheer, commanding the 502d C.A. of New York City, the Reserve regiment in charge of instruction this year. The 502d is an antiaircraft regiment and Colonel Scheer felt that the training the CMTC in antiaircraft would not only stimulate their interest in this work but would be of tremendous benefit to the officers of the regiment, since they would have added opportunity to perfect themselves in the work they would be called upon to do in case of a national emergency.

As there is no mobile antiaircraft artillery at Fort Hancock a detachment from the 62d C.A. (AA), crack antiaircraft regiment of the regular army, under Captain Lathrop R. Bullene will supply a battery of 3-inch antiaircraft guns, a battery of antiaircraft machine guns and a platoon of antiaircraft searchlights. The CMTC candidates after suitable instruction and drill will fire these weapons at targets towed by an airplane under conditions similar to those in actual combat.

On July 6, 1937, the CMTC battalion was formally presented with its colors at an impressive ceremony. The battalion was marched on the parade ground by Major Warren with Captain H. V. Ryan of Belleville, N. J., in charge of Battery "A," and Captain R. J. Possiel of Scarsdale, N. Y., in charge of Battery "B." Judge Thomas Brown and former United States Senator W. W. Barbour both of New Jersey, presented the colors to the battalion.

The bearing and spirit of the candidates as they passed in review before Senator Barbour and Judge Brown, to close the ceremony, was praised by all who saw this pleasing event.

The target practice season at Fort Hancock started on May 17 with the firing of the eight-inch railway rifles by Battery "E," 52d Coast Artillery. Battery "C" followed on May 27th with the twelve-inch railway mortars. Poor visibility delayed and interfered with the firing on each occasion.

On Saturday, May 29, the New York Society, Military and Naval Officers of the World War, headed by Major General John J. Byrne made a trip to Fort Hancock for the purpose of presenting the trophy awarded to the best organization in the Second Corps Area for general efficiency during the period November 1, 1935 to October 31, 1936. General Byrne and party composed of some fifty members of the society with their families left New York on the Army Mine Planter *Ord*. They were met at Fort Hancock by Colonel L. B. Magruder, 7th Coast Artillery, the post commander, and by a guard of honor. After the salute, the customary honors were extended General Byrne, and the party proceeded to the Officers' Club for refreshments. A shore luncheon was served by the 7th Coast Artillery.

In the afternoon, a review was held and General Byrne presented the trophy to Headquarters Battery, 7th Coast Artillery. The trophy was received by Captain W. C. McFadden, the battery commander, who was personally presented with a gold medal commemorating the activities of the unit. A part of the afternoon was spent in visiting historic points of interest. After a reception and dance at the Officers' Club, the visitors boarded the *Ord* for their return trip to New York City.

The annual camp and training period for the 261st Separate Battalion, Coast Artillery (HD), from Delaware, was held at Fort Hancock from June 12th to 27th. This battalion is under the command of Major Henry Roscoe, Jr. Lieutenant Colonel H. W. Stark, C.A.C., and Captain Sylvan Berliner, C.A.C., the regular army instructors on duty with the battalion were present with it at Fort Hancock. Battery "A" under command of Captain William Torbert, Jr., fired the first practice with ten-inch seacoast guns on June 22d, making a fine score. This practice was followed on June 24th at the same gun by Battery "B," Captain Ralph S. Baker, commanding. Battery "B," is only a year old, having been formed in July, 1936. For lack of an armory, Battery "B," drilled and stored its equipment in the auditorium of the Georgetown High School. Apparently this was not much of a handicap as this battery did exceedingly well, destroying the target with the last shot fired, and making an "Excellent" score.

During the period June 20th to July 3rd, some thirty newly appointed second lieutenants of the Coast Artillery Reserve received special training under the supervision of Lieutenant Colonel Stewart S. Griffin, C.A.C. On July 1st they fired their service practice using the twelve-inch railway mortars.

Headquarters Battery of the 7th C.A., Captain William C. McFadden, commanding, is busily engaged in planting mines. The U. S. Army Mine Planter *Ord*, Captain C. M. Wolff, commanding, is assisting. Submarine practice is scheduled for July 12th, 16th and 26th. The training in submarine mine work will be completed about August 13th at which time service practice will be held.

The camp of the Reserve Officers' Training Corps opened on June 18th and terminates on July 29th. The students are largely composed of groups from Fordham University and from the University of Delaware. Major Donald H. Dutton, C.A.C., is executive officer, and Major Joseph P. Kohn, is the senior instructor. Among other regular officers on duty at this camp are Major Reamer W. Argo, C.A.C., Major J. G. Murphy, C.A.C., and Captain F. J. Cunningham, C.A.C. The ROTC students fired an antiaircraft gun practice on July 1, 1937. Machine-gun practice was held on July 2, 1937. On July 21st this group will have target practice with the 155-mm. guns, and on the 22d, they will fire the six-inch disappearing seacoast guns.

Officers of the 620th and 621st Regiments of Coast Artillery are scheduled for training during the period of July 18th to July 31st inclusive.

Their target practice will include firing of AA machine guns on July 29th and 30th, firing of twelve-inch mortars (Ry) and 155-mm. guns on August 10th.

In September Battery "C," 52d Coast Artillery, is scheduled to fire the three-inch AA (fixed guns on the 9th and 16th). Battery "E" will fire the same guns on the 14th and 21st. Headquarters Battery of the 7th, is scheduled to fire the AA machine guns on September 20th and 27th.

Some of the regular officers of the garrison are also scheduled to participate in a CPX which will take place in the near future.

Fort Tilden

At noon on Saturday, July 3, 1937, the new Marine Parkway Bridge over the Rockaway Inlet which connects Fort Tilden, and the Jacob Riis Park with Brooklyn, was formally opened. Gunfire from Fort Tilden by Battery "B," 62d Coast Artillery (AA) announced the event. The center span, its 540 feet making it the largest vertical highway lift-span in existence, came to rest as the band played the national anthem. The Jacob Riis Park which bounds the Fort Tilden military reservation on the east has a large parking space said to hold some 15,000 automobiles. During the sultry heat wave experienced during the first part of July this park was crowded day and night with thousands of people who had come there to keep cool.

During the period June 28th to July 2d, basic training was given at this station to many Reserve officers. The local garrison was augmented by some 31 officers and 271 men. The 539th and 910th Regiments of Coast Artillery are scheduled for training at Fort Tilden during the period August 9th to 13th. This post offers considerable advantages as a firing point for the training and preliminary firing of antiaircraft machine guns.

News and Comment

THE UNITED STATES COAST ARTILLERY ASSOCIATION

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

Subscription Increase

IT IS highly encouraging to see a substantial increase in the subscription list as a result of the active duty training period. The fine work done by our Regular, National Guard and Reserve Officers in getting non-subscribers to sign up not only gives impetus to further improvement in the JOURNAL but guarantees that the progress already made will continue. The staff of the JOURNAL and the whole Corps are certainly indebted to the officers who so freely have given their time to achieve these outstanding results.

The spirit in which requests to aid have been received proves that the JOURNAL is appreciated and is of service to the Corps. The time will soon arrive when the financial structure will permit us to further increase its usefulness.

All Coast Artillerymen are grateful to those willing workers who are making it possible for the rest of us to have such an excellent magazine.

No One Knows It All

NO individual ever learns so much that he cannot learn more. Progressive and intelligent persons never forget this. Only by constant study and exchange of ideas can we continue to go forward. It is the aim of the JOURNAL to furnish the basis for continuous progress. Our staff is so small that it is essential that the members of the Corps submit their ideas if we are to accomplish our purpose. We invite those who are so fortunate as to be experts in any line of endeavor and others who have had unique or interesting experiences to tell the rest of us about it. We are in especial need at this time of articles on seacoast and tractor-drawn artillery.

Air Raid Precautions

THE recent action of European powers has drawn our attention to the necessity for educating and training civilians in air raid precautions. A brief résumé of the measures taken in foreign countries against attack from the air may be of interest.

FRANCE.—A very detailed law prescribes the obligations of all citizens and violations are punished severely. The Chief of the General Staff is at the same time the Inspector General of Aerial Defense. An alarm service is provided for by the National Association for Passive Defense and is always ready to function. The anticipated cost of the law is between two and three billion francs. One hundred million francs has been borrowed for the passive defense of Paris alone. A special organization has been formed to provide for the evacuation of old persons, pregnant women, children, and the sick and crippled. The proprietors of all apartment houses are required to post signs giving the instructions for passive defense.

ITALY.—Passive defense is controlled by the General Staff. The military aero-chemical service is charged with the defense measures against gas in collaboration with technical and industrial organizations. All factory workers are required by law to provide themselves with gas masks.

GERMANY.—The Union for Passive Aerial Defense comprises twelve million members. All inhabitants are

required by law to be provided with protective material and to have assigned protective stations. Three hundred thousand officers and a million and one-half chiefs of refuges are occupied with the execution of passive defense measures. Twenty-two hundred schools of passive aerial defense, with the aid of eleven thousand instructors have taught four and one-half million persons the means of defense. The state advances 50% of the cost of refuges to an amount not to exceed one thousand marks each.

GREAT BRITAIN.—Eight battalions of infantry, stationed in London, have been transformed into permanent passive aerial defense troops. The Minister of Interior has created a national school of defense against gas at Falfield. A service of rescue parties and clearance of debris has been organized. All water and gas lines are to be laid double to prevent interruption of service. New apartments are required to be constructed with modern refuges. Apartments with underground refuges now being constructed are all completely rented long before they are completed, as an indication of the English feeling on this subject.

The importance that the British place on provisions for passive defense is emphasized when one realizes that in their 1938 estimates they provide £3,530,000 for respirators, £598,000 for fire precautions, and £10,000 for research and experiment. Much larger sums are being invested for chemical research and the training of those who will control and advise the population.

RUSSIA.—In Russia the "Ossoaviachim," a semi-military organization with sixteen million members instructs the civil population in defense, both passive and active against air attack. One hundred thirteen aeronautical clubs and fifteen hundred aviation schools, both motor and glider, are associated with this organization. The construction of refuges is being pushed strongly with government support.

* * *

All European nations are actively engaged in instructing their populations in passive aerial defense. In the countries where some degree of development has been attained (England, Germany, Italy, Russia, etc.) the control is in the hands of the military. It is only where responsibility and competence are united in one body that successful preparations can be made.

The action of our European neighbors points the way for the United States. The problem is ours as well as theirs. Therefore, responsibility for the education and training of the civilian population should be placed in the hands of an "Air Raid Precautions Department" specifically charged with this important function.

* * *

Intermediate Caliber Antiaircraft Gun

FOR many years our antiaircraft enthusiasts have been convinced that the probable solution of their problem was a gun of approximately 37 mm. in size. Tests of the destructive effect of high explosive shells, similar to those that would be used in a gun of this size strengthened the belief in the effectiveness of this weapon. Many difficulties were experienced in overcoming mechanical troubles and in the development of thoroughly dependable ammunition. This seriously handicapped the supply of such a gun to our services. That the difficulties encountered are not insurmountable has been demonstrated by foreign governments.

The faith in intermediate caliber guns arose initially in France from observance of the so-called "Pom-Pom" gun. The results reported to have been obtained by intermediate caliber guns in Spain have added to the confidence placed in these weapons. Many contend that the effective range of the caliber .50 antiaircraft machine gun is insufficient and that the destructive effect of its non-explosive bullet is not great enough to bring down an airplane unless a hit is secured at a particularly vulnerable point. Foreign governments, especially Germany and Great Britain, are daily giving evidence of their belief in the effectiveness of intermediate caliber guns. The most promising guns of this type are reported to be the Oerlikon 20 mm. and the Bofors 25 and 40 mm. which are described elsewhere in the JOURNAL.

The prompt development of an effective intermediate caliber gun for our service should be given serious consideration at this time. However, the problem will not be completely solved until efficient fire-control mechanism is produced.

* * *

Emergency Fire-Control Apparatus

THE standard antiaircraft fire-control equipment is generally conceded to be efficient and to satisfy the major requirements. However, it is complicated and somewhat delicate. A failure of one or more of the basic elements will normally render a battery inoperative even though the guns themselves are in good order. It has been realized that such a possibility is a real deficiency and because of its importance major efforts have been made with a view to correcting it. The Chief of Coast Artillery has had prepared an inexpensive emergency system designed to operate under any likely failures in the standard fire control system. All of the elements of the proposed system are relatively simple in their operations. Additional details concerning this apparatus are contained in the Coast Artillery Board Notes.

Tests will probable be held in the near future in accordance with a tentative program already submitted to determine the advisability of issuing the emergency system to the service.

* * *

Television

SPECULATION as to the future possibilities of television in connection with military and naval activities is always with us. It would be hazardous, indeed, for any individual to dogmatically state that this field offers no great possibilities to the army, for he would have to overlook the remarkable strides made in all branches of the

communications field in the past twenty years. A much shorter period should show the fruits of the research and investigation now being conducted by the various commercial companies in the radio television field.

A scant two years ago the *Army and Navy Journal* carried a new item that touched on some of the possibilities. It is reprinted here in the hope that it may point the way for further exploration on the part of those interested in practical television:

> Announcement that the Radio Corporation of America plans extensive development of the new art of television was hailed this week by ranking communication officials of the Army and Navy, who foresee important military uses for it in the not too distant future.
>
> The picture was drawn of a GHQ planning room equipped with television screens upon which are continuously projected the shifting scenes of battle at the front sent from aircraft hovering over the areas of conflict. In the opinion of officers of the Services, the equipping of aeroplanes with television transmitting sets is entirely practicable, and with the development of this new field, scout planes sending back to Headquarters instant moving pictures of enemy troop movements, maneuvers, artillery placements, etc., is definitely to be expected in a future war.
>
> Flagships of the future, also may have receiving apparatus installed in their plotting rooms, and the "Eyes of the Fleet" will be able to bring before the view of the Commander-in-Chief and his Staff the movements of the enemy's vessels, as they are made. Other military uses for this great new field of radio development are under study by the War and Navy Departments, it is hinted, but their nature is carefully kept secret.
>
> The decision of the Radio Corporation to devote $1,000,000 to the development of television was praised by Capt. S. C. Hooper, U.S.N., Director of Naval Communications.
>
> "It is a fine step," Captain Hooper said, "and bound to result in not only obvious value to the public, but in developments which will become of value to the military services as well."
>
> "Undoubtedly television is a coming thing," declared Lt. Col. Dawson Olmstead, S.C., U.S.A., Acting Chief Signal Officer of the Army. "It will be of value to the Army when developed for use in the field. We already have facsimile transmission and television is an accomplished fact in the laboratory, but it has not yet been developed to the point where it can be employed commercially or by the military. The Signal Corps is very much interested to hear that television development is to be actively prosecuted in this country, as rapid strides have already been made in England and in other countries."

Radio-Controlled High-Speed Target

THE development of a seacoast artillery target capable of operating on courses and at speeds expected of modern warships has been the subject of considerable planning and thought. The necessity for such a target, which will permit training under conditions closely approaching those to be encountered in time of war, is apparent. The development of a radio-controlled high-speed target was initiated by the Coast Artillery Board about five years ago. This target is based upon a Gar Wood, 28-feet, speedboat wth a V-type hull, powered by a Hall-Scott, 6-cylinder, *airplane* engine converted for marine use.

Briefly, the target, as remodelled by the Coast Artillery Board, is capable of being started from a stop with engine at rest and the propeller clutch engaged; of changing from minimum to maximum speed or vice versa; of being steered, right or left by either sharp or gradual turns, or straight ahead; and of being halted through stopping of the engine. All these operations are controlled by means of radio signals which can be transmitted from any radio transmitter which can emit modulated continuous waves of sufficient power and of the proper frequency. In addition, devices are provided which automatically stop the engine and bring the rudder to a dead ahead position in case radio signals cease to be received for any cause.

Tests recently completed by the Coast Artillery Board, as reported in their notes on Project No. 953 in this issue, have demonstrated the practicability of operating by radio control high-speed target suitable for Coast Artillery use. It is indicated that great advancements in training will result from the use of such a target. The days of firing seacoast target practice at speeds of 7 to 10 miles an hour should be past.

Motorized and Mechanized Forces in Coast Defense

A STRONG contention that there is need for a completely motorized force in any efficient and economical coast defense is made by Major R. H. Jeschke, U. S. Marine Corps, in a recent issue of *The Marine Corps Gazette*. He believes that part of this force should, if practicable be mechanized so that it may rapidly bring its enormous fire power to bear on any threatened point. He stresses the damage that the mechanized force can do to landing parties, first on the small boats as they come in the beach and then on the hostile troops once they land. Major Jeschke discusses the historical examples of the movement of large units by motors including General Gallieni's movement from Paris. He discusses also the lessons learned from various American and British maneuvers. He points out that forces that are motorized and mechanized are highly mobile and that they are capable of moving 200 miles or more in a day. He contends that this high mobility, if used in connection with efficient intelligence and reconnaissance services of the air, radio and navy, will enable a commander to maneuver his force on land as a transport troop commander maneuvers his ship at sea and that he will be able to parallel any movement up or down the coast that the enemy troop ships may make. This enables him to meet the first attempted landing at the time and place the leading waves hit the beach and he will be able to block it before it gets well under way. He also points out that the next most important use of motorized and mechanized forces in coast defense is their use as sector and local reserves.

Austrian 20mm. AA Cannon

IT IS REPORTED that the Austrian army has adopted the Swiss "Oerlikon" 20mm. machine cannon as a standard antiaircraft weapon and has issued it to four machine-

cannon companies for protection of military air fields. Some technical details regarding this weapon are given below.

The 20mm. machine cannon was devised by the "Oerlikon" machine tool factory. It fires while the bolted breech is moving forward. The barrel remains motionless. The breech is forced forward by a recuperating spring and after the completion of the forward movement it is driven back to its former position by the pressure of the powder gases. In continuous firing the cycle of operations is repeated in rapid succession as long as the barrel is fed with cartridges. Due to this principle the effect of recoil is lessened and a high rate of fire achieved. Using a magazine containing 15 cartridges the practical firing speed is 170 rounds per minute. The theoretical speed, however, is 280 rounds per minute. The barrel is air-cooled. There are arrangements for single and continuous firing. It is claimed that the weapon functions reliably both in firing upwards and downwards and that its functioning cannot be obstructed by sand or dust. It can be completely dismantled and put together without the use of tools.

Thorough tests made with the accessory carriage have shown that it satisfies all requirements both for firing at air and ground targets.

The gun can be set up also on a tripod. The aiming device permits elevations ranging from minus 15 to plus 85 degrees. When firing from the tripod the lateral traverse is 360 degrees with or without aiming devices. When firing from the wheeled carriage traverse is limited to 60°. The tripod is fitted with a levelling device.

On motor cars the carriage is transported without wheels and is mounted on a platform. The total weight of the gun is 300 kilograms but it can be taken to pieces for transporting readily by pack animals or men.

The horizontal range is about 5,000 meters. The vertical range about 3,700 meters. For firing at airplanes high explosive shells which burst into very small fragments upon impact are used. To prevent shells which have failed to hit a target from bursting when hitting the ground they carry a time fuse which causes them to burst after a certain time has elapsed.

It is claimed that this gun is very accurate and that at a range of 1,000 meters the average dispersion in firing single shots amounts to only 80 x 70 cm. and in continuous firing to only about 150 x 70 cm.

Antiaircraft Targets

CONSIDERABLE investigation and study with a view to utilizing rocket-propelled gliders and radio-controlled airplanes for antiaircraft artillery targets has recently been made. This has indicated that we can look for progress in the manufacture, stabilization and operation of rockets propelled by the discharge of incandescent gas. It is well within reasonable expectation that such a rocket will furnish a practicable antiaircraft target.

The desirable military characteristics of an antiaircraft target are:

a. It should be able to attain and maintain for 10 minutes an altitude of at least 12,000 feet.

b. It should be capable of a speed of at least 200 miles per hour.

c. It should be susceptible of such control, under fire, as will cause it to simulate the maneuvers which may be expected of a loaded hostile bombing plane.

d. It should be visible to the unaided human eye at a range of 25,000 feet.

e. The cost should not be so great as to preclude intentional destruction by antiaircraft fire.

f. Provision should be made for the recapture or salvage of the target upon its return to earth.

Definite action has been taken to push to completion the development of an antiaircraft target embodying the characteristics listed above and to give serious consideration to rocket construction.

The employment of a radio-controlled airplane as an antiaircraft target was found to be not feasible in view of its excessive cost. The Air Corps Board estimated that the probable cost of each target of this type would be between $11,000 and $18,000.

Searchlight Demonstrations

IN AN effort to increase further the good relations existing between the Army and civilian communities, many requests from civic activities to furnish searchlights for lighting and demonstration purposes have been approved. Some difficulty has been met in using these lights to their maximum advantage at celebrations of this type. The difficulties encountered have been due to the essential requirements that the light furnished must be so diffused that all elements to be illuminated will be shown to their best advantage and no spectator will be placed in a glare.

Successful night demonstrations have been held in many places both in this and foreign countries. Searchlights will be used more in the future for non-military purposes and the good will normally created by their use will justify their expanding non-military use. An interesting and instructive article entitled "Tattoo Searchlighting," by Lt. R. B. Muir, appeared in the June, 1937, number of the *Royal Engineers Journal*. This article points out that searchlights used for non-military purposes are becoming "more ambitious, more commercialized, more of a business." It contains a detailed and interesting discussion of the use of searchlights for this purpose and outlines a plan for their use to maximum advantage with the minimum of cost and difficulty. Battery commanders will find Lt. Muir's article most timely.

Air War and the Civilian

DR. L. HADEN GUEST, M.C., late medical instructor, Air Raid Precautions, British Home Office, predicts that the next war will have for every citizen

of London and other great cities a significance beyond any precedent. He states that cities will be attacked from the air and attacked in all likelihood with gas in spite of international conventions prohibiting it. Great structural damage is inevitable he believes, but the military effect of the attacks will depend on whether or not they destroy the morale of the population; and that will depend in its turn on how far the population had faced the danger in advance both mentally and materially. He advocates provisions for protection through gas masks, decontamination and fire-extinction equipment. He believes these provisions to be the business of the Government and local authorities. He states that thought should be given now to the strengthening of all buildings and their preparation to resist air attack both by means of high explosives and gas. With all these difficulties, great administrative problems and great expenditure of public funds are unavoidable, but if the difficulties are faced the civilian population can be made safe against gas and to a large extent safe against high explosives except in the case of a direct hit. He stressed the point that it was the first duty of the individual to avoid either exaggerating or under-estimating the possible danger. He concludes that a passive nonaggressive defense is essential in itself and that it has the advantage of making the success of surprise attacks of hostile aircraft doubtful and very much less likely, for an enemy who realizes that effective protective measures have been taken will think longer before he risks his bomber and invites counter-attack.

Barrage Balloons

THERE HAS BEEN considerable discussion of late drawing attention to the use of barrage balloons as a means of air defense. This method is described as quite novel and new, but it is not, for it was used during the World War in France, England, and Italy.

The February, 1923, issue of The COAST ARTILLERY JOURNAL contained an interesting translation entitled "Ideas on Antiaircraft Defense," by G. Fontaine, *Chef d'Escadron d'Artillerie,* Chief of the Bureau of Antiaircraft Defense of the French Army Air Service. The article describes this means of defense as a passive one, the direct purpose of which is to obstruct approach routes. One of the methods discussed was that utilized for the defense of London. In this case each element of the barrage net was composed of three balloons, each of 1,000 cubic meter capacity, supporting between them metallic cables from which were suspended smaller cables maintained in a vertical position by sacks of sand attached to their lower extremities. These balloons were approximately 500 yards apart. The vertical cables had lengths of 350 yards. In this manner a net of 1,000 yards in length and 350 yards in height was maintained. Also a description was given of what was termed the most practical process; a method of using balloons which did not offer any obstruction to aircraft except their own retaining cables. The Italians used this system in the defense of Venice. Barrage balloons also were employed in the defense of Paris, Nancy, and other important points in France.

The British Government has apparently completed preparations for utilizing this means of defense as an item of first priority. It is especially interesting to note that they do not consider barrage balloons a passive means but an active one.

Air Commander L. E. O. Charlton in the January 28, 1937, number of the *United Services Review,* in his article entitled "Air Defense of the Future" says that the much advertised balloon barrage even though bringing joy to the cable manufacturers and fabric merchants has its limitations. He contends that although they might deny a substantial section of the sky to the hostile bomber that these balloons will have to be miniature airships in size for real efficacy. Moreover, if filled with hydrogen they are especially vulnerable and will be readily brought down in flames. He contends further that the attacker of these balloons while at work can depend on a measure of immunity, for aerial combat will hardly be practical in their immediate vicinity, and for the same reason neither will the antiaircraft batteries be able to open fire. He predicts that if the balloon barrage succeeds in obtaining a really high ceiling it will eventually spur the development of city-bombing from the sub-stratosphere, thereby vastly increasing the overhead area necessary for planes.

Commander Charlton's views are quite pessimistic, and maybe he sees only the disadvantages of using barrage balloons. The World War use of this means of defense indicates that it is a valuable one and seems to justify its employment in the future.

Battery E, 243d C.A. (HD) Wins Trophy

BATTERY "E," 243d C.A. (HD), Westerly, R. I., was recently awarded the Governor's Trophy as the battery of the Rhode Island National Guard having the best target practice during 1936.

Battery "E" is commanded by Captain Elvin J. Andrews. The range officer was Lieutenant Francis N. Spry, the executive officer Lieutenant Elmer R. Sherman, the gun commander Sergeant George R. Baton, the plotter Sergeant Frederick O. Roever and the assistant range officer was Sergeant Henry Yurrisi.

Battery "E" fired Battery Barlow, equipped with 10" gun, (DC) at Fort Wright, New York, at an average range of 13,650 yards and obtained a score of 110. The ranging shot method was used for trial fire. The center of impact of the trial shots for range was plus twenty-eight yards; for direction nine yards. The center of impact of the record shots was minus twenty-five yards for range; for direction seven yards. The last shot of the practice was practically a direct hit. The rate of fire was one shot per gun per minute, no attempt being made to speed up the normal rate of fire.

The excellent results attained by Battery "E" were due to thorough training, careful preparation of fire, accurate range finding, uniform ramming, accurate sporting and absence of personnel errors.

Open Forum

The Usefulness of Air Power

Sir:

DR. IRVINE'S recent discussion on air power is, in the words of Mark Twain, "one of the finest things of its kind, *in a way*, that we have recently encountered." Unfortunately his fine, academic article has as little chance of affecting the future use or "misuse" of air power as a mushroom has of pushing its head through a concrete pavement. Wisdom or no wisdom, the professional soldier may as well conclude that bombing of open towns and civilians will be an essential part of the next *grande guerre*. The daily occurrences of the civil war in Spain may not embarrass Dr. Irvine in his view of the military wisdom of such steps, but they clearly reveal the trend of the times.

There are two rather startling weaknesses in Dr. Irvine's otherwise admirable study. The first, is his failure to take in account the justifiable character of an air attack which aims at forcing the enemy to disperse and use up his military resources in counter measures. The second is that the author forgets that the next great war will be a struggle between irreconcilable philosophies of life. Such a conflict, will be waged *à outrance* from the start, and "moral indignation" or "moral opprobrium" will be just so many rather silly words. Everyone will have the issues settled in his mind before the first bomb is dropped, so that charges and counter-charges will be wasted breath.

Let me develop the first thought. The German air attacks on England clearly showed that although the moral effect on the English people was slight, great military advantages were gained by the Germans. The spearhead of the attack was *Kampfgeschwader* No. 3, which never numbered more than thirty planes. The largest number of bombers to set out for England prior to the last great raid on May 19-20,1918, was twenty-seven. The threat of this small force, however, caused the British government on two occasions to withdraw fighting squadrons from France. It caused England to form three first-class fighting squadrons at home and to make immense increases in antiaircraft matériel and personnel. A small German squadron tied down ten times its own number of fighting airplanes. Moreover, the raids had a marked effect on the output of munitions. As high as 75% of the munitions workers in areas warned of an attack ceased work. The output remained below normal for an average of 24 hours *after* a raid. So it appears that the British have come to regard the air attacks of the Germans as justified from a military point of view. With very limited resources the Germans attained large scale military results. The cream of the jest would be, however, to have some zealot break into the column in a month or two with the startling news that Dr. Irvine was right after all—the Germans did lose the war.

Now a word about the new Armageddon. One can accept the fact that in a war between totalitarian states no useful weapon will be overlooked. Military men charged with responsible commands must not only study the rapidly changing styles of their profession, but they would do well to keep a weather eye cocked on the political history of the day. Europe is rapidly dividing into two camps with irreconcilable differences of opinion as to the nature and function of a state. These views are taking on the form of a new religion which is systematically ground into the citizens from childhood up. When the rival systems clash, one must expect all the fanaticism and horror of another Thirty Years' War. In such a struggle, right will be merely a question of geography. More than ever before will the whole energy of nations be expended in an effort to crush the adversary. Mass executions of civilians from the sky will in all probability be regarded as justifiable, since you cannot convert a communist—or a fascist, for that matter.

The new warfare of mass fanaticism will raise jolly hell with a lot of highly-touted military views. Not only will Dr. Irvine find his views more obsolete than they are already shown to be, but a number of other military prophets will have to fold their tents like the well-known Arabs and silently steal away. General Fuller, with his creed of the end of the mass army, Captain Liddell-Hart, with all his tanks and hurry-up, may well be acutely embarrassed before the slow, bitter attrition of masses locked in a new religious war. After the tanks, gas, and planes have had their innings, the side which has studied old von Schlieffen the most carefully may well be the winner. Wouldn't that be a first-class celestial joke to pull on the learned writers and critics? THERSITES.

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.

SECTION I

Projects Completed Since the Last Issue of The Journal

PROJECT NO. 953—RADIO-CONTROLLED HIGH-SPEED TARGET.—The final tests on this target were completed during the month of May. The non-synchronous control system constructed by the Board was tested by using as transmitting stations, an observation airplane, an attack type airplane, and the mine planter *Schofield*. The non-synchronous system was found to operate successfully and to have eliminated the difficulties which interfered with the synchronous system previously used. Immediately after the completion of the tests, the engine of the boat was disassembled and thoroughly overhauled so as to place the target in condition for further operation in connection with tracking tests and firings soon to be held and in which a new seacoast gun data computor, the T5, is to be used. The writing of the final report on this project marked the end of a prolonged series of delays most of which were due to power plant troubles and not to difficulties in developing the radio control apparatus. The Board concluded in its report that the practicability of the target and the radio control system had been demonstrated satisfactorily. It was recommended that the development and procurement of such targets be continued, the next step in the development being the procurement of a commercial speedboat of standard design and the remodelling of certain parts of the control apparatus in order to establish a standard pattern which will be applicable to a type of boat that is procurable from commercial sources.

Modified field jacket.
Left: *Slash pocket model.* Right: *Bellows pocket model.*

PROJECT NO. 1079—MODIFIED FIELD JACKETS.—In the final report on this project, the Board recommended that the length of the jacket with slash pockets be increased slightly and that the modified garment be adopted as standard for use in lieu of the woolen coat which is at present authorized to be taken into the field. Corresponding changes in tables of basic allowances and in AR 600-40 (Wearing of the Uniform) were also recommended.

PROJECT NO. 1092—CHAMBER SPONGE, T4E2.—Several attempts have been made to design a lighter chamber sponge for the twelve- and fourteen-inch cannon. The T4E2 type of chamber sponge is the latest

of these designs. In this design, the sponge head is entirely of metal and consists principally of four flexible steel fingers, each carrying a metal extension with steel bristles which are intended to grip a wrapping of burlap or waste soaked in swabbing solution. The weight of the T4E2 sponge was but slightly less than the weight of the standard type of sponge head. Tests demonstrated that the T4E2 had considerably less swabbing efficiency than the T3 type of sponge which was tested under Project No. 945 during the year 1933. The T3 sponge has a greater brush area than the T4E2 and because of its tapered shape is easier to insert in the breech opening. Also the T3 does not push burning particles ahead of it but pinches them against the wall of the powder chamber until quenched by the swabbing solution. The Board recommended against adoption of the T4E2 but in favor of developing a design similar to the T3 sponge.

PROJECT NO. 1093—FUZE SETTERS M5 AND M6, ELIMINATION OF LOCKING MECHANISMS.—An M5 fuze setter was modified by removing the parts, about forty in number, which performed the function of locking the round in the fuze setter until completion of the setting operation. The tests which were conducted included the firing of forty rounds. Though some malfunctions occurred, they were of minor nature, easily corrected by the gun crew. In no instance was it necessary to dismantle the fuze setter nor did any round stick in the fuze setter. It appears that the functioning of the modified fuze setter can be further improved and its mechanism greatly simplified by removing all of the parts which now serve to lock and unlock the setting handwheel at the proper stages and by substituting a manually operated latch to be operated by No. 5 of the gun section after the round has been inserted in the fuze setter.

SECTION II

Projects Under Consideration

PROJECT NO. 1088—ANTI-CORROSIVE PAINT FOR SUBMARINE MINE CASES.—Preliminary reports on the six-months test on use of modern ship paint for mine cases indicate some improvement over present standards. The galvanized surface of mine cases provides in itself a high resistance to corrosion but it also tends to resist paint. Extreme care has to be used in brushing in the primer coat. Despite precautions taken in cleaning the galvanized surface and applying the primer, most of the primers exhibited tendencies to blister. Some of this blistering appeared to be due to insufficient drying of the paint and indicated that manufacturers should specify longer drying periods in humid climates. Fouling of mine cases by marine growths does not appear to be sufficient to warrant the use of antifouling paints in temperate climates.

PROJECT NO. 1094—TIME INTERVAL APPARATUS EE-85-T6.—The development and test of a suitable time interval system for mobile artillery has engaged the attention of the Coast Artillery Board several times in recent years, but, so far, no system has fully met the requirements of the service. The design now under test consists of two control units and the necessary "howlers" for the plotting room and emplacements. One of the control units, the time interval apparatus proper, consists of an electric clock which produces one-second electrical impulses. These impulses drive a magnet-type motor which in turn rotates several time interval disks. By connecting to the proper disk, any one or more of the following time intervals may be obtained: one, five, ten, fifteen, twenty, thirty, and forty-five seconds. The chosen time interval is then transmitted electrically to the second control unit called the Line Connector Unit. This unit serves to superimpose the time interval signal as a "tone" on the readers' and observers' telephone lines. A provision is made for staggering the signals of two or three batteries so that the shots or salvos of any one battery, in battle, may be identified. The control units are operated by a single six-volt battery, but each "howler" requires two dry cells. The apparatus was used successfully for several firings and seems to be suitable in principle. Some improvements in sturdiness and reliability are needed.

PROJECT NO. 1096—TIME INTERVAL APPARATUS EE-86-T1.—This equipemnt was designed for use in fixed harbor defenses. It employs several of the principles of the mobile artillery unit described above. The "tone" signal superimposed on the telephone line is, however, considered objectionable in fixed defenses because of the "cross talk" effect in long cables. Bells are therefore retained. Provisions for synchronizing and staggering the bells in several widely separated forts are afforded. This feature, together with a complete modernization of the equipment, is effected in the new design. It is intended that the apparatus be given extended test at Fort Monroe and Fort Story.

PROJECT NO. 1086—POSITION FINDING BY AERIAL OBSERVATION.—A continuance of the tests outlined in the May-June number of THE JOURNAL failed to yield evidence that it was possible to navigate an airplane by dead reckoning well enough to enable the aerial observer to fix his own position and to take instrumental observations on the targets so as to locate the target with the degree of precision desired for artillery fire. Several other methods of accomplishing this task are under consideration. The possibility of using an autogiro for position finding by aerial observation is under study and it is likely that there will be an opportunity, at some time during the fall of the present year or the spring of 1938, to make actual tests of the efficiency of such aircraft in observing for seacoast artillery.

PROJECT NO. 1095—SHOCK ABSORBING DEVICE FOR ANTIAIRCRAFT DIRECTORS.—At the request of the Chief of Coast Artillery, the Ordnance Department has designed and built a shock absorbing platform for directors of the M3 and M4 types. This device, which is built up from angle irons, consists of two superimposed rectangu-

lar frames. The director is clamped in the upper rectangle and the lower rectangle is bolted to the floor of a truck body. The two frames are fastened together by means of four rubber mountings which are designed to absorb the road shocks and the shocks due to acceleration and deceleration of the truck. One of these devices has been furnished the Coast Artillery Board for test with a T8 director.

SECTION III
Miscellaneous

SPOTTING AND RANGE ADJUSTMENT FOR ANTIAIRCRAFT GUNS. — Captain Grayson Schmidt, Coast Artillery Corps, submitted for consideration a new and most ingenious method of spotting and range adjustment for antiaircraft guns. The proposed method, designed to replace the angular unit method of adjustment, will give precise results regardless of the lateral deviation of a burst. (Under certain conditions, spotting by the angular unit method will give inaccurate results if the bursts do not occur on or close to the line of position). Briefly, the proposed method requires that the azimuth of the target, from both battery and flank positions, and the lateral deviations of the burst, as seen at both battery and flank positions be measured. (These deviations are measured in the slant plane: base line—target.) These data are combined by means of nomogram or mechanical device containing cams, differentials, and other mechanisms, and the proper altitude correction, expressed in per cent of the altitude, is obtained. The Board concluded that the proposed method was feasible but that, since the lateral deviations of the opening rounds of the average target practice are usually small, it would be an unnecessary refinement to consider the range effect of these lateral deviations. Furthermore, the proposed method requires either additional, complicated, equipment or a complicated method of solution by means of a nomogram. The occurrence of personnel errors is quite likely in the latter method.

GUNNER'S QUADRANTS M1918.—The Board was called upon for comment on whether or not gunner's quadrants should be issued to all antiaircraft gun batteries. At the present time Ordnance Department Standard Nomenclature Lists do not provide for the issue of these articles to antiaircraft batteries, except those manning M1918 guns. It is understood that such allowances were omitted for the more modern guns under the assumption that the elevation setting of gun and director could be brought together by bore sighting. The Board recommended that the gunner's quadrant be issued to all gun batteries, since its use was considered essential for the following purposes:

To check and adjust the elevation indicators when a clinometer is not available.

To recheck and adjust the elevation indicators in the event that bore sighting shows they do not agree with the director.

To check the elevation of the gun after it is loaded for firing a trial shot.

To lay the gun in elevation when firing trial shots from guns equipped for Case 1½ pointing.

METHOD OF ALTITUDE DETERMINATION.—Captain J. E. Reierson, Coast Artillery Corps, submitted for consideration a method of determining target altitudes for antiaircraft gun batteries. In this method, two A.A., BC telescopes and a plotting board are to be employed to determine altitudes in a manner similar to the plotting board method of analyzing gun target practices. Captain Reierson claims extreme accuracy (maximum error of 0.125%) for the plotting board solution and proposes that the method be employed for only two or three readings at the beginning of each course in order to determine, by comparison of results, the correction "for the moment" to be applied to the height finder or altimeter readings during the remainder of the course. The Board concluded that use of the proposed method during service practices or in action was inadvisable because it would be slow in operation, it could operate over only a limited portion of the field of fire, and it is doubtful whether the method possesses the accuracy claimed for it. The Board believed that the proposed method has some value during the training period since it provides an independent means of verifying the results obtained by height finder or altimeter observers.

BOAT TELEPHONE, FOR SUBMARINE MINING.—The Coast Artillery Board recently made a comparative test of the standard boat telephone, Model 1917, and a model of the recently perfected "sound-powered" or "batteryless" telephone. The "sound-powered" telephone proved to be much superior to the present standard boat telephone. Communication, over fourteen miles of single conductor mine cable with ground return, by means of the sound-powered equipment was comparable with the clarity and volume of commercial telephone service. On the other hand, conversation by means of the standard model 1917 set, over the same length of cable, was barely audible or understandable. The sound-powered telephone has an added and distinct advantage over the present hand-set in that it is not only moisture-proof but waterproof for a limited time. Present plans contemplate retaining the signaling mechanism of the Model 1917 boat telephone set but substituting sound-powered handsets as replacements for unserviceable Model 1917 handsets.

ANTIAIRCRAFT SEARCHLIGHT MODIFICATIONS. — Recently received reports, on antiaircraft searchlight target practices in which blackened airplanes were used, contained a number of comments on the performance of the matériel. The higher speed and diminished visibility of the targets imposed on the matériel a more severe test than has heretofore been experienced. Exceptional quickness in making the transition from searching to carrying operations was required. Also difficulty was experienced in carrying the blackened airplane when there was only one searchlight on target. It was brought out that the drop in voltage at the instant of striking the arc weakened

the power of the distant electrical control motors to such an extent that synchronism between the searchlight and the binoculars was lost. This loss of synchronism was particularly apt to occur when the controls were being moved rapidly at the time, or immediately after, the arc was struck. The difficulty can be partly overcome by taking care not to start searching with the oscillating search handwheel until after the voltage has stabilized. Another expedient, and one which incurs less chance of losing pickups, is to refrain from using the oscillator handwheel entirely. Instead, the azimuth and angular height matching operators make the search by unmatching their pointers by predetermined amounts above and below the readings of the comparator dials. A similar result can be obtained mechanically by readjusting the oscillator search mechanism so as to change the pattern of search and reduce the speed of search. This readjustment should be performed only by maintenance representatives from the Corps of Engineers. The Board was asked to comment upon several schemes for modification of the searchlight equipment intended to afford a permanent remedy for the loss of synchronization. One of these schemes can be applied to matériel already in service. It consists, essentially, in the installation of a separate cable from the generator to the distant electrical control motors. By this expedient the line drop in the searchlight power cable is obviated and the voltage at the distant electrical control motors is made substantially equal to that of the generator. A new system of cabling and data transmission has been favored by the Board for application to new equipment to be manufactured in future. By this system, greater flexibility in locating the relative positions of the searchlight, power plant, comparator, and sound locator are permitted. The data transmission method is altered somewhat so that the comparator will no longer indicate the angular height and azimuth of searchlight and sound locator. Instead a zero reader at the comparator will indicate whether or not the searchlight is matched to the sound locator. If not matched, the distant electric control operators at the comparator use their handwheels until a match is secured. The search is conducted semi-automatically, but at a slower and more gradual rate than with the present oscillator mechanism. With this arrangement, the sound locator and searchlight cannot get out of orientation with respect to each other. It is possible, however, for the binoculars to get out of orientation but a slipping clutch for quickly bringing the binoculars into the beam is to be provided to offset this comparatively minor disadvantage. One of the principal advantages of this modification is expected to be the flexibility permitted in locating the positions of the elements of the searchlight section. At present, the fixed cable lengths provided have to be employed in order to secure proper electrical operation. While longer or shorter cables may be arranged for, they should be used only after the electrical elements of the system have been readjusted by a maintenance representative of the Corps of Engineers. Experience, as stated in the reports of target practice, indicated that it may be desirable to separate the searchlight from the comparator by distances greater than those now permitted by the standard cable lengths. This will be feasible with the modified equipment proposed for manufacture.

Emergency Systems of Fire Control for Antiaircraft Guns.—During the past year the Board has devoted considerable time to studying the possibility of devising what may be called an emergency system of fire control for antiaircraft guns. The need for expedients which would enable the battery to continue firing when the data computor is disabled has been apparent for some time. The solution usually advised is to "put sights on the guns." For several reasons, this expedient lacks much of being a complete solution of the problem. The Board, in its study, began by defining and classifying the various conceivable emergencies. Possible remedies for each such situation were then canvassed to determine the most suitable. In thus analyzing the situation, the Board found that the providing of gun sights held but little prospect for simplifying or cheapening the cost of antiaircraft fire control equipment. The provision of four sets of sights and sight mounts for each antiaircraft battery would cost a sum estimated to be as great as, or greater than, the cost of a duplicate set of the present standard type of fire control equipment. In view of these circumstances it seems desirable to seek some other expedient which will serve, at least, for the more frequently occurring emergencies. From experience and from study of target practice reports, the Board estimated that the data transmission system is probably the least fragile and most easily repaired element of the fire control system. Furthermore transmission of data by telephone, even for Case III firing, offers possibilities which can be utilized at small extra cost. The Board therefore recommended that the tests be conducted to determine the possibility of employing a very simple type of tracker or "master sight" which could be employed to track the target and transmit to the guns the present angular height and present azimuth of the target corrected by the vertical and lateral deflection angles, respectively, and superelevation. This instrument is also to compute and transmit fuze range to the fuze setter. A simple graphical lead computor can be devised to furnish the deflection angles or, at worst, they can be estimated. The standard data transmission system is to be used as long as possible, but, in the event of a breakdown, data is to be transmitted by telephone. The cost of such a system is estimated at only a fraction of the cost of providing four equally effective sets of sights or of providing a complete spare set of standard equipment. The Board has been directed to conduct a test of this system in the near future.

Coast Artillery Orders

(Covering the Period May 1 to June 30, 1937)

Colonel Earl Biscoe, from Hawaii, to 1st C. A. Dist. Boston.

Colonel H. E. Cloke, retired, May 31.

Colonel R. W. Collins, from Fort H. G. Wright, to Chicago, revoked.

Colonel H. C. Merriam, from Inspector General's Dept., Wash., D. C., to Hawaii, sailing San Francisco, October 1.

Colonel F. H. Smith, from member of General Staff Corps, from General Staff with troops and from Chief of Staff of the Panama Canal Dept. Previous orders revoked.

Colonel H. F. Spurgin, from Fort Monroe, to office Chief of Coast Artillery, Wash., D. C.

Colonel W. K. Wilson (CAC) General Staff Corps, appointed Brigadier General May 7.

Lieutenant Colonel Franklin Babcock to Inspector General's Dept. June 23. Previous orders amended.

Lieutenant Colonel H. C. Davis, Jr., from Hawaii, to 6th, Fort Winfield Scott.

Lieutenant Colonel W. D. Frazer, from Fort Worden, to Hawaii, sailing San Francisco, Nov. 13.

Lieutenant Colonel F. E. Gross, from duty as Coast Artillery representative, Aberdeen Proving Ground, Md., to Hawaii, sailing New York, September 11.

Lieutenant Colonel W. W. Hicks promoted Colonel June 1.

Lieutenant Colonel C. E. Hocker, from Hawaii to instructor, C. & G. S. School. Previous orders revoked.

Lieutenant Colonel J. B. Maynard, from Hawaii, to 11th, Fort H. G. Wright.

Lieutenant Colonel G. F. Moore, from Fort Monroe, to Agric. & Mech. College of Texas, College Station.

Lieutenant Colonel O. G. Pitz, from the Philippines, to 69th, Fort Crockett.

Lieutenant Colonel O. H. Schrader, from Univ. of Pittsburgh, to 8th, Fort Preble.

Lieutenant Colonel C. M. S. Skene, from office Chief of Coast Artillery, Washington, D. C., to Hawaii, sailing New York, October 20.

Lieutenant Colonel E. B. Walker promoted Colonel June 1.

Major C. E. Atkinson, from Hawaii, to 52d, Fort Monroe.

Major E. L. Barr, from Redding, Calif., to recruiting duty, Fort Slocum, N. Y.

Major H. P. Detwiler, from Panama to 63d, Fort MacArthur.

Major W. H. Donaldson, Jr., from Hawaii, to General Staff with troops, Seventh Corps Area, Omaha.

Major D. B. Greenwood, from Panama, to Detroit High School, Detroit.

Major F. H. Hastings, from student, Army Industrial College, Washington, D. C. to the office of The Adjutant General, Washington, D. C. Previous orders revoked.

Major Milton Heilfron, from Hawaii, to Mississippi State College, State College, Miss.

Major L. A. Hudgins, from Panama, to 8th, Fort Preble.

Major Kenneth McCatty, from student C. & G. S. School, to instructor, C.A. Mo. N.G., Carthage.

Major Maurice Morgan, from the Philippines, to 6th, Fort Winfield Scott.

Major G. M. O'Connell, from Fort Winfield Scott, to Panama, sailing November 2.

Major M. H. Parsons, from the Philippines, to 14th, Fort Worden.

Major W. S. Phillips, from Hawaii, to Va. Polytechnic Institute, Blacksburg.

Major P. W. Rutledge, from Richmond, to instructor, So. Car. N. G., Columbia, S. C.

Major A. W. Waldron, from Fort Preble, to recruiting duty, Fort Slocum.

Captain H. S. Aldrich, from Fort MacArthur, to Kansas State College, Manhattan.

Captain G. W. Ames, from Hawaii, to University of Washington, Seattle.

Captain D. J. Bailey, from the Philippines, to 62d, Fort Totten.

Captain R. E. Bates, from the Philippines, to Utah State Agric. College, Logan.

Captain G. C. Bunting, from Fort Totten, to Utah State Agric. College, Logan.

Captain J. B. Carroll, from Fort Totten, to duty on U.S.A.M.P. *Joseph Henry*, Fort Hancock.

Captain G. A. Chester, from student, C. A. School, to instructor, C.A. School. Previous orders revoked.

Captain R. W. Crichlow, Jr., from student, C. & G. S. School, to instructor, Washington National Guard, Camp Murray.

Captain J. V. deP. Dillon, from student, Georgetown University, to student in the Dept. of Justice, June 30.

Captain H. P. Gard, from student, C.A. School, to Hawaii, sailing New York, August 13.

Captain E. M. Gregory, from Univ. of Washington, Seattle, to 62d, Fort Totten.

Captain M. A. Hatch, from Fort Barrancas, to Panama, sailing New York, September 25.

Captain G. F. Heaney, Jr., from Fort Winfield Scott, to Hawaii, sailing San Francisco, October 1.

Captain David Hottenstein, from student George Washington Univ., to student in the Dept. of Justice, June 30.

Captain W. Q. Jeffords, Jr., promoted Major April 1.

Captain F. R. Keeler, from Hawaii, to 6th, Fort Winfield Scott.

Captain E. W. King promoted Major April 1.

Captain R. E. McGarraugh promoted Major April 29.

Captain J. M. Moore, from Panama, to 11th, Fort H. G. Wright.

Captain O. A. Nelson, from Fort Totten, to Panama, sailing New York, September 25.

Captain G. F. Nichols, assigned commanding officer, U.S.A.M.P. *Ellery W. Niles* in addition to his other duties at Fort DuPont, Del.

Captain G. A. Patrick promoted Major April 1.

Captain H. C. Reuter, from Fort Stevens, to Submarine Mine Depot, Fort Monroe.

Captain M. M. Santos, from student, C. & G. S. School, to the Philippines.

Captain P. C. Sevilla, from student, C. & G. S. School, to the Philippines.

Captain J. P. Shumate, from Panama, to 13th, Fort Barrancas.

Captain L. S. Smith, from student, C. & G. S. School, to Adjutant General's Dept., Chicago.

Captain P. McC. Smith, from Panama, to 52d, Fort Monroe.

Captain H. E. Strickland, from Panama, to Univ. of Cincinnati.

Captain M. W. Tracy, from Fort Monroe, to Hawaii, sailing New York, October 20.

Captain C. B. Wahle, from Fort Sheridan, to Panama, sailing New York, September 25.

Captain T. L. Waters, from Fort H. G. Wright, to Univ. of Delaware, Newark.

Captain F. M. Wilson, retired, upon his own application, September 30.

Captain C. P. Young, from Fort MacArthur, to Mississippi State College, Miss.

First Lieutenant Edward Bodeau, from Springfield Armory, Mass., to student, Ordnance School, Watertown Arsenal.

First Lieutenant C. J. Bondley, Jr., from Panama, to Air Corps Training Center, Randolph Field, for flying training, October 1.

First Lieutenant L. A. Bosworth, from student, Ordnance School, Aberdeen Proving Ground, to Watervliet Arsenal, N. Y.

First Lieutenant G. R. Carey, from Hawaii, to 6th, Fort Winfield Scott.

First Lieutenant E. W. Chamberlain promoted Captain June 14.

First Lieutenant Erskine Clark, from Hawaii, to 6th, Fort Winfield Scott.

First Lieutenant F. P. Corbin, Jr., from student, C.A. School, to 52d, Fort Monroe.

First Lieutenant F. E. Day promoted Captain June 14.

First Lieutenant M. K. Deichelmann promoted Captain June 14.

First Lieutenant C. E. Dunham promoted Captain June 14.

First Lieutenant P. W. Edwards promoted Captain June 14.

First Lieutenant T. deN. Flynn, from Panama, to 14th, Fort Worden.

First Lieutenant A. D. Gough, from student, C.A. School, to 2d, Fort Monroe.

First Lieutenant E. G. Griffith, from student, C.A. School, to U.S.M.A., West Point.

First Lieutenant E. W. Hiddleston, from Fort Monroe, to the Philippines, sailing New York, January 6.

First Lieutenant J. J. Holst promoted Captain June 14.

First Lieutenant M. M. Irvine, from student, C.A. School, to student, Mass. Inst. of Technology, Cambridge.

First Lieutenant V. M. Kimm promoted Captain June 14.

First Lieutenant J. H. Kochevar promoted Captain June 14.

First Lieutenant O. H. Kyster, Jr., promoted Captain June 14.

First Lieutenant P. A. Leahy, retired, June 30.

First Lieutenant A. J. Lepping promoted Captain June 14.

First Lieutenant R. W. Moore, from Fort Sheridan, to student, C.A. School, revoked.

First Lieutenant G. F. Peirce promoted Captain June 14.

First Lieutenant A. C. Peterson, from student C.A. School, to 51st, Fort Monroe.

First Lieutenant J. R. Lovell promoted Captain June 14.

First Lieutenant N. A. McLamb promoted Captain June 14.

First Lieutenant W. L. McNamee promoted Captain June 14.

First Lieutenant M. L. Ogden, from Hawaii, to 51st, Fort Monroe.

First Lieutenant F. T. Ostenberg promoted Captain June 14.

First Lieutenant Arthur Roth promoted Captain June 14.

First Lieutenant Peter Schmick, from student, C.A. School, to 52d, Fort Monroe.

First Lieutenant L. E. Shaw, from Hawaii, to 3d, Fort Stevens.

First Lieutenant W. M. Skidmore, from Ordnance Dept., Ordnance School, Aberdeen Proving Ground, to student, C.A. School. Previous orders revoked.

First Lieutenant A. R. Thomas, from the Philippines, to 13th, Fort Barrancas.

First Lieutenant M. R. Thompson, from Panama, to 61st, Fort Sheridan.

First Lieutenant L. E. Shaw, promoted Captain June 14.

First Lieutenant H. F. Townsend promoted Captain June 14.

First Lieutenant N. B. Wilson, from student, C.A. School, to Hawaii, sailing New York, August 4.

First Lieutenant J. T. Wrean promoted Captain June 14.

Second Lieutenant C. L. Andrews promoted First Lieutenant June 12.

Second Lieutenant J. O. Baker, Ordnance Dept. promoted First Lieutenant June 12.

Second Lieutenant L. K. Beazley promoted First Lieutenant June 12.

Second Lieutenant S. R. Beyma promoted First Lieutenant June 12.

Second Lieutenant J. M. Donohue, from Fort H. G. Wright, to Hawaii, sailing New York, October 20.

Second Lieutenant H. W. Ebel promoted First Lieutenant June 12.

Second Lieutenant R. G. Finkenaur promoted First Lieutenant June 12.

Second Lieutenant S. I. Gilman promoted First Lieutenant June 12.

Second Lieutenant C. W. Hill promoted First Lieutenant June 12.

Second Lieutenant T. F. Hoffman promoted First Lieutenant June 12.

Second Lieutenant L. L. Ingram promoted First Lieutenant June 12.

Second Lieutenant H. J. Jablonsky promoted First Lieutenant June 12.

Second Lieutenant Franklin Kemble, Jr., promoted First Lieutenant June 12.

Second Lieutenant K. R. Kenerick promoted First Lieutenant June 12.

Second Lieutenant W. H. Kinard, Jr., from Fort Winfield Scott, to Hawaii, sailing San Francisco, October 1.

Second Lieutenant G. L. Kushner promoted First Lieutenant June 12.

Second Lieutenant E. W. Moore promoted First Lieutenant June 12.

Second Lieutenant R. R. Moorman promoted First Lieutenant June 12.

Second Lieutenant P. S. Peca promoted First Lieutenant June 12.

Second Lieutenant J. S. Piram promoted First Lieutenant June 12.

Second Lieutenant D. R. Routh promoted First Lieutenant June 12.

Second Lieutenant K. R. Schweidel, from Hawaii, to 62d, Fort Totten.

Second Lieutenant J. J. Stark promoted First Lieutenant June 12.

Second Lieutenant DuV. Stevens, from Hawaii, to 52d, Fort Monroe.

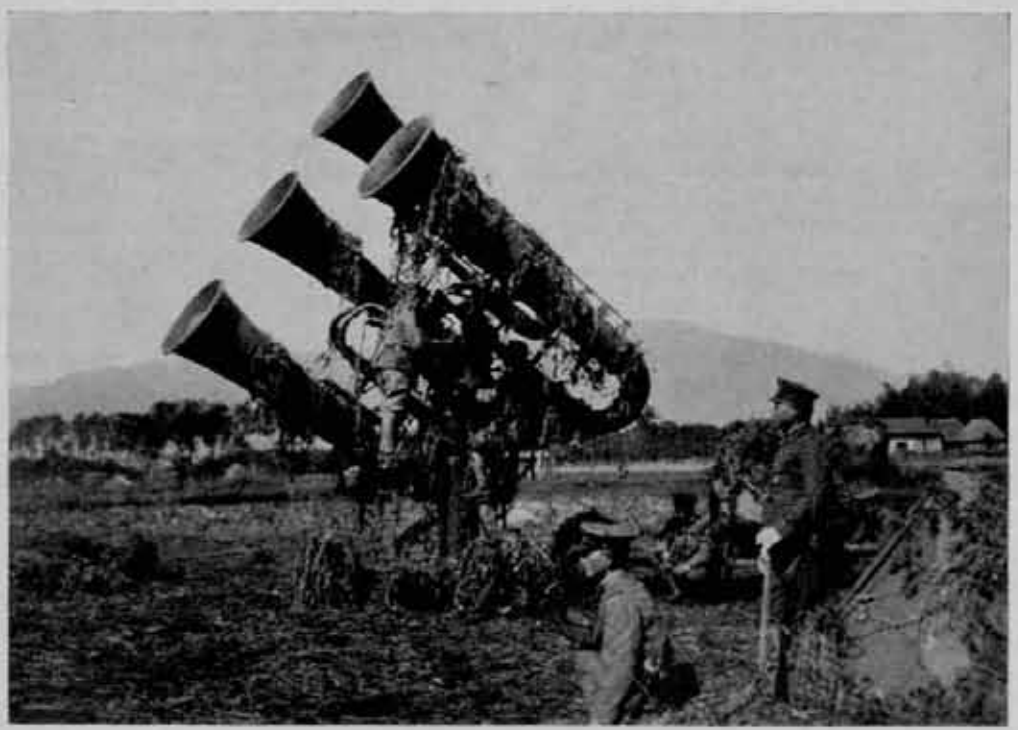
Second Lieutenant A. J. Stuart, Jr., promoted First Lieutenant June 12.

Second Lieutenant H. F. Turner promoted First Lieutenant June 12.

Second Lieutenant W. E. H. Voehl promoted First Lieutenant June 12.

Second Lieutenant G. J. Weitzel promoted First Lieutenant June 12.

Second Lieutenant Y. H. Wolfe promoted First Lieutenant June 12.



Latest type Japanese antiaircraft sound locator.

At the Schools, 1937-1938

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Captain W. L. Weible

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Student

Lt. Col. Robert N. Van Volkenburgh

THE ARMY INDUSTRIAL COLLEGE

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Lt. Col. J. F. Kahle
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THE INFANTRY SCHOOL

Instructor

Major R. E. Turley

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Student

1st Lt. H. H. Irvine

The Contributors

Major CHARLES W. BUNDY, Coast Artillery Corps, returns to the JOURNAL with a contribution on the new standard searchlight unit. We carried a biography of Major Bundy in the March-April, 1937 issue in connection with his article on "Seacoast Fortifications of the Future." That article proved popular abroad as well as at home, for several foreign military magazines reprinted it, in addition to the *Military & Naval Digest*.

Colonel MATTHEW A. CROSS, Coast Artillery Corps, is a graduate of the Military Academy (1904); the Coast Artillery School (1925); the Command and General Staff School (1926); and the Army War College (1927). He is a member of the Initial General Staff Corps Elgible List, and served as a member of the General Staff Corps from 1920 to 1924. All of his service has been in the Coast Artillery Corps, except for a two-year detail in the Ordnance Department.

Colonel Cross is known the length and breadth of the Corps both for his ability as an instructor and his pleasing personality. He is now on duty as executive officer of the Cleveland Military District.

Colonel JAMES H. CUNNINGHAM, C.A.C., fondly known to many of us as "Eh Bien," graduated from West Point in 1908. Has had continuous and varied service in the Coast Artillery Corps. Graduate of Army War College, Command and General Staff School, Coast Artillery School, Advanced Course, and Ecole Supérieure de Guerre. Served with the 61st C.A. (AA) at Fort Monroe, during the 1929 Aberdeen tests, and also at Fort Sheridan. Served four years in Washington on the General Staff prior to joining his new station at Fort Mills where he is now on duty as Commanding Officer of the 60th C.A.

Lieutenant Colonel FRED M. GREEN, Coast Artillery Corps, has given us a second article dealing with early Revolutionary war battles. The first one brought out some points about Lexington and Concord that aren't mentioned in school histories. This one does the same for Bunker Hill.

Colonel Green entered the service in September, 1910. He is an honor graduate of the pre-war Coast Artillery School, and of the Advanced Course, Coast Artillery School, (1924); and of the Command and General Staff School (1925). He was director of the department of engineering of the Coast Artillery School for four years; has served on the Coast Artillery Board, and as artillery inspector of the Coast Artillery Training Center.

The articles he has contributed to the JOURNAL number among them such varied subjects as "The Angular Travel Rule," "Cadet Artillerists," "Effect of the Earth's Rotation Upon the Point of Fall," "The Future of our Minor Armament," "Railway Artillery for Seacoast Defense" (prize essay), and "The Capture of the Baltic Islands." Verse from his pen has appeared in The *Cavalry*, *Field Artillery*, and *Infantry Journals*.

Captain CHARLES T. LANHAM, Infantry, was born in Washington, D. C. in 1902. From the exalted rank of colonel of the Washington High School Cadets he dropped to the lowly status of a plebe at the Military Academy from which he graduated in 1924. He is a graduate of the Company Officers' Course, The Infantry School, and has had service in Panama and on a language detail in France.

He has been a prolific writer since early youth. At West Point he served as literary editor of the *Pointer*. A number of well-known periodicals published his verse during his cadetship and since that time. All told, over 100 magazines, newspapers and anthologies have carried his poetic contributions. He has been a steady contributor to a number of military magazines for some years. He assisted in the edit of *Battle Leadership*, and is a co-author of *Infantry in Battle*.

Captain Lanham's present assignment is with the National Guard Bureau in Washington. In his spare time he entertains himself (and others) by acting as associate editor of *The Infantry Journal*. When these occupations pall, he goes fishing.

EVERETT M. MELSON is a member of the staff of the Bausch & Lomb Optical Company. He spends the larger part of his time in writing scientific and technical articles in language easy on the layman. His current contribution to the JOURNAL bears witness both to his scientific background and his skill with words.

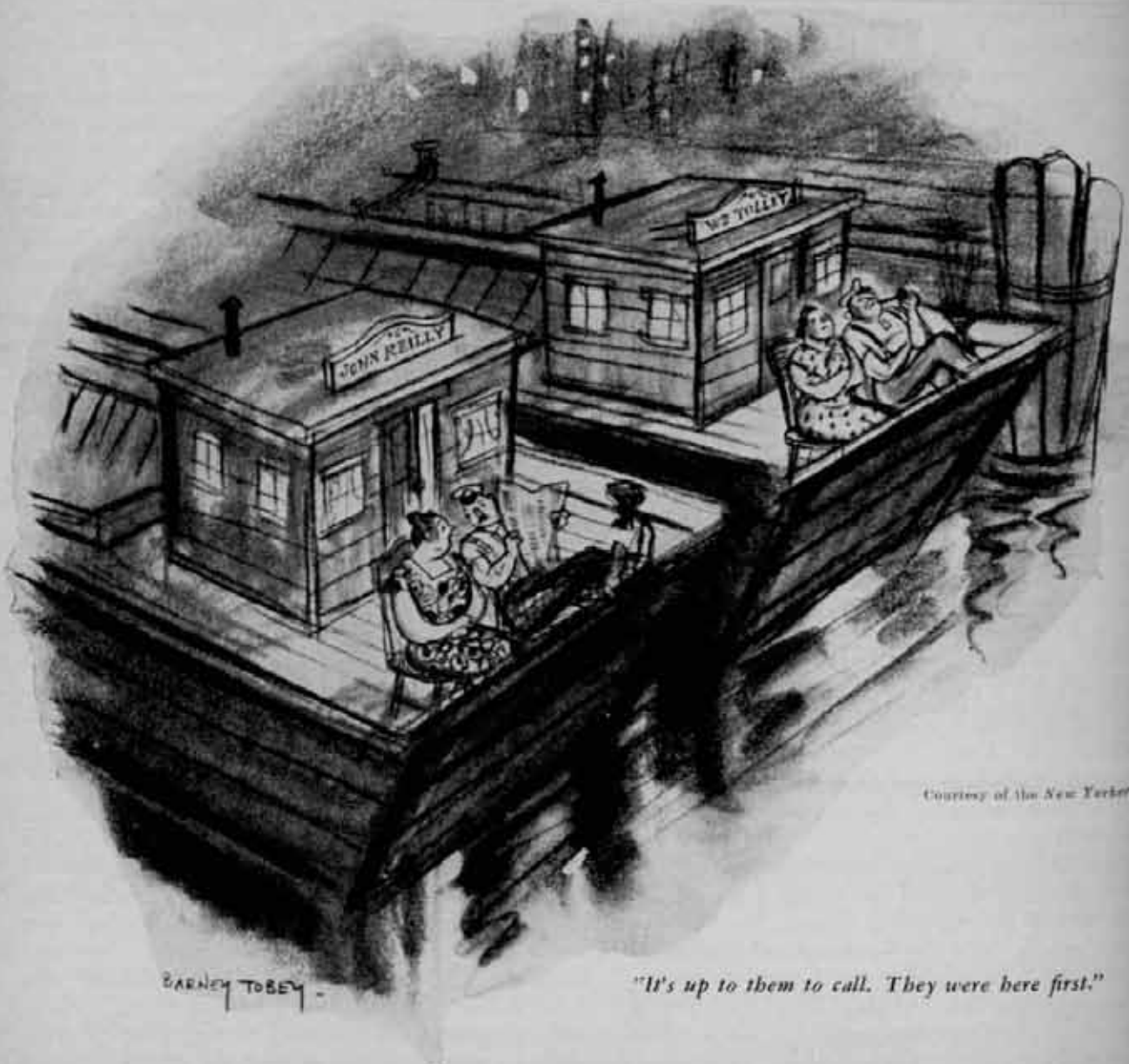
The JOURNAL is probably guilty of sharp practice in publishing Lieutenant Colonel GEORGE L. SIMPSON'S "All-Time Command Team." Here is the story. Colonel Simpson corresponds with a member of The JOURNAL staff. In a recent letter he remarked that he had been amusing himself by picking out an all-time command team. He added that he was enclosing his selections with a line or two of explanation under each name. Well, to make a long story short, we liked his subject and disagreed violently with his selections; you will probably do the

same. We hope so, anyway. But we really must point out that Colonel Simpson had no idea that his evening's amusement was to appear in The JOURNAL. In fact, we haven't even gotten any biographical data on him. However, we do happen to know that he is G-2 of the 32d Division and that he is a graduate of the Command and General Staff School's special course for National Guard and Reserve Officers.

Major BERNARD SMITH, Corps of Engineers will be remembered as the author of "The Fortunate Islands" in the May-June, 1937 issue of the JOURNAL. That number carried a biography of Major Smith.

Colonel THOMAS M. SPAULDING was born in Michigan in 1882. He is a graduate of the University of Michigan and the U. S. Military Academy, class of 1905. He later received the degrees of A.M. from the University of Hawaii (1924), and Litt.D. from the University of Michigan (1932). He served as major, lieutenant colonel (temporary) during the World War. After the war his service was in the Adjutant General's Department. In 1936 he retired upon his own application.

Colonel Spaulding drafted the army reorganization act of 1920. He is the author of numerous magazine articles and notes, several papers on Hawaiian history and over one hundred articles in the *Dictionary of American Biography*, mostly on military men—Chaffee, Cullum, Early, Forrest, and others. The principal Hawaiian papers are: *The Crown Lands of Hawaii, Cabinet Government in Hawaii, The Constitution of the Hawaiian Republic, Early Years of the Hawaiian Legislature, The Adoption of the Hawaiian Alphabet, Chief Justice William Little Lee.* Colonel Spaulding is a member of the American Historical Association, Columbia Historical Society, Hawaiian Historical Society (ex-trustee) the Alumni Advisory Council of the University of Michigan, and the library committee of the Washington Cathedral.



Courtesy of the *New Yorker*

"It's up to them to call. They were here first."

Book Reviews

ARMY WITHOUT BANNERS. By Ernie O'Malley. Boston: Houghton Mifflin Co., 1937. $3.50.

For years young Ernie O'Malley was "on the run," organizing units of the Irish Republican Army and fighting the British. He slept with his pistols tied to his wrist, made a daring trip to London, was wounded and captured. He escaped and lived to hear songs of his exploits, to see Ireland a Free State. But his *Army Without Banners* is not only the exciting story of the adventures of an unusual man, it is another casebook on guerrilla warfare. We have tended to overlook the still timely military lessons of the Irish "Trouble." Finally, here is a sincere account without the English heroine and the other cinema trappings.

After the shrewd self-sacrifice of Easter Week, 1916, the insurgents became a guerrilla force without banners to thrill to, but with very formidable obstacles to overcome. The Irish Republican Army had to fight the motorized and highly disciplined troops of a first-class power just emerging victoriously from the World War. It had to organize, arm and train itself. Moreover, it had to win popular support from its own people.

The single problem of arming and training the I.R.A. was tremendous. There were practically no guns: "In the Tip. battalion we would find ten of our rifles and thirty shotguns opposed to eleven hundred and fifty of the military and police." Sometimes there was "a rifle to about every one hundred and seventy men." Few of the men had ever handled a gun, and ammunition was too valuable to waste at target practice. World War veterans frequently proved liabilities: "they lacked individuality and initiative and looked too much to their N.C.O's for guidance." Such training as there was, principally in scouting and patrolling, had often to be carried on in areas studded with British barracks, and frequently the local population proved indifferent, if not obstructive.

Nevertheless, the I.R.A. carried on a nimble and desperate campaign, paralyzed the civil government, won over the populace, and secured the recognition of Ireland as a Free State. The British inadvertently helped somewhat—their indiscriminate retaliatory measures cost them large sections of public opinion, and generally poured water on blazing oil.

In this affair we see that machinery alone, even superior discipline, training, and numbers cannot always be relied on to crush the operations of small, mobile units of resolute, intelligent men fired by intense devotion to a cause. High morale and flexibility of mind were powerful weapons, and so was familiarity with the terrain. Most of the rebels fought, as it were, in their own backyards. The communications system of an army is its Achilles' heel. But guerrilla troops can frequently establish their base in the sympathies of the people—a base that is almost impregnable. From that point they can work freely against enemy installations and lines of supply.

It may surprise some to learn that the Irish organized with great care and skill; a triumph of their organization was their almost perfect intelligence system. The achievements of the I.R.A. espionage were often amazing. Its ramifications even penetrated to vital spots in London, and its operations were, as always in this type of warfare, of invaluable assistance.

In short, this narrative seems to approve almost in detail the premises which Col. T. E. Lawrence outlined in his article, "Science of Guerrilla Warfare," in the *Encyclopædia Britannica*. The supremacy of individual efficiency over corporate discipline; the values of surprise and dispersion; the necessity of friendly relations with the populace; the fruitfulness of attacks on communications; the vital rôle of military intelligence; these and other doctrines for guerrilla forces, so successfully applied in Arabia, were again applied, and with equal success, in Ireland from 1916 to 1921.

Army Without Banners provides every soldier with food for thought: the kind of warfare described has a long past; some suggest that it has a promising future. And besides that, Ernie O'Malley is a vivid fellow, a fighter with a strong dash of the poet, who was never too busy to take keen note of the psychology of the people, the changes of the seasons, and the beauties of Irish landscapes. Perhaps his impetuosity may be blamed for the occasional and annoying violations of unity in his narration.

✦ ✦ ✦

WAR MEMOIRS OF DAVID LLOYD GEORGE, Vol. VI (1918). Little, Brown and Company. Boston, Mass., 1937. 406 pages. Index, $3.00.

Reviewed by Major General H. D. Todd, Jr., Ret.

With this volume Mr. Lloyd George finishes his recollections of the World War. Literature pertaining to the war has grown to enormous proportions but, almost without exception, it has been written by military men. Here we have a book written by a civilian—one with an exceptionally keen, intelligent and educated mind. Not only that but, what is most important to remember in reading the book, is that Mr. Lloyd George was one of the controlling factors in Great Britain's conduct of the war. He writes as a Minister of the Crown, the "only Minister in

any country who had some share throughout the whole of the War in its direction." The author tells us that he started the craft of writing books in his seventieth year and consequently craves to be judged and ranked as an amateur.

He does claim, however, a most carefully and richly documented account of the great struggle, but even so, it is submitted that he is far too modest. There is no question as to his great work in personal research throughout the five years consumed in writing his memoirs. He made no attempt to rely on contemporary documents; although such a course as he feelingly states would have saved a great amount of drudgery and labor.

He writes most frankly and consequently his memoirs must have stirred up many bitter controversies; and it must be remembered that he writes from hindsight. In his criticisms of men and events and in the value he attaches to his own views, there was when he came to write his book no fog of war. The German official records, in many instances substantiate his opinions.

The volume begins with a discussion of the Beauvais conference which according to General Bliss, "resulted in the nearest approximation to giving General Foch supreme command that was ever attained." Mr. Lloyd George was a firm believer in obtaining unity of command and the Allies can thank him for his efforts to that end. Although this conference did not take place until May, 1918, in the spring of 1917 the author had conferred with Briand on the subject of a supreme commander. We read that he "encountered the resistance of two men, Haig and Robertson, whose most outstanding faculty was stubbornness. Their abilities were average, their obstinacy was abnormal. That type, in a narrow trench which had to be held at all costs, would have been invaluable; commanding a battlefield that embraced three continents their vision was too limited and too fixed."

In the above quotation, we have Mr. Lloyd George's "fixed opinion" in regard to the British Commander in Chief (Haig) and to the Chief of the Imperial General Staff (Robertson). Throughout the book, two features are outstanding. One is Mr. Lloyd George's firm belief that, owing to the practically impregnable intrenchments constructed by the Germans from Switzerland to the sea, the Allied operations on the Western Front should have been more of the nature of a holding attack while the vulnerable fronts of Italy and Salonika should have been attacked with a determination to crush the opposition.

The other feature, considering the nationality of the writer is most astounding. This British author actually gives great praise to the accomplishments of America in the war and to the conduct of our troops in battle. And here again, he is perfectly frank. He refers to our lack of training as compared with the English and French veterans of over three years of war, but his study convinces him that the arrival in France each month for many months of two or three hundred thousand soldiers who showed "dash and fearlessness" in battle proved a decisive factor in ending the war in 1918. Again and again.

in sharp contrast to British military authors he gives credit to American troops. In reference to the American divisions with General Mangin's force in his movement against the western flank of the German salient delivered from the forest of Villers-Cotterets on July 18, 1918, the author states, "they covered themselves with glory"; also we read "It is difficult to overestimate and it would be ungenerous and unjust to underestimate the part which the American Army played in this dramatic change in the fortunes of the Entente. They had eight divisions (the equivalent of twenty French divisions) in this fateful battle. These fought with reckless dash and courage and contributed substantially to the victory of the Marne salient." Mr. Lloyd George, moreover, quotes the German records that "paid a warm tribute to their courage and fearlessness."

Also, Mr. Lloyd George continually dwells on the "inevitable result" due to the hundreds of thousands of American soldiers arriving at the battle front. In general, it can be stated, that the attitude of Mr. Lloyd George, supported by careful painstaking research of both Allied and German records, on the conduct of the A.E.F. places his book in a class by itself. The reviewer, like others who have read many British books on the War, has been so impressed with the superciliousness and ignorance displayed by the authors, from generals down, in their statements concerning our troops, that he hopes Mr. Lloyd George's last volume will be widely read on this side of the Atlantic. It might be pleasant to note that some of our critics came under what is really scathing criticisms from Mr. Lloyd George. His narrative of the incidents connected with what he calls the Massacres of the Chemin des Dames and of Passchendaele certainly give cause to consider those offensives as ghastly blunders. At Passchendaele the British at the end of four months, won five miles of useless land and 34,000 prisoners, but lost 400,000 men. Similar results occurred at Vimy and on the Somme, and the author is very critical of Sir Douglas Haig's preparation to resist the German attack that practically eliminated the Fifth British Army from the War.

This crushing defeat was due, in the opinion of the author, to the German Army having every advantage which good leadership could confer, while the British Army was placed under every disadvantage in which bad generalship could land any troops. Another criticism of the British high command is their unfailing overestimation of the enemy's strength and underestimation of the Allied strength. In fact their computation of relative manpower was such as to convince Mr. Lloyd George "that common arithmetic does not seem to constitute a part of the training given at Staff Colleges." Many of the incidents recorded in the book, incidents corroborated by history, seem to substantiate the author's opinion of several of the ranking officers of the British Army. One of these is the "Estimate of the Situation" submitted by the Chief of the Imperial General Staff to Mr. Lloyd George under the title of "British Military Policy, 1918-1919." It was dated July 25, 1918. In this report the

"very clever but somewhat erratic officer," Sir Henry Wilson, ambling all over Europe and a large part of Asia and Africa, produces a document that judged from the standpoint of his having access to the military wisdom and foresight available to him either at the war office, at the British G.H.Q. in France or at the French G.H.Q. is, as Mr. Lloyd George describes it, "an astounding production." It would undoubtedly be so described by every graduate of the U. S. Army War College. In fact, the Chief of the Great British Imperial General Staff so greatly over-estimated the strength of the enemy in the various theatres of operations as compared with that of the Allies that his report can be labeled most illogical if not absurd. It should be read when one wants to be amused.

The following statement of Sir Douglas Haig submitted to the British Cabinet on Oct. 19, 1918, will also amuse American soldiers:

"The American Army is disorganized, ill-equipped and ill-trained with very few N.C.O's and officers of experience. It has suffered severely through ignorance of modern war and it must take at least a year before it becomes a serious fighting force."

This was delivered by General Haig five days after the First American Army had pierced the Hindenburg Line, and sixteen days before the American Army started an attack which in seven days and in spite of desperate resistance drove the Germans beyond the Meuse. The more one studies the records presented by Mr. Lloyd George the more one is apt to agree with his estimate of Haig, Robertson, and Henry Wilson.

The reflections of the author on the "differences and disputes between the civilian Government and the generals in the field" are worthy of study. Both sides are well presented. A similar condition did not exist, however, in reference to the American Army because for the first time in history, soldiers instead of politicians controlled the operations of our troops and the President and his cabinet strongly supported the general commanding in the field. However, the war as far as we were concerned was of short duration.

Among other "reflections" the author refers to the distances between chateaux and dugouts "as great as that from the fixed stars to the caverns of the earth" and calls attention to the difference between generals and admirals in reference to the location of their stations in battle. While in many cases, the Chauteaux-dugout distance was probably too great, his comparison in this respect between generals and admirals is obviously most illogical.

It is apparently impossible for any civilian author of a book on military matters to refrain from criticizing the personnel of the military profession. Many pages are covered with aspersions against the brains, talents, and methods of soldiers in general and against the leaders of both the British and German armies in particular. However, Mr. Lloyd George strongly resents the implication that he condemned every general and admiral who took

any part in the War. He claims that while those who really read his volumes would undoubtedly find much censure of two or three generals, they could also find lavished praised of many. And, moreover, it will be found, he claims, that he expresses unstinted admiration for the millions of officers and men who fought and endured to the end. Finally it is submitted that history will show that the skill and energy displayed by Mr. Lloyd George in the maintenance of the "home front" largely contributed to the success of the British Army in the field.

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WHY WE WENT TO WAR. By Newton Baker, Secretary of War, 1916-1921. Harper Brothers, for Council of Foreign Relations, Inc. 199 Pages. $1.50.

With war clouds gathering over Europe, rearmament programs evident, and three world powers testing weapons and tactics in the Spanish civil war, the United States may well examine afresh the causes that drew this nation into the last European conflict. Mr. Wilson's Secretary of War, and associate at the Versailles Peace Conference, has made a dispassionate study of the available evidence that led us to forsake in 1917 our traditional policy of neutrality. Since the future policy of our country will likely be influenced by what we believe to be the past, this lucid narrative is valuable, particularly to the post-war generation.

The munition maker and international banker were not the cause of our entrance into the World War. Neither can it be explained solely by economic consideration. The author emphasizes the influence of emotional and spiritual factors and thinks they frequently produce action at variance with obvious economic interest.

Asserting a government must protect the lives of its people as well as govern, Mr. Baker expresses his conviction that our entrance into the war was caused directly and solely by the German use of submarines. In substantiation he quotes a letter from the Councillor of the German Embassy in Washington to the German Headquarters.

> No Government and no party would venture to give in to Germany on the question which is one involving the lives of American citizens, after America has so definitely announced what it considers its international rights.

Finally the former Secretary of War says: "For all practical purposes, nations have ultimate interests which they would rather fight for than surrender. In 1917, the United States had such an interest."

Recognized as one of America's most effective public speakers, Mr. Baker writes, as he speaks, with conviction, clarity, and conciseness. W. W. I.

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YOUR WINGS. By Assen Jordanoff. New York: Funk and Wagnalls Company, 1937. 290 Pages; Profusely Illustrated; Index. $2.50.

Mr. Jordanoff presents in one easily-read volume a large amount of valuable information on flying and allied sub-

jects. His method of approach, that of treating the reader as a student flyer, contributes much to the interest.

The portion dealing with flying instruction and methods of maneuver is especially well written, and incorporates the latest thoughts on flying training.

The average lay reader will find aviation's allied subjects treated in such manner as to impart a maximum of information. These include aerodynamics, engines, instruments, and radio navigational aids.

Your Wings should appeal alike to the seeker after flying information and the student birdman. A. C. K.

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OUR GALLANT MADNESS. By Frederick Palmer. Garden City, New York: Doubleday, Doran and Company. 320 pages. $2.50.

When Frederick Palmer returned home from the Western Front in the winter of 1915-16 he was amazed to find so many of his countrymen behaving like Europeans instead of Americans.

War propaganda Mr. Palmer understood. He knew that neither side had a monopoly on all the wrongs or all the right. He knew that neither could afford to be entirely truthful. What amazed him was that so many Americans believed all that was said, either by one side or the other. They seemed unable to steer a straight

course through the fog by the aid of the compass of their own national interest.

The vocal elements of our people were lining up as if they were French or English on the one hand, or German on the other. Our finance and trade were already deeply involved with the Allies, and the Germans, coolly weighing the issues in their race against the blockade, determined on unrestricted submarine warfare and sent the Zimmermann note to Mexico in the effort to create a diversion on our southern border.

When, in 1917, our slowly-mounting sense of outrage pushed us over the dam, we went into the war under the spell of an idealism which demanded no commitments from the Allies. "This was the redeeming feature of this case of war madness. We believed we had a mission." This was our "gallant madness."

The stamp of the Regular Army was on the AEF, and it was the stamp that Sylvanus Thayer had laid upon West Point. It saved perhaps double our casualties, and it gave us General Pershing's unswerving purpose to build a great army of our own.

In the end Pershing's strength and the AEF's enthusiasm brought victory. Had the war gone on into 1919, Palmer believes that Pershing's personal qualities, his favorable position as a neutral between France and England, and his youthful and powerful army would have made him the allied Generalissimo.

The war won, we found the old world unchanged. We paid the costs and got nothing.

Should war come again we can keep out of it only if we give up freedom of the seas and keep our ships and goods at home. We will suffer. Will we suffer less if we go in? But "Europe still influences our ideology out of keeping with our adult national self-respect." We take sides too fervently for Edward or for Baldwin, for Spanish loyalists or insurgents—for everything but our own interests. Our first effort, now and for the future, should be to avoid aligning ourselves on one side or the other as if we were embattled foreigners; our business is to study how to be Americans.

E. S. J.

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REVIEW OF THE ORGANIZATION AND OPERATIONS OF THE GUARDIA NACIONAL DE NICARAGUA. By direction of the Major General Commandant, United States Marine Corps.

This book tells the story of the Guardia Nacional de Nicaragua organized by the Marine Corps in their effort to restore peace to troubled Nicaragua. The story is of interest and is full of important lessons. It points up the fact that the Services do not make, but only carry out the policies of their Government.

The five-year record of accomplishment of the Guardia in a continuous savage guerilla warfare is a moving one. The story is impersonally told and with the detached viewpoint of an official report, nevertheless the heroic deeds of the Marine Corps shine through it.

The student of small wars will find much to repay him, for the account contains many descriptions of typical contacts between the Guardia and bandit forces.

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CAESAR IN ABYSSINIA. By George Steer. Boston: Little Brown and Company. 1937. 407 Pages; Maps; Index. $3.00.

The author represented the *London Times* in Abysinia during the Ethiopian campaign. The fruit of his travels is a graphic account of the country, the war, the personalities, and the international situation.

Mr. Steer believes that the campaign was not a telling test of the Italian war machine. It merely confirmed that unorganized, ill-trained, and poorly armed tribesmen cannot withstand modern equipment, scientifically used. As an individual, or member of a small group, the Ethiopian was the better fighter; but he lacked organization, training, and discipline. Moreover, he was motivated by tribal loyalty rather than national patriotism.

The Ethiopians scored a few successes against Italian infantry, captured a few tanks, and managed to weather artillery. But they were shattered by aerial bombs, and broke and fled under mustard gas. They finally disintegrated under the pressure of overwhelming odds.

The book is worth reading for its historical and ethnological interest but has little value for the student of strategy and tactics. C. R. L.

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