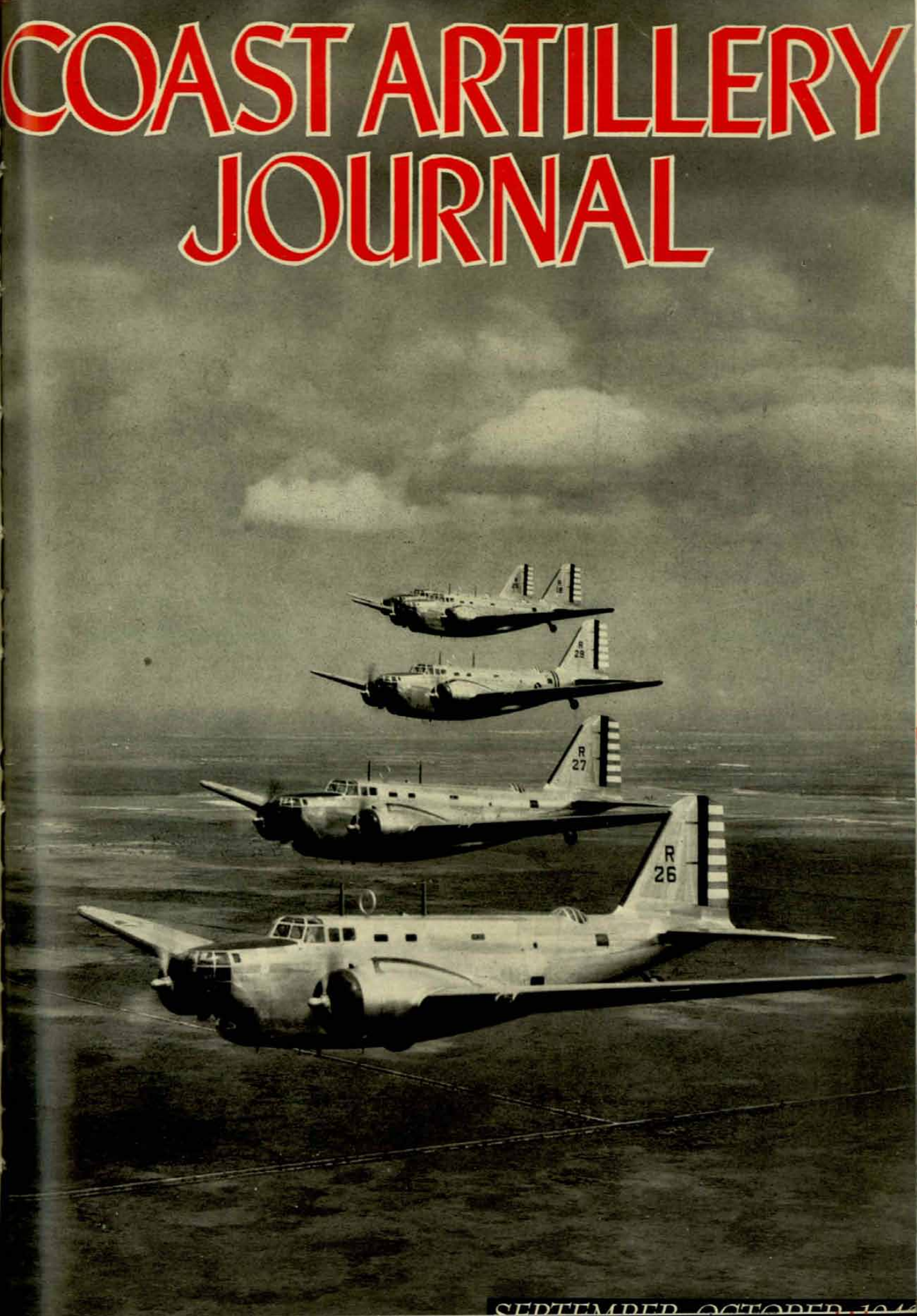
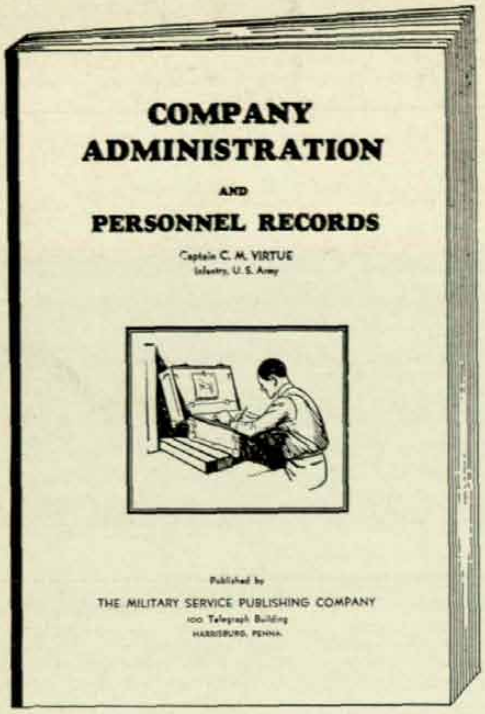
COAST ARTILLERY JOURNAL



SEPTEMBER-OCTOBER 1946



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Company Administration

By CAPTAIN C. M. VIRTUE
U. S. Army

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THE COAST ARTILLERY JOURNAL

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LIEUTENANT COLONEL CHARLES THOMAS-STAHLE, *Editor*

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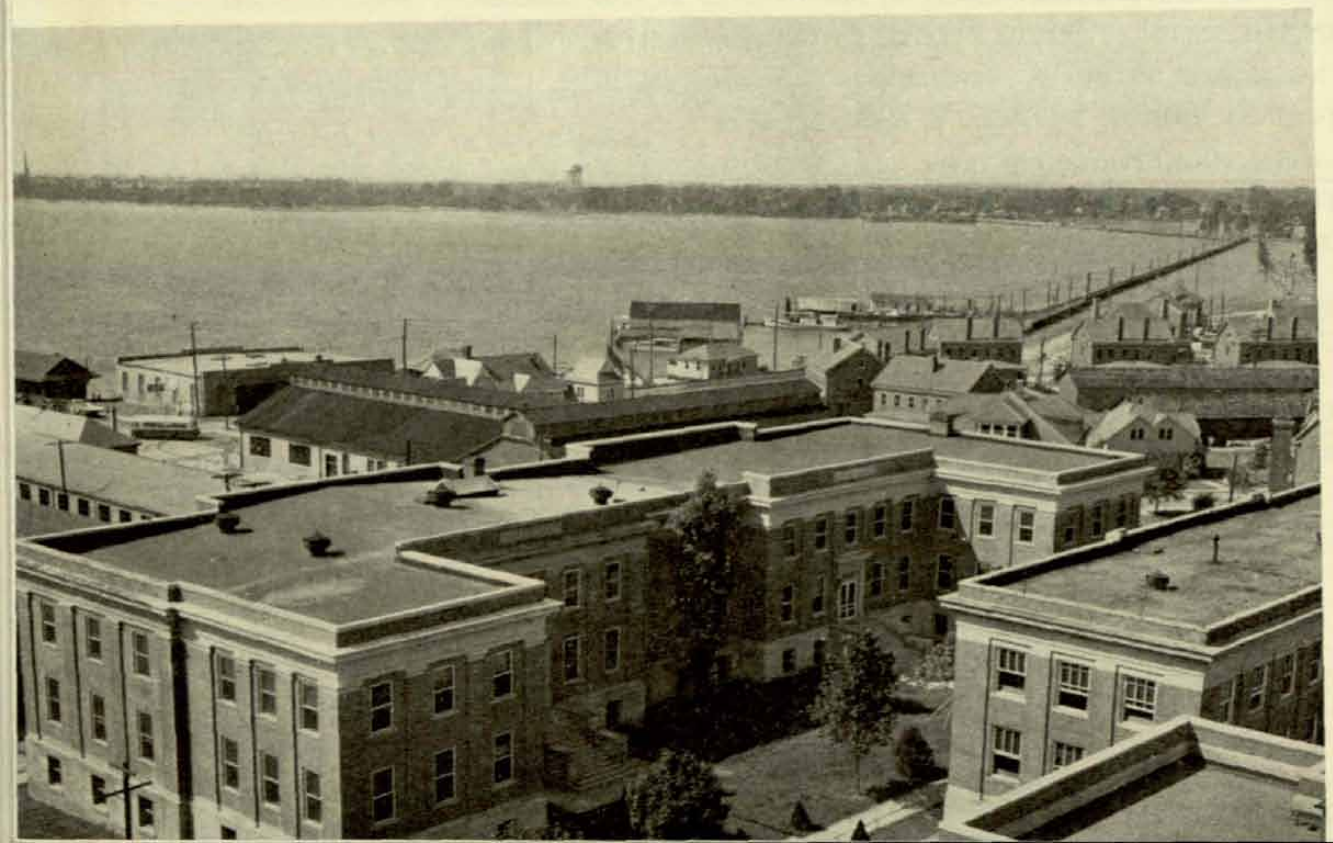
THE COAST ARTILLERY SCHOOL IN

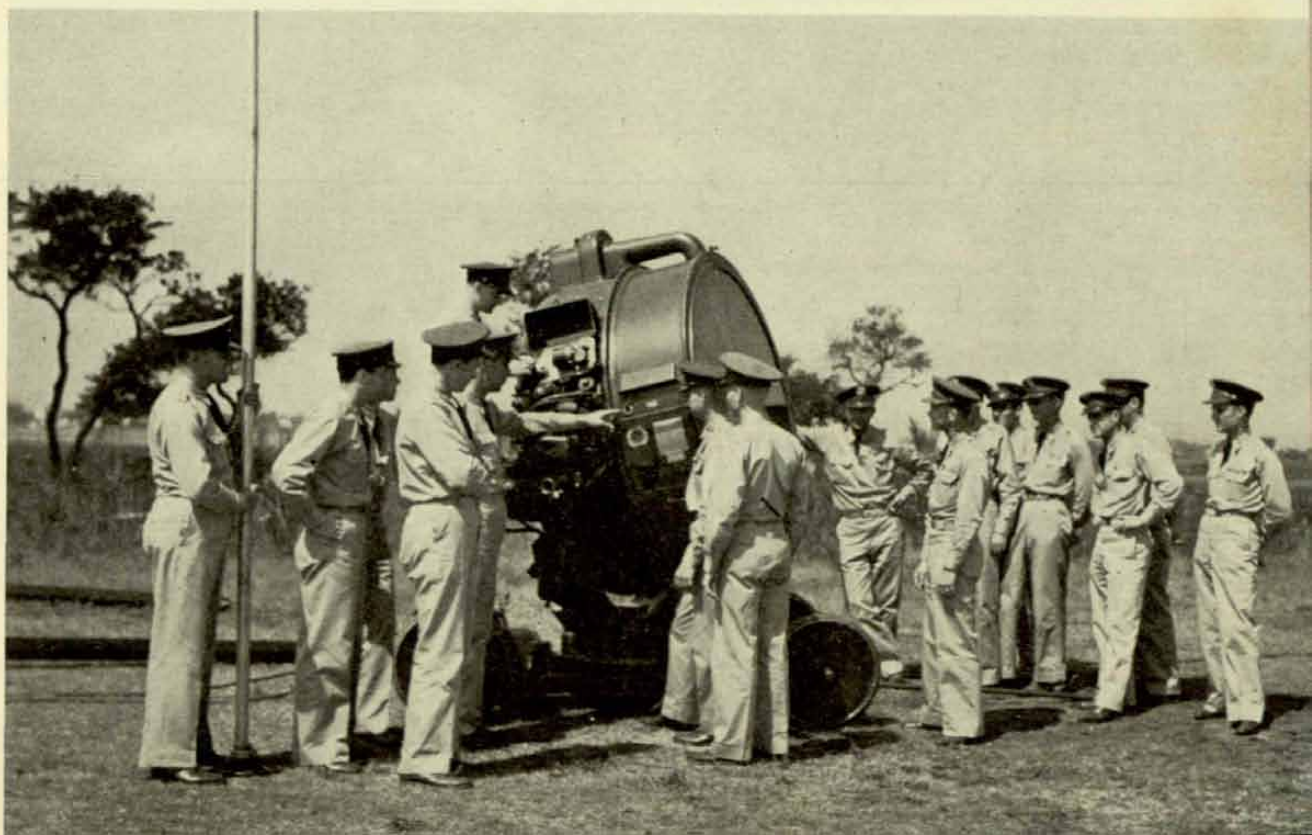
By Brigadier General F. H. Smith



For more than two months junior officers have been trekking to Fort Monroe from practically every Coast Artillery post in the Continental United States to pursue a course of instruction at The Coast Artillery School. No doubt there is speculation concerning this course in the minds of officers everywhere. It is to answer these questions that this article is written. It presents the problem the school is trying to solve and informs officers of the Coast Artillery of the progress that is being made to provide an efficient training center in which officers can be quickly prepared to meet the problems they will soon face.

Expansion of the Coast Artillery Corps, and especially the increased importance of antiaircraft artillery, has created a demand for a great number of

THE EMERGENCY



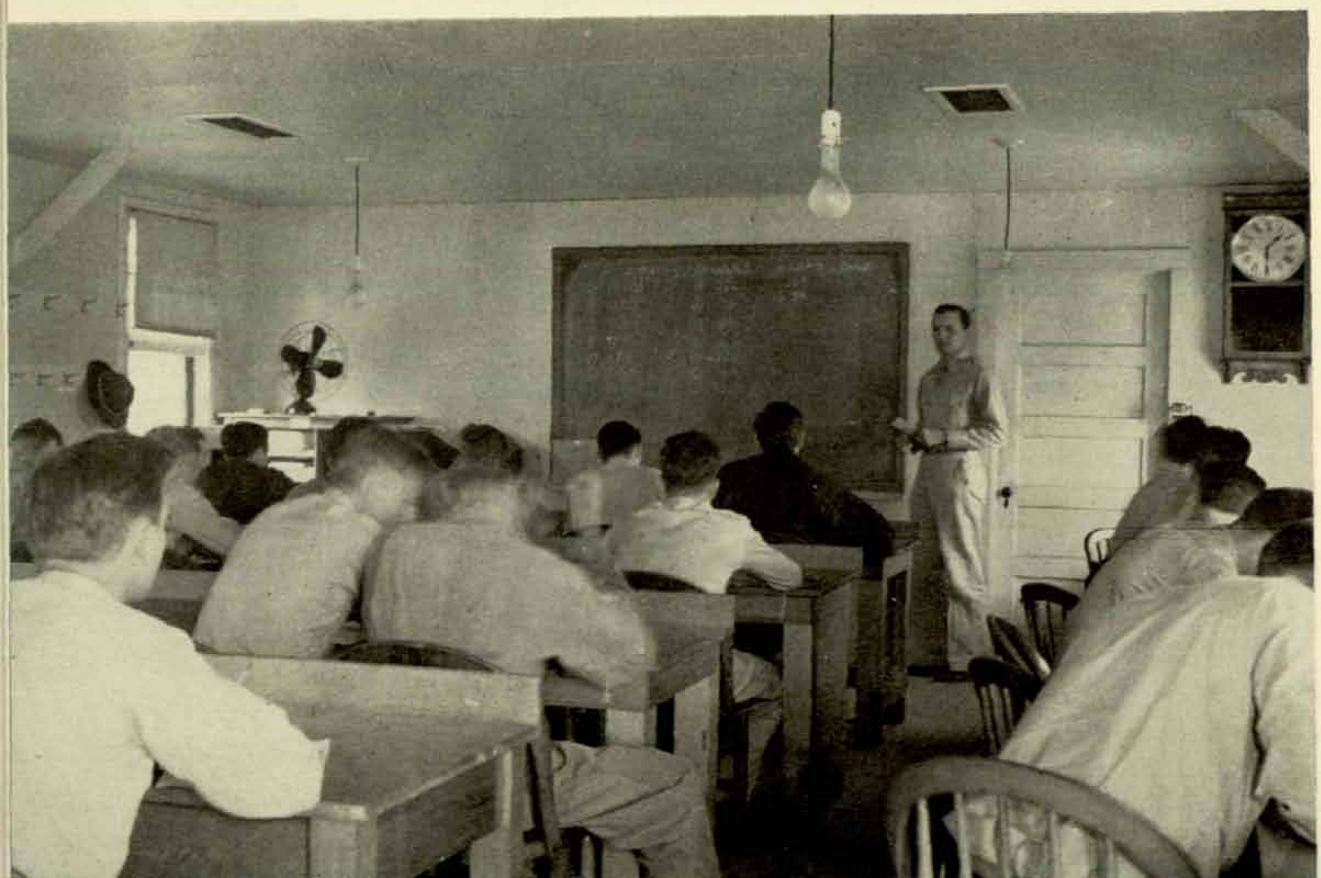
trained officers. To fulfill this need it is desirable to offer a course of intensive instruction to as many officers as possible. The accent is being placed on instruction in the antiaircraft problem. Every effort is being made to present a well-rounded course that will bring the officers up to date in the technique of antiaircraft gunnery.

Four-Weeks Refresher Courses

During the period July 1st to September 14th, six four-week classes were conducted by the school. These courses consisted, in brief, of a week of instruction in gunnery for antiaircraft guns, a week of instruction in automatic weapon gunnery and searchlights, another week of study of antiaircraft matériel, and a final week of practical firing problems at Wilson Park. Problems were conducted with 3-inch and 37-mm. antiaircraft guns and .30 and .50 caliber machine guns. The M-4 director, searchlights, sound locators, and height finders were studied. Batteries B and C, 2d Coast Artillery and Batteries B and D, 74th Coast Artillery (AA) furnished personnel and equipment for demonstrations and problems.

In planning the courses, the problem of handling a larger number of students than has been in attendance in the past was met by telescoping the classes. The instructors were arranged in groups, each to have the class one week. The first class, after completing the first week of instruction, was passed on to a second group of instructors, while a new class arrived to be in the hands of the initial group. And so each week the number of students

Classroom instruction, height finder school



enrolled was increased by one new class until the capacity of the facilities was reached. The limit of capacity naturally occurred in housing. In Camp No. 3, the old cantonments were used as barracks. As enrollment increased it became necessary to use tents to supplement the barracks. With a mess established in the camp area the school operated without placing a strain on the facilities of the regular garrison.

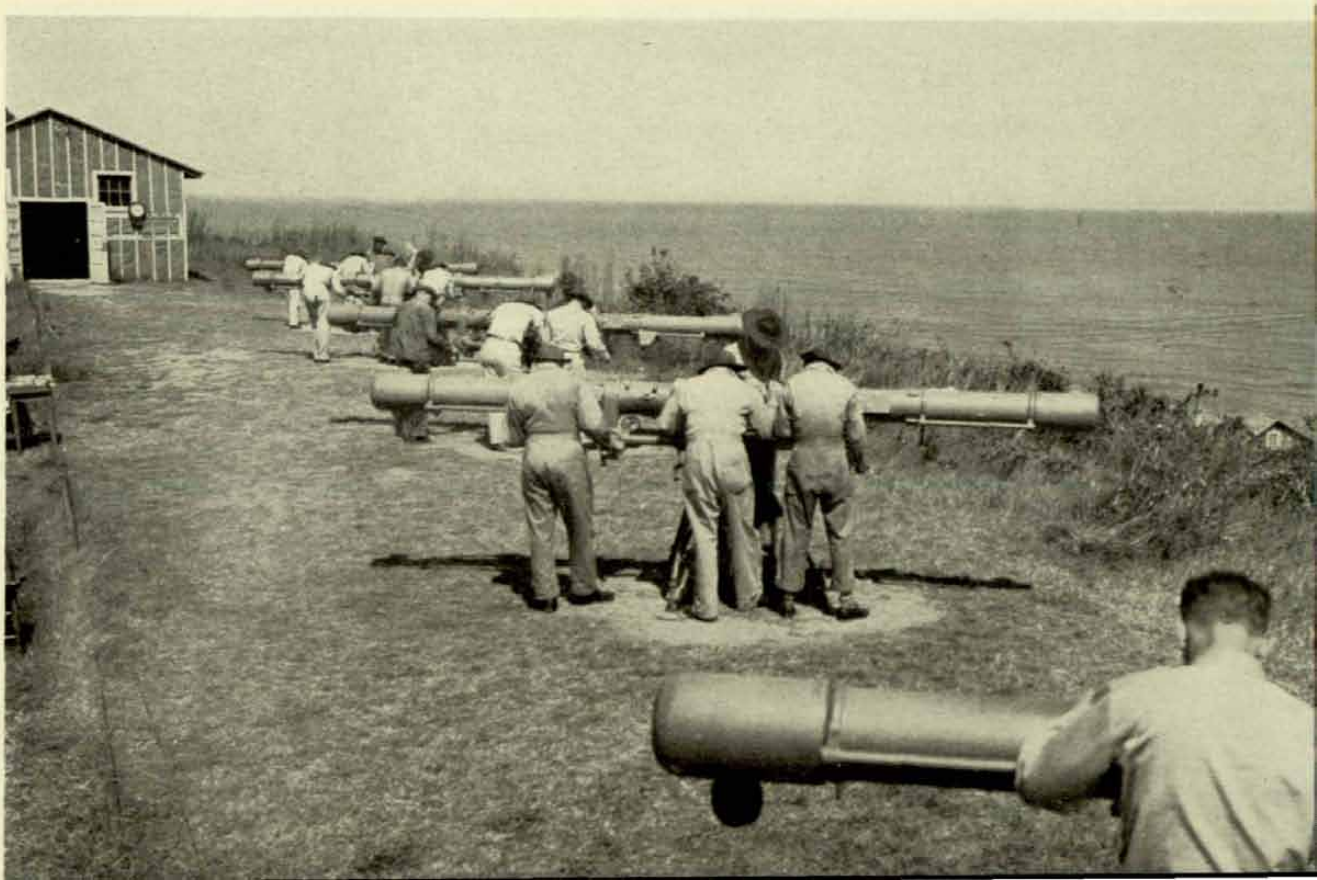
Classes were conducted from 8:00 A.M. to 12:00 noon, and from 1:00 to 4:00 P.M., daily, Sundays and Saturday afternoons excepted. All officers were required to observe the study period from 7:15 to 9:00 P.M., daily, except Saturday. The classes were divided into sections, with section leaders assigned, whose duty it was to insure that their sections reported promptly to the designated place of instruction. This system made it possible to maintain a full schedule with little dead time between assignments.

On Thursday evening, during the study period, in the last week of each course, a written examination was given each class. Results indicated that the classes had absorbed a great deal during the course.

The classes ranged in size from sixteen in the first to ninety-three in the fifth course. The short notice on which the first class was organized is responsible for the small number enrolled. In the six classes a total of 375 lieutenants completed the course of instruction. This total was made up of:

107 Thomason Act officers
198 Reserve officers on extended active duty

Practical work, height finder school



70 Regular Army officers

Of this last group sixty-five were graduates of the United States Military Academy, Class of 1940, all of whom were enrolled in the fifth class, which started instruction on August 12th. This group was called to duty from graduation leave on August 1st. Those who arrived at Fort Monroe prior to the opening of the school course received instruction in battery administration with organizations under direction of Colonel M. M. Kimmel, commanding the 57th Coast Artillery.

Ten-Week Courses for Officers

Starting on September 15th, courses will be ten weeks in duration. Class and study hours and the organization as outlined for the four-week course will be continued. The buildings at Camp No. 3 will be utilized until the completion of new construction. Courses will again be telescoped, with a two-week interval between groups.

Initially, the schedule calls for instruction in antiaircraft artillery only, with the possibility of including instruction in seacoast artillery in courses starting after February 15, 1941.

Time will be allotted as follows:

2 weeks—Gunnery for guns
1 week—Gun and director matériel
1 week—Gunnery for automatic weapons and automatic weapon matériel
2 weeks—Firing of guns and automatic weapons
2 weeks—Tactics (antiaircraft artillery and aviation)

Mess Hall, Camp No. 3, Officers' Refresher Course

2 weeks—Searchlight, sound locator, height finder matériel and communications

A tentative schedule with the allotments of students follows:

September	16-November 24	55	National Guard officers
		25	Reserve officers
		8	Marine officers
September	29-December 7	30	National Guard officers
		50	Reserve officers
October	13-December 21	42	National Guard officers
		38	Reserve officers
November	24-February 1	80	National Guard and Reserve officers
December	8-February 15	80	or more officers
January	5-March 15	80	or more officers

When facilities become available, the size of classes will be increased to a maximum of 160.

To assist in handling the increases in student personnel, the faculty of the Coast Artillery School is being augmented by the addition of Reserve officers on extended active duty.

Enlisted Specialists Courses

Courses up to 12 weeks duration, are planned for enlisted specialists in the following divisions:

Stereoscopic observers course

Officers' Squad Room, Camp No. 3

Master gunners course
Radio courses
Electrical courses:
35% General
15% Automotive
50% Antiaircraft
Clerical course

Most of these courses will be conducted as refresher courses for noncommissioned staff officers of the National Guard and as basic courses for the Regular Army, with about equal numbers in each category attending.

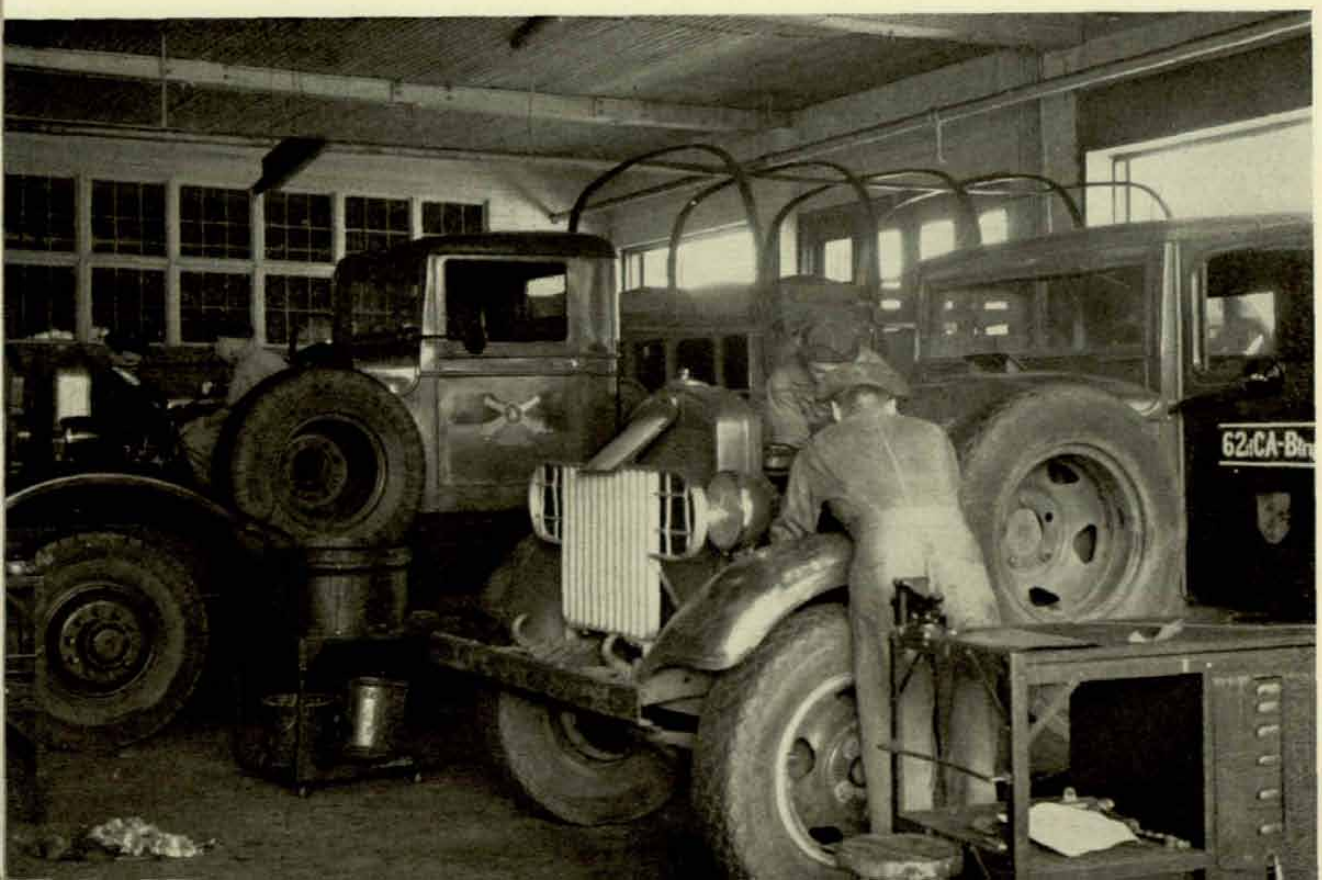
New Construction

With the prospect of large classes of officers and enlisted men scheduled to report in the fall, a program of new construction was initiated. While the complete plan is not on paper as yet, there are a number of projects that will soon be under way.

For the officers' division, it is planned to fill in the area bounded by Camp No. 3, Battery Eustis, and the sea wall in order to raise the surface about three feet. On this fill it is proposed to build twelve temporary barracks, one of which is to be of the bachelor officers' type for the senior members of the school classes. In this area there will be additional buildings for school classrooms, mess halls, and the necessary supply establishments. Until the completion of this project, officers will be accommodated in the old cantonment buildings, supplemented by tents if necessary.

The buildings in the old stable area are to be

Automotive Repair Section, Enlisted Specialists' Division



razed to make way for the increase in the enlisted specialist classes. Suitable buildings to provide for classrooms, a searchlight laboratory, and instructors' offices will take the place of the stables. A separate building of the vehicle-shed type is to be provided for the searchlight laboratory.

In the vicinity of the tractor shed it is proposed to build four cantonment barracks, a mess hall, a day room, and a storeroom to provide additional accommodations for the enlisted specialists.

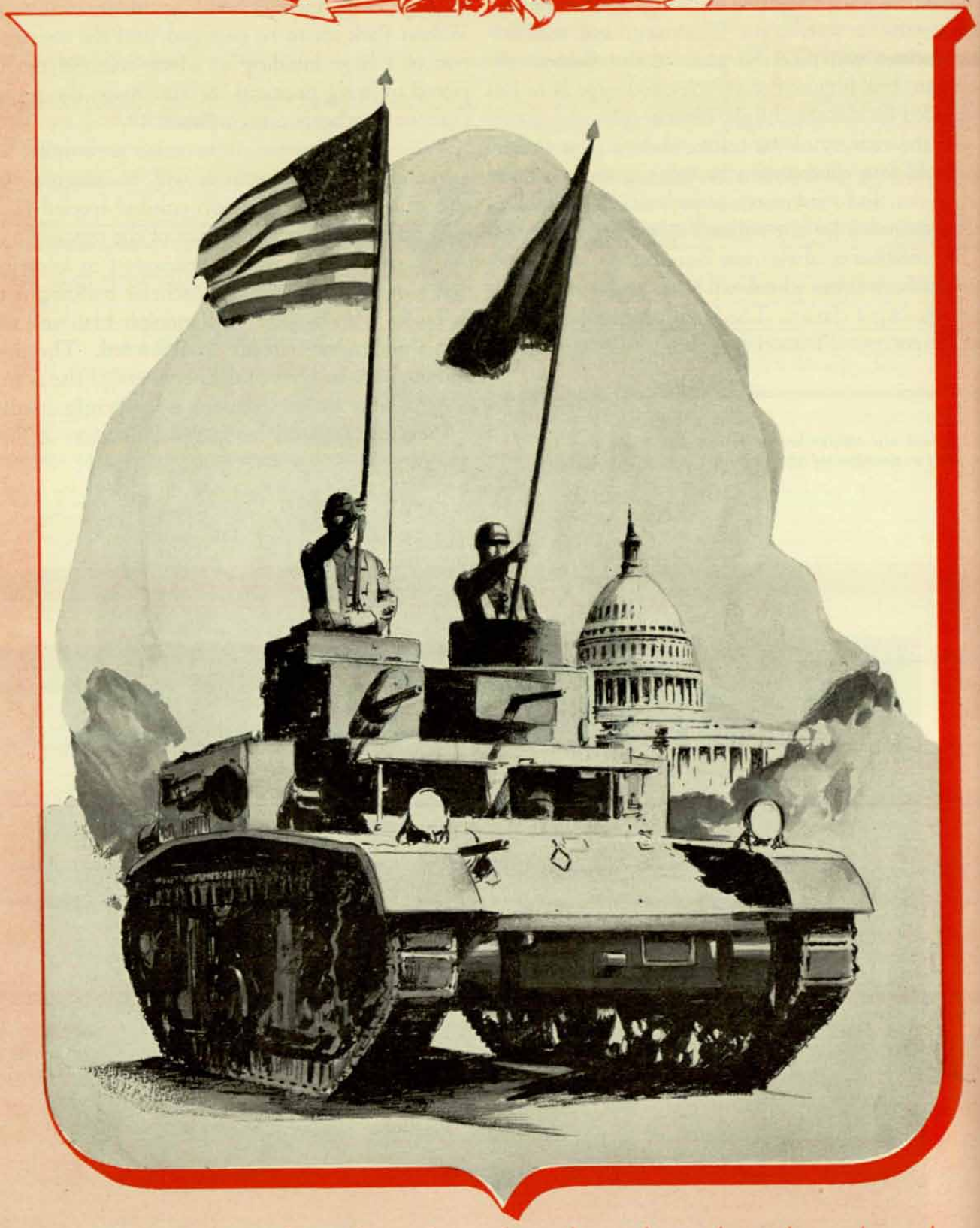
In addition to these new installations, the present facilities of the school will be enlarged to accommodate larger classes. The height finder building, on the parapet of Battery Ruggles, is to be enlarged. A radio laboratory is to be constructed in the same vicinity. The matériel buildings in the vicinity of Wilson Park are to be enlarged, and the construction of a large building in which matériel can be placed in firing positions for instruction during inclement weather is contemplated.

When the proposed construction is complete accommodations and facilities will be adequate for 480 student officers and 400 enlisted specialists.

While it is not strictly a part of the expansion of the school, readers will be interested in knowing that a new forty-apartment bachelor building is to be built. The facilities of Randolph Hall and the 100 Building are already overcrowded. The new building is to be built in the north end of the riding ring. These accommodations are urgently needed to meet the demand for bachelor quarters at Fort Monroe.

These old stables are to be razed to make way for the expansion of the enlisted specialists' division

The



American Professional Soldier

By Major John H. Burn

Let us first go back a year ago. The shadow of war lay over the world. Pacifism had failed; weakness was an invitation to partition, treaties were being cynically disregarded, and arbitration had become a mockery. The stronger, the ruthless nation had begun to dispense justice for its own benefit. Already only military power could guarantee to a nation the chance for existence and eventual survival. People of all nations were beginning to look anxiously around and to plan for their future safety; we, perhaps, not yet so much as those nations which lay close within the darkest part of the shadow. Hurriedly, nervously, they checked over their defenses—guns, tanks, planes, ships, factories, and masses of men. At that critical time in our own nation few of our citizens were noticing the men who would direct the energies of this vast nation in war—the professional soldiers. They were, for the most part, unknown and unimportant.

The intelligentsia—the jugglers of modern ideologies—looked down their noses at the Army. They forgot that the people who make a war may be silly, but that the people that wage it cannot afford to be. True, an occasional modern thinker might intellectually find a reason for an army if he could bring himself to think clearly about it. But in most of their minds there was clear animosity—an animosity not based on reason but on emotions aroused by the symbol of the one thing that human thought appears unable to solve. That one thing is war. And war, to the intellectual, was too plainly indicative of the primitive, puny state of our vaunted human intellect.

So these workers in words, ideas, and thoughts, the articulate part of the American folk, were mainly alike in their aversion—to use a mild term—to the Army. Strange, wasn't it, how this heterogeneous list of writers, speakers, idealists, scientists, religionists, philosophers, pseudo-philosophers—practically all the vocal parts of our population—had one powerful emotion in common. They disliked the professional soldier. One could also add the revolutionary Communist to this group, so that often we had the spectacle of the atheist and the man of God sharing the same bed. A quaint conceit—the red nightcap of liberty on the same pillow with the churchly black one.

All of these people shuddered over the horrors of war, and rightly so. For who does not? But often the basis for their shuddering was the self-conscious feeling that they themselves were not capable of standing up in battle—unless it be waged with words. Consequently, many of them acquired a sense of inferiority which grew distortedly and caused them to vent their spleen on the only symbol of war that confronted them—the professional soldier. So it was often true that back of the intellectual opposition to the military lay, not cold reason, but hot emotion.

Not that all this ever bothered the soldier. The soldier has yet to be heard of who, because of this, ever added a stroke to his golf score. But the soldier could nevertheless see the danger in certain of the modern ideologies, certain of the social processes that would not produce soldier material. He yearned for the type of man that went into the Wilderness and into the Argonne. But he had long since begun to fear that he would not get them. For to the modern educator especially—a sluggish thinker for the most part—the acquisition of ideas was paramount, the acquisition of ideals secondary, and the physical defense of either, abhorrent. Thus the products of our educational timberline might perhaps be only inferior soldier material, and, by the same token, inferior human beings.

But the soldier does not make wars. He merely takes the war handed to him by the people, and tries his level best to finish it in accordance with the wishes of the very people who began it. The picture of the professional soldier which for years has been so assiduously projected by the portrait of a thirsty, power-drunk individual, only too eager to engage in any war just for the fun of it—is simply silly. Indeed, many wars would have been prevented if the counsel of the professional soldier had been taken. And many future wars may likewise be prevented.

So the professional soldier gets along reasonably well and pays little attention to the attitude of any particular class. He himself knows that his government—any gov-

ernment, for that matter—is upheld by bayonets. He may not know how to model a statue or write a sonnet, or even turn a neat paragraph of prose, but he does know how to handle the bayonetmen. Which is important.

Little enough study is given to the professional soldier and his cohorts by the busy research worker who investigates almost everything else under the sun. The military has been called "the next to oldest profession." But fifty weighty tomes are written by sociologists and other students about "the oldest profession" to one book about the military. Yet the sociologist who neglects the significance of military force and looks on an army as a glorified police force—negligible in sociological matters—is missing a big point. He fails to observe fully modern events and fails to interpret them fully.

At almost any time in the past one could envisage wars, then in embryo, that every sensible military man would hate to see born. But those wars were born, never fear, for people make wars—not soldiers. The soldier only fights them.

The professional soldier does not start a war under any circumstances unless he is sure of the outcome. He is a practical man who regards war fundamentally as a business and not as a game. There is little romance in it for him. And he never—no, never—gives his opponent an even break if he can help it. The people who make the war may want to do that and in our country generally have. It is hard going to have to wage such a war. One hopes it will not happen again.

It could well have been asked up to about a year ago why the Army existed when so many classes were either actively or passively hostile to it. But in a democracy there is always a certain hard-headedness which the *illuminati* often dub ignorance and which resists all attempts to inculcate the belief that the millenium is just around the corner. Even though democracies are usually ungrateful to their leaders, particularly the military ones, still they know in the back of their collective heads that they need them. Furthermore, as the past year has shown, it is always astonishing in the end how little weight the writers and speakers carry when they go against the deep swift current of public opinion.

Of all people in the modern industrial system, the professional soldier has more insight into the minds of men than any other class. He is the best practical psychologist extant. He does not regard men as a conglomeration of reflexes and conditioned responses, as the psychologists appear to do. He knows him for what he is, an integrated personality, with great capacity for self-sacrifice and an irritating habit of doing thoughtless, roistering things at an inopportune time. He sees man in the round and knows him in the raw, and doesn't think he is such a bad product after all. To the professional soldier, man is not damned by original sin; nor is he, as our "uplifters" would have us believe, the victim of circumstance.

Nobody in our modern civilization thinks of men as the professional soldier does. To all others men are producers, consumers, clients, sales prospects, cases, subscribers, parishioners, or what not. Seldom, if ever, does any per-

son deal with more than one facet of the perplexing phenomenon called man. But the professional soldier deals with all sides of man. He feeds, clothes, doctors, works, amuses, shelters, disciplines; arouses self-respect, faith, loyalty, patriotism; teaches self-reliance, courage, sex, and other subjects neglected by the schools. There is more to the job than just teaching the art of war. The soldier therefore knows men individually or in the mass as no other group in modern life does. He can do more with men.

And this last by itself is something worth close study. Note for instance that your industrialists cannot get a man to work overtime fifteen minutes without giving double pay; whereas the professional soldier in peacetime can work him twenty-four or forty-eight hours at a stretch with no more reward offered than a good meal, a good sleep, a word of commendation. And in war he can lead men into a sleet of deadly lead in order to gain an objective. Men offer their lives to the professional soldier for nothing when they won't give their employer fifteen minutes. These are the stark facts. A strange commentary on our so-called scientific civilization.

The writer or student who dismisses all this by saying that it is only iron discipline—fear of the commander—which drives a soldier forward, is only proving how little he actually knows of men and particularly of the soldier. Furthermore—and this should strike home to the gentlemen who are running our schools—the soldier calls on his men to sacrifice themselves, to offer their lives for the good of the whole, and he gets his request. On the other hand the schoolmaster could not persuade his pupils in general to sacrifice anything important for the good of

anyone. Yet the schools have over ten years to produce their effect, the army only a few short months on the average. Crude as the professional soldier may seem to most intellectuals, he still has something which puts over to those he leads a great moral lesson in a short time. He accomplishes something that almost no one else in our modern civilization can accomplish or is accomplishing.

Just what sort of a fellow is the American professional soldier? He is generally the product of a middle-class home, seldom of a wealthy home. Indeed, many a laborer or mechanic or farmer now has a son wearing the shoulder straps of an officer. Men have often practically lifted themselves by their bootstraps from lowly jobs to a commission, and often these last, when placed in competition with graduates of West Point, Harvard, Columbia, Yale, or Princeton, come out on top.

The accusation is often levelled at the professional soldier that he is narrow, reactionary; with little vision and no imagination—in short, trustworthy but doltish. This will bear a little investigation. For the most part, Army officers are graduates of some good college or university. But that is only the beginning of their studies. They must do much postgraduate work in the Army schools. It is not unusual for an Army officer to put in six years of study during twenty or twenty-five years of service more or less, in such schools as The Infantry School, The Artillery Schools, The Air Corps Tactical School, The Command and General Staff School, and The Army War College. You will seldom find an officer on the War Department General Staff who has not had from three to six years, or even more, of postgraduate study to fit him for his job. In civil life all of these officers would have earned through such study the magic letters Ph.D.—which would automatically entitle them to admittance into the inner circle of the intelligentsia and to respectful attention whenever they gave out an opinion.

It is doubtful if any professional group are so rigorously trained and educated as the American officer. Foreign officers, because of birth or breeding, may be selected for higher training, but the American Army tries to give it to all who can qualify, and there are a lot that do qualify. When men in other professions are beginning to relax a bit after making their niche in life, the professional soldier is still plugging at his books. Men with grey-sprinkled hair not uncommonly work all night at their problems—a forty-eight hour stretch is not rare. This strenuous work often goes on, not for a few months only, but over a period of years.

Narrow work, no cultural value, one might say. Again, perhaps; but not as narrow as the graduate study in medicine, psychology, engineering or other sciences. What is there cultural about learning to snatch out a pair of tonsils; or the reactions of a rat in a maze; or the efficiency of the mercury-turbine engine? These are no more cultural than studying how to bring up Class I supplies, industrial mobilization, or the exterior ballistics of machine-gun fire, all of which are elementary subjects in the soldier's training. His proper field of study is everything that man has ever done, not only as an individual, but as a member of a nation or group of nations. From this he traces the causes of past wars and from his data he can predict why there will be future upheavals. As a consequence he is not so naïve as to accept the conclusion—so prevalent today—that our entrance into the last World War was due to the machinations of our munitions makers. Moreover, he is obliged to go back to the humanizing influence of troop duty, where he deals with men in the mass and thus never does he get far away from the vitalizing, warming, though often crude contact, with human nature. All the theories he learned must square with this realistic environment.

True, we have a few—a very few—professional soldiers who are also professional scholars. They are great lads. They can reach down through the corridor of history and with a long arm pluck out any fact or, on the other hand, project themselves into the future and tell exactly how a gigantic regulating station should be run in the next war. They can discuss Spengler, Freud, or the Italian *condottiere*. They are clever fellows, all sib to the doctors of philosophy, but—and this is a pity—the troops are cold to them ever.

Aside from that, the professional soldier has all the weaknesses of other humans but with few of the petty virtues. He'll take a drink or several of them and on special occasions get politely tight. But he has three great virtues which are not too common: One, he is absolutely honest, and this applies not to money matters only; second, he has a clean-cut conception of what the word "duty" means, and, drolly enough in this modern age, he uses it in all seriousness; and he has faith. Faith in the country and its destiny, in democracy and its methods, in something greater outside of this puny human intellect of ours. And this last, no doubt, disqualifies him utterly from ever being a modern intellectual.

He has spent a great part of his life traveling up and down this broad continent, from Monterey to Montreal. He knows the people, has lived with them, and knows their problems. And yet he is not one of them. He is a citizen of no state but of the United States at large. He seldom, if ever, votes or becomes intellectually or emotionally entangled in political problems. He may not be a great social thinker but he knows what the common man wants because he knows the common man—is a common man. And he realizes when political or economic evils press hard on this common man and make him restive.

Furthermore, he has spent years beyond the limits of the United States. He knows the tropics, the heat, the fecund growth, the insects, the dankness, the people who live there, struggling in the grip of Nature at her cruelest. He knows the beach at Waikiki and the liquid sunshine of Hawaii, and the remnants of the giant Hawaiian chieftain class—figures such as Phidias never had to model from. The Far East is more familiar to him than New York is to the Kansan.

He admires the Chinese girls with their semi-modern garb, the throat-high military jacket and the skirt slit to the knee. Their faces of pale-yellow ivory pointed to the

chin, their slanting provocative dark eyes, the thin, small feet—all these he knows. And also the Chinese merchant, clothed in silks of rich hues, grave in his courtesy, calm; dignified despite his rotund shape. A gentleman in the mart of trade. But behind all this the professional soldier senses the 400,000,000 that is China, the civilization that extends back thousands of years when the western European was a half-naked, vermin-infested savage. He sees China awakening after her long sleep and just now beginning to rub her eyes. Here is vast physical power, such power as he understands well, and he hopes it never will be unleashed in his day.

And he comes home to the provincial thought of the United States wondering. What if he cannot become vitally interested in the newest social experiment, or the latest frill in psychology, philosophy, or the like? He has seen enough of the world and its people to know that neither he nor anyone else has the ability to solve all the problems that arise. Only piece by piece do we progress. No one generation can do more than make a tiny advance —just a fraction of a step. So he doesn't bother to support or oppose any scheme which, its originator thinks, solves the problem of life. After all he is but a soldier.

Therefore, he turns to his job which is to make this country safe from aggression so as to permit its people to develop as they must, or as the last resort, to fight the wars of the people when—God help them—the people make such wars. If, in ordinary times, he seems importunate in his demands for weapons of war, and doubly so in times such as the present, this is not because he wants to begin a war, but because he knows this imperfect world of ours and has a very definite idea of what it means to try to fight wars without the tools it takes to win them.

It would be better for all concerned, as many non-military folk are now finding out, if thinking people knew the soldier personally—his life and his function. Merely seeing a parade or a military review is not to see the professional soldier. It would, indeed, pay any professor of history, psychology, or sociology, to spend part of his sabbatical year with the army—if only he would leave behind his preconceived notions with his books. And if such a one should make this visit, he should never tell the soldier that some new scheme is going to prevent all wars. For the soldier has heard that before, and wars are still going on and will go on when all who live today are dust. Bigger minds than any in our own crass culture have tried that and have failed miserably. Do not say to a soldier that war is silly and unscientific. He knows that perfectly well. And he knows something else often forgotten: man himself is silly and unscientific.

It is not too late now—though it is a bit late—for the intellectuals to come close to the Army. Many are already realizing that fact. At all events it is the soldier who will take the sons of the people and make soldiers of them. If he does his job well the people will win the war when next it comes. For it always does come, as the soldier knows.

THE MONGOL

I: The German Imitation

In the last few months the nations of Norway, Holland, Belgium, and France, have been stunned by the hammer-blows of the Third Reich. And now, after these examples, the pattern of this new quick war is becoming clear.

But the Reich's design for war is not new. It was followed by the Mongols 700 years ago. Exactly 700 years ago this autumn the Mongol attack upon the civilized nations of the world, initiated by Genghis Khan reached its high-water mark in the west. It penetrated the line of Poland-Vienna-the Adriatic after conquering all that lay behind it in Europe and Asia.

This writer has before him a letter from a Cardinal of the Vatican saying, "It is 1235 over again . . . The nations will be destroyed one by one." The Mongol attack on Europe was first planned in 1235; His Eminence had made a study of the Mongols.

What was this Asiatic method of attack? How, when it was put into effect by barbarian horsemen from the isolated region of the Gobi Desert, did it succeed at every point against the greater powers of civilized peoples?

It was a method of annihilating the resistance in a nation to be conquered. A total war, terrible beyond belief to those faced by it. It was a series of operations designed to crush morale and manpower. It had little to do with the conventional warfare of professional armies. In fact, it broke most of the canons of European military tradition. Call it war to the uttermost—deliberately planned destruction carried out, often, at incredible speed. In other words, the prototype of the blitzkrieg.

The deadly thing about the Mongol method was that it always accomplished its purpose. Napoleon once said, "I was not so lucky as Genghis Khan." But luck played

a small part, if any, in the continuous victories of the Mongols. For thirty-nine years the Mongol attack suffered no real check. For a century the Mongol *Drang nach Osten* (and West) conquered and held in its military rule the greater part of the known world.

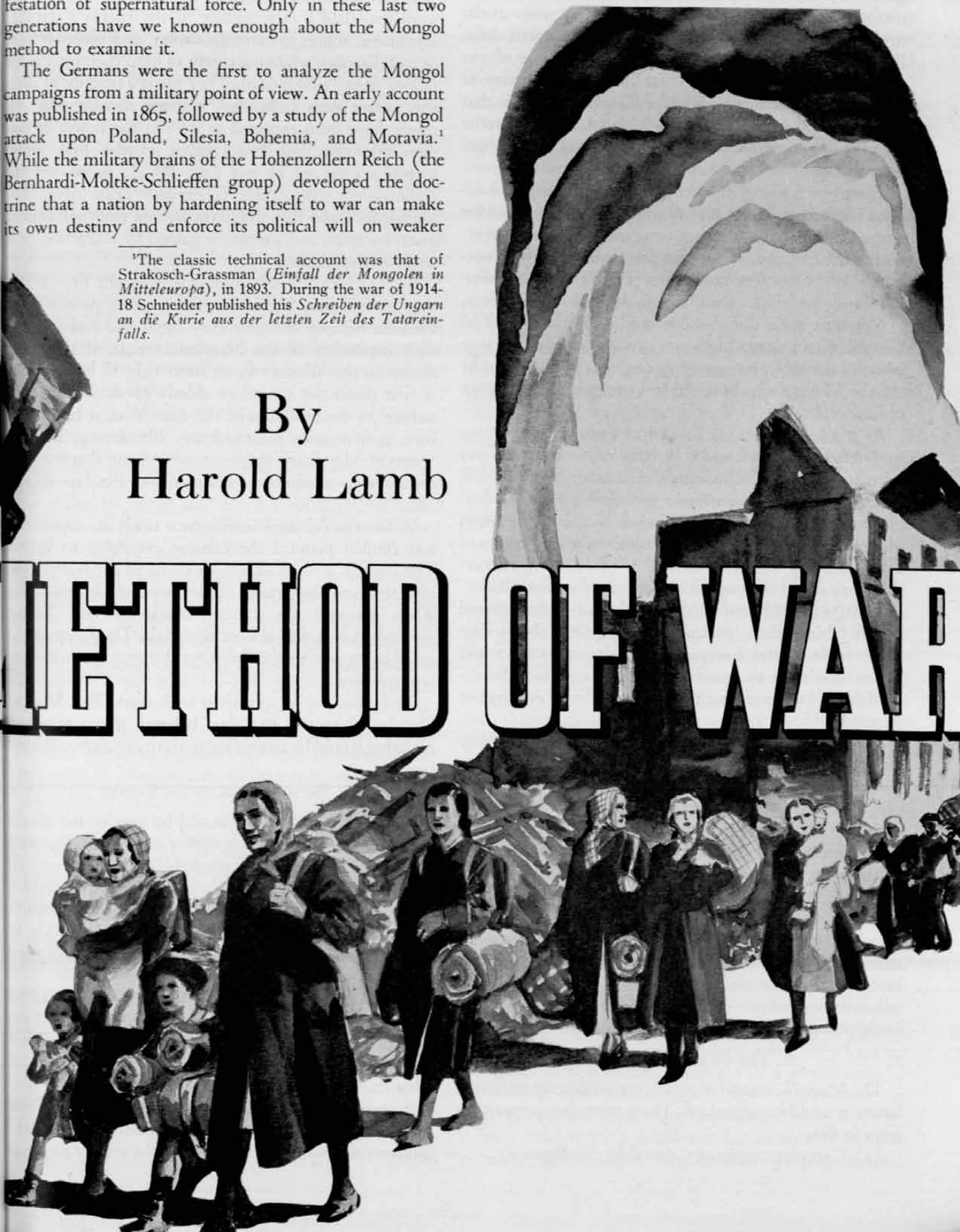
For a long time, because even historians were superstitious in the past, this feat was explained away as a manifestation of supernatural force. Only in these last two generations have we known enough about the Mongol method to examine it.

The Germans were the first to analyze the Mongol campaigns from a military point of view. An early account was published in 1865, followed by a study of the Mongol attack upon Poland, Silesia, Bohemia, and Moravia.[1] While the military brains of the Hohenzollern Reich (the Bernhardi-Moltke-Schlieffen group) developed the doctrine that a nation by hardening itself to war can make its own destiny and enforce its political will on weaker

[1]The classic technical account was that of Strakosch-Grassman (*Einfall der Mongolen in Mitteleuropa*), in 1893. During the war of 1914-18 Schneider published his *Schreiben der Ungarn an die Kurie aus der letzten Zeit des Tatareinfalls.*

PROTOTYPE OF THE BLITZKRIEG METHOD OF WAR

By Harold Lamb



neighbors, these technical studies of Mongol military achievements were in the hands of German readers.

No such study seems to have been made by British or French until several years after the 1914-18 war. The great majority of Americans knew even less about the methods of Genghis Khan. Our interest lay more in the mysteries of the archeology and folklore of Central Asia. But these last months have shown us—in spite of our disinclination to believe it—that the military brains of the German Reich have developed a plan of attack that works along the same line as the Mongol. And it may be enlightening, now, to have a rough outline of the Mongol method before us.

There was nothing supernatural about it. Nor did it depend on pressure of superior numbers, as was believed for a time. Usually, the Mongols were inferior in manpower; during the first and last attack upon China they were outnumbered in startling proportion. Their rapid maneuvering simply multiplied their force in the eyes of the enemy.

Nor were their victories due to the legendary skill of Genghis Khan alone. He was a genius, but also a savage who did not know the use of writing. He happened to be the one Mongol who broke, as it were, into the front page of history.

As a soldier, Genghis Khan had two weaknesses: an ungovernable temper, which he held in iron restraint, and a latent savagery which drove him at times into a fury of destruction. But his dominant personality gave the barbarians of the Gobi a Leader. "I shall raise this generation of those who dwell in felt tents above the other peoples of the world," he said. He instilled in them the conviction that they could accomplish the seemingly impossible.

The great field commanders—Mukhuli who crushed North China; Batu, conqueror of Russia; Subotai who made fools of the European generals and kings; and Bayan who broke the power of the Sung empire in Southern China—were at least the equals of Genghis Khan as strategists.

The Mongols as a whole were gifted in one way. They had the natural aptitude of horse nomads for maneuvering. Generations of hunting wild beasts over vast areas—and of tribal warfare—had accustomed them to tracking down, rounding up and killing men and beasts without waste effort. Their natural tactics were the swift maneuvering of the steppes. And they learned many secrets of war from their enemies, the Chinese, who were masters of the art of strategy 2,000 years before von Moltke was born. The Mongols were close students of such efficiency. In their world-attack, they commandeered Chinese engineers, bridge builders, artillerists—along with gunpowder, still unknown in Europe—and all the Chinese scientists they could prevail on to serve them.

The Plan of Attack

The Mongol method of attack was to destroy resistance before it could be organized. There were five preparatory steps to this.

(1) Complete espionage (modern intelligence).
(2) Intimidation of the enemy.
(3) Sabotage of enemy's strength.
(4) Deception, as to the nature of the attack.
(5) Surprise, as to the time of the attack.

The Mongols never worked out their plan of operation until they had a clear picture of the enemy's territory, armament, routes of communication, and probable place of mobilization, while managing to keep their own preparations pretty well hidden. They made a practice of doing this before each campaign, without trusting—as they might have been expected to do—in the power of their own offensive. Sun-Tzu, author of the first known treatise on the art of war (490 B.C.), points out that commanders who expect to conquer must have "foreknowledge" and that this must be had from information given by spies, and cannot be gained by deduction or by any past experience.

Better for the French commanders in the Franco-Prussian affair if they had obtained more of a picture of the Prussian military machine they faced and had forgotten their experience of the Napoleonic wars. If the British Army on the Western Front from 1914-18 had not been at first under the control of elderly cavalry commanders steeped in the traditions of the Boer War, it might have been spared years of murderous blundering. And the events of May-June, 1940 seem to indicate that too many commanders remembered only too well the days of 1914-18.

While the Mongol intelligence made its reports, the war council planned the coming campaign to its end. The council, or *kuriltai,* was made up of the veteran commanders, and the princes of the house of Genghis Khan. They designed the coming attack—for the Mongol method of war was always to attack. They managed to avoid being put on the defensive, by expedients that will be explained.

This rehearsal of operations took time. The Mongols, like the Chinese of that day, believed that a mistake in planning would be more dangerous than an error in execution.

Intimidation of an Enemy

A summons to submit would be sent to the doomed nation. More of a warning than a summons. The people to be attacked would be reminded of the disasters that resulted to other people in their attempts to resist. A Mongol peace would be offered on these terms: demolition of the nation's defensive walls; payment of a yearly tax; admission of Mongol armies into the country; and a small levy of fighting men to serve with the Mongols.

Unless the terms were accepted, and reigning authorities were sent to make submission in person to Mongol headquarters, the Mongols would not be responsible for consequences. "That will happen which will happen, and what it is to be we know not. Only God knows."

Even if the doomed nation submitted, the attack would be carried out deliberately, just as planned. It would be quicker and more effective, because the enemy had hoped

for peace. Rarely did the invaders from the Gobi respect an agreement with an enemy. Treachery was a most useful weapon, and the methodical Mongols saw no reason not to use such a weapon in war.

Their purpose in war was not to win battles, but to destroy the power of resistance of the enemy.

Moral issues have no place in the total war. A Chinese commentator wrote of such a war: "Why do scholars prate their stale formulas of 'virtue' and 'civilization' condemning the use of military weapons? They will bring our country to impotence."

Deception as a Screen

The strategy of the campaign decided on, the Mongols tried to mask their purpose. The routes of attack through the doomed country would be surveyed. Grazing lands were set aside along the lines of march as far as the frontier; heavy supplies were moved ahead by slow transport, to await the attacking forces.

A harmless-looking caravan escorted by riders across the frontier might have weapons and equipment concealed in its bales—the riders might be Mongol troopers, the owners of the weapons.

In fact, in moving slowly toward the frontier the Mongol *tumans* or attack divisions usually carried no arms. Their weapons waited for them at arsenals along the road. It was impossible to judge, from the casual movement of these bodies of horsemen, which direction their attack would take. At times a whole Mongol army would wheel through an adjacent, neutral area.

Spies sent out by the Mongols and captured within the doomed area would give, under torture, false information. The net result was that the defenders of the menaced country would be in the dark as to whether the Mongols would attack, or where they would first appear. Meanwhile, across their frontier, the Mongol political agents would be sapping their powers of resistance without seeming to do so.

In their blitzkrieg against the Russian principalities, 1237-1238, the Mongol armies spent two years in preparation and in working their way across mid-Asia. The attack itself destroyed most of the central Russian cities, the centers of resistance, in some three months—and in midwinter! The Russians had not believed that large armies could move in the cold and snow of those months.

The Sabotage Preparation

The Mongols lacked the modern facilities for sabotage within an enemy area. They were not sophisticated enough to try to spread a defeatist propaganda. But they tried to create confusion or civil war, if possible.

Ingeniously, in their invasion of the great Sung empire, they broadcast the report of the double-dealing and profiteering of the Sung minister who was head of the defense measures. As it happened, these reports were fact.

They were apt to buy the allegiance of a brilliant commander on the opposing side, or to win over rebels. Even a man who had fought against them to the end they would try to coax into their service.

When Subotai struck at Middle Europe, 1240-1241, he chose a year when that part of Europe was divided—the German Empire being then locked in internecine war with the Papal powers. And the Mongols, in preparing that blow, contrived to divide the enemies immediately in front of them. As it happened, some strong tribes of Kipchak Turks had taken refuge in Hungary to make a stand against the dreaded Mongols. By a cunningly contrived letter addressed to the Hungarian court, but written in a script that only the Turks could read, the Mongols managed to breed suspicion between the two. The result was that the Turks and Hungarians were fighting like dogs and wolves when the Mongols appeared on the scene.

As with today's German strategy, the methodical Mongols secured a decisive advantage before their first patrols crossed the frontier. Political operations had smoothed the way for the military attack.

And it came with the stunning force of surprise. Columns of war-hardened horsemen swept into the doomed area at terrific pace. They crossed wide rivers without a check, worked their way through ill-defended mountain passes, sometimes covering eighty miles in a day.

They were maneuvering according to a definite plan, often keeping to a fixed time-table, before the defenders realized the power of the attack. Such a lightning thrust got through the Chinese Maginot Line, the Great Wall, in a few hours. The Mongols had discovered that the way to penetrate such a fortification was to win over the commander of one point, and to take it by surprise. They were also aware that once penetrated, the rest of the line served no more purpose than a monument of masonry and stone.

The audacity of their attack was apt to stun defending officers. A Mongol *ming-khan*, or commander of a hundred might appear suddenly in a district and force its surrender because the defensive force had no means of knowing how many thousands might or might not be at the heels of the hundred.

But this was a calculated audacity. The Mongol columns were self-contained; they carried iron rations—they could supply themselves off the enemy country. It did no particular damage if their communications were cut, because they had no reserves behind them.

They had discovered too that safety lay in this speed of movement. By their greater mobility they could maintain the pressure of attack on the enemy. The columns, moving almost with the pace of German tanks and motorized columns of today, could scatter small defensive formations. And they could unite at equal speed against a main army. Lacking the radios of today, they kept up communication between the tumans by a combination of signals and mounted couriers. Their *yam* or pony express was capable of covering two hundred miles in a day.

Such maneuvering could not be attempted by new recruits. The Mongols were products of their steppes,

hardened to fatigue. They were trained to a lifetime of war, and aided by organization complete even to small articles of equipment.

Their nomad clans had been mobilized as a whole for war. Men from seventeen to sixty served, according to their qualifications, in the fighting ranks, in the transport, or by guarding the herds that provided most of their food. Their women, the old men, and youngsters cared for the home encampments.

Individual Mongols were equipped for speed and striking force—not for defense. Loose leather and felt capes protected them against the weather. Their helmets of light metal, or lacquered leather, had a leather drop to protect the neck. Few of the regiments had armor—and those only to protect the front of the body.

Their saddle kits were small, and complete to ropes and a leather sack for iron rations of dried meat and milk curds. The swords were shaped like the modern cavalry saber—the lances light and serviceable.

But their effective weapon was the bow. Each rider carried two of the double-curved Turkish bows, strengthened by horn—one for handling from the saddle, the other for long-range firing on foot. Arrows were carried in two cases, one with tempered-steel points for piercing armor, the other for longer range. The rider could draw the bow from its case at his hip with his left hand, and an arrow with his right, and fire swiftly, without checking his horse.

The Mongol bows had power to outrange most European weapons. And their rapidity of fire took other armies by surprise. "They kill men and horses," a European spectator observed sadly, "and only when the men and horses are crippled do they advance to attack."

So careful were the Mongols to use this "fire" preparation, that their divisions had machines dismounted and carried on pack animals—stone and javelin-casters and flame-throwers. They even used smoke screens, and attacked behind burning grass. They avoided hand-to-hand fighting except as a last resource.

Since a Mongol army kept its formation for a lifetime, the various units were so trained in battle drill that their maneuvering was carried out according to a plan given in advance—without orders shouted during action. They had signals to use at need, whistling arrows, and colored lanterns raised or lowered at night. "Silent and inflexible," another eyewitness relates, "and swift beyond belief, they moved as if at the command of one man."

This mechanical perfection in action came from two causes: the Mongol forces were all one arm, and like a motorized division today, they could all maintain the same pace. Also, the men in the ranks had spent a lifetime with their officers. Usually a regiment was made up of men from the same clan. (The Mongols used the decimal system of units—ten in a squad, ranging up to the tuman, the division of ten thousand.)

Like the men, the officers had in the highest degree the "intellectual discipline" demanded of soldiers by Marshal Foch. Youngsters served in the *keshik* or élite division which was always kept by Genghis Khan or his successors. They learned their lessons on the march, or in campaign conditions.

Such officers were carefully weeded out. Physical bravery and endurance were taken for granted. They were trained to be cautious. Those who seemed to be foolhardy as well as brave were transferred to the transport service. Those showing traces of stupidity went lower down. The glory-hunting type was not wanted.

Of one officer who seemed to have every qualification, Genghis Khan said: "No man is more valiant than Yessutai; no one has rarer gifts. But as the longest marches do not tire him, as he feels neither hunger nor thirst, he believes that his officers and soldiers do not suffer from such things. That is why he is not fitted for high command. A general should think of hunger and thirst, so he may understand the suffering of those under him, and he should husband the strength of his men and beasts."

Mission of Officers

The leader of the first squad in a company took command of the company if its officer was killed. And so with a regiment. Ability was the only demarcation be-

tween troopers and officers. Officers were promoted by ability alone. Seniority, the curse of the professional army, cut no ice. At the age of twenty-five Subotai commanded a division.

The men had confidence in their officers, knowing them intimately, well aware that if an officer were not fit to lead he would not hold his rank long. This confidence was increased by enforcing a rule that will be appreciated by all service men. It was the first requirement of an officer *not* to risk the lives of his men. A loss of Mongol life was the unforgivable sin in the army.

Months after a battle which came near to deciding the fate of Europe, Batu Khan reproached his staff general, who happened to be Subotai, because Subotai delayed in building a bridge over a river, had been late in supporting him. "You were the cause of my losing Bahatur [an officer] and twenty-three men," Batu complained.

Their armies were welded together by an inflexible discipline. For this the driving personality of Genghis Khan was responsible. He made death the punishment for failure of the members of a squad to carry off a wounded squadmate, and death was also the penalty for failure of a rear-rank rider to pick up an article dropped by a front-rank man. Before going into action the officers were required to inspect personally the full kit of every man under their command, to be certain that nothing was lacking.

There was even a lost-and-found department in each division, to keep track of missing equipment. This meticulous care of details gave the Mongols an advantage in equipment over the armies they faced. (The new German Army, rebuilt after Versailles by von Seeckt had this characteristic.) A lacquer coating of equipment protected it from dampness. A detail—yet one that made it possible for the Mongols to use their bows in the rain. The tempering of arrow heads gave them the advantage of steel over the iron used by Europeans. The extra ropes carried by the riders of the *ordus* could be attached to wagon transport and war machines to drag them up grades and over heavy going.

With such highly trained mobile columns, operating under iron discipline, the Mongols were able to take risks. It was part of their strategy to take such risks at the start of a campaign in order to avoid being drawn into a major battle. Their object was to stun resistance by surprise, and then to destroy the opposing manpower, during this second phase of a war.

They had three methods of doing this, decisive in their

effect: by a paralysis of terror; by the immediate destruction of the enemy government, so the invaded region would be without control; and by outmaneuvering the armed forces, so that they could be scattered and then liquidated at leisure.

So the first aim of the invading Mongol columns was to create anarchy in front of them. It was no ordinary war, but a destruction of all power to resist.

Take the campaign of 1219 that broke the resistance of the Khwaresmian Turks. This particular Turkish empire was strong in manpower and fortified cities. It had the war-like spirit of Moslems defending themselves against an attack by pagans. Its forces under arms outnumbered the Mongols three to two.

The Turkish armies were extended along the line of a wide river, the Syr, facing north. A chain of walled towns strengthened this defensive line. Behind it lay the large cities of Bokhara and Samarkand. Behind these, Turkish reserve contingents were assembling slowly. All Turkish units were facing the northwest, where the Mongol armies were emerging slowly from the mountain ranges of mid-Asia. Three Mongol columns moved into the open, storming isolated towns at either end of the Turkish line.

Once such a town was entered, the inhabitants were led out and divided into three groups—the boys and young girls sent back into Asia as slaves; the trained artisans spared to form a labor battalion to aid the Mongols in the next siege. All other living beings were tied up and killed methodically.

This slaughter stunned the inhabitants of the first defense zone. But the three armies operating along the Syr were serving to mask the fourth and strongest, under the direct command of Genghis Khan and Subotai. This fourth column slipped around the left of the Turkish defenses, crossing the Syr without being observed. And then it vanished. Genghis Khan led it straight to the south for nearly 200 miles across the Red Sands Desert. And it emerged at headlong pace before the walls of Bokhara far in the rear of the Turkish armies.

Then began the rapid maneuver of the Mongol blitzkrieg. The garrison of Bokhara, trying to sally out, was annihilated. The surviving inhabitants were driven in a mass toward Samarkand to serve as a human shield for the main Mongol army. The regular Turkish armies were thrown into confusion by the attack from the rear, and began to retreat separately. The swift-moving Mongol columns concentrated, to scatter them one at a time.

And simultaneously, two picked Mongol divisions—about 20,000 riders—were told off to isolate and destroy the government (in this case the Khwaresmian Shah, his ministers and court). This flying column located the Shah's court and attacked it suddenly. It retreated further south *away from the remnants of the Turkish armies* toward Balkh. The two divisions picked up its trail and drove it into headlong flight. When the Shah fled from Balkh with his treasure, his immediate family and a few nobles, his government ceased to function. Thereafter he was never allowed to gain touch with his fighting forces, and he was hunted into the waters of the Caspian where he died almost alone, haunted by fear of the inexorable horsemen who tracked him down.

Without any central authority to lead them, individual Turkish commanders made brave stands here and there. But the paralysis of growing fear numbed resistance. New recruits did not know where to assemble. Citadels remote from the area of conflict found themselves attacked before they could mobilize a defense. There was no longer a front. In five or six weeks the resistance of a powerful empire had been broken completely. Turkish remnants became isolated, uncertain what was happening ten miles away, under the pall of terror. Bands of fugitives fled like animals from the main roads where the Mongol regiments galloped.

"The living," a chronicler relates, "envied those who were already dead."

Herds of captives were driven to the task of tearing down the walls of cities. Then they were killed, their bodies left to fester in the ruins. Detachments of Mongols hid in the ruins and put to death survivors who came back to the sites of their homes. The organized life of the country was ripped open like a melon. The only law enforced was Mongol military necessity. It became a crime to resist a Mongol order.

Since the horse herds had been commandeered and the roads occupied by the invaders, the surviving Turks were without means of ordinary communication. Administration was taken over by the Mongol *darugashis* or road masters. Turkish routine had fallen into anarchy; it was replaced by the harsh military rule of the conquerors.

But the breakdown of resistance had been brought about in the first place by the almost incredible wheel of the column under Genghis Khan across the desert to the rear of the Turkish armies.

Surprise as a Weapon

The Mongols managed to destroy the strong Kin empire in middle China by brilliant strategem. The Kin were a warlike nation protected by mountain ranges in the north and west, and a chain of fortresses facing the Mongols in these two directions. The Mongols made no attempt at first to force these frontiers.

Instead, a small army of three divisions was sent down past Tibet, through almost impassable country, to emerge in the south, in the rear of the Kin forces. Tului, a son of Genghis Khan, asked Subotai how he was to meet the Kin armies when he approached them.

"They are town-bred people," Subotai advised him, "and they cannot endure hardships. Harry them enough, and you can defeat them in battle."

When some of the Kin forces about-faced, to meet Tului's column at their rear, the Mongol retreated before them, drawing them up into the mountain region that had already taken toll of his veteran regiments. Cold and hunger in this region nearly exhausted the heavily armed Kin forces.

And when the Mongols counter-attacked in the hills, they had little trouble driving the Kin covering force back to the plains. Meanwhile, Subotai with the main force of Mongols had rushed the northern frontier—getting through before the Kin garrisons could flood the lowlands along the Hwang-ho. The Kin armies were caught, disorganized by the pincer thrusts, between Tului's flying column and Subotai's main body, in the plains where the Mongols easily surrounded them.

Not until they were so caught did the Mongols engage in a major battle and annihilate the armies of defense. To gain this strategic advantage, they had sacrificed the greater part of Tului's three divisions but they had escaped serious loss to their main army.

In so doing, they had obeyed to the letter the advice of Sun-Tzu: "In war, the successful strategist only *seeks battle* after the victory has been won, whereas he who is destined to defeat first fights and afterwards looks for victory."

Subotai Tricks Nan-king

The Mongols were capable of winning a campaign by deception at the end, instead of the beginning—a much more difficult feat. Subotai tried to surprise the strong walled city of Nan-king with his siege army. For six days he made attempts at different points to force a way through the defenses. When he failed, he broke off the action, to avoid wasting the lives of his men. He built a blockade wall, fifty-four miles long, around the fortified area defended by the resolute Chinese. Nan-king was said to have a population of four million.

The blockade reduced the Chinese to near-starvation. Epidemics broke out in the city, but it did not surrender. Then Subotai let it be known that he might be bribed. The Chinese sent out an enormous sum to him, to buy his withdrawal.

And Subotai did retire, abandoning his blockade line. Beyond the observation of the Chinese, he rested his men, out of danger from the epidemic. When the Chinese were convinced that Nan-king had been spared, the Mongols reappeared suddenly. Taken by surprise, the Chinese resistance collapsed.

Their will to resist had been strong enough to hold off the Mongol attack and to endure hunger. But it did not survive the let-down, when they believed the siege to be over. The Mongols gained Nan-king at the price of a small casualty list. By treachery! Certainly. That is one of the most useful weapons of the total war.

How different were the tactics of Falkenhayn and the German Crown Prince who staged the attack on Verdun in 1916, to create a mincing machine of artillery fire by which the resistance of the French would be broken. The Verdun charnel house sapped the resistance of the Germans as well as the French, and it was not broken off when it failed to accomplish the strategic aim that inspired it.

Neither Falkenhayn nor the Crown Prince could have agreed with Sun-Tzu, who said more than 2,000 years ago: "You can begin a battle by *direct* methods, but indirect methods are needed to secure victory."

The commanders of the Third Reich, today, have learned this lesson.

Bayan's Peace Offensive

Perhaps the most extraordinary deception worked by the Mongols was to camouflage at least one great war as a peace offensive. The staff general Bayan and Kubilai Khan worked it out together to break the resistance of the mighty Sung empire. The territory of the Sung, south of the Yang-tse had not been invaded for centuries. Its immense population was high-spirited, but accustomed only to an economy of peace.

The Mongol armies of invasion faced a potential manpower thirty to forty times as great as their own. They might have been expected to experiment with a blitzkrieg. Instead—probably aware of the size and strength of the cities confronting them—they did the exact opposite.

Their strategy was to avoid rousing up such human masses against them. Bayan's armies moved south at an oxen's pace. Their expedition became a series of summer encampments. At times they displayed banners with the slogan, "It is forbidden to take human life."

Their flanking detachments distributed farming tools and seed to the peasants of the countryside. They issued food to the villages. Where Bayan came upon an epidemic, he sent physicians from the Mongol divisions to check the disease.

When he was forced to give battle, or to take a city by siege, he buried his enemies with honors, and himself prayed publicly at the graves of the most daring of the Sung commanders. Meanwhile the peace propaganda penetrated in advance of his armies. In regions where the Sung leaders were trying to rouse the common people to resist, Bayan would be apt to send officers to make a distribution of coins. He was gambling on the stubborn inclination of the southern Chinese toward peace. His propaganda emphasized that the Sung commanders were getting the agricultural regions into trouble, while the Mongols were aiding the economy of peace. It was a foolish business for the Sung people to leave their shops and fields to join the ranks of an army where soon or late they would be killed, in spite of the desire of the Mongols to protect their lives.

Naturally, the strategy of this bloodless war—or a war planned to be bloodless—required iron discipline in the ranks of the Mongols. The story is told of a soldier who helped himself to some onions from a field and was dismissed from the army. And it required the endless patience of a—Mongol.

But it sabotaged the military strength of the Sung. The Sung nobility, trying to promote a death-or-glory resistance, became very unpopular with the field workers. The strength of Bayan's strategy lay in the demonstrated fact that he had made resistance futile and unprofitable. After nine years the reigning city of the Sung surrendered with-

out conflict. Bayan accomplished what had not been done in the centuries before his time, or since—the subjection of the whole of China to an invader.

This form of peace offensive, supported by propaganda, was tried rather clumsily by the Red Army in Poland during September, 1939, and again in the invasion of Finland. The camouflage fell away from it in a few hours. The real purpose of the Red Army in each case was to occupy a foreign area as rapidly as possible by force. Propaganda that the Red advance was to protect inhabitants of the area against capitalistic control proved to be meaningless—a transparent screen of words flung in front of the advancing tanks.

In the same way the peace propaganda that camouflaged the German push into Norway broke down within a few hours. The Germans might explain that they had appeared to take over the Norwegian ports to safeguard them from an attack by the British, but their actions made clear at once that this was a military invasion. A Trojan horse ceases to be useful when armed men are seen climbing out of it. The Germans took the ports, but they were involved in military action with the Norwegians within twenty-four hours.

War Without Battles

By the Mongol method of warfare, their armies of invasion entered an enemy country with a decisive advantage already won. To put it broadly, the war was half won by the time military operations began.

With this advantage, the second phase of the war—the maneuvering of the attack columns—was certain to be successful, unless something unforeseen occurred. By deception and surprise, the Mongol attack columns had "got there first." They were already following a carefully prepared plan, and moving at a speed the enemy could not match. They had gained, as it were, full momentum. It was their strategy not to "git thar fustest with the mostest men," but to get there first with the best men.

This momentum often proved decisive. In 1914 the momentum of the wheel of the right flank of the German armies—after deception and surprise—through the static Belgians and the scattered British and French divisions almost won Paris and the Channel ports. Which, in that case, might have meant the war.

In 1939 the momentum of the four German attack armies (each with a spearhead of motorized units) closing in on Warsaw broke through the resistance of the half-organized Polish armies immobilized by the bombardment from the air during the first three days. At least two of the four German armies were able to penetrate to Warsaw without a major battle. The resistance of the mixed Polish forces caught around Warsaw was hopeless, as we know now. It was ended by artillery fire and bombing from the air without serious loss to the German commands.

The Mongols were more successful in avoiding ranged battles. Their strategy kept enemy forces in movement, either forward or back. They knew by experience that a courageous and unbroken civilized army would almost always advance against them; and a broken army would seek safety in flight away from them. So their maneuvering during the third phase of a war—following the preparation and penetration—was intended to prevent a decisive battle. They did everything possible to keep enemy forces from gathering in strength to make a stand on favorable ground.

Napoleon, the greatest of the European opportunists, rarely accomplished or tried to accomplish this almost impossible feat. He relied upon the pressure of the "strongest battalions" to break the enemy resistance in battle, and upon victory in battle to win a war. But this procedure, from Austerlitz to Eylau, and to Borodino, ended in Waterloo. His "strongest battalions" had become ineffective through wastage in lives.

We find no such glittering chain of battles in the campaigns of Genghis Khan. The Asiatic conqueror was too chary of the lives of his Mongols. By avoiding an Austerlitz, he never knew a Waterloo. Subotai is said by tradition to have won thirty-two wars and sixty-five battles. If this be true, the conqueror of Europe needed an average of less than two engagements to a campaign.

Sun-Tzu, writing in the dawn of history, reminds us "That commander is most successful who achieves victory without being drawn into battle."

A theoretical axiom? The Mongols practiced it. Their strategy avoided a massed battle in three ways: (1) By infiltration (that is, by moving past a strongly defended point like a fortress without attacking it, in order to break resistance behind it); (2) by flank attack (that is, by refusing to make a frontal advance against a stationary enemy, and by forcing him to move by wheeling around him); (3) by counter-attack.

These three movements can only be carried out today by highly trained and mobile units. Like the Mongols, the armies of the Third Reich have mastered the first and third particularly. Their tactical expedient in attack is to find weakness and slip past strong points, which are left to special units to reduce later. Their defense system is the well-known elastic type, by which a frontal position is held by small detachments, while the stronger forces are held back of the first line, in readiness to counter-attack.

These now well-known tactics the Mongols employed in the larger scale of strategy. That is, in the masked movements of their divisions over the entire area of the conflict. If the infiltration attack failed to demolish the enemy resistance, the Mongols would be apt to feign a general retreat, to draw the enemy out in pursuit before attacking again unexpectedly from the flanks.

Such a maneuver broke the first two Russian armies at the river Khalka in 1222. Subotai used it to demolish the main army of the European campaign of 1240. And by it, he managed to avoid a pitched battle.

Battle Without Loss

In March of the year 1241, the main resistance of the Europeans was gathering around the city of Buda on the wide Danube. It was gathering in the way usual to courageous but little-trained citizen soldiery. Armed men were collecting in the outlying country, and marching in under their leaders to Buda, the concentration point, there to find out how they were to fight and where.

In the Buda castle their higher command—the Hungarian king, bishops, nobles, commanders of Templars—were discussing what measures they might take if the Mongols should appear on their side of the Carpathian Mountains. These Christian soldiers were accustomed to marching out against an enemy and fighting hand-to-hand—for the most part on foot. They felt confident enough, because they knew only that the still-invisible Mongols were barbaric pagans, and an armed and armored Christian host could easily win a victory over pagans. These allies—Hungarians, Croats, Austrians, French Templars, and others—were good soldiers by the European standards of the day, and determined to come to battle. They knew nothing, in reality, about the movements of the Mongols.

While the Allied Council debated, the Mongols were already in full momentum, four attack columns driving through and around the Carpathians sweeping over weak resistance, and uniting against stronger forces, destroying elsewhere the Slavs, Poles, Silesians, and Transylvanian Germans who stood against them. The Mongols were using their favorite pincers attack, overrunning the points of mobilization before closing the pincers on the main resistance at Buda. The rendezvous of their flying columns was the Danube at Buda. The date, March 17.

The first news the Allied Council had of the war was the sudden appearance of an officer of the frontier guard to report that the Mongols were through the mountain passes, nearly 200 miles away. He reached Buda March 15. The next day the Mongol advance units appeared at his heels along the river.

The Allied army, under leadership of the Hungarian king, was taken by surprise but not thrown into confusion. It did not scatter or make a hasty attack across the river. The Mongols had no means of crossing the Danube.

After two weeks or so, the Allied army, now some 100,000 strong, crossed the river to give battle. It saw nothing of the Mongols except for patrols of horsemen that withdrew before it. As might be expected, the Hungarians and their allies followed up this retreat. For six days they marched eastward, away from the river, without being able to come up with the elusive horsemen. On the sixth night they camped in a plain hemmed in by low, vine-clad hills, with a small river—the Sayo—in front of them.

They were warned by an escaped prisoner that the Mongols were five or six miles on the other side of the river. They took the precautions of experienced soldiers. A strong advance detachment was posted at the one bridge over the Sayo—a wagon ring drawn up around the main encampment.

That night the Mongols moved to destroy this army. The advance guard at the bridge was driven back by the fire of war machines; elsewhere the Mongols built a bridge of their own. From two directions they occupied the higher ground around the Christian camp.

When the Mongols were seen at the first daylight, the heavily armed Allied chivalry made a frontal charge from the camp. This charge up a slope was broken by "fire" from the Mongol bows and machines. A second charge led by the Templars still failed to come to hand-to-hand fighting.

The Mongol line in front of it withdrew, the Christian knights were enveloped in a smoke screen, decoyed off into rough ground, and cut to pieces from a distance. Not one of the Templars survived.

In the camp behind the wagon ring, the main body of Christian soldiery on foot was still resolute enough. But the Mongols made no attack on their lines. Instead, they began a long-range fire of arrows and flame projectiles on the camp. This fire from above, to which the Christians could not reply effectively, broke the morale of the soldiers. They could not charge the Mongols on foot, they could not hold their position in the camp. They began to retire to the west, where the Mongols had left a wide gap in their encirclement. This was in the direction of the Danube, and safety.

Still the Mongol regiments made no direct attack. For six days they followed on the flanks of that mass in retreat, killing the men who fell behind from weakness, and herding the fragments of the mass aside, to be destroyed more easily in woods and brush. Some 70,000 of the Europeans are said to have died in this methodical operation.

Grim as was this slaughter, it was only an episode in the Mongol military conquest. Inferior in numbers to the central Europeans, Subotai had managed to destroy their mobilized armies without coming to battle at close quarters and with a wastage of lives so slight among the Mongols that his divisions were intact. Behind the strategy of the old Mongol, there were two very material aids in his triumph at the Sayo—the skill of his engineers in bridge-building, and the range of his "fire" power.

The Mongol method of attack made it impossible for the eastern Europeans, who were their equal in fighting spirit, to stand against them. Unaware of what they were facing, the Christians went into "battles" that were lost beforehand.

Zone Method of Conquest

In their general attack on civilization, the Mongols limited each advance according to a fixed plan. It can be called the zone, or the avalanche, method.

Once the military blitzkrieg was over, and the walls of fortified cities demolished, the Mongols proceeded swiftly to the dismemberment of a conquered nation before it could recover from the paralysis of the attack. The

reigning monarch was hunted to death or exile, the travel routes taken over by a road master. The horse herds were rounded up, with cattle for the army. The surviving manpower was divided. Trained workers were formed into labor battalions, fed by the Mongols. The strongest-appearing men were drafted into the reserve contingents of the invader's army. Noted scholars and scientists were sent east to Karakorum, the Mongol capital in the Gobi regions.

From a census taken by methodical Chinese secretaries, a tax record could be prepared. Field workers were left to harvest the next crop.

So, when the armies of attack moved on to the next zone they took with them a large part of the manpower of the first zone, which was now without leaders to organize a revolt. This commandeered manpower would be used against the next zone. And only a minimum of guard posts would be needed to keep the first devastated zone under control.

If they anticipated an attack from an outlying power, the whole frontier of the farthest zone would be ravaged and burned, to destroy the supplies that could maintain an army.

By limiting the area of each advance, the Mongols dealt as far as possible with one nation at a time. But their zones were designed more for geographical reasons than any other. Each one stemmed out from the Gobi region. In their invasion of the west from 1235 to 1242 the Mongol ordus advanced as far as the Volga before concentrating against the vast steppe and forest area of Russia. Their second zone extended nearly to Kiev and the Baltic shore. Their third swept through the barrier of the Carpathians as far as the Danube.

By this limitation the Mongols avoided over-reaching themselves. By isolating each zone in their peculiar fashion from the outer areas of the world they escaped being put on the defensive by an enemy attack. They took time to consolidate before each advance.

Not since the long-forgotten days of the Assyrians had the civilized world *in toto* faced such a total attack upon its powers of resistance. So there existed in the Mongol era no military machine that could check their advance, and the more peaceful powers of the outer civilization proved to be incapable of joining together for a combined resistance.

In their methodical advance, the Mongols contented themselves with appropriating the wealth and labors of the vanquished peoples. Whether from superstition or because they found the priesthoods useful as intermediaries with the subject races, the horsemen from the Gobi never interfered with religion.

They established, in their passing, the deathly nomad peace in the conquered areas. (In their home life the Mongols proved to be kindly and good-natured men, who wore no weapons and indulged in no quarreling. This brief sketch of their military strategy does not deal with the Mongols as a people.)

To a certain extent the strategy of the Third Reich now follows the zone method of the Mongols. The captured resources of Czechoslovakia—especially the munitions—were employed in the surprise attacks on Poland, the Low Countries, and France. Contingents of Slovaks, and apparently some Czechs, were ordered to advance into the second zone of Poland behind the motorized thrusts of the Reich's divisions. Such detachments were seen passing through the Tatras Mountains with German artillery moving behind them, and German aviation overhead.

In their occupation of Poland, the agents of the new imperialism of the Reich severed the nerve centers of the stunned nation.

They seized control of the food of the area—reducing the population to dependence on the new military authorities for the means of life itself. And they dealt with—by exile or execution—the natural leaders of the population who might head a revolt. Curiously enough, in their section of the invaded area, the Soviet agents were doing the same thing. The excuse made by the Reich was that, while the bulk of the common people were offering no resistance, the *intelligentsia* were causing trouble. The propaganda of the Red occupation was that only the *capitalistic landowners* were being molested.

It came to the same thing. The best brains and keenest spirits among the Poles were at once cancelled.

Even a brief study of the Mongol invasion brings home to us several lessons, forgotten in the West during the long era of industrialization and prevailing peace.

First, that Europeans have no monopoly of military genius. Asia can produce strategists of the highest caliber.

Second, that Asia has, in the past, understood the operation of the "new" total war that destroys resistance.

Third, that Asiatics can match the fighting power of Europeans, *if given an equality in weapon power*. In the desultory combats along the Amur frontier, the Japanese have proved themselves more than a match for the Soviet forces in the air, and in tactics on land.

Also, that the volunteer armies of a high-spirited citizenry with little training may go down to sudden defeat before the attack of a highly trained military machine.

There is no defense against the lightning attack on land *except an equally efficient military organization*. The increased power of the air force to cripple resistance on land has added to the danger of the blitzkrieg. Because it adds to the speed of the attack—as the Germans have proved once and for all. The fast-moving tank has also added to the speed of the attack, so long as the tank can be followed up by motorized infantry units. So these two modern inventions have made even more dangerous the strategy of the Mongol horsemen.

How close a study, if any, German military brains have made of the Mongol campaigns I do not know. There have been at least five studies of the Mongol attack upon Europe published in German, as against one in French and none in the English language.

A Field AA Supply Officer

By Captain Burgo D. Gill, Coast Artillery Corps

The supply section of the 61st Coast Artillery (AA) met and coped with many diverse problems during the recent Third Army maneuvers in the Texas-Louisiana-Sabine River Area. Some of the situations were merely ridiculous; others were more serious; as for example the crisis that arose when the daily ration issue for the regiment was almost captured. But comic or serious, all lapses were blamed on the RSO. And perhaps rightly so.

The experiences of the 61st before and during the maneuvers approximated those of a wartime mobilization. Last fall, the regiment was only a mixed battalion, which had recently lost fifty per cent of its men to foreign service. Then new tables of organization and basic allowances were received which made it necessary to recruit up to 1,350 men from a strength of 250. Six new batteries were formed and their men completed recruit and initial training.

Then came the problem of the journey to Texas.

Gasoline was obviously the largest item to plan for during the trip. In fact, so large did this problem loom that one or two other points were overlooked. Procurement of gasoline for convoys may appear a simple matter, but one

must remember that the 61st had many new officers who had little or no experience and consequently detailed plans had to be made.

Although tactical gassing—that is using the trucks' ten-gallon containers—might be best under war conditions, the use of filling stations in conjunction with gas trucks and gas tankers seemed to be more practical in this case. To use an old bromide, it all depended upon the situation.

In connection with gassing, new officers and noncoms had to be impressed with the fact that servicing vehicles takes priority over other campsite and road-halt functions. The reasons are obvious to experienced personnel but these men had never known "—the loss of a nail."

Prior to the departure from the permanent station, there were differences of opinion as to whether or not the RSO should be the MTO as well. Experience gained on this trip satisfies me that RSO and MTO duties should be handled by different officers.

One staff officer believed that the agent finance officer need carry no cash while on convoy. However, if no government funds had been carried, the RSO (and the regiment) would have been greatly embarrassed on several occasions.

One school believed that foodstuffs should be ordered in advance by letter, a second school thought it would be sufficient for the RSO to invite agents and salesmen to the bivouac area, while a third group stated that the RSO should make all purchases upon arrival in a bivouac area. Still another group said that the battery commanders should do their own worrying about rations.

A regiment of 1,350 men descending upon a small town considerably depletes wholesale supplies. The system used was the last; the batteries carrying along enough dry stores and canned goods to guard against shortage of local supplies.

The whole supply story changed when the regiment arrived at Jasper, Texas, and was instantly assigned positions to protect the concentration of the Red IX Corps. There rations were drawn daily by the RSO and taken to a convenient spot, where they were split up for various batteries. Equitable subdivision of these rations might seem to be a small matter, but it was an important one to the 61st's RSO.

For example, the total number of rations issued might be 1,189, on a day that A Battery had a strength of 221, B Battery 109, and so on. Then Battery A should receive

221/1189ths of the available food, which is complicated. However, a quick inspection was enough for the RSO to say that a simple number of shares representing 1,189 was approximately twelve. On that basis, A's 221 were assigned 2¼ shares, and B's 109 were allotted one share. An assistant RSO with a slide rule checked this method on a basis of exact percentages, and found the ordinary error less than two per cent.

The regiment once moved forward almost forty miles from Jasper to protect the bridges over the Sabine River. The batteries were scattered in three groups over a thirty-mile front. The ration DP, so corps stated, would be moved from Jasper to Burkeville, a distance of twenty miles. However, when the supply truck train visited the expected location of the ration DP, it was not there. This entailed a two-hour search over thirty miles of roads at night to locate the new DP. It was finally found right near camp at the Burr Ferry Bridge, where two soldiers had been stationed to flag down some civilian freight trucks that had been hired by the Army Quartermaster. In any event, the rations were delivered by 1:00 a.m.

When the IX Corps was forced back from Leesville to the Sabine River, the 61st Coast Artillery received orders at about 10:00 p.m. to withdraw immediately to the river to protect the Burr Ferry Bridge. The ration trucks were just about to start for the DP a mile away to draw rations. The RSO requested a decision as to whether he should get the rations, or turn his trucks over to the headquarters commandant to transport regimental headquarters. It was decided that regimental was more important at the moment, so the rations were left behind.

About noon the next day it was ascertained that no rations were available to replace lost or captured rations. So it became necessary to locate the abandoned ones.

Three heavily armed trucks were dispatched forward to the old ration DP at Leesville which was then part of the rapidly fluctuating front line. Luckily for the regiment (and the RSO) the rations were still there, but would have been captured in another thirty minutes when Leesville fell into Blue hands.

On two occasions rations were divided into battalion lots and turned over to the battalions for distribution. This caused friction, and I believe that this should never be done except in a real emergency.

Gasoline was perhaps of as great, or even greater importance than rations. Only one method of distribution was used. The RSO "discovered" the location of gasoline DP's changes of location, and so on, and sent the information to the various batteries. Then, one or two trucks with empty containers were sent out individually from each organization as it needed gasoline.

We learned a lesson on this maneuver about servicing trucks. Whenever a motor section parks for the night, no matter how late, how bad the weather, or how tired the

men may be, the trucks must be serviced at once, and be made ready to answer instantly a call for a long march. Here is a case in point.

About 3:00 o'clock one weary morning, the RSO instructed his drivers, who had just completed a mission, to sleep and forget about re-gassing. Nothing could happen until noon. But things broke wide open before breakfast, and the men were barely able to perform their missions. War-time is certainly no time to get softhearted.

The corps troops had only one gasoline DP. For a couple of days the 61st, as well as other outfits, had to haul gasoline thirty miles. More gasoline DP's should and undoubtedly would be set up in actual field operations. The RSO had little to do with the MTO section except to draw the supplies it requested, or to deliver supplies picked up with the rations at the Corps truckhead. The MTO had permission to deal directly with the corps third echelon quartermaster repair unit.

Filled requisitions for supplies such as repair parts, sandbags, and clothing were delivered with the rations. Consequently, when the RSO went forward to draw rations, two trucks were taken for food, a third truck for ice, and a spare for other matériel. The remainder of the eight supply trucks were left in bivouac, or dispatched separately to the ration split-up point.

In a changing situation an RSO often cannot spot the battery messes prior to drawing rations. In two instances the battalions were directed to leave guides at certain road junctions. Once the guides could not be found when the RSO brought up his ration trucks because they thought that if the rations did not arrive by midnight, they would stand relieved. The moral seems to be that guides should be issued sandwiches, and instructed to wait twenty-four hours, if necessary, or until relieved by higher authority.

Although the regiment several times was scattered over an area of thirty miles, it was never found necessary to split up the RSO section. Once, however, a machine-gun battery was sent on a mission so distant that it was not feasible for the regiment to supply it. Therefore this organization drew its supplies from a divisional DP and the battery commander acted as his own supply officer.

In addition to quartermaster supplies, signal equipment was issued at the corps truckhead. An Ordnance detail visited each regiment daily, took orders, requests for repairs, etc., from the RSO office, and made deliveries on the following day.

Medical cases were dispatched rearward by the regimental ambulances. Of course, the medical field ambulance trains assisted in this evacuation in addition to returning all cured patients.

The question of ammunition created a great deal of friendly discussion among the members of the staff before the maneuvers and during the early days in the field. One group thought that the RSO should be the regimental munitions officer and attend to the paper work while the battalion munitions officers and their detachments performed the labor. The other school believed that there should be a regimental munitions officer. However, as long as there are enough officers, this job should be handled by a separate staff officer, and this method was used.

The maneuvers forcibly brought to the fore the amount of paper work a peacetime garrison RSO must do to conform with regulations. It is virtually impossible to keep up with paper work on a blitzkrieg maneuver.

The present supply system for an antiaircraft regiment worked splendidly. But it is obvious that differences of opinion will always occur, and must be ironed out. And the various battery commanders, MTO sergeants, supply and mess sergeants must be thoroughly informed as to what they may expect.

Logistical Notes

Regimental convoy from campsite 5 miles south of Many, Louisiana, to Bloomington, Illinois ... 845 miles

Gasoline consumed ..... 27,912 gallons

Gasoline required to move regiment 1 mile 33.1 gallons

(The regiment was short twelve searchlight trucks. If completely equipped according to TO it would have used 35 gallons to move 1 mile.)

On a 1,007 mile convoy (approximate distance from Many, Louisiana to Fort Sheridan, Illinois) the time was:

Start—12:01 a.m. (midnight) May 26, 1940.

Finish—3:00 a.m., May 30, 1940.

Time: four days and three hours.

Convoy made two forced marches of 305 and 342 miles respectively. The other two marches were 230 and 130 miles.

In planning for re-gassing points, it was found that the Federal, 1½-ton, searchlight truck was the weak link in the chain. Using ten gallon containers—one plus 10% per truck—Battery A could only be counted upon to run about 175 miles.

Time consumed in re-gassing entire regiment; using truck tanks and spare containers; best and worst time:

7,545 gallons issued by a single QM filling station with *one* pump and nozzle and hose: 9 hours.

5,202 gallons using one commercial gas station with two pumps and two delivery gas trucks: 2½ hours.

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Fire at High-Speed Maneuvering Target

By Major Arthur B. Nicholson, Coast Artillery Corps

On April 23, 1940, pursuant to the instructions of the Commanding General, Fort Monroe, Battery F, 2d Coast Artillery, fired a special service practice with 8-inch railway guns at a high-speed, maneuvering, hypothetical target. Twenty-three rounds of ammunition were made available to the battery for the shoot. On April 25, a similar problem was assigned to the battery as an advanced practice in place of its regular annual target practice, and was fired two days later. For the advanced practice only fourteen rounds of ammunition were available, and a correspondingly shorter course was fired upon.

Although much of the following account describes methods familiar to many, it is possible that a description of the training and tactical approach and the results achieved may be of general interest.

In firing at a high-speed maneuvering target, the desirability of attaining the maximum rate of fire is obvious. If the beginning of turns are to be detected quickly, it is highly important that observation data be taken at the most frequent practicable intervals and the reduction of the length of the prediction period, plotted point to setforward point, be reduced to the minimum.

General Training

The shortest practicable firing interval for 8-inch railway guns is forty seconds. At elevations over thirty degrees it is difficult to maintain this interval, even with the best of crews. Consequently no reduction in the firing interval was attempted. But to increase the frequency of observations and to reduce the prediction period was another matter.

Considerable experimentation with the range section, once they became proficiently trained, developed the fact that the plotter was able to make a prediction on the Cloke plotting board and transmit the uncorrected range and azimuth of the setforward point to the range percentage corrector and the deflection board in an average time of about ten to twelve seconds after the observing bell. Since the rate of travel of a naval target, in either range or azimuth, changes gradually rather than suddenly, even through right-angled turns, it was possible for the operators of the latter instruments to make their own predictions to the expected new settings in advance of the plotter's readings. Upon receipt of the true readings from the plotter it was only necessary to make a slight adjustment in order to correct the predicted setting to the true position and to read the corrected data to the guns within approximately three seconds after it was read by the plotter. For example, the deflection board operator, between readings, set his wind and drift chart to the *predicted* corrected range of the expected setforward point, which was read to him between data settings by the operator of the range percentage corrector. He then adjusted his wind and drift corrector pointer to the proper curve, made his prediction on the azimuth scale and awaited the true setting from the plotter. The error in azimuth possibly produced by setting the chart to a range predicted by the operator of the range percentage corrector instead of to the awaited plotter's range was always materially less than the width of the curves on the chart and less than the least reading of the board. An examination of the board will show that an error of at least fifty yards in the setting of the wind and drift chart is required to produce a perceptible error in the position of the correction pointer on the curves. However, the maximum error in prediction by the range percentage corrector operator, never exceeded twenty yards, and very frequently was zero. Therefore it was possible to save several seconds on both instruments by making such settings *before* the plotter's readings instead of afterwards. This resulted in the sending of firing data to the guns in an average time of fifteen seconds after the observation was made notwithstanding the inherent slowness of the Cloke plotting board.

The setting of data on a gun such as the 8-inch railway piece, which must be laid in direction by a panoramic sight and in elevation by a bubble, is materially slower than in the case of the average fixed gun. However, the gun pointer and elevation setter were also trained to predict their own settings and to lay the piece as nearly as possible to the expected reading before it reached them. This they were able to do with such success that an average time of only five seconds was required for their settings after the data reached them, and a total elapsed time of twenty to twenty-five seconds from observation to the setting of the data on the guns was never exceeded. It thereupon became obvious that a prediction period of thirty seconds would be ample, with a reasonable leeway of five to ten seconds, if needed. During the advanced practice, a total of twenty seconds was not exceeded and the battery could have used a twenty-five second prediction interval.

Combining a twenty second observing interval, a thirty second length of prediction period, and a forty second firing interval was accomplished without difficulty by the use of a staggered system of time interval bells. A full cycle comprised twenty seconds. Two such cycles, a total of forty seconds, comprised a firing interval for a given gun. In a given cycle, at Second No. 7, one warning bell rang; Second No. 8 was skipped, followed by two bells, one each on Second No. 9 and No. 10. This group, including the warning bell, was the observers' bell. The cycle was completed by the firing bell group, comprising two bells only, one each on Second No. 19 and No. 20, *not* preceded by a warning bell. It will be observed that observers' signals continuously alternate with firing signals at ten second intervals, that between any two successive firing signals twenty seconds elapsed, and likewise between any two successive observers' signals. The thirty

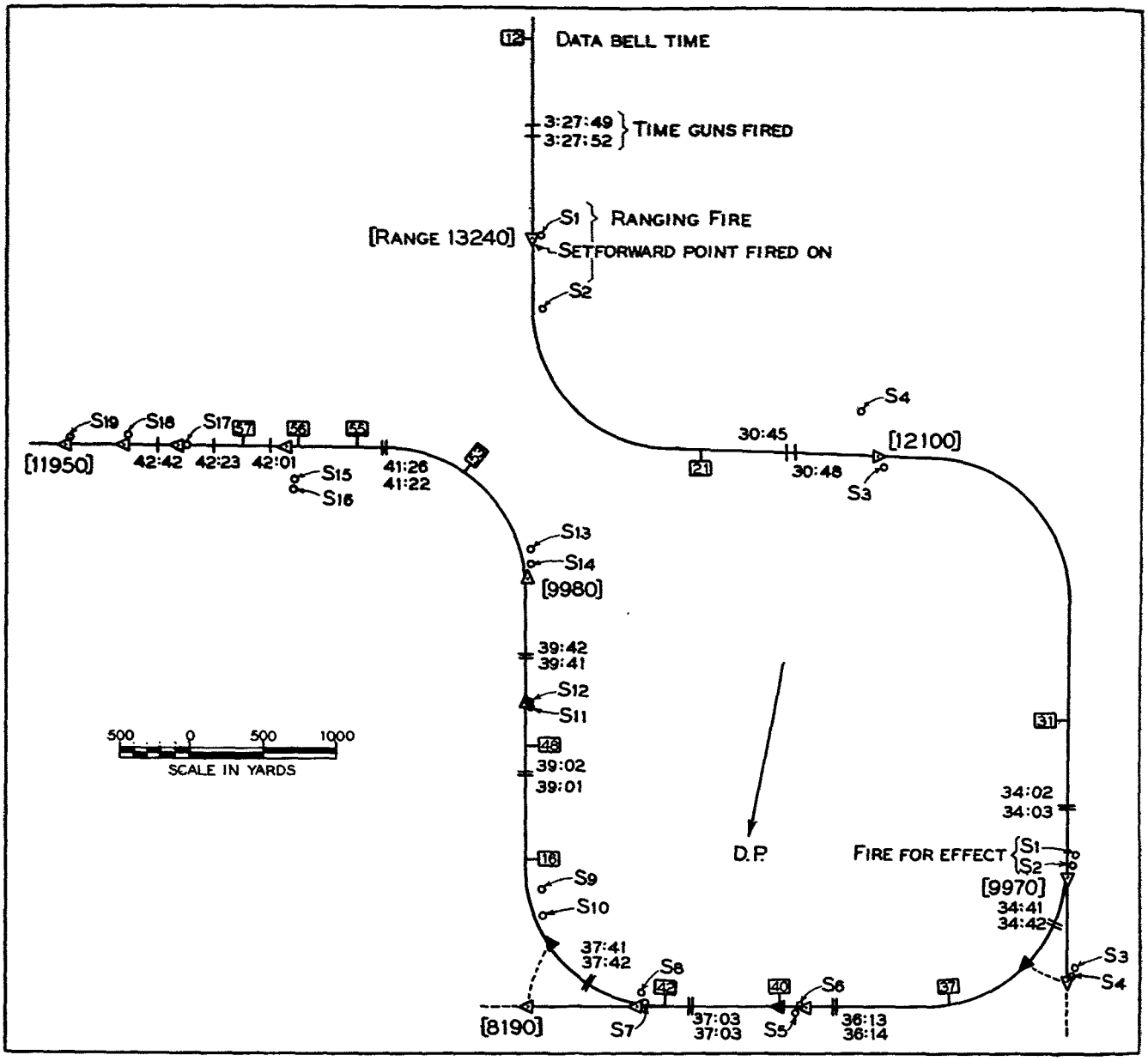


Figure 1: Hypothetical course, special practice.

second prediction from plotted point to predicted point, was made from a given plotted point, obtained on an observers' bell, to the *second* firing bell ahead, due to ring thirty seconds later. The plotter read the travel between the last two plotted points, obtained respectively on the last two observers' bells, twenty seconds apart, and multiplied it by 1½, by means of a setforward chart, to obtain the travel during the coming thirty seconds to the second firing signal ahead. The travel actually read from the setforward chart, of course included in addition the further travel during the time of flight to give the total travel to the setforward point. As described above, when approximately fifteen seconds had elapsed after an observer's bell rang, the corrected data to the new setforward point based thereon, went to the guns. About five seconds thereafter, the next observer's bell rang, and ten seconds after that, or a total of about fifteen seconds after receipt of data by the guns, the bell on which it was to be fired, rang. In other words, firing was always to occur upon the first firing signal after the receipt of the data.

The complete operation, observing, plotting, predicting and the sending out of data, was repeated every twenty seconds, and entirely new data were consequently available every twenty seconds, or for every firing signal. In consequence, although normally a given gun, firing once in forty seconds could use only every other set of data, if it should for any reason be forced to relay it had only twenty seconds and not forty, to wait for fresh data upon which to fire. The advantages of making observations and in making data available at twice the firing rate are obvious, not only in minimizing relay delays and thereby increasing the rate of fire, but are of especial importance in a practice of this sort or in actual service, in detecting maneuvers in half the usual time.

Spotting and Adjustment

Spotting was accomplished by means of an additional Cloke plotting board. Uncorrected range and azimuth of the setforward point was taken as read from the main plotting board, and these were plotted on the spotting board by means of the primary arm to give the positions of the setforward points fired upon. When the setforward point was located, two sliding deviation scales—one for lateral deviations on the azimuth circle, and one for range on the primary arm—were set with their normals at the position of the setforward point. Both read only in reference numbers, the one for range graduated in yards to the scale of one unit (reference numbers) = 10 yards. That is, 299 = 10 yards over; 310 = 10 yards short. Scales were reversed so that a deviation was read as a correction. For conversion into percentage a conversion chart was employed, having as its vertical argument bands of range, its horizontal argument, range deviations in yards in reference numbers, and reading in percentage of range in reference numbers. Reference numbers were employed throughout. At no place in the system was there any opportunity for anyone to call a short for an over, a right for a left, or to put on a correction in the wrong direction.

Spotters located at the base end stations, read the azimuths of each splash to the spotting board, where it was plotted in the normal manner for the plotting of a target position, and its lateral and range deviations, from the setforward point, were read from the scales to the lateral and range adjusters. Each splash of a salvo was plotted separately during ranging fire, to reveal any possible radical gun-to-gun divergence, but salvo centers of impact only were spotted during fire for effect. The slowness of the Cloke plotting board, which requires reorienting the platen before each plot, with new setforward points to be plotted often at the same time as the splashes were being spotted, rendered it inadvisable to attempt the spotting of separate splashes during fire for effect.

Adjustment, both laterally and for range, was conducted in the normal manner by means of magnitude charts. Corrections only, and not deviations, were spotted on the charts, and net corrections read directly, as required, to the deflection board and range percentage corrector operators.

There has been some discussion in the past as to the advisability in actual service of spotting with respect to the material target. In spite of the disadvantages incident to the inherent complications of the method, a material practical advantage remains in fire at a maneuvering target. Under such conditions, a large deviation from the material target, produced as result of a turn of the target after the data had left the plotting room, might easily stampede an adjusting officer into attempting to remedy it by an arbitrary correction when such a correction was not required by any lack of adjustment of the battery's center of dispersion. Such a correction, if applied, would throw the adjustment off in the opposite direction immediately afterward, when the plotter discovered the turn and placed

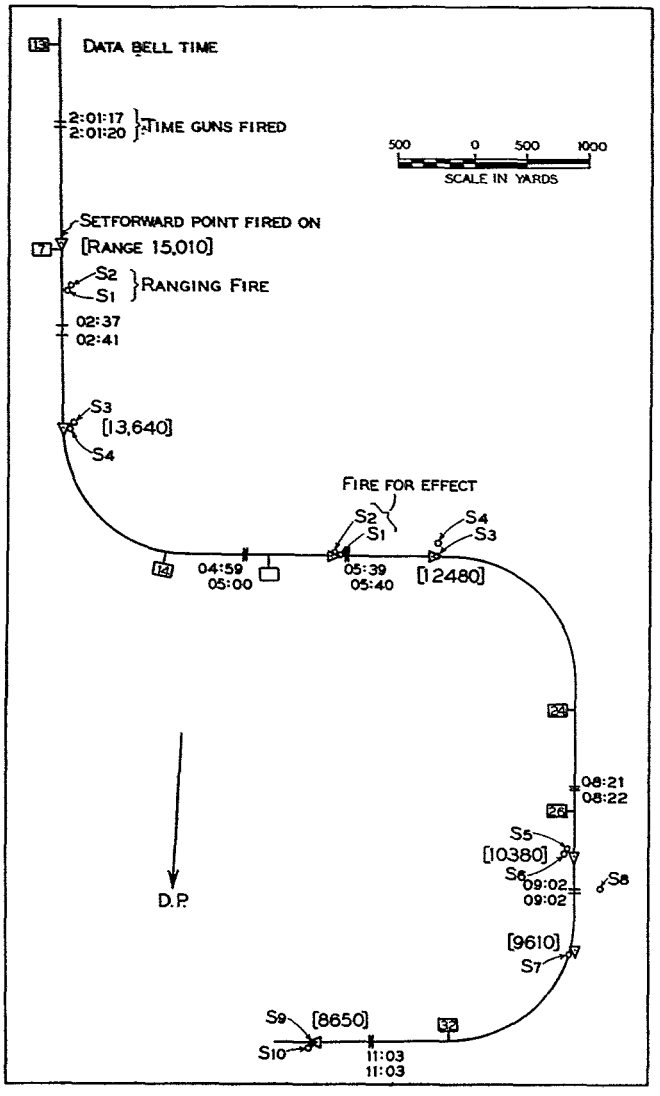


Figure 2: Hypothetical course, special practice.

his setforward point on the new course, and through consecutive maneuvers, might continuously throw the center of dispersion off from one side to the other. It is believed that the difficulties encountered in thus trying to outguess the plotter and the maneuvers might well outweigh the greater ease and simplicity of spotting with respect to the material target.

Special Difficulties Presented by Speed and Maneuver—The Course Finally Adopted

A thirty-five knot target covers approximately twenty yards per second, or 1,200 yards per minute. In order to pick up maneuvers with the least loss of time, the predicting interval (plotted point to predicted point) was reduced as previously described from forty to thirty seconds. At medium to long range, the time of flight added thirty to forty seconds more, which resulted in a setforward point located ahead of the corresponding last plotted point by the travel of the target during a total time of from sixty to seventy seconds or by from 1,200 to 1,400 yards. Had the former predicting interval of forty seconds been used, the total time (plotted point to setforward point)

would have been increased from an average of sixty to seventy seconds to an average of seventy to eighty seconds, a difference of ten seconds of travel or 200 yards in the position of the setforward point.

This reduction becomes of material importance in the case of the first setforward point occurring just after a turn has started, possibly placing the setforward point on the target near the point of turn instead of erroneously locating it 200 yards out along the old course, thereby turning an almost sure miss into a possible hit, and in any case reducing the total prediction error by 200 yards.

A difficulty was encountered in the laying out of courses, in keeping them within a safe field of fire. It was necessary in the preliminary special practice to begin ranging fire at maximum range, conduct fire for effect continuously throughout the course from one side of the field of fire into short range, across to the other side and then out, ending the last several salvos at near maximum range in order to complete fire before the target got completely out of range. In the advanced practice with only fourteen rounds available, it was imperative that ranging fire begin at maximum range and that fire for effect begin as early as possible and be conducted as fast as possible if the average range of the rapidly incoming, maneuvering target be kept reasonably long.

Tactical Considerations

In his presentation of the problem to the battery, the commanding general emphasized that he desired a shoot so designed as to simulate service conditions as nearly as practicable, varying therefrom only to the irreducible minimum necessitated by the peculiar conditions involved in fire at a hypothetical target. In consequence, the hypothetical course was laid out to resemble as nearly as could be estimated one of those which a single cruiser of the fastest, most modern type might follow under fire at its extreme speed of thirty-five knots or about forty miles per hour, if free to maneuver to the greatest practicable extent for vessels of its type. It was borne in mind that a cruiser of the 10,000 ton class could be considered a normal target for 8-inch railway guns, although a battleship of the *California* class is prescribed as normal for target practice. Such heavy vessels are definitely limited in the maneuvers practicable at high speed. After consideration, various courses were decided upon and laid out, comprising straightaways varying from a minute to a minute and a half in length between turns, and turns laid out on a minimum radius of 1,000 yards. It is believed that no heavy vessel would be capable of making a sharper turn at a speed of thirty-five knots. Although six different types of courses, laid out in accordance with these general principles, were drilled upon by the battery for about two weeks before the shoot, the plotter did not know in advance the particular course upon which the battery would fire. Neither was any possible foreknowledge as to when turns could be expected made use of by anyone to prevent misses on the turns. If such faking had been resorted to at least two wasted salvos could have been saved on each turn of the special practice. On the first of these, one bow-on and two broadside hits would have been secured but for the turn.

The course adopted was based upon the belief that a single vessel could reasonably be expected to initiate a turn immediately after the first splash occurred, and probably periodically and continuously thereafter, as long as it was fired upon. Accordingly the first turn occurred shortly after the target arrived within maximum range and immediately after the first salvo of ranging fire. Ranging fire was completed at once after the first turn, and fire for effect initiated as soon as corrections could be applied, the target meanwhile having made its second turn. Fire for effect was continuous thereafter, never being held up deliberately because a turn was artificially expected. Firing was relayed one firing interval only, *after* the plotter had seen a curve begin on the plotting board, to give him time to sketch in the curve with pencil and get out a good prediction in the new direction. Since the straightaways averaged only ninety to one hundred seconds in length, the first half of which was often required for the prediction interval for the first setforward point, and since the firing interval for the guns was forty seconds, it was normally possible to fire only three salvos before the next turn. Of these salvos the first two should be reasonably good, and the third sure to miss on the succeeding turn. On the old course the placing of three erroneous setforward points at twenty second intervals was inevitable before the curve appeared on the plotting board. The first one might be in error only slightly, the second by perhaps 400 yards, and the third by as much as 600 to 700 yards. The guns, depending upon circumstances, might fire upon No. 2, for a serious miss, or upon No. 1 for a slight miss and No. 3 for a very large one. If the latter, the combination of plotting times and firing times was such that the first plotted point on the curve actually appeared on the plotting board some three or four seconds before the guns would fire upon No. 3. In order to save this bad miss, a switch was installed beside the plotting board, which when opened cut out the time interval apparatus at the guns and saved the salvo. This was effective, and resulted in the saving of three salvos, one each at the first, second and third turns during fire for effect. No other method was found quick enough.

Results

In determining the hits, the course was replotted and the proper positions of the setforward points carefully determined. These accurately replotted setforward points were considered to represent the positions of the hypothetical target at their respective times, in all cases when the guns fired precisely on the bell. For times when guns fired late or early, the position of the target was moved along the course accordingly. The positions of the actual splashes were fixed by officials in the two spotting stations located on either flank of the battery, who read the azimuths of the splashes by means of the 1910 azimuth instrument. These positions were then plotted on the

plotting board in the normal manner, and their lateral and range deviations read. Some shots of the preliminary special practice were unfortunately lost by the officials, although centers of impact were picked up by the battery's spotting details. However, in that practice a total of five definitely identified hits were obtained on the prescribed double target, one broadside hit in ranging fire and one bow-on and three broadside in fire for effect. These were in addition to any possible hits among those splashes lost by the officials. If it be considered, as would appear logical, that the target was a single enemy vessel, always proceeding in the direction of the course, a total of not less than two broadside hits would have been obtained on a single target. As will be seen from the figure, the course, during fire for effect, presented approximately a bow-on target on two legs, and approximately a broadside target during the remainder. The score of the practice, if computed according to the usual formula, would be 102.1, not considering those splashes lost by the officials.

In the advanced practice, in order to secure tactical effect with the minimum delay, and to complete fire before the range became unduly short, the first ranging salvo was fired at 15,010 yards and the second at 13,640 after a forty second delay to ascertain that the splashes of the first could be picked up. Fire for effect began one minute and forty-eight seconds after the end of ranging fire, adjustment corrections having been applied during this period, which included a forty second period of "no data" while the plotter was making his new prediction after the turn. The total elapsed time of the practice, from the first ranging shot to the last salvo of fire for effect, was nine minutes and forty-six seconds, including a forty second period of "no data" on each of three ninety degree turns. One broadside hit was obtained in ranging fire, and eight hits, five broadside and three bow-on, were obtained with the ten rounds of fire for effect. Of the latter, four broadside hits would have been obtained on a single vessel traveling always along the course, the three so-called bow-on hits having been obtained when a single vessel would have been broadside, and one broadside hit when a single target would have been bow-on.

The score of the advanced practice, computed by the prescribed formula, was 126.6.

Conclusion

In the conduct of these practices, as above stated, at no time was any action taken as a result of any possible foreknowledge of the nature of the hypothetical course. Fire was continuous throughout, being held up for turns only after they actually appeared on the plotting board. It is believed that the only point at which lack of realism existed was in the lack of a material target for the observers to track actually by eye, rather than to have precomputed azimuths read by their readers.

But whatever the results of these practices it is believed that excellent training in plotting, prediction, laying of guns and conduct of fire at high-speed targets, maneuvering under realistically simulated war conditions, can be had by this method which would probably not be available by any other.

☆ ☆ ☆ ☆

If We Don't All Hang Together . . .

It ain't the guns or armament, or the money they can pay,
It's the close coöperation that makes them win the day;
It ain't the individual, nor the army as a whole,
But the everlastin' teamwork of every bloomin' soul.

J. Mason Knox in Coöperation.

THE ARMORED CORPS

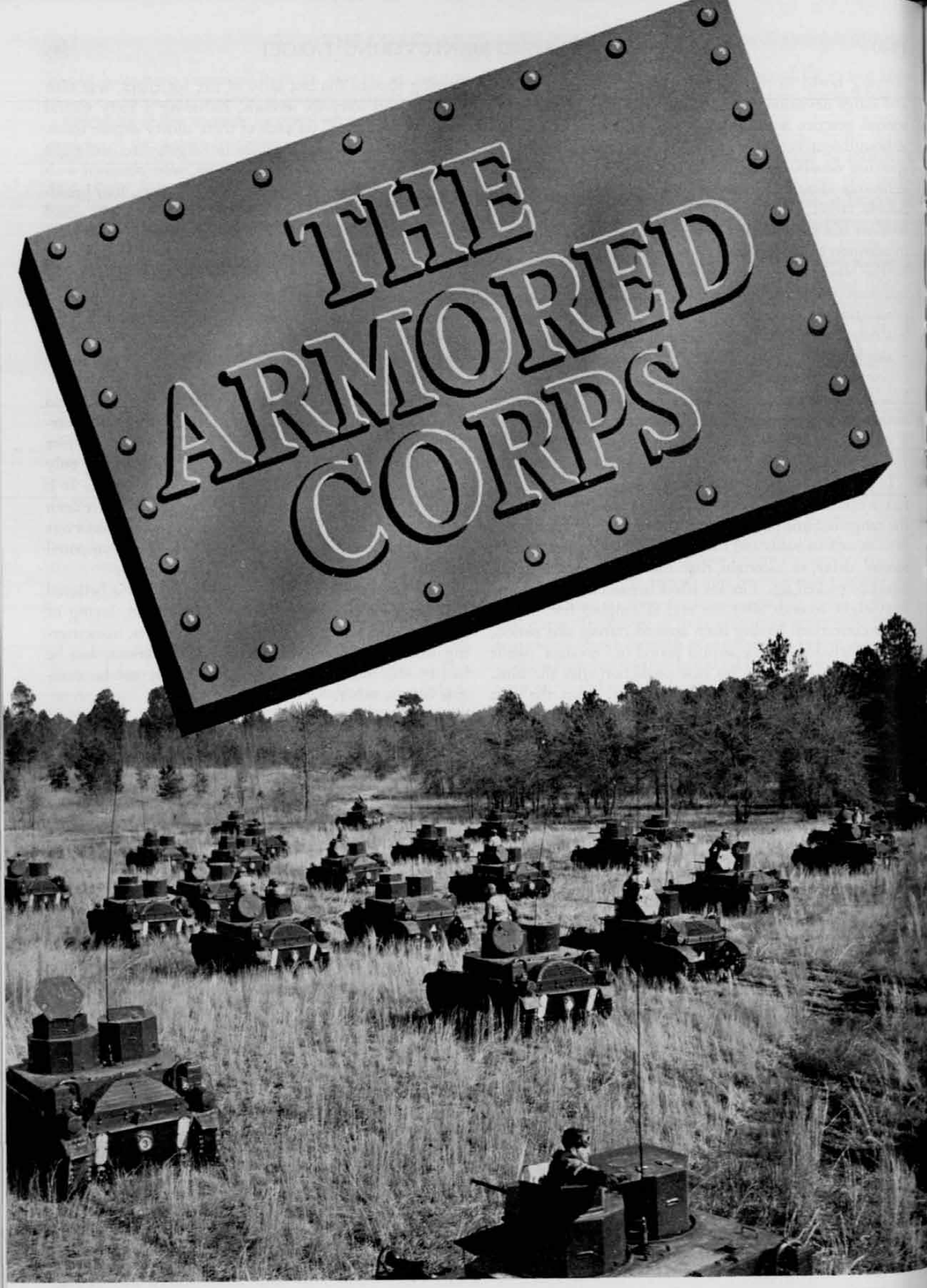
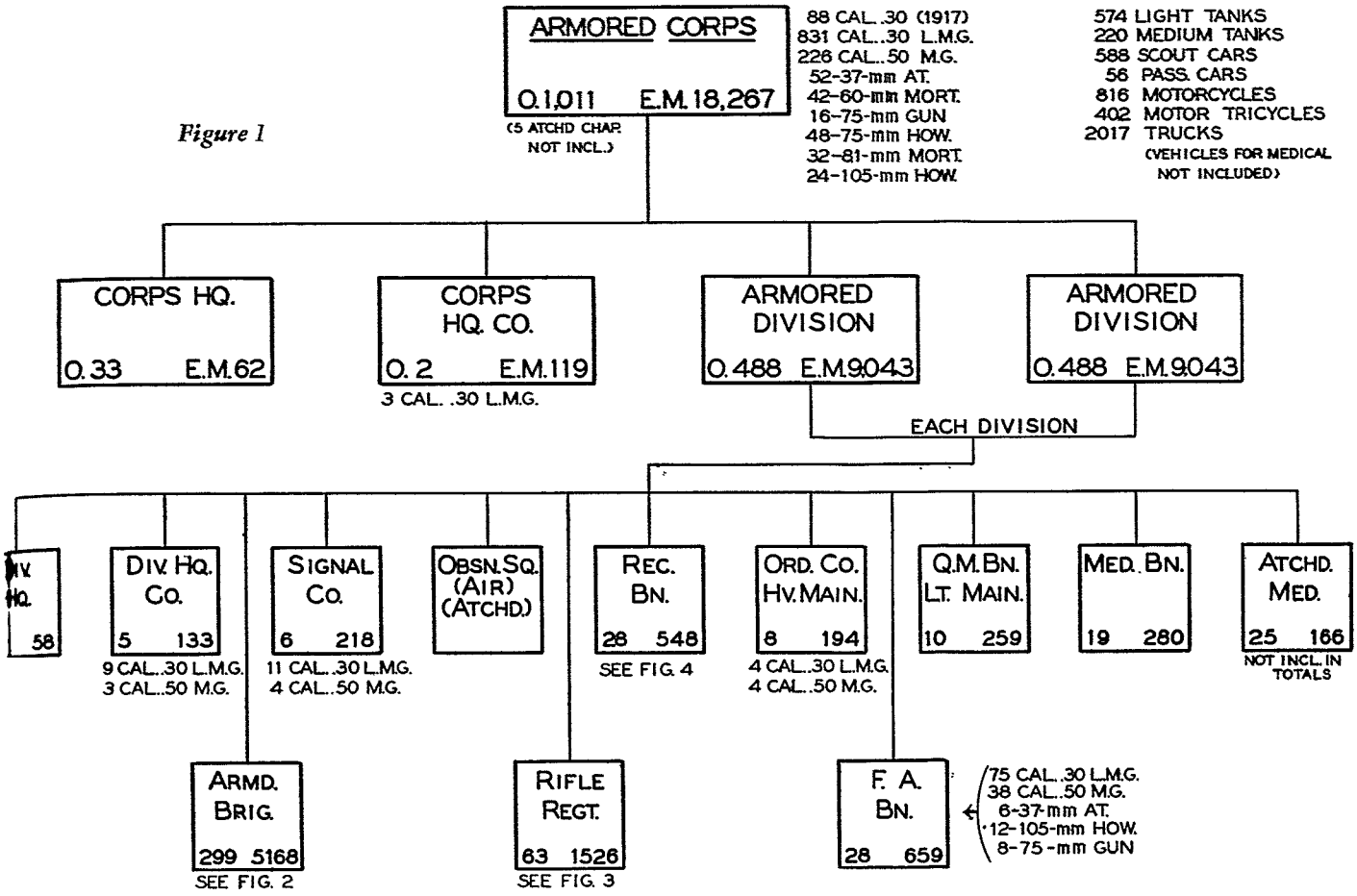


Figure 1

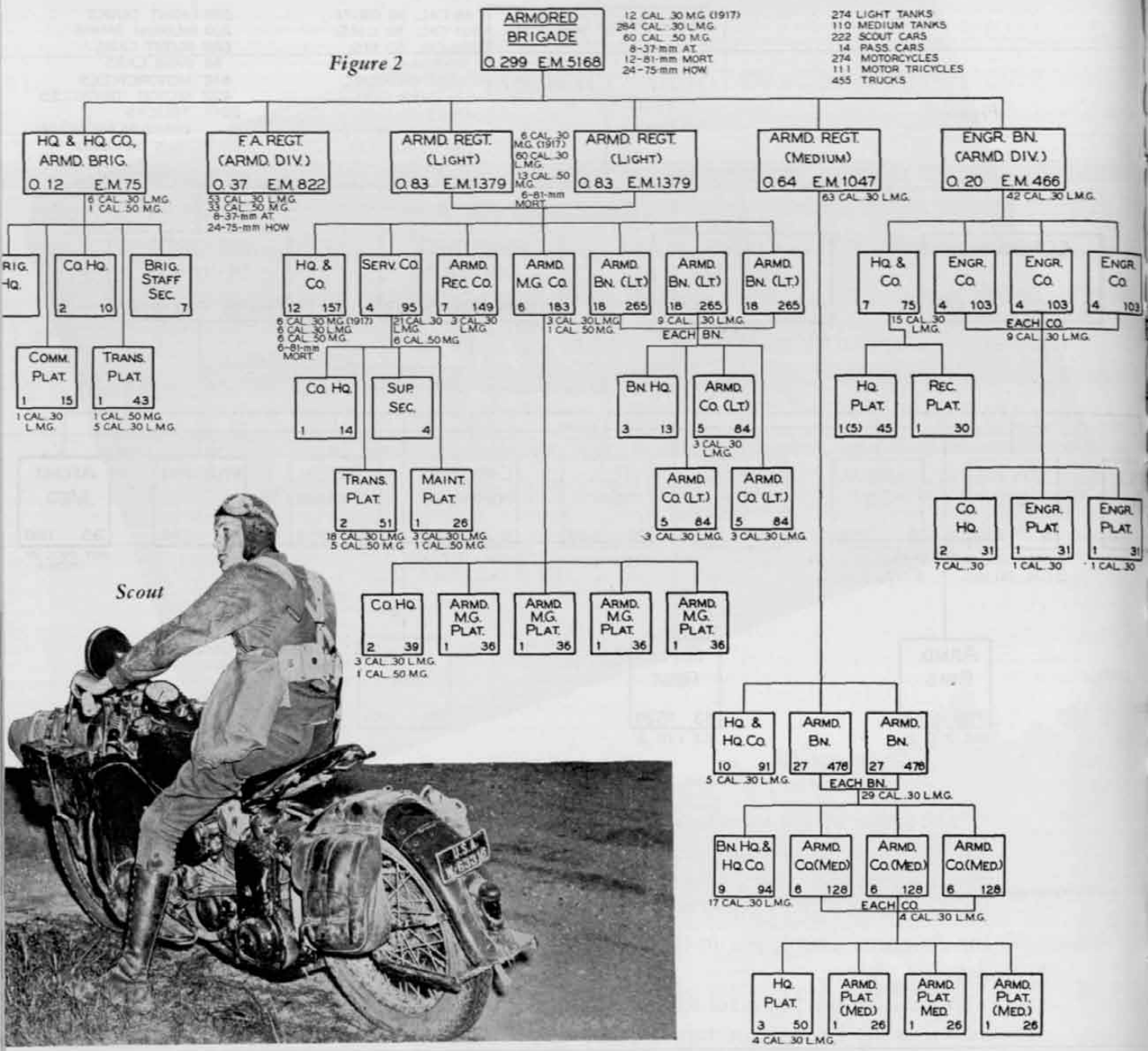


The tracks of the vehicles of the Armored Corps are now rolling extensively over all kinds of passable and practically impassable terrain as this newest major unit of the army tries out its tactical methods. There has been something general in the newspapers about the organization of the Armored Corps, but in the following pages will be found a more detailed picture.

All in all it is a powerful striking force built up primarily for offensive action as the chart at the top of this page plainly shows. Just what its technique of operation will be—just how it will coöperate with units of the air and other types of corps on the ground to gain its objectives, and just how the infantry units of the armored corps will operate—these important aspects will have to wait until a later number of The JOURNAL.

The charts given do not show the armament of the different combat vehicles. The light tank, of course, carries three light, caliber .30 machine guns, one caliber .50 machine gun, and one caliber .45 machine gun. In the medium tanks are the following: one 37-mm. gun, six caliber .30 machine guns, and one caliber .45 submachine gun. The scout cars have two caliber .30 machine guns, one caliber .50 machine gun, and one caliber .45 submachine gun. Each motorcycle carries one caliber .45 submachine gun. Personnel carriers have two caliber .30 machine guns, one caliber .50 machine gun, and one caliber .45 submachine gun. And each truck carries a machine gun in the ratio of three trucks with caliber .30 machine guns to one truck with a caliber .50.

Figure 2



Scout

Truck Convoy

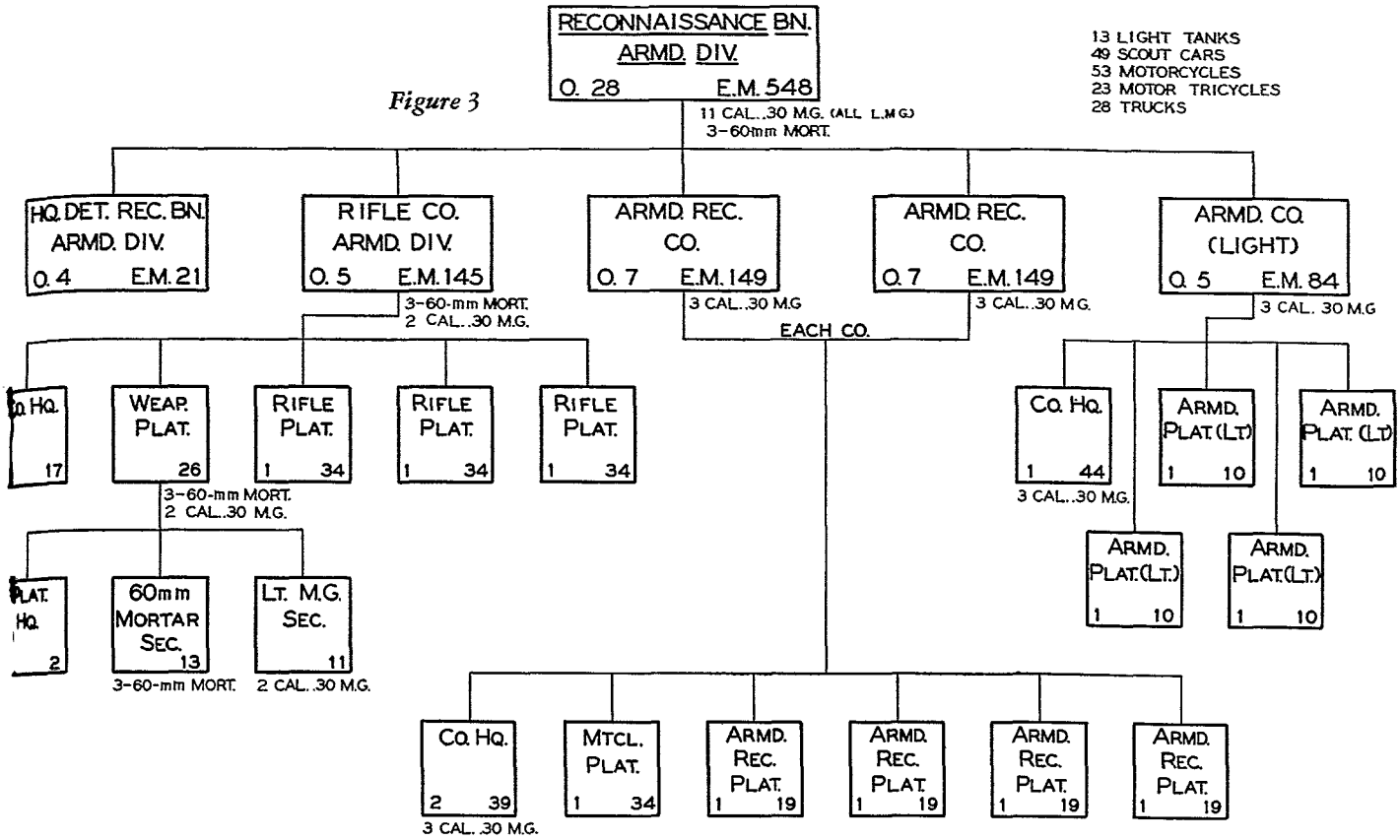


Figure 3

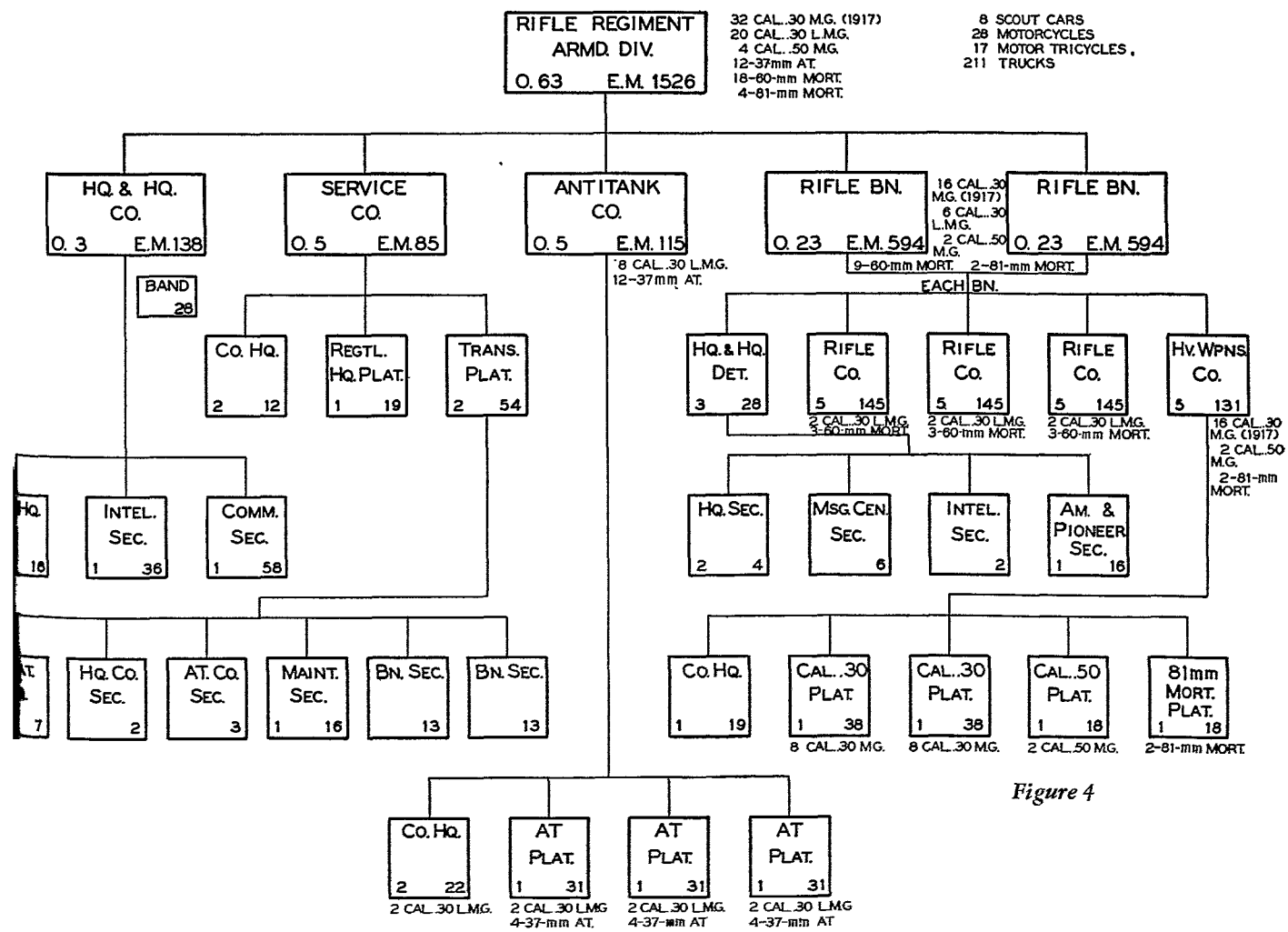
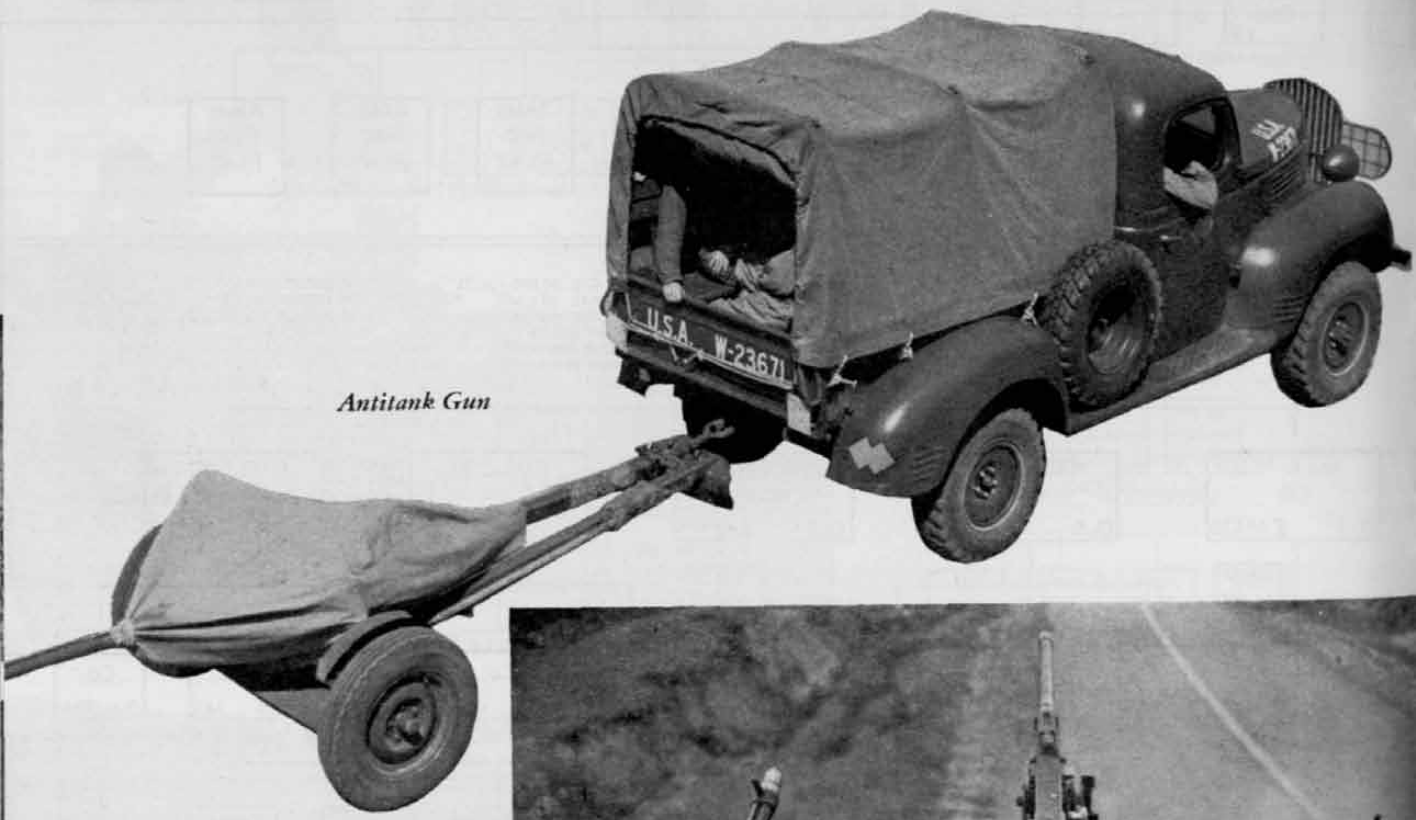


Figure 4



Antitank Gun

Scout Car

Half-track car towing 75-mm. howitzer

105-mm. howitzer, and 2½-ton truck

W-22846

4
II/66
U.S.A. W- 30122

U.S.A. W-30270

C
II/66
U.S.A. W- 30381

The Dawn of British Artillery

By Major General Sir John Headlam, K.B.E., C.B., D.S.O.

Artillery first found a place in an English army under the Plantagenets in the XIVth century, and its first definite achievement came with Henry V's siege of Harfleur in the XVth; but it was not until the Renaissance reached England in the XVIth that its real development began. In that century, and the first half of the XVIIth, under the Tudors and the early Stuarts, it was given an armament, organization, and gunnery which were to remain essentially the same, not only until the formation of the Royal Artillery in the XVIIIth century, but until smooth-bores gave place to rifled guns in the XIXth. In this paper an attempt has been made to portray, if only in outline, the main features of that development, and to present them, wherever possible, in the words of contemporaries.

I.—The Guns[1]

The Wars of the Roses taught the Tudors the value to the Crown of an artillery that could batter down the castle of a turbulent baron. At first they were dependent upon Flemish gun-makers, and Henry VIII took care to provide himself with a fine "Trayne" before embarking upon his first continental adventure. "Henry has enough cannon to conquer Hell" wrote the Venetian Ambassador in 1512. They served him well, but he was much too shrewd a man to remain dependent upon such a source of supply, and soon brought over some of the foreigners to start the gun-founding industry in London. Their works are still commemorated by "Gun-Yard" in Aldgate and "Gun-House Stairs" in Vauxhall, and their first brass (or bronze) gun of any size was cast in 1521. The iron-workers of Sussex then took up the trade and cast their first iron gun in 1543.

There ensued much controversy among gunners as to the relative merits of the two metals,[2] especially as regards resistance to heating, the cause to which the frequent bursts were generally ascribed. Thus the bill for Henry's Flemish guns expressly limits their guaranteed performance. "Every Apostle shoots of iron 20 lb., and powder 20 lb., and may be shot thirty times a day." And though, with improvements in metal and powder, this limit was gradually raised, a halt for cooling at midday was always insisted upon. The gunnery books are full of advice as to the measures to be taken to ward against accident. "If the Peece by often shooting be growne so hot that it is dangerous, if the service be such that she may not have time to rest, in that case she must be cooled with spunges wet in Lee, which is best, or in urin and water, or water and vinegar, or with the coolest fresh or salt water; bathing and washing her within and without, until she is come to her due temper againe; but if I may I will rest her one or two houres in twelve, and betweene-whiles cool her every tenth or twelfth shot."

With the Renaissance cult for beauty the guns lost their uncouth appearance, and ceased to be regarded as works of the Devil to be exorcised. But the titles bestowed upon the various natures suggest that they were still looked upon with some suspicion, for they are all derived from the names of venemous reptiles or birds of prey. Many lists of these guns are extant, differing considerably in detail, but the following compilation shows all those in general use, omitting the smaller natures and such "freaks" as "Basilisks."[3]

Nature	Shot Weight Pounds	Gun Calibre Inches	Gun Length Calibres	Gun Weight Pounds	Team Horses
Falconet	1¼	2	24	210	3
Falcon or Faucon	2¼	2¾	26	700	4
Minion	4	3	32	1,500	6
Sacre or Saker ...	5¼	3½	30	2,500	8
Demi-Culvering..	9	4¼	28	3,600	12
Culvering	15	5	26	4,000	16
Demi-Cannon ...	27	6	23	6,000	22
Cannon of 7 or Whole Cannon	47	7	17	7,000	24
Cannon of 8 or Cannon Royall.	63	8	12	8,000	30

The above table is only a broad generalisation, for at this period the standardisation was very lax. Sakers varied in calibre from 3½ to 4 inches (and correspondingly in weight, etc.), culverings from 5 to 5½, and so on.

The "cannon of 7" and the culvering were the typical siege guns, or "battering pieces," the demi-culverings and sakers the field guns.

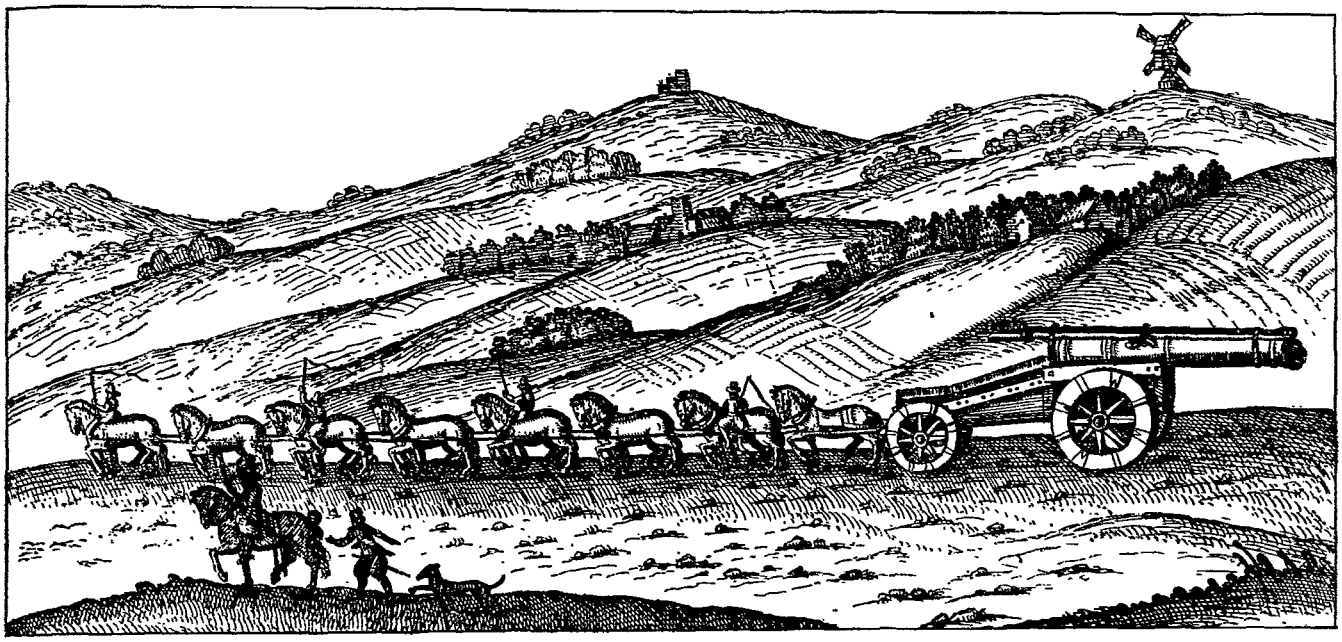
With the slow-burning powder of those days the guns had to be very long, and consequently heavy and unwieldy. So, early in the XVIIth century, the new demand for mobility, combined with improvements in the powder, led to the introduction of a series of shorter pieces of the principal natures, generally known as "Drakes" or "Bastard-Pieces," having about half the length of the "Legitimate" pieces of the same calibre. Thus a saker-drake (or "Pelican") weighed only 1,200 lbs., a demi-culvering drake ("Aspicke") 1,500, and a culvering-drake ("Serpentine") 2,000.

Another type, a development of the bombard of the middle-ages, and a prototype of the howitzer, was the "Cannon-Perier" or "Perior," with a length of only about

[1] Many most interesting specimens of the guns of this and earlier periods are to be seen in the Museum of Artillery in the Rotunda Museum at Woolwich.

[2] Borgard's guns were all of brass, but by the end of the XVIIIth century the increasing cost of brass and the improvements in iron had led to the general adoption of the latter, although in India bronze was retained until after the adoption of rifled guns.

[3] "The Great Basiliscus of Dover," or "Queen Elizabeth's Pocket-Pistol," was a 4¼" gun with a length of 63 calibres. "Load me well, and keep me clean, I'll carry a ball to Calais Green."



A Culvering and Team of the XVIIth Century. ("The Gunner" by Robert Norton. 1628.)

eight calibres; and shorter still came the "Mortar-Peece" with a length of under six calibres. These were "not to be used as Great Ordnance in shooting at great distances, but of great value for reaching the enemy when hidden by hills or walls so that other ordnance cannot be used against them, or being charged with stone shot to beat down the houses of the enemy, or to fall amongst men being assembled together, or charged with balls of wild-fire to burn the enemy's ships, houses, or corn."

Finally there came into use the "Petard"—then an artillery weapon—"devised to make overtures into Townes, Castles, etc., by breaking open their gates, coming unexpected."

The advantages of breech-loading for increasing the rate of fire and also "to the saving of gunners killed in loading or spunging other Ordnance at ye mouth" were early realised, but the difficulty of providing efficient obturation prevented their general adoption.

Carriages.

In the middle ages the guns had been simply strapped down to great beams of wood—"gun-stocks"—and carted about in wagons. By the period we are considering, however, all but the heaviest had been placed on wheels, and, with the invention of trunnions, their mounting had taken the form of the field carriage as it has remained to this day. Last of all came the idea of the limber, though still only in a rudimentary stage—"In the middle of the Tayle Transom let there be a hole . . . to receive a bolt, whereupon may be fastened an extra (axletree) and a payre of wheels to draw the Piece into the Field when next shall require. But in Forts this may be spared."

Powder.

As with the guns, so with powder, Henry VIII terminated his dependence on foreign sources of supply by establishing powder-mills in London. Throughout the Tudor period the powder everywhere was of a very poor quality, but in Stuart times we find a master-gunner writing—"There was in ancient times a kind of powder called Serpentine. This powder being the first was made in a small kind of dust like meale, and was but of a weak receipt in comparison of that we now use, and neither was it corned as our powder that we use in these days, for which cause, though it were then but weaker and now the strength is in a manner doubled which thing, not yet considered, causeth the gunners to commit much error."

Projectiles.

Stone shot were dying out, though the old name still lingered somewhat quaintly in such official titles as "The Queenes Ma'tie's Gunne-stone maker of yron." Their place was taken by iron balls for guns, by embryo shells for periors and mortars. Thus, when Henry took fifty mortars to the siege of Boulogne in 1544, "for the use thereof they made hollow shot of cast iron to be stuffed with fire-works or wild-fire, whereof the bigger sort had screws of iron to receive a match to carry fire kindled that the firework might be set fire to break in pieces the hollow shot, whereof the smallest piece hitting any man would kill or spoil him."

From these hollow shot the true "shell" developed in Stuart times. They were called "grenadoes" from their resemblance to pomegranates, for "as they do shut up in their rinds a great quantity of grains, so our military are filled with a number of grains of powder the which having received the fire do break into a thousand and a thousand shivers."

With the development of the hollow-shot into the grenadoe, came naturally that of the match into the fuze. "Every ball hath a hole left to put in a fuze or piece of wood just like a faucet for a spigot. The wooden fuze is made taper when filled with composition driven gently in amongst the powder, leaving a little of it without. Of

this kinde there are infinite diversities and inventions." And so it has been ever since!

There were many other sorts of "fire-workes very necessary to be used both for sea and land service to spoile or annoy the enemy. Fire-balles for divers uses as to enlighten the champion, burne combustible objects, burne and brake poison, or blinde the enemy or pierce the flesh to the bone where it first toucheth." And the gunners were expected not only to use, but to make, all the above. No wonder that all the gunnery books of the period finish up with recipes for salves and unguents recommended for use "against the burning of gun-powder, sulphur, hot-iron, melted lead, etc."

II.—The Gunners

The interest of the Tudors in their artillery was not confined to matters of *matériel:* they were as solicitous regarding the *personnel.* In the words of the Historian of the British Army—"The arm wherein Henry worked most improvement was undoubtedly the artillery. . . . Henry VIII created the British gunner."

The Master-General.

Henry VII established the Ordnance Office in Westminster, and Henry VIII moved it to the Tower, which remained the Headquarters for many years. He also laid down the Master's duties "when he went forth to war with the King," and these are in principle identical with those allotted to the G.O.C., R.A., in the South African War of 1899-1902—the last in which a general officer was in command of the artillery.

The position of the Master—or, as he soon became, the Master-General—of the Ordnance grew rapidly in importance, until in Elizabeth's reign it had become one of the great Offices of State, held by the highest in the land[4] —Warwick, Essex, Devon. There naturally followed the addition of a Lieutenant, or later Lieutenant-General, to his staff as executive chief of artillery, and commander of "The Train" in war.

The Master-Gunner.

Up to this time the permanent artillery consisted only of little bands of garrison gunners, each under a master-gunner, belonging to such fortresses as had been given an armament. In extending the jurisdiction of the master-gunner of the Tower to "all places as well within Our Tower of London as within Our Kingdom of England and Elsewhere" Henry VIII took the first step towards consolidating these bands. And the man he selected for the post was worthy of the distinction. Christopher Morris is notable in our history—not only as the first Master-Gunner of England but still more as the first artillery commander whose personality emerges from the records, his name being frequently in the State Papers. We first hear of him as having some "falcons" with the Earl of Surrey in his expedition into Scotland. Next he is in France blowing in the gate of Morlies and then heading the stormers. Promoted to Lieutenant of Ordnance, and knighted, he commanded the artillery in Hertford's expedition of 1544, and in the attack on Edinburgh distinguished himself by bringing up a culvering and blowing in the Canongate, after the repulse of a premature attack by the vanguard. Encouraged by this success he took his guns right up through the town, and embarked on an artillery duel with the castle. But the walls were so strong that "the shot which Sir Chr; Morres made for almost two hours nothing impaired them," and after one of his guns had been dismounted he was ordered to retire "after bursting up the dismounted gun, the place being too dangerous for men to stand to mount it again."

In spite of this rebuff the King took him to France with him in the autumn to command the siege-train at the attack on Boulogne. Here "Sir Christopher Morris, Master of the Ordnance, with his great artillery and mortar-pieces so battered the walls from three several places" as to establish practicable breaches. But the defence was stubborn, and among those who fell before the place surrendered was "Sir Chr. Morys hurt with a hand-gun, but he demeaned himself very valiantly before and killed all the master-gunners of Bulloin."

The Gunners.

Perhaps even more important than the consolidation of the garrison gunners under a Master-Gunner of England was the elimination of the foreign element from their ranks. Up till Henry VIII's reign England was largely dependent upon the Continent for gunners as well as guns. All Henry V's master-gunners were foreigners, and Henry VII "had a lot of Flemish gunners in his daily pay." But a feature of the Renaissance was the growth of national feeling, and as early as 1514 the Warden of the Marches, writing to Henry VIII about the shortage of gunners in his border stronghold at Berwick, finishes up with the hope that "whatever gunners are allowed will be Englishmen and not strangers."

Let us see now what a gunner's duties were. Like the knight with his squire and page, the gunner had his retinue—his coadjutor or mate, generally known as servitour or mattross, and a man to serve them both, often referred to as a labourer. "One to handle the ladle and sponge, and the two others to provide wad or shot and hold the budg-barill, and to serve with their handspikes on all occasions." The equipment included "Ladle, Rammer, Spunge, Wad-Screw, Coyne, Linstock, Priming-Iron, Flask of Priming Powder, and a Leaden Plate to cover the Vent," and in the process of loading there were no less than thirteen motions. The old books give us such a graphic description of the procedure, that it is easy to picture a battery at standing gun drill. Indeed to any who served with a horse or field battery in the 80's the detail for serving the vent, sponging, ramming home, and "springing the rammer" will sound very familiar. They will recall, also, cases at Woolwich and Aldershot of the rammer being blown out as described.

[4]In 1582 we have Sir Philip Sidney writing "The Queen at my Ld. Warwick's request hath been moved to join me in his Office of Ordnance."

Loading.

"To charge any Peece of Ordnance Gunner-like, set your boudge or barrell on the wind-hand of the peece, and causing one of your assistants to hold the same aslope, thrust your Ladle into the same, filling it full of powder, and fixing your thumb just under the staffe of the Ladle, thrust the same home to the chamber of the peece where the powder lyeth, turning the Ladle so as your thumb be directly above the staffe, and in so doing the powder will falle or turne out of the ladle cleanly, then drawing out the said ladle giving two or three shakes that the powder may be turned out cleane and that the ladle bring no powder back therewith, for that be a foule fault for a professed gunner to commit, with the tampion on the other end of the staffe thrust home the powder with two or three strokes causing your assistant to hold his thumb close on the touch-hole of the peece; then taking a close round wad of hay, tow, untwisted rope or suchlike, thrust in the same with your rammer-staffe close to the powder; and after put in the bullet close to the wad. And the speciall point belonging to a gunner in charging of any great peece, is to loade the same standing side-ways of the peece, and not directly before her mouth; for it sometimes happeneth that a peece having flawes or honeycombs within her, being often offcharged together, doth for a season keep some sparks of fire in the said holes, so that thrusting home the ladle with the powder to loade the peece, standing directly before the mouth of the peece, it taketh fire and killeth the Gunner and such as are directly before the mouth of the peece, as happened in Anno 1573, at the siege of Edinburgh Castle, to two experienced Gunners, who if they had stood sideways to the peece, might have escaped that danger."

"When three or four of you are together take your Ladle and Spunge, and practice to load a Peece in jest without powder, and by this manner you shall be expert in handling your Ladle and Spunge, whereby you may be fit to load a Peece before a Prince or Great Commander with credit and reputation both of your Captain and yourself."

Firing.

Firing was almost as tricky a business:—"In giving fire to any great peece of Ordnance, as Cannon, Culvering, or such-like, it is requisite that the Gunner thereto appointed first see that the peece be well primed, laying a little powder about the touch-hole as a traine, and then to be nimble in giving fire, which as soon as he espieth to flame, he ought with quicknesse to retire back three or four yards out of the danger of the reverse of the wheeles and carriage of the peece; for oftentimes it happeneth that the wheels or axle-tree doth break and spoile the Gunner that giveth fire, not having agility to move himself from the danger of the same: yea, I did see a Gunner slaine with the reverse of the wheele of a culvering, which crushed his leg and thigh in peeces, who if he had had a care, and nimblenesse withall, might have escaped that misfortune. Also if the priming powder be dankish, or the cole of the match not cleare, the Gunner cannot speedily give fire; and therefore behoveth to fore-see it; or if he hold the linstock in which his fired match is tied long over the touch-hole, the violence of the flame issuing thereout is able to spoile him, or some there about throwing the linstock or staffe which he gives fire with out of his hans. I have seen the linstock and match blown out of Gunners hans more than 80 yards from the peece by the violent blast of the fire issuing out of the touch-hole of the peece in giving fire to the same. And it is to be noted, that the wider ye touch-hole of ye peece is, the greater flame doth issue out of thereat, which causeth ye peece to work lesse effect than she would having a lesser touch-hole."

Further Duties.

Complicated as the ordinary service of the guns was, it by no means exhausted the gunners duties. As one tells us—"When I was first admitted a gunner I thought it a shame to take the King's pay for a gunner and do no other service than watch and ward and to load a peece and shoot her off, which even every foole may doe." The Renaissance gunner had to face problems unknown to us, caused by variations in the dimensions of the guns with which he was provided, as well as with actual flaws in the casting. One can sympathise with the gunner, evidently groaning under some vagary of the manufacturing departments, who wrote:—"Impossible to show all the differences and inequalities of severall pieces of one same kind and sort, made according to the Officers of the Ordnance invention or some founder's self-conceits." If he was to get the best out of his weapon "the principall thing that a Gunner ought to looke into when he is to take many pieces of ordnance into his charge, is first to search and examine how they are fortified, and whether they be sound and safely serviceable, and then to know of which sort each peece is of that kind, and then whether they be ordinary, re-inforced, or lessened in their Fortification of Metall,[5] and whether they be Cambred, either equall or taper-borded, and with or without an Orlow or Rellish, be they of Cast-iron or of Brass mettall; and how much powder they are each of them to shoote, with any shot be it of Lead, Iron, Stone, Grenado, or other Fire-workes."

The most serious matter was the liability of the guns to burst. The care to be taken to avoid over-heating on this account has been referred to above, but there were more reasons than this for the frequent cases recorded. It behoved a gunner to be cautious—"If you feare that the Peece you are to serve with have some crack, blow her with a quarter or halfe of her loading in powder, and presently stop her mouth with some cloth or other thing, that no smoak issue out, causing another to do the like at the touch-hole: and if there be any crack in the Peece the smoak will issue out thereof." Certainly the Renaissance gunner had to "know his Peece."

[5]The standard thickness of metal was one calibre at the touch-hole. Those with greater thickness were known as "Fortified" or "Reinforced," the reverse as "Lessened." It was essential that the gunner should know "whether they be sufficiently fortified or not, so as to be able to judge what powder each peece in loading is able to endure with safety to perform her uttermost services."

Nathaniell Ney. Mathmatician.
Master-Gunner of the City of Worcester.
Author of "The Art of Gunnery." 1670.

And the above does not by any means exhaust the subject. Here are some of the complications. How is the gunner "to know the goodnesse or the badnesse of the powder, and to use discretion in loading the peece accordingly." What is he to do "if he is commanded to serve with a Peece that hath lyen long charged, that either the shot is growne fast to the inside of the Peece with rust, and so may be dangerous for Peece and Gunner discharging it? What if the mouth of a Peece be growne wider than the rest of her chase within by means of wearing, how will you choose shot fit for her?"

Qualifications.

That all gunners did not rise to the high standard required is not perhaps to be wondered at. Master-Gunners are exhorted "to see that every gunner is able to discharge his duty, and not for favour or affection to preferre such as say most and doe least, but that every man be preferred to place of credit and esteemed according to his honest behaviour and skill in this singular Art. . . . not to suffer every tagge and ragge to be a gunner as is too much used in these days in Townes of Garrison, who are never practised in the Art, nor hath discretion nor desire to practice therein: a great number of such have but only the bare name of a gunner, although their standing hath beene of long time."

But after all the fault was not with the gunners. "Having seen and observed the wonderful ignorance of many professors of the Gunner's Art I began to consider whether this neglect do rise from the Gunners or the Commanders and I find the fault to be in both, in the Commanders because either they do not or know not how to exercise the gunners under their charge and command, and the idle laziness of the gunners that had rather spend their time in potting and canning than in the knowledge of their Pieces or practice of their profession.

"Therefore I call upon all that are Governors and Commanders of Castles or Forts to consider your Gunner, of what disposition he be, as well towards God as faithfull towards his Commander and Country, for it is most certain that a man that fears God cannot be disloyal to his Prince or Commander; to make such a man your Mr. Gunner, and let all the other Gunners be ruled and directed by him."

III.—The Gunnery

The Gunnery Treatises.

The administrative genius of the Tudors had given the artillery organization and armament, and, with the elimination of the foreign element, professional interest was soon stirring among English gunners. Before the end of Elizabeth's reign the scientific spirit of the Renaissance was leading them to inquire into the mysteries of gunnery. In 1587—the year before the Armada—there appeared the first English treatise on the subject, to be followed in the next century by a succession of similar works. An extract from the first sheds a flood of light upon the position of the artillery in those days.

"The cause that hath moved me to write this rude volume is this, for that we English men have not been counted but of late daies to become good Gunners: and the principal point that hath caused Englishmen to be counted good Gunners, hath bin, for that they are hard or without fear about their Ordnance: but for the knowledge of it, other nations and countries have tasted better thereof: for that English men have had but little instruction but that they have learned of the Dutchmen or Flemings in the time of King Henry the eight. . . . Hitherto I have not seen any such booke; although it hath been very neere two hundred yeares since the first invention of Ordnance.[6] I have seen a number of bookes that have been written concerning Ordnance, but they that have written these bookes that the gunners have amongst them were utterly unlearned in any measure of science, which were in the beginning in the time of King Henry the eight made by Flemings; for in the warre of those daies the King sent over into Flanders and those parts thereabouts to have gunners to serve him in the warres: and the gunners have no other books but such as were written by them. I am so bold as to be the first English man that put forth any book as touching the causes."

It would be pleasant to linger over these old writers, notwithstanding the difficulty of the Black Letter in which the earlier are printed, for, in spite of the naiveté of their style, they took themselves and their Art very seriously. And throughout their pages there shines forth their in-

[6]This appears to dispose of the Crécy legend, for that battle was fought 240 years before our author wrote.

tense love for their profession and their pride in it.—"Amongst all the Arts that adorne the life of man upon earth . . . yet none comparable to the Art and Practice of Artillery."—"In the warres of our age there is no earthly force than can more command the Fortified, and resist the assaulting enemie than Great Ordnance duly used."—"The Art is like to a circle without end, or like to a Labyrinth, where a man being well entered in, knoweth not how to get out againe, and therefore it must be exercise and industry that must make a perfect Gunner."

Space does not admit of any detailed examination of these works here, but before going on to an analysis of the Art they taught, a few words may be said about some of the most interesting. That they were bought and read is proved by the names of their owners and the marginal notes. One careful gunner used the back of a plate of the Quadrant to record the births of his children, with full detail of year, day of month and week, and hour. They commence in 1649, and as the book was only published in 1643, one may, perhaps, assume that it was a wedding present—to be used as a Family Bible.

The Authors.

William Bourne, the first, gives no particulars concerning himself, but recommends his work "The Arte of Shooting in Great Ordnance" as "containing very necessary matters for all sorts of Servitours either by Sea or by Land." Still in Tudor times, we have *Thomas Smith* "Souldier of Barwick-on-Tweed," who was no doubt one of the little band of garrison gunners belonging to that fortress. Then *Thos. Binning, Marriner,* as he styles himself, certainly deserves mention, for we shall find him in command of the artillery in Edinburgh Castle, and doing some curious shooting there. After him *Nathaniel Nye,* Master-Gunner of the City of Worcester, gives us a charming portrait of himself, and explains that he writes "not as he is a Mathematician but as he was a Practical Gunner." Such a claim naturally drew a counter-blast, modestly announced as "The Art of Gunnery wherein I am very well assured I have done more being a private person than all the Engineers and Gunners with their yearly salaries and allowances since the first invention of this warlike engine. If any should ask how I came to know these things being no practicall gunner it is answered. They are proved by Mathematicall Demonstration which is more satisfactory than Mechanic Tryal." Finally we have *William Eldred* "sometime Mr. Gunner of Dover Castle." He tells us how "having spent the most part of my life, being about sixty years, in the Practice of the Art of Great Ordnance in the time of Q. Elizabeth, K. James, and their now successor King Charles in that his chiefest Fort in the Cinque Ports. . . . I have found some carefull to approve themselves Gunners and serviceable, but many others careless and negligent, which proceeds, I conceive, through want of good Instruction, and therefore to give a clearer light to these things I have brought this Worke to view, and have intituled it the Gunners Glasse, in which I conceive, everyman may see his defects and amend the same." The book has a peculiar interest in the fact that it has the author's portrait in colours as frontispiece. It is I believe the earliest picture of a gunner in uniform, and of a gunner of whom we may be proud, not only for his technical qualifications but for his attitude when the Civil War broke out. He had shown one of his inventions (for the suppression of recoil) to Charles when he visited Dover, and had been told that he would be summoned to London to give a demonstration. Then came the war, and a friend wrote to suggest that he should submit his invention to Parliament. In reply he wrote:—

"I am well assured that if the King my Master had not had these unhappy troubles I should have seen not only this, but things of greater consequence, to be put in practice before this time, but as it falls out I am glad that my other propositions take no effect, for I see too much practice already to destroy men; and therefore I think it more fit to importune our good God by faithful prayer for the happy union of his Majesty and his judicious Parliament than to study any new devices to destroy our friends."

We may now glance at the gunnery they taught, and commence with their ballistic theories.

Ballistics.

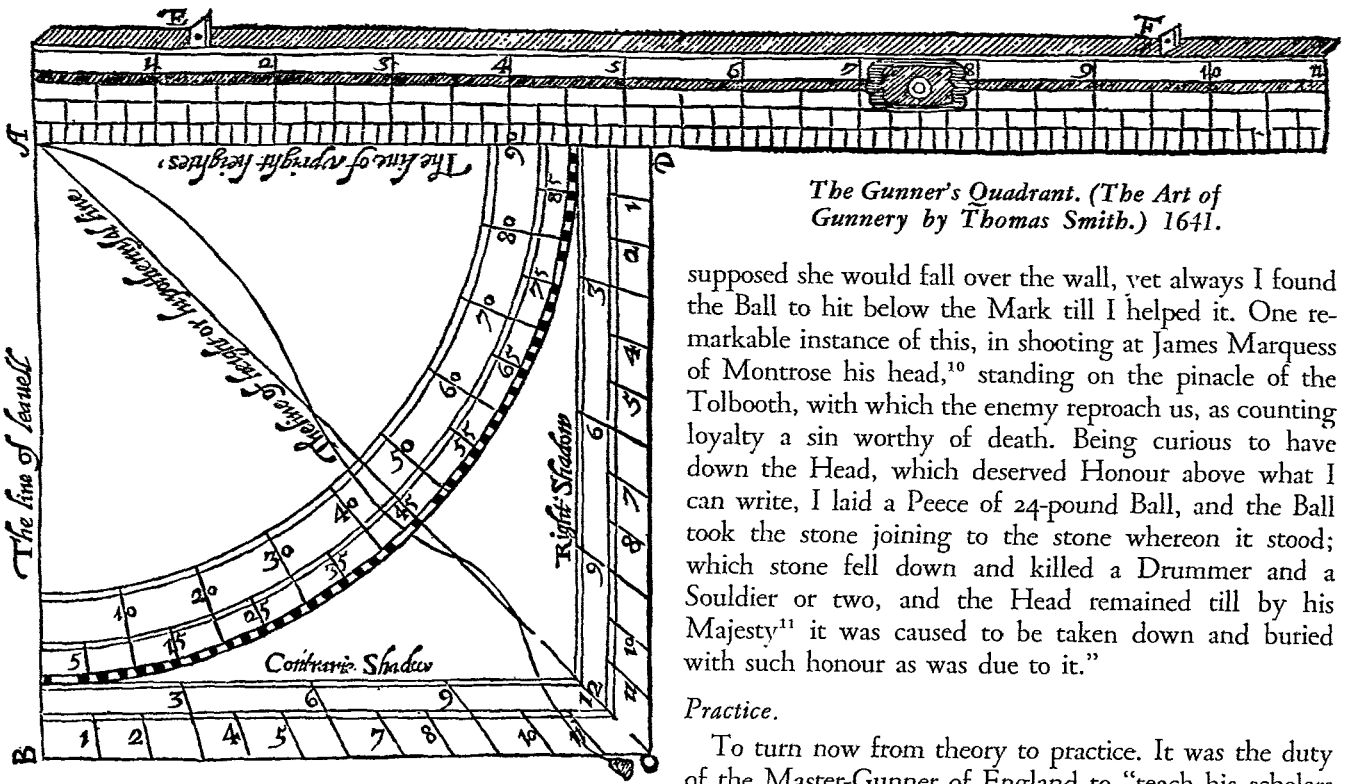
"If any peece be discharged upon any Angle of Randon, albeit the violent motion contend to carry the Bullet directly to the true Diagonall: yet the perpendicular motion being not directly opposite, doeth though insensibly, even from the beginning by little and little, draw it from that direct and diagonall course. And as the violent doth decay, so doeth the naturall encrease: and of these two right-lined motions is made that mixt Curve Helicall circuit of the Bullet."

"Any peece therefore discharged at any Mount or Randon first throweth forth the Bullet directly a certain distance, called by some Gunners their Point-Blanke Range, and then it maketh a Curve declining Arke, and after finisheth either in a direct line, or nigh enclining towards it."

"Every one that will learn to shoot at Randon must draw his peece on a levell ground, where first shooting levell, he must observe that distance in feet or paces, then mount his peece to one degree and mark where that shall graze, thus finding the distance of every degree to the tenth."

So far so good. But a later writer found that when he fired a series at one elevation they did not all fall together. As a first reference to the "Error of the Gun," his account is worth recording, and his explanation is certainly ingenious:—

"I have discharged a peece seven times in the space of fifty minutes with the like weight of powder, shot, and elevation, and have found the ranges 416, 436, 440, 432, 425, 410, 394 paces.[7] The reason is this—At the first shot the bullet found the aire quiet, at the second the bullet found the aire stirred with the first shot and also moving towards the place at which it is shot, and therefore finding



The Gunner's Quadrant. (The Art of Gunnery by Thomas Smith.) 1641.

a lesser resistance. . . . But as the peece waxeth hotter so much the more attractive is the concavity of the peece made, which suppleth and retaineth continually more and more of that wind which should serve to expel the bullet. The Vertue expulsive in that peece doth thus continuously more and more decrease, and the shot flyeth not with that swiftness as it did before."

Firing down-hill was a great problem with smooth-bore guns, frequently mentioned in connection with the action of artillery in battle—The Scots at Flodden, the Royalists at Edgehill. "Shooting at a mark, and the levell from above downwards is far more uncertain and difficile than any other kind of shooting by reason of the small resistance the shot makes against the force of the powder. No Author or Practitioner else, to my knowledge, hath divulged any good use or order for the same."

In this connection Thomas Binning tells a very curious story of a gruesome experiment he made to prove the falseness of a Dutch writer's theory on the subject. "I cannot blame the Hollander in regard his country is very plain, and no remarkable Height whereby he might have confirmed what he saith by practice. But I rather adhere to . . . that a ball being shot from a Height will strike below the Mark as I myself have found divers times. . . . For in the year 1650 I was in the Castle of Edinburgh[8] when that army of Rebels did beleaguer that castle, so that many times I had occasion to shoot so far under Metal, or below the Level-Range, that I have been forced to cut the Brest band of the Carriage quite out, and so to elevate the Breach of the Piece[9] that it hath been supposed she would fall over the wall, yet always I found the Ball to hit below the Mark till I helped it. One remarkable instance of this, in shooting at James Marquess of Montrose his head,[10] standing on the pinacle of the Tolbooth, with which the enemy reproach us, as counting loyalty a sin worthy of death. Being curious to have down the Head, which deserved Honour above what I can write, I laid a Peece of 24-pound Ball, and the Ball took the stone joining to the stone whereon it stood; which stone fell down and killed a Drummer and a Souldier or two, and the Head remained till by his Majesty[11] it was caused to be taken down and buried with such honour as was due to it."

Practice.

To turn now from theory to practice. It was the duty of the Master-Gunner of England to "teach his scholars to shoot in Great Ordnance in the Artillery Garden . . . whereunto the gunners of the Tower do weekly repair, usually every Thursday; and there levelling certain brass pieces of great artillery against a butt of earth made for that purpose, they discharge them for their exercises." There must, however, have been something more, even in Tudor times, for Bourne, writing in 1587, mentions among the causes that have "letted or hindred English men to become cunning in the shooting of Great Ordnance" that "although divers prooves have bin made . . . and the Ordnance hath bin had into the Fields both in Master Bromefields time when he was Lieutenant of the Ordnance, and at divers times since, yet these prooves were no proofs, but to cause these Gunners that did see the experience of those Profes to commit a further error touching the shooting in Great Ordnance, and the reason thereof is this. . . ." But we need not follow him in his criticism of the conduct of the practice. Under the Stuarts it was apparently allowed to decline, for Wemyss, Master-Gunner of England, petitioning Charles I for more practice ammunition, bases his demand on the "few gunners in your kingdom at this time who understand the several ranges of Ordnance, or use of the mortar, which, in effect, are the special points belonging to a gunner and impossible to attain without a great and continual practice." There are also complaints that "so much care and pains is taken in trayning the small shot and little or none at all done in exercising the Gunners in Great Ordnance."

Laying.

Now, at last, we come to the laying of the gun. And the first thing we have to realise is that there were no

[7]The "pace" was sixty inches or five feet.

[8]Binning was in command of the artillery. The castle was held by the Royalists.

[9]Thus anticipating Koehler at Gibraltar.

[10]Executed by the Covenanters shortly before.

[11]Charles II.

sights in those days—not even the nick on the base-ring and the button on the muzzle which came in during the XVIIIth century. To lay his gun, therefore, the gunner had to begin at the very beginning. "Of all things belonging unto the gunner the chiefest is to bring the mettal of his Peece even; which the gunners call dispparting. The dispart for any Peece of Ordnance is nothing else but to equall the difference between the thicknesse of the mettal that the Base-Ring hath in semi-diametre more that the semi-dyametre at the Muzzle-Ring, without which equall differences applyed vpon the upmost of the mettalls on the Muzzle-Ring either had (or guessed at with discretion) it is impossible to direct a Peece to any marke to make a shot to an assured good affect. . . . When you have found out both the dispart and placed it, and also found what point in the Base-Ring is to answer it, then make some very small mark on the Base-Ring and in that place hold your head about two foot from the base-ring and then you shall best observe, as the Peece is travising when you are in a direct line with the mark; this being done give one of your Matrosses order to raise or fall the Peece with his Handspike as you shall appoint him, until you can with your eye perceive the mark at the base-ring and the top of the dispart in a direct line with the mark: at that instant stop the motion of the Peece with a coyne."

The Gunner's Quadrant.

"If the mark be further than the Peece will reach with her metall, then must you elevate the Peece with so many degrees as will reach the same." To do this the gunner had recourse to his quadrant "the most common and especiall Instrument used among the Professors at the Art of Gunnery; most easie to understand of the unlearned, both for bringing their guns levell with any mark, as also to shoot at any degree of the randon. You must have a ruler about two foot long, and of weight to counter-poise the quadrant, fastened to one side of it. This must be put within the concave of ye peece, the quadrant hanging without, and by the plumb-line you shall find how many of these degrees the peece is elevated unto, and the Quadrant being thus placed you may mount the peece to what degree you shall find fit to shoot by."

Its construction is clear enough from the illustration. It remained little altered for centuries until the plumb-bob was superseded by the spirit-level.

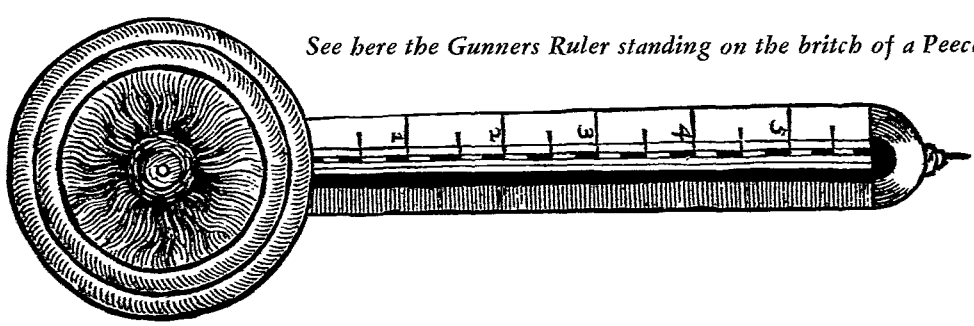
The Gunner's Rule.

There were, however, practical limitations to the use of the quadrant, for "if the wind is high you will have very much adoe to make the plummet stand still; if your gun is firing over a wall it is inconvenient to get at, and in field service you cannot use it, the plumb-line is over-long before it stand still." So the Gunner's Rule was introduced—the prototype of the tangent sight.

This was about a foot long, the lower end cut in a curve to fit the breech of the gun, with "a long slit down the middle thereof, and in the middle of the slit a lute-string, and upon that a bead, which you may move up and down at pleasure. On one side of the slit must be placed a division of inches and tenths, on the other side must be placed the Degrees and Minutes, when you shall find by the length of your gun how many inches and parts goes to make one degree, and to this you may set your bead. Then, the dispart being placed upon the muzzle-ring, place your rule upon the Base-ring, and let one standing by hold it perpendicular. Then mount the piece until you bring the bead to the top of the dispart and marke, all in one line. Stop then the peece with a coyne."

Space does not permit of any account of the methods recommended for firing at a moving target, for indirect fire, or for firing at night, so we may close with a piece of general advice. "If a man do not know his Peece, her height, her length, her strength or fortification, her defects, what Powder she may beare, and the dispart, the perfection or imperfection of her founding, how can he ground any other rule for her shooting or execution, or the distance how farre she will carry."

Finally if he wants to make good practice the gunner must see that his peece has a good platform "otherwise the wheels in often reversing will sink into the ground, and the peece shall sometimes shoot amisse by reason the one wheele will sometimes sink deeper than the other. He must observe the weather, whether it be calm or blow hard, or if the wind is with or against him, or if it be to the right or left. Having duly considered these things the gunner may do well the first shot, but if he erre he must amend the next. If it were wide I would place my eie on the Base-ring at the next time a little more to the same side, according more or lesse: if it were too high, direct the Top of the Dispart under the mark as much: if too low, lay some small stone or straw on the highest of the Base-ring, and by that bring the dispart and the Marke into one with discretion. To fayle at the first shot, if the gunner be not acquainted with the Peece and mark is passable; and at the second to fayle is pardonable; but to fayle at a fair shot at the third time is too much, and argues but little judgment and discretion in such a gunner."



See here the Gunners Ruler standing on the britch of a Peece.

Snug in the Snow at Forty Below

By LIEUTENANT AVERY M. COCHRAN, Infantry

The Russo-Finnish affair may change some of our ideas as to winter warfare, for in modern times a large-scale war had never before been fought under such conditions. But if other things are equal, it seems certain that the troops with the best winter clothing and the best shelter should win because the bitter Arctic cold will quickly kill off those not adequately prepared to meet it.

It is conceivable that we may some day be faced with a winter campaign in Alaska. If Alaska is invaded, defense will be much harder than in Finland. Alaska is underpopulated and the defending forces will not have thousands of warm farmhouses from which to base their operations.

When the thermometer drops far below zero man must have shelter or he will freeze to death. At present we have no shelter adequate for winter campaigning. The double shelter tent does not provide enough protection for it cannot be heated properly. Candles and canned heat are the only means of heating double shelter tents—and this in a land that abounds in firewood. The pyramidal tent with the Sibley stove would be fine except that it is too heavy and the air space to be heated is too large. Equipment must be light so that it can be carried on the dogsled or even packed by the soldiers when necessary.

A heated shelter, light enough to be packed by the men using it, and large enough to allow them to re-

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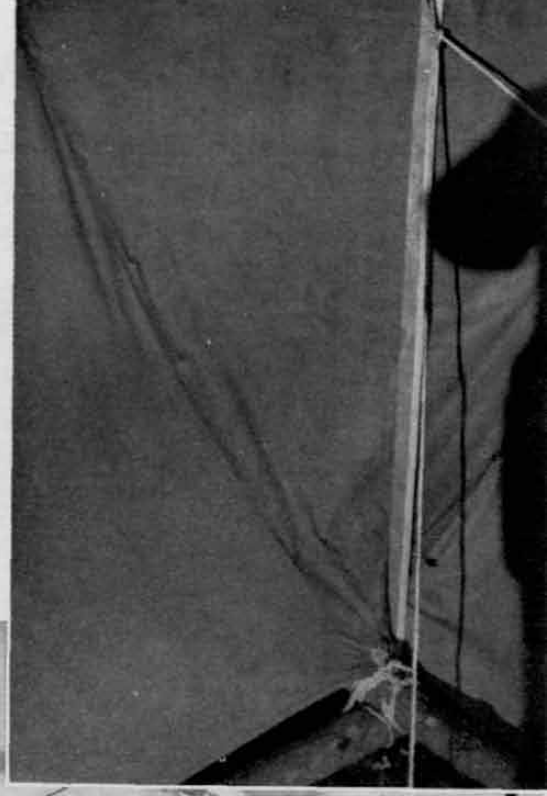
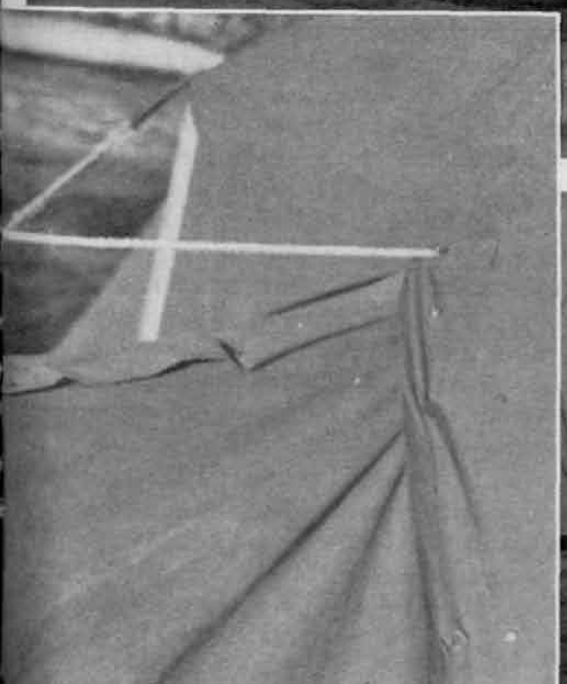
Figure 1—Chilkoot Tent with Stove. Figure 2—Corner of Chilkoot Tent. Figure 3—Chilkoot Tent. Figure 4—Method of Securing Shelter Tent to Chilkoot Tent. Figure 5—Shelter Tent Entrance.





move their heavy outer clothing before getting in their sleeping bags is what we need.

An experimental tent to meet these requirements recently was constructed at Chilkoot Barracks, Alaska, from salvaged shelter halves. For want of a better name this tent will be termed the Chilkoot tent. Imagine four shelter tents pitched with the open ends meeting on the four sides of a square with the corners of adjacent tents overlapping. Now imagine another tent enclosing the open space over this square, with flaps to hang down and close the open spaces between the shelter tents.

The Chilkoot tent combination meets all requirements for an Arctic tent. It is light enough for the eight men it shelters to pack it. It provides a means of burning wood to furnish heat. It is large enough so that four men can stand erect to dress at one time.

The Chilkoot tent is seventy-two inches square with a forty-eight inch wall and a pyramidal roof. The roof ends in a seventeen-inch square top. This flat top is covered by a sheet of galvanized iron securely riveted to the top of the tent. A three-inch hole in the center of the top allows the stovepipe to protrude from the tent. Each wall has a V-shaped opening provided with buttons, buttonholes, and grommets so that a shelter tent can be securely fastened to it. The tent pole is made of three sections of iron pipe, each section thirty-one and a half inches long. The bottom section is screwed into a fitting with two arms riveted to it. These arms are turned at right angles to prevent the pole from sinking into the ground after the heat from the stove has thawed it. The top section is threaded so that it can be screwed into the fitting to which the wires holding up the tent are attached. This pole goes inside the stove and stovepipe when the tent is pitched. (See figure 1.)

To Pitch the Chilkoot Tent with Central Pole

Materials Needed

1 Chilkoot tent
1 stove
3 sections stovepipe
1 jointed pole
8 shelter halves
4 shelter tent poles
20 shelter tent ropes
8 metal pins with hook
4 spruce poles 22 feet long (cut at site)
4 spruce poles 50 inches long (cut at site)

Note: If only short poles can be found they can be lashed together to make the 22-foot lengths.

Cut and trim four lodge-pole spruces so that the finished poles will be twenty-two feet long. Measure off eight feet from the butt end of each pole and cut a notch. Measure off six more feet and notch the pole again on the same side. Lay two poles down parallel to each other, six feet apart, with the notches up. Place the other two poles across these poles so that the notches fit together. Lash the poles together.

The Chilkoot tent is then unfolded and placed inside

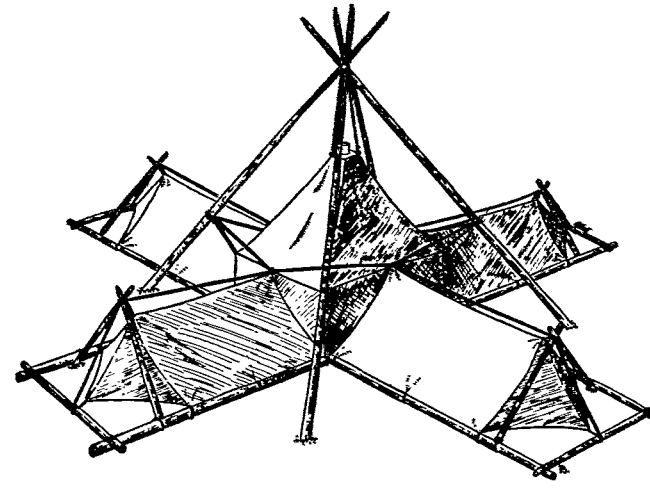


Figure 6: Method of Pitching Chilkoot Tent Without Central Pole or Pins.

the square formed by the poles. The jointed pole is screwed together and the three sections of stovepipe are assembled to the stove. The jointed pipe pole is then placed inside the stove and stovepipe and the whole assembly goes inside the tent. The stovepipe and pole now are guided through the hole in the flat metal top of the tent. The pole is then turned so as to screw it into the fixture to which the four wires supporting the tent are fastened. The crossarms on the bottom of the pole are spread and the tent is raised. The four guy ropes from the corners are stretched and secured to metal pins. The bottom corners of the wall are then lashed to the spruce poles on the ground. (See figures 2 and 3.)

Two shelter tents are then buttoned together at the ridge. A shelter tent rope is then run from inside the tent through the grommet in the inside triangular wall of the Chilkoot tent, through the grommets in the ridge of both shelter tents, and out through the grommet in the outside triangular wall of the Chilkoot tent. When this rope is tightened it draws the shelter tent ridge in tight against the Chilkoot tent. (See figures 1 and 4.) The shelter halves are then buttoned to the wall of the Chilkoot tent. The sides of the shelter tent are lashed to the spruce pole frame. The rear pole is placed in the shelter tent and it is raised. The rear triangle is stretched and a metal pin is driven through the inside loop. The outside loop is placed over the hook on the rear of the pin. This allows this triangle to be opened to permit entrance and egress. (See figure 5.) The rope connecting the top of the shelter tent to the Chilkoot tent is then drawn tight over the ridge of the shelter tent and half-hitched around the nail in the rear pole. Another shelter tent rope is then tied to this rope and it is passed over the hook in the rear pin, drawn tight, and secured by several half-hitches. Short poles are then placed under the corner loops to hold up the walls of the Chilkoot tent. (See figure 2.) The three other shelter tents are then pitched in the same way. (See figure 3.)

Spruce boughs are then cut and placed in the shelter tents for bedding. Sleeping bags are unrolled over the

boughs. Snow is banked around the ground frame to seal the bottom of the tent. A fire is started, and enough firewood cut and brought inside to last for the night and the shelter is ready for occupancy.

A tent pitched as described has remained standing while the Skagway wind was blowing, which is all that one can ask of any tent.

The next method of pitching the tent is for use in deep snow where it is impossible to make pins hold without digging down to the ground.

To Pitch the Chilkoot Tent on Deep Snow

Materials Needed

1 Chilkoot tent
1 stove
3 sections stovepipe
8 shelter halves
20 shelter-half ropes
4 spruce poles 22 feet long
4 spruce poles 15 feet long
8 spruce poles 5 feet long
4 spruce poles 7 feet long
baling wire
ball of rope

Arrange the four 22-foot spruce poles as described before and place the Chilkoot tent inside the square. Lash the four corners of the tent to the corners of the square. Place the four 15-foot poles together on the ground and fasten the poles securely together about one foot from the top with baling wire. Place these poles over the square so that the junction is about six feet above the center of the square and the butt ends are on the diagonals of the square extended. A wire is then securely fastened to the junction of the poles and connected to the fitting on the top of the tent. When fastened, the top of the tent should be about three feet from the junction of the poles. The tent is then raised by walking in with the four poles until the walls are vertical and the roof is tight. The butts of the poles are then pushed into the snow and the corner guy ropes are tied to the lodge poles. The stove is then installed and the four shelter tents pitched. A bipod made from two 5-foot spruce poles is used to support the rear of the shelter tent. The rear triangles of the shelter tents and the rope passing over the bipod are tied to a 7-foot spruce pole which is lashed across the open end of the parallel 22-foot poles. This is illustrated by the picture on page 478.

This is the only workable method for pitching this tent in deep snow. A tent pitched in this manner will also withstand strong, gusty winds. The "spring" of the poles allows the tent to give instead of tearing away when hit by a fresh gust. The tent then comes back into shape perfectly. When properly lashed this tent remains in shape in all kinds of weather.

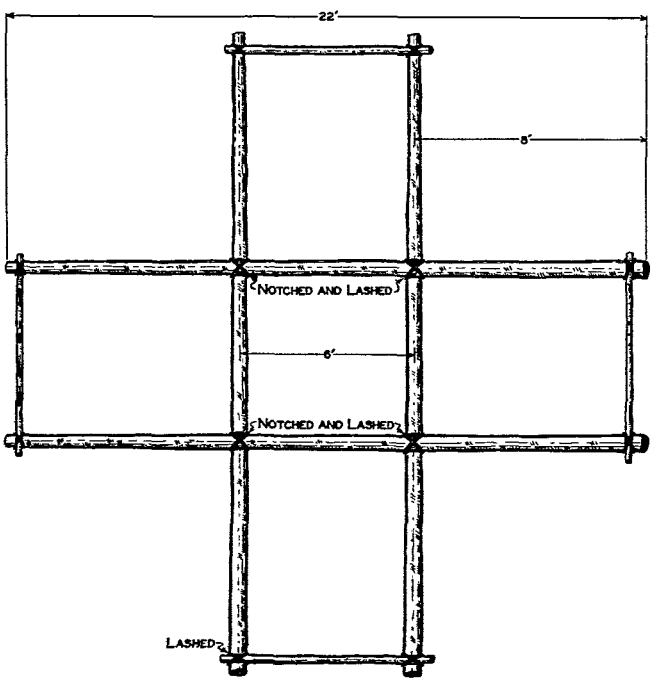


Figure 7: Plan of Spruce Pole Frame for Pitching Tent on Snow.

MARKING MOTOR VEHICLES

By Captain V. C. Stevens, Coast Artillery Corps

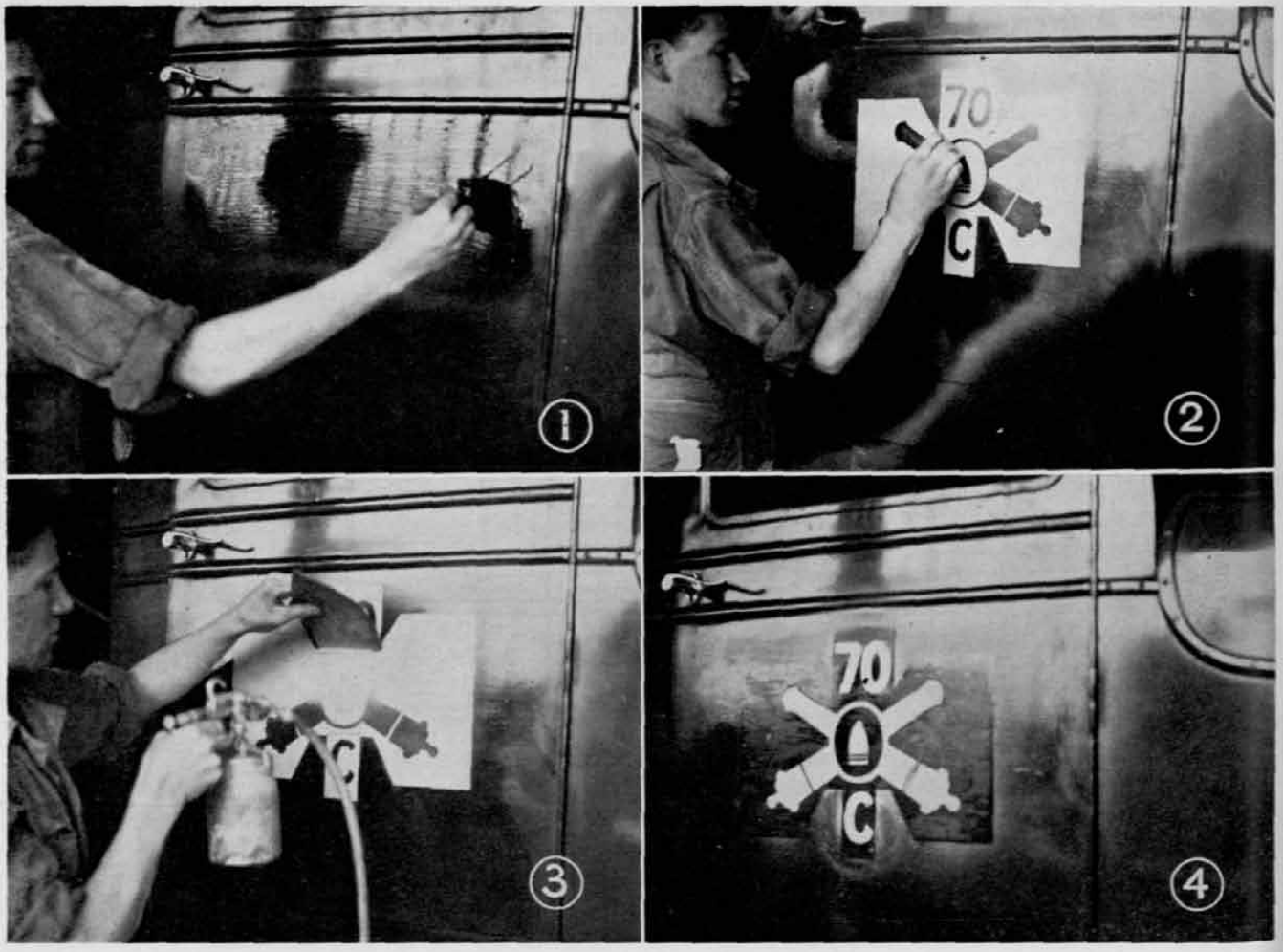
Side marking motor vehicles as required by AR 850-5 has always been a slow, costly and more-or-less unsatisfactory process. In a search for a faster and cheaper method than that afforded by the use of marking tape and decalcomania the Coast Artillery School garage recently adopted a marking process in use by a large automobile manufacturer. The process requires the use of a new product—Pap-R-Mask—and gives a neater and longer-lived job than oiled or metallic stencils. The garage obtained enough of the material on competitive bid to mark a large group of newly-acquired vehicles. The cost is nominal, and the material comes cut to any design specified. Other organizations may find this process helpful in solving their motor vehicle marking problems.

Pap-R-Mask, manufactured by C. O. Dicks Company, 8544 Grand River, Detroit, Michigan, is a thin kraft paper coated on one side with a special rubber cement. The design is cut out with a jig saw, from paper held in firm blocks in lots of about 250 sheets. The Pap-R-Mask Company carries common sizes and patterns of letters and numerals in stock and will cut any numeral or design pattern if a tracing is furnished. The Coast Artillery School garage not only bought the items illustrated, but also U.S.A. lettering and some of the common first three truck numbers en bloc. Special designs can be cut locally with a knife.

The stenciling is quite simple. First (figure 1) a special rubber cement furnished by the company is thickly brushed on the spot to be stenciled and allowed to dry. This cement is very cheap; three gallons are enough for about 250 trucks. No substitute can be used since most rubber cements ordinarily contain benzol which is very destructive to paint.

Then the stencil is placed on the spot, the lettering supports are cut out with a knife, and the open spaces are rubbed down with a stiff nail brush (figure 2). The nail brush removes the cement in the spaces and also roughens the finish so that the paint takes hold better.

Now the stencil is sprayed or brushed (figure 3). We used three colors; yellow for the gun and shell, red



1—Rubber cement is brushed on the spot to be stenciled. 2—The open spaces are rubbed down with a stiff nail brush. 3—The stencil may be sprayed or brushed. 4—The stencil is removed and the rubber cement is rubbed off by hand.

for the oval, and white for the letters. To speed up the work, we used lacquer. Synthetic enamel must be used if the pigment is to be applied by a brush. If care is taken not to remove the rubber cement around the stencil, additional masking is not necessary.

Finally, the stencil is removed and the rubber cement is rubbed off by hand (figure 4).

Two hundred and fifty vehicles were marked in 4½ working days. Ten men did the work. These were three painters, each having in his paint gun one of the three colors used, four mask appliers and removers, one rubber cement man and two door cleaners. On new unpolished vehicles the door cleaners would not have been needed.

The following precautions were found necessary during the work:

The doors had to be chemically clean and wax free. We used Val-Kleen.

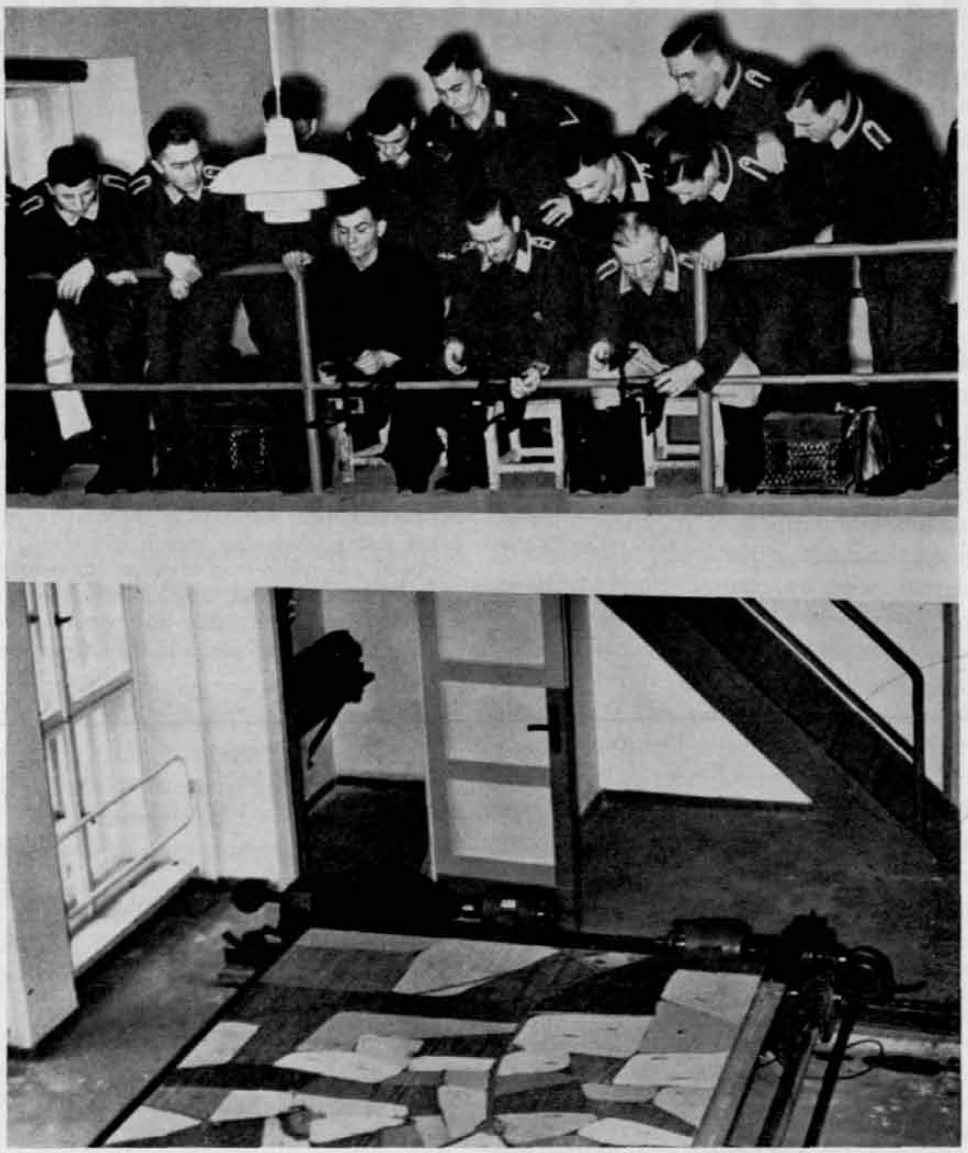
The rubber cement had to be applied in a thick coat and allowed to dry, because a thin coat welds to the finish, and a wet coat allows the stencil to slip.

All work must be done in the shade and in a dust free place.

The stencils must be removed at once to prevent paint bridging.

An air hose is a great help in blowing the stencil into position gently.

The front and rear marking of these vehicles was provided by means of the raised number license plates (drawing No. 2641), which can be obtained very cheaply from the Federal Prison Industries, Department of Justice, Washington, D. C.



SCHOOL FOR BOMBERS

This picture, released in January, 1939, shows German airmen receiving indoor instruction in the use of the bombsight. A device that gives the illusion of flying presents a moving panorama below the students who gaze through bombsights.

WAR AGAINST WORDS

By Edward L. Bernays

"The place of artillery preparation for frontal attack by the infantry in trench warfare will, in the future, be taken by revolutionary propaganda to break down the enemy psychologically before the armies begin to function at all. The enemy people must be demoralized and ready to capitulate, driven to moral passivity. . . . How to break down the morale of the enemy, that is the question that interests me. Mental confusion, contradiction of feelings, indecisiveness, panic—these are our weapons."

This is a well-known quotation of Adolf Hitler by Rauschning in *The Voice of Destruction*.

A quotation from *Germany Prepares for War* by Ewald Banse, Professor of Military Science at Brunswick Technical College in Germany, published here in 1934, elaborates on this. It is significant to note that Professor Banse was given his professorship on the accession of the Nazis to power in Germany in 1933:

> Applied national psychology as a weapon of war means propaganda directed towards influencing the mental attitude of the nations to a war. It has four functions: (1) to gain one's own nation's support for the idea of the war, fill it with hatred and bitterness against the enemy, inspire it with an unquenchable war spirit, in short, to do everything possible to fill it with a passionate determination not to sheathe the sword till the enemy is laid low. (2) One's allies must be persuaded in the same attitude and induced to identify their interests with one's own. (3) The neutrals must be filled with aversion for the enemy and an interest in one's own cause so that they may as far as possible be dissuaded from coquetting with the enemy and be drawn to one's own side, and also get the idea that it is only from the latter that they stand to gain anything; in particular, they must be firmly convinced that one's own cause is the only just one in the eyes of God and man. (4) Perhaps the most important point of all, it is essential to attack the enemy nation in its weak spot (and what nation has not its weak spots?), to undermine, crush, break down its resistance, and convince it that it is being deceived, misled, and brought to destruction by its own government, in order that it may lose confidence in the justice of its cause and that thus the opposition at home (and what nation is without one?) may raise its head and make trouble more successfully than before. The originally well-knit, solid, powerful fabric of the enemy nation must be gradually disintegrated, broken down, rotted, so that it falls to pieces like a fungus when one treads on it in a wood.

In *Propaganda Technique in the World War,* published in this country in the late nineteen twenties, an attempt is made by the author, a social scientist, to isolate the purposes of war propaganda:

(1) Fasten the war guilt on the opposing nation. All wars, then, become defensive wars to those engaged in them, he says.

(2) Call for unity and victory, in the name of history and the deity.

(3) State war aims. In the last war, the Germans failed to do this successfully. The Allies made successful counter-propaganda out of it. Security, peace, a better social order, vindication of international laws, are fre-

"Counter-propaganda—attack and counter-attack"

quently projected as war aims, according to his findings.

(4) Fortify the mind of the people, who already believe that the opposing enemy is responsible for the war, with examples of the enemy's insolence and depravity.

(5) Make the public believe that unfavorable news is due to enemy cunning. This weapon will conquer disunity and defeatism at home, he states.

(6) Follow this with horror stories. Many of these, like the story of the Turk who sits before a tubful of eyes of his tortured captives, go back to the Crusades. Horror stories, says the author, should have authoritative, or seemingly authoritative sources.

In *Allied Propaganda and the Collapse of the German Empire in 1918* George G. Bruntz makes a somewhat different classification of propaganda and counter-propaganda. He sees five types:

(1) The propaganda of enlightenment: This concerns itself with getting true facts to the people and army of the opposing country, negating the false information they are fed by their own country.

(2) The propaganda of despair: This attempts to break down the morale of the enemy by indicating that death, disaster, and defeat face him.

(3) The propaganda of hope: This presents to the opposing people and army a picture of a promised land, if they will only lay down their arms. President Wilson and his Fourteen Points used this as an honest attempt to state America's war aims.

(4) Particularist propaganda: This is aimed at factions in the opposing country and army, seeks to divide them into antagonistic groups—Catholic against Protestant, the people of Alsace-Lorraine against the Prussians in the last war.

(5) Revolutionary propaganda: This is aimed at breaking down the government of the opposing country from within. The propaganda by the Allies in the last war aimed at stirring up the German people against the Hohenzollerns.

These are the five main points made by the author.

I believe that the potency of propaganda as an important weapon of warfare today is generally recognized. The need to develop weapons—counter-propaganda, to meet this new force, must likewise be recognized. In warfare, every weapon demands weapons to meet it and overcome it. Effective preparedness looks towards the perfection of such weapons. In an appeal directed to the authorities in Washington during the last war, General John J. Pershing is quoted as saying: "I will smash the German line in France if you will smash the damnable Hun propaganda at home." A British general once remarked aptly that "armies fight as the people think."

Effective propaganda and counter-propaganda led to the collapse of the German empire in 1918. L. G. Knesebeck describes this breakdown—"in the first year of the war the soldiers spoke of 'death on the field of honor'; in the second year they spoke of 'giving our lives for the Fatherland'; in the third year they spoke of 'falling in a foreign land in the fulfillment of our duty'; and in the fourth year they spoke of 'dying as a further offering to this terrible war.'"

Strategy, planning and timing counter-propaganda activities, becomes a vital obligation of the army command. The strategy of terror, the war of nerves and words, must be met. Counter-propaganda is not a new weapon. But changes made by science and invention, with the use of such mediums as radio, the multiple printing press, rapid methods of communication and transportation have speeded up the weapons of propaganda, made them more widespread. New knowledge of psychology and sociology has made propaganda more effective. The natural corollary of this is that more effective tools are provided for counter-propaganda.

Every military commander, no matter how highly placed or how low in rank, should have a knowledge of the principles and practices that govern propaganda and counter-propaganda techniques in war time, and should call upon the experts available to him in the different fields of knowledge to help him solve their problems.

Effective propaganda and counter-propaganda must have certain characteristics. It must conform to policies laid down in advance. It must be coördinated, unified. It must be integrated with every phase of the country's war activity. It cannot be permitted to remain an unrelated effort to the other forces that make for victory. It must have continuity. Haphazard attempts are too indefinite to accomplish results. It must be timely and adapted to the publics it is reaching. It should be subtle, not obvious, must do its job without creaking in its machinery.

The individual carrying out the propaganda should have an objective approach, should be professional in his outlook and work. He must be selective in the use of his mediums.

For instance, the importance of the printed word in undermining the enemy's forces, was recognized in the Great War by the United States in that special weapons were devised for shooting propaganda over the enemy lines. In July, 1918, for example, grenades were discharged and tracts and pamphlets scattered along enemy trenches from special rifles with considerable exactitude at range of 200 yards. For greater distances, small balloons made of cloth were used. Airplanes were occasionally used for these purposes. The effectiveness of this kind of counter-propaganda was indicated by the fact that army reports of the period state: "The Germans have issued an order punishing with death the retention, by their soldiers, of any examples of American or Allied propaganda."

The military commander deals with counter-propaganda among five publics. He needs to take into consideration the morale of his army or its subdivision, that of the people where his army is functioning, that of the opposing force, that of the people in the enemy country, and that of neutrals.

There is, of course, no guarantee that the enemy may not be employing lies and falsehoods in its propaganda. Counter-propaganda must be prepared to meet falsehoods and lies. Categories of lies to be met by the counter-

propagandist have been catalogued by commentators on the subject.

There are deliberate official lies which may be put out by a government through official spokesmen or bureaus. There are deliberate unofficial lies, which a government may put into the mouths of unofficial spokesmen. There are hysterical hallucinations by individuals responsive to this kind of manifestation. There are lies of which a government may know, which for good reasons are not denied by officialdom. There are deliberate mistranslations. General obsessions, started by false rumors, play their part. There are deliberate forgeries and omissions in documents given to the public. Other forms of lying propaganda which counter-propaganda has to meet are deliberate exaggeration and concealment of the truth. Faked photographs play a part in lying propaganda. So do lies emanating from indeliberate or deliberate unreliability of witnesses. The catalogue concludes with the lies of pure romance, official secrecy, sham official indignation, false accusations, and charges.

This recital is by no means an all-inclusive list. There might be put in this category too, the matter of preparing the public in advance for the event which would otherwise have undesirable repercussions. All of this indicates to some extent how circumspect the counter-propagandist must be in evaluating the idea-weapon he is fighting.

How does he plan and carry on counter-propaganda activities? Briefly, in this manner.

A study of the attitudes of the particular public to be affected is made. Accurate well-defined methods are used to find out what people think or feel and why, and what mediums convey to them the ideas which affect their judgments. Such an inquiry determines, too, what ideas —what symbols—modify the attitudes and actions of this public. An army can use these methods as effectively as can American business. Cosmetic manufacturers know women will use a certain cosmetic, not only because it is good, bad or indifferent, but also because "Lady Balmoral of London" uses it. "Lady Balmoral" is the human "symbol" the public accepts. Certain automobiles are sold, not only because of their high horsepowered engines but because some leader—some symbol—whom the public admires, has bought that particular make of car.

The army is already organized to make studies of different publics through G-2, the military intelligence division of the army's staffs. Highly developed psychological and practical researches in mass action and reaction are at hand which make it possible accurately to interpret such findings as a basis for planning effective counter-propaganda campaigns. This indicates to those who have the knowledge and experience, what effective planning, strategy and timing should be. Such analysis gives a basis for interpretation as to the activities to be carried on. These activities must always be part of a whole.

The strategy of terror, instilling fear into the enemy, getting him jittery, breaking down his resistance, softening him up—are the terms describing a propaganda technique much used today.

How can counter-propaganda meet this strategy of terror?

The most effective method, of course, is to develop in one's own adherents an overpowering will to victory, a belief in strength, a certainty of success, a forceful morale. Morale is dependent on many factors. Counter-propaganda can meet the strategy of terror aimed to break it down by—

(1) Emphasis by reiteration of the weaknesses of the enemy, using facts, figures and dramatization regarding his weak spots.

(2) Emphasis by reiteration of the strength of one's own forces, using figures, facts, and dramatization of strong spots.

(3) Deflation of the attack of words before it is launched by calling attention to it, exposing the method, and thus taking the wind out of its sails.

England has utilized these methods. She has dramatized her air raids into Germany. She has built in her own people a belief in the impregnability of England. She has dramatized individual activities, her heroes triumphing over stronger foes.

Rumors are also important in propaganda. Fifth columns and spies spreading rumors by the Nazis contributed to the fall of the Lowlands and of France. Rumors in wartime are particularly difficult to deal with. Rumors always travel more speedily, are more potent in an atmosphere of insecurity and disequilibrium. The effects of Orson Welles's *Invasion from Mars* broadcast are a case in point. That is known by the enemy. Rumors thrive where freedom of speech and the press has been curtailed or abolished. Censorship, and consequent ignorance by the public of what is going on, make for greater credence to almost any statement, no matter how preposterous.

One way to deal with antagonistic false rumors is to make the spreader of such rumors liable to grave punishment. This is often resorted to and carried out as a counter-propaganda measure. The second method is to blanket the rumor by dramatizing effectively to the people among whom the rumor is current, an action which, by implication, denies the rumor. If a false rumor has been spread in your command that the water supply has been poisoned, and this has caused fear among your soldiers, it will be relatively simple to dramatize the untruth of this rumor by having a public ceremony at which officers drink of the water to show the purity of the water supply.

It is generally unsound to make straightforward denials of the rumor. Usually, that only gives it wider publicity. Where there is a desire to believe, it establishes greater belief in the malevolent rumor. Defense by admission and justification usually accomplishes more than denial. Losses or retreats in such a case become strategic retreats. A third method of dealing with rumors is to deflate the character of the source of the rumor by throwing doubt on the integrity and veracity of those known to be spreading it. In counter-propaganda, outside of the field of rumors, this blanket or distraction technique is often used. It offers a favorable alternative in place of a depressing fact.

which reduces the effect of the unfavorable impression.

An army often accuses its enemy of cruelty. This has a double purpose—to blacken the character of the enemy army before its own people, and also to stimulate its own forces and the people back of them to make them more eager to slay the cruel foe. Such propaganda can be met by humanizing the soldiers accused of cruelty—photographs of soldiers feeding babies at peasants' doorsteps.

Each army command in the field boasts that its forces are superior in propaganda to the opposing army and people in daily reports or communiques of victory. There are often grave discrepancies in the communiques issued by contending armies.

The most desirable method for meeting propaganda of this kind among one's own forces and people, as well as among neutrals, is to build up in the mind of these publics the truth of one's own communiques and the mendacity of the enemy's. This can also be done by deflating the veracity of the opposing side by presenting other cases in which the enemy was plainly lying.

It is important in counter-propaganda to utilize ideas in words or pictures that will pass easily into the minds of the people to be reached. The unusual may be startling, but it may also be difficult to gain acceptance for such counter-propaganda. Propaganda must take account of conditions, prejudices, native history, and temperament. Historic friendships help countries to be allies. "Lafayette, We Are Here"—undoubtedly had a sound effect.

When Hitler, for the English broadcasting of his appeal to reason speech used a commentator with an English accent, it was an effective kind of presentation, for the British accent passed easily into the consciousness of the English people. There were no hazards to overcome, as there might have been if the translation had been a stilted one delivered in the German accent.

The English, on the other hand, were slow in mastering this prerequisite. They still use men with poor German accents to get their ideas over.

Group interests and interest groups should be appealed to. The choice of words and pictures and ideas easily accepted by those whom it is desired to reach is a very important aspect of effective counter-propaganda.

In counter-propaganda as in other aspects of war, one may take the offensive or the defensive. The most efficient type of counter-propaganda is obviously that which anticipates the attack and which might well be called offensive counter-propaganda. If one can deflate one's enemy before he gets the chance to make an attack and to put one on the defensive, one is better off. The counter-propaganda that just waits is therefore at a greater disadvantage than the counter-propaganda that recognizes in advance what will come and acts early to meet it.

An outstanding example of a missed opportunity for counter-propaganda is that of the Prussian officer in charge of German propaganda in the last war who failed to make any noise after the execution of two German nurses by the French just after the Nurse Cavell episode under similar circumstances. Asked why he hadn't used the episode for propaganda he said, "What? Protest? The French had a perfect right to shoot them." German counter-propaganda often failed in the last war, because it was treated within the bounds of military routine.

Our army, as at present constituted, is set up for espionage, for counter-espionage, for military intelligence, and to some extent for propaganda. But in the army, as in many other important phases of our life, there is a lag between science, invention, and knowledge, and the application of these elements to the particular subject at hand.

The effective employment, however, both of propaganda and counter-propaganda is dependent upon scientific knowledge and approach. A large group of professional men who have made a study of those scientific fields and their practical application to the question should be utilized. Experts in military science, psychology, neurology, sociology, history, economics, politics, education, public opinion, and public relations are available.

The army should draw on men from all these fields, each of whom has made a special study in his special field of its relationship to modifying attitudes and actions of human beings. Just as the army now draws on medical experts for its medical corps, it should draw on these specialists for its morale corps. These men are available for scientific judgment, and practical advice and material, on any matters that may arise concerning morale in all its phases—propaganda and counter-propaganda.

Such a special corps of the army would also aid in developing broad policies and programs of action for peacetime and wartime pursuit. Its expert social scientists and public opinion technicians are in a position to supply advice, information, and material, if, as, and when required. Their services are at the command of the army, ready to serve the national defense in this important period of our history. The problems of morale, of propaganda, of counter-propaganda, are not ones for the amateur.

The question as to what central authority should call this group of experts into being and supervise it is open to discussion. Morale affects every phase of our national life. Hence, for the greatest national good, the work of such a group of experts should be available to many government activities. Thus it may well be under other than military control since its work will not be exclusively a military function. A military leadership of all morale-building activities might have a tendency to place too tight a control upon them, and perhaps to neglect to some extent certain social and psychological considerations. But pending further discussion, there is every reason why the army should initiate active measures toward a thorough counter-propaganda.

The Army of the United States must make full use of this art and this science if it is to have the highest potential morale within its own forces, and the highest efficiency in attack and counter-attack on the enemy in the psychological warfare of today.

AT Means and Methods

Only armored units can fully protect moving troops.

By Probus

Much has been said and written about antitank measures during the first year of the war in Europe—so many pros and cons have been proffered in behalf of specific weapons and methods—that it has now become necessary to re-analyze the whole matter. In doing this it will be best to begin with the basic essentials.

We need to consider just four agencies in a tactical study of antitank-defense systems, and one of these need only be mentioned. The passive means of antitank defense—antitank obstacles and mines—we may dismiss by simply stating that their principal importance lies in supplementing and reinforcing the antitank-gun units. That leaves us with three active agencies: antitank-gun units, armored divisions, and infantry (GHQ) tanks.

These agencies have to be considered in two situations, with the armies in movement and with the armies occupying a defensive position.

Let us first consider with some care the missions of antitank-gun units and define these missions in view of the powers and limitations of such units. Without natural or artificial obstacle defenses antitank-gun units are, of course, highly vulnerable. If they are caught in the open or in movement without the benefit of any particular passive means of defense, they have no chance of success against hostile foot troops firing from cover, and none at all against hostile armored vehicles. Accordingly, they cannot be employed to counter-attack armored vehicles. They can only be used to fire from positions which have adequate defilade and which they have occupied from cover from hostile tank attack well before such an attack. Antitank-gun units, moreover, by themselves have little defensive power against foot troops or cyclist troops. Such hostile forces can usually work around the flanks of an antitank-gun unit without much difficulty.

It follows from what we have already seen that antitank-gun units, in defense, are effective against serious attack only when they are protected by foot troops and when their flanks are covered by other troops or are otherwise secured. It is also apparent that when foot-troop units which are being protected by antitank-gun units are in movement, the AT units must occupy successive positions. This must usually be accomplished by echelon and by bounds. Against any large hostile mechanized force such a distribution is only effective to a very limited degree. If, however, AT units are actually occupying positions and are protected by foot troops, they can be used effectively as a pivot of maneuver for armored forces.

Antitank units which are defending a position must deal with three successive phases of hostile tank action

First, the attack by the enemy's infantry and infantry tanks, which the AT guns must meet in position. There is small chance of moving reserve AT units into position to protect a battle position once the hostile attack has begun. The next phase which AT units defending a position may have to meet is a break-through. A break-through can only be met by armored units. The action of such units may be pivoted on AT units. Unarmored AT units, however, do not have the power to counter-attack. The final possibility is, of course, a hostile penetration by armored divisions after the enemy's infantry and tanks have opened a gap. Again, this can only be met by armored units, for here too unarmored vehicles cannot counter-attack. They can only form a pivot of maneuver for counter-attacking armored divisions.

Now from these considerations we can arrive at several conclusions. For one thing, it is apparent that the first AT defense measure should be to defeat the hostile armored forces with armored units of our own. At the same time, AT units protecting a defensive position, if adequate in numbers, should be strong enough to put up an effective defense. Such units must, however, be in position and must not be held mobile with a view to counter-attack. Furthermore, AT battalions of divisions, corps, and armies, are to be regarded, in a defense, as available reinforcements for the AT units of the front-line infantry regiments; or, they may be attached to armored units. And finally, it is not practicable to protect a movement of troops adequately by means of AT units. When a force is in movement both the foot troops and the AT units are highly vulnerable. Only armored units can insure their adequate protection.

We are now brought to our main conclusion: we must, to a great extent, rely on armored units for AT defense. This means in turn that we must abandon our doctrine of using tanks for offensive missions only. Tanks must always use an offensive form of action. But their mission in respect to other troops may be defensive and must be defensive if the general situation is defensive.

With this as our basic AT doctrine, we may now outline a system of AT defense, first for a defensive situation and second for a force in movement.

In the defense of a position regimental AT units should occupy positions with the main purpose of covering the battle position. Elements of AT battalions from large units should be attached to the regiments in line as reinforcements in accordance with the situation; or they should be combined with attached tank battalions and with the divisional infantry reserve, thus to form a counter-attacking reserve; or they should be attached to armored divisions in army reserve. Infantry-tank battalions should be attached to infantry divisions in accordance with the situation, and should be combined with reserve infantry regiments and AT units as already described. Armored divisions, reinforced as needed by AT battalions, should be employed as a counter-attacking force against hostile penetrating armored divisions.

For the AT defense of a force in movement the follow-

The 37-mm. gun in rough terrain

The plane supports the tank attack

ing is the way in which the defense should be arranged. The armored divisions move on the front or flanks of the army, carrying out reconnaissance in the direction of advance and seeking out the hostile armored mass and penetrating through gaps to envelop hostile forces. Successful offensive action by these units is by all odds the most effective antitank defense. During a movement regimental AT units should occupy successive positions by echelon and by bounds. They should usually be reinforced by rifle units. Such a combination should be effective against minor inroads by hostile armored vehicles and should give some measure of delay against weightier hostile attacks. In the movement of a force, AT battalions should also be combined with tank battalions as in a position defense, and where necessary should also be combined with divisional reconnaissance elements. The force thus formed would cover the advance of the division on its most dangerous flank or on its front. The AT units should occupy successive positions by echelon and by bounds, thus to form pivots of maneuver for the tank units.

The foregoing method of antitank defense requires, it is plain, that a large body of tanks be available. Indeed, we can no longer think of warfare without at the same time thinking of tanks in thousands, or even in tens of thousands. We must visualize infantry tanks as being present in all parts of a combat zone which are suitable for their employment. They must in fact be as commonplace as foot infantry, for they can no longer be regarded as a special weapon.

It is also clear that tanks must be brought into an even closer relation with foot infantry than in the past, since the two have complementary functions on the battlefield. Neither can act independently of the other for any length of time. Foot infantry can take advantage of the cover on terrain where tanks must expose themselves. Tanks, on the other hand, are immune to hostile small-arms fire but vulnerable to gunfire. Hence they need the support of the infantry flat-trajectory fires to neutralize the fires of hostile AT guns. Ground which tanks cannot capture because of natural or artificial obstacles must in the usual case be captured by foot infantry, as in the Flanders break-through, before a tank attack can be launched at all. Tanks cannot force a stream crossing. Finally, a strongly armed foot infantry can hold ground but tanks cannot. Their action must be offensive, whether, in an offensive or defensive situation.

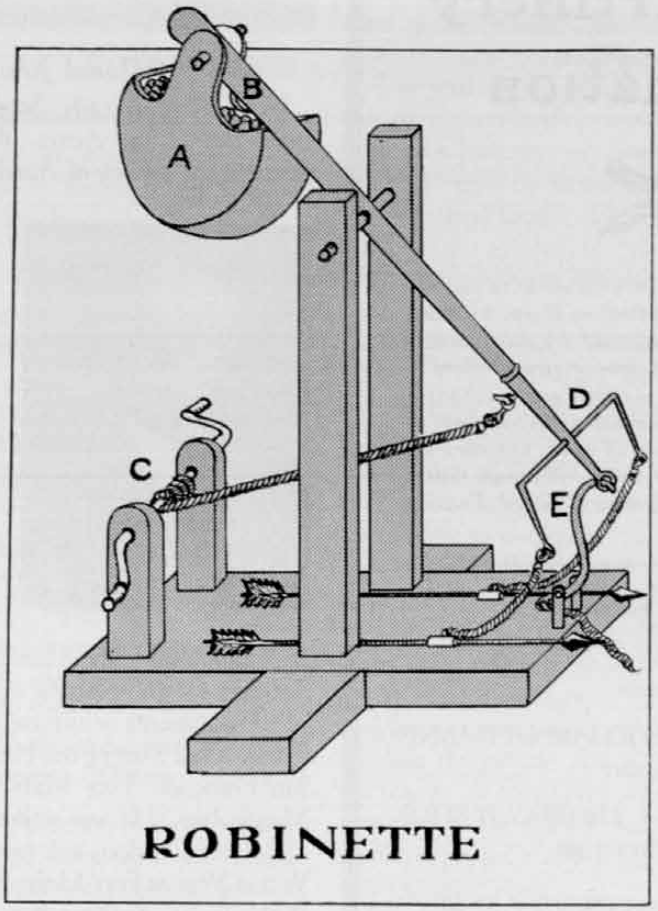
It is also plain that the AT battalions of large units must be brought into closer relations with tanks, for their limitations are too pronounced to permit of any independent employment. Their rôle is static, and the attempt to use them for counter-attack must be abandoned.

Not to proceed along mistaken lines in building up our means of AT defense, we must especially take care to draw correct conclusions as to the reasons for the failure of AT defense in the war in Europe. There were, it is true, some deficiencies in the matériel of the French AT units. But this was not on the whole the dominating reason for the AT débâcle. That débâcle came about rather because of the lack of effective mobile means of action. The AT guns were inadequate, not only in power but in mobility, to meet a break-through, even a break-through exploited by the most lightly armored tanks. The remedy lies in providing more armored units and not in multiplying AT units.

Priority should be given in all cases to positive antitank action—the action of armored units.

The Story of Artillery Through the Ages

By W. A. WINDAS



Chapter 11: THE ROBINETTE

In addition to stone catapults the age of chivalry produced arrow-throwers as well. These were intended primarily for siege rather than mobile operations. In point of fact, the design of the arrow-thrower limited its use to position warfare. The robinette was a typical arrow-thrower.

Like other medieval catapults, the robinette was a counterweight engine. The container at (A) was filled with scrap metal to form the weight. The arm (B) had its fulcrum nearer to the weight than to the flinging end. The winch at (C) cocked the piece. The unique fixture at (D) was for throwing the arrows. Sockets are held by chains to the arm, and the arrows placed in the sockets.

The robinette was operated by cocking with the winch, and engaging the trigger (E). After the arrows were inserted, the trigger was tugged free and the drop of the weight would snap the arrow-end of the arm upward. This would move, of course, at higher speed than the weight, being further from the fulcrum. As the arm came to the end of its arc, the arrows continued forward out of their sockets.

The arrows are described as "long, with heavy, solid, pyramidal heads."

Unlike the warriors of the classical age, soldiers of this period were rarely given to writing about their armies or exploits, for only a few could write at all. For this reason, most written accounts were left by scribes who had little if any first-hand knowledge of the arrow-thrower and we are therefore unable to obtain exact figures as to the range of the robinette.

One rare soldier-writer says that he saw an arrow-thrower shoot 1,000 yards. But he goes on to say that the piece was fired from the brow of a cliff. He does not tell us how high this cliff was, so even from this exceptionally good source we get no definite information.

All in all, it would seem that the efficiency of the robinette was not proportional to the bulk of the machine.

The United States Coast Artillery Association

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

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The Coast Artillery Journal

LT. COL. CHARLES THOMAS-STAHLE, Editor

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

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News and Comment

Colonel John A. Lundeen

The death in early September of Colonel John A. Lundeen, U. S. Army, Retired, closed a career that spanned the history of American Coast Artillery from the days of the muzzle loader to the 16-inch gun. A graduate of the United States Military Academy Class of 1873, Colonel Lundeen received his initial commission as a second lieutenant, 4th Artillery. All of his forty years of service on the active list were rendered in the Artillery. Early in his military service Colonel Lundeen was an Assistant Professor of Mathematics at West Point. He attained the grade of colonel, Coast Artillery Corps, in 1906. Among his more important prewar assignments while on the active list were the command of the Post of the Presidio, the Artillery District of San Francisco, Fort Mills and the Artillery District of Manila Bay. He was retired by operation of law in 1912.

Colonel Lundeen was recalled to active duty during the World War at Fort Monroe. Here he served as President of the Coast Artillery Board, Coast Artillery School Librarian and as Editor of the *Journal of the U. S. Artillery*, the forerunner of The COAST ARTILLERY JOURNAL. During the war period he also commanded the Coast Defenses of Chesapeake Bay and the Coast Artillery School.

At the time of his death Colonel Lundeen was ninety-two years of age and resided at Oceanside, California. He was buried in Arlington National Cemetery.

Dual Missions

In order that all antiaircraft artillery fire units may be trained to perform contingent antimechanized missions effectively, a training directive will be issued in the near future requiring annual training in the technique and tactics of antimechanized defense.

An allowance of twenty-five rounds of 37-mm. antitank ammunition (modified) for each 37-mm. antiaircraft gun M3 and 500 rounds of caliber .50 machine-gun ammunition for each caliber .50 machine gun in an antiaircraft regiment has been authorized for this training by a recent change to AR 775-10. No firings in connection with this training will be conducted with the 3-inch and larger caliber antiaircraft guns until certain modifications are made.

Further Mechanization

Many officers will hear with regret the passing of the horse from the Coast Artillery School—and some possibly will entertain quite other feelings. For good and sufficient reasons, it has been recommended that equitation be discontinued at the Coast Artillery School and that the horses be sent elsewhere.

Ordnance Research

The September-October, 1940, number of *Army Ordnance* carries an article ("Ordnance Research" by Colonel G. M. Barnes) that should do much to refute the belief of many commentators that the Army consistently shuns new ideas.

Colonel Barnes gives a picture of the broad scope of the Ordnance Department's activity in technical and scientific fields from early days to the present and reviews the important work currently being done in collaboration with American science and industry.

The article has been reprinted in pamphlet form together with eight pages of pictures that show work in progress at arsenals and proving grounds. The pamphlet will be sent without charge on request to the Editorial Offices, *Army Ordnance,* Mills Building, Washington, D. C.

Non-Recoiling Artillery

Adolphus L. Helwig, Major, Corps of Engineers Reserve (Bulletin of The Society of American Military Engineers)

Within the last half century the power of naval artillery has been increased sixfold, and from now on muzzle velocities of 6,000 feet per second with present powders are possible.

This is a far cry from the bombards of our forefathers who were glad to hurl a stone shot a distance of several hundred feet. The cannon which Napoleon used, of bronze and smooth bore, loaded at the muzzle, were no different than those which Louis XIV used in his campaigns. No great progress was made in artillery until up to a short time before the Franco-Prussian War of 1870, when breech loading and rifled barrels were adopted.

During all this time the recoil was considered an unavoidable characteristic of artillery. All artillery on land as well as afloat was, therefore, mounted on wheels; nothing seemed able to render the recoil impossible.

The invention of the elastic shock absorber took place between 1890 and 1900. This permitted the barrel to recoil easily on a carriage, and then return automatically to its initial position. This was a great step forward, because it permitted the carriage to be solidly fixed to the ground or on the deck of a ship.

Suppressing the energy of the recoil was considered to be impossible, and this impossibility was taken as theoretically proven. With the advance of science, however, and in studying more closely the phenomena produced at the moment a shot is fired from a cannon, it appeared that the impossibility previously mentioned was only relative, and that the mathematical formulas used were incomplete and applicable only within very narrow limits.

When a projectile leaves the bore of a cannon there remains behind it in the tube a mass of gas equal to the mass of the powder, and at high temperature and high pressure. This gas contains a quantity of energy which in present artillery is entirely lost. The gas escapes after the exit of the projectile, causing a flash and a blast which to say the least are very annoying. The energy (to speak exactly) "goes up in smoke."

With these facts as a basis the question was raised as to whether the recoverable energy would not be sufficient to counteract practically the energy of the recoiling mass. In cannon firing at a muzzle velocity of 2,400 feet per second, it has been demonstrated that the recoverable energy is equivalent to the energy contained in the recoiling mass. If a cannon, however, is firing with a muzzle velocity of 3,000 feet per second—which was the case with Big Bertha of World War fame—it has been calculated that the energy lost at the muzzle is more than sufficient completely to overcome the energy of the recoiling mass.

It seems evident that a cannon with a barrel open at both ends, having a proper powder chamber in the middle, which would simultaneously fire two projectiles, one forward and one to the rear, having the same weight and speed, should in no way recoil. This seemingly odd sort of a cannon was produced during the World War by the English Admiralty, and was installed on airplanes under the name of the Davis cannon. The projectile which was shot at the enemy was a normal shell, and the projectile expulsed towards the rear was composed of very fine grains of lead.

It is easy to see that when an ordinary cannon is fired a gas projectile composed of all of the gases, caused by the combustion of the powder in addition to the metal projectile itself are expelled forward, and that their effect is cumulative. Hence the problem is to have these two effects counteract each other, as in the Davis cannon—and have the reaction towards the rear annul the recoil of the main mass.

From the foregoing it must be clear that to make a cannon without recoil, it is necessary to find a practical way to accomplish the following three things:

1. Prevent the gases of the powder from following the metallic projectile towards the muzzle.
2. Divert the path of these gases towards the rear.
3. After this change of path to stop them so as to avert their destructive effect on the personnel and matériel.

From the constant research carried on since 1916—particularly by the French artillerists—it is claimed that these problems have been completely and satisfactorily solved, and that, from now on, it is possible to make cannon of great power and of any caliber in which the energy of recoil is practically suppressed. This new method of checking the recoil by means of gases of combustion is

certain to cause a complete revolution in the construction of artillery, and will make possible the creation of cannon of lightest weight and greatest power.

The new method is equally applicable to the infantry arm, the rifle, and other auxiliary weapons, such as machine guns, and with equally favorable results.

In Europe it has been proposed to build airplanes armed with 4-inch cannon and provided with a supply of from 25 to 30 shots, served by three men. This the experts say would make such an airplane a veritable aerial cruiser, of high speed, and formidable power, provided the cannon is arranged to fire with the recoil counterbalanced by the gases in order to arrive at minimum weight and maximum stability.

Batten Down the Hatch

By Commander H. J. Wright, United States Navy

The writer knows of no finer rebuke to talkative "experts" than that given to his critics and advisors by Lucius Aemilius Paulus, a Roman consul, who had been selected to conduct the war with the Macedonians, B.C. 168. It should be read, studied, and followed, in principle, by every naval officer. Before departing for Macedonia, Paulus went out from the Senate house into the assembly of the people and addressed them, according to Livy, as follows:

"In every circle, and truly, at every table, there are people who lead armies into Macedonia; who know where the camp ought to be placed; what posts ought to be occupied by the troops; when and through what passes Macedonia should be entered; where magazines should be formed; how provisions should be conveyed by land and sea; and when it is proper to engage the enemy, when to lie quiet.

"And they not only determine what is best to be done, but if anything is done in any other manner than what they have pointed out, they arraign the Consul, as if he were on his trial.

"These are great impediments to those who have the management of affairs; for everyone cannot encounter injurious reports with the same constancy and firmness of mind as Fabius did—who chose to let his own authority be diminished through the folly of the people, rather than to mismanage the public business with a high reputation.

"I am not one of those who think that commanders ought never to receive advice; on the contrary, I should deem that man more proud than wise who did everything of his own single judgment. What then is my opinion? That commanders should be counselled, chiefly, by persons of known talent; by those, especially, who are skilled in the art of war, and who have been taught by experience; and, next, by those who are present at the scene of the action; who see the enemy, who see the advantages that occasions offer, and, who, embarked, as it were, in the same ship, are sharers of the same dangers.

"If, therefore, anyone who thinks himself qualified to give advice, respecting the war which I am to conduct, which may prove advantageous to the public, let him not refuse his assistance to the State, but let him come with me into Macedonia. He shall be furnished by me with a ship, a horse, a tent, and even with his traveling charges.

"But, if he thinks this is too much trouble, and prefers the repose of a city life to the toils of war, let him not, on land, assume the office of pilot. The city, in itself, furnishes abundance of topics for conversation. Let him confine his passion for talking, and rest assured that we shall be content with such councils as shall be framed within our camp."

U. S. Naval Institute Proceedings, August, 1940.

Exit the Sidecar

Under a new policy recently announced no more motorcycles with sidecars are to be procured—solo motorcycles being substituted for them whenever tactical requirements can be met by such vehicles. In cases where additional passenger carrying capacity is essential, motor tricycles will be provided. Since this latter vehicle is still under development, purchases this fiscal year will be limited to solo motorcycles and procurement of the necessary motor tricycles will be begun after a satisfactory vehicle has been developed and standardized.

Additions to the Japanese Navy

Revista de Publicaciones, January to March. — Although there is practically no official information, there are reasons to believe that Japan is building four battleships of more than 40,000 tons. One of these, the *Nisshin*, was launched November 30th at the Kure Navy Yard, and another one on November 27th which has not been identified, the *Zuikaku*, may be a sister-ship of the *Nisshin*. It is possible that the *Kadekuru*, launched on the first day of last June at Yokosuka, is another one of the same type, even though unconfirmed reports have been circulated that it is a battle cruiser of 16,000 tons displacement. The 10,050-ton aircraft carriers *Soryu* and *Hiryu* are in service at present.

It is understood that the *Hiryu* differs from the former in that she has a light tripod mast aft of the bridge on the starboard side. Each one has twelve 5-inch guns, with a high angle of elevation, mounted in pairs. A third unit which may belong to this type is the *Syokaku*, launched last June 2d in Yokosaka. But according to a report its length is 800 feet as compared with the 721 feet of the *Soryu*, so it probably is a new and larger type. Both the *Kaga* and the *Akagi* which formerly were 26,900-ton aircraft carriers, have had extensive alterations; their combat decks have been extended to the bow, and a superstructure has been added on the starboard side.

Work has been finished on the last two cruisers of the type of the *Mogami*, *Tone*, and *Tikuma* and have twelve 6-inch guns instead of the fifteen which the first ships of

this type had. It has been reported recently that the quarterdeck has been moved in order to make room for launching airplanes. However, this cannot be confirmed until photographs are received.

The most curious units produced by Japan during the recent past are the three hydroplane carriers, *Titose, Tiyoda,* and *Miduho* of 9,000 tons displacement. These units have a speed of only seventeen knots while the other two have made twenty knots. However, to compensate for this loss in speed, they mount six 5-inch guns with a high angle of elevation, instead of only four. During the last sixteen months Japan has launched eleven new large destroyers of 2,000 tons displacement. Although photographs have not as yet been made of these, they are an enlarged edition of the preceding types, according to some details received.

It is believed that since 1937 at least sixteen submarines of from 1,500 to 2,000 tons have been begun. On the other hand the Japanese Imperial Navy has been very busy recently constructing small mine layers, gunboats, submarine chasers, and mine sweepers.—From *U. S. Naval Institute Proceedings,* September, 1940.

Snug In the Snow

The contribution of Lieutenant Avery M. Cochran entitled "Snug in the Snow at Forty Below" on page 450 brings to the JOURNAL a new field of endeavor for Coast Artillery. The increasing interest in the acquisition and operation of defense installations in northern latitudes may soon place Coast Artillerymen under the necessity of inuring our commands, long accustomed to service in the tropics, to the rigors of climates even more severe than those of the northern United States. The JOURNAL introduces Lieutenant Cochran in the hope that his article may attract further thought and discussion on the new problems that are certain to arise when men and matériel are exposed to wind and snow at below-zero temperatures.

The 75th Coast Artillery to Alaska

It has recently been announced that the 75th Coast Artillery will be sent from Fort Lewis, Washington, to Anchorage, Alaska, for station about November 1st. The 75th has been at Fort Lewis on a temporary basis and now goes to its permanent station as part of an increase in the garrison at Anchorage totaling approximately 2,400 officers and enlisted men and including infantry, field artillery, signal troops and service elements as well as the Coast Artillerymen.

Offsetting Noise in Modern Battle

There has been much comment on the press and on the radio with respect to the terrifying aspects of warfare as it is now conducted. In fact, books are beginning to appear about the war which contain the word "terror" in their titles. Writing in *The Army Quarterly* for July, 1940, Air Commodore P. S. M. Fellowes, DSO (ret.), makes some sound comments on the German use of terror by noise as a weapon.

Air Commodore Fellowes first points out that if we think any noise means sudden pain and death, it tends to cause terror within us. That feeling is all the more intense if we have been led to think "that the louder the noise the greater the chance of hurt and death." The French failed to offset this technique of modern warfare in spite of the fact that it had been clearly demonstrated in the invasion of Poland. "The French are a logical race," he writes, "and if it has been clearly implanted in the understanding of the *poilu* that the mathematical chances of either being hit by a bomb or by a machine-gun bullet from the air are extraordinarily small, particularly if in the case of a bomb attack he were lying in a ground depression or flat on the ground or standing up in the case of machine-gun fire (they seldom happen at the same time), then I believe that the débâcle of the Ninth Army would not have happened."

This writer thinks that lectures should have been given to all troops, not only on the noises of airplanes but also to explain the feeling of an enemy soldier in a tank when that tank knows he is probably running into antitank gun fire or approaching a minefield. "If a man on the ground with a machine gun were only to realize the feelings of the normal man in the air, he would be twice the man in defense and offense."

There is plenty of sound combat psychology in what Air Commodore Fellowes says. The noise of warfare at least is something that we can do a lot to accustom our troops to in their training away from the battlefield and in their peacetime training. Nor is it a small matter. The very contrast between the peacefulness of a peacetime command post, for example, and the same kind of command post in war, has a serious effect upon the conduct of affairs, certainly until a staff gets used to the difference. The combat troops themselves have a little opportunity on maneuvers to undergo a simulation of the noises of combat. But they have far fewer such opportunities than they should have.

This, after all, is a matter of basic military psychology which should therefore be thoroughly studied and then all practicable means of training troops to do their work in war in the midst of turmoil put into effect.

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Coast Artillery Activities

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☆ ☆

Fort Monroe

BRIGADIER GENERAL FREDERIC H. SMITH, *Commanding*

COLONEL WILLIAM S. BOWEN
President, Coast Artillery Board

COLONEL ELI E. BENNETT
Executive, Third Coast Artillery District

COLONEL FRANCIS P. HARDAWAY
Post Executive; Commanding Harbor Defenses of Chesapeake Bay and 2d Coast Artillery

COLONEL DELMAR S. LENZNER
Commanding, Submarine Mine Depot

COLONEL HAROLD F. NICHOLS
Assistant Commandant, Coast Artillery School

LIEUTENANT COLONEL MANNING M. KIMMEL, JR.
Commanding, 57th Coast Artillery (TD)

MAJOR WILLIAM HESKETH
Commanding, 74th Coast Artillery (AA)

MAJOR EDWARD W. TIMBERLAKE
Commanding, 71st Coast Artillery (AA)

By Major Lloyd W. Goeppert and Lieutenant Walter F. Ellis.

Change has been the watchword at Fort Monroe. Even the weather has gone in for rapid transitions. We have had alternating hot and cold spells and at present are experiencing our own rainy season. Those who attended the first training camps have felt quite at home at the present day Fort Monroe. Again there are columns of officers, name cards over their breast pockets, filing off to classes at the Refresher School. The old cantonment buildings once more ring with the voices of student officers, and the lights burn late in the study halls as they prepare for the morrow's classes.

But it is when we review the changes that have taken place in the organizations at Fort Monroe that we really feel limp. On the first of June the 1st Battalion, 57th Coast Artillery and the 2d Battalion, 69th Coast Artillery were activated at Fort Story. On June 25th and 26th, the 70th Coast Artillery (AA), commanded by Colonel Richard F. Cox bade farewell to Fort Monroe and departed for its new home at Fort Screven, Georgia, and Fort Moultrie, South Carolina. On June 27th and 28th the components of the 57th Coast Artillery and the 69th Coast Artillery (AA), moved to Fort Monroe. On the first of June the 503rd Coast Artillery (AA) and the 504th Coast Artillery (AA), were redesignated the 74th Coast Artillery (AA) and 71st Coast Artillery (AA), respectively; and the 2d Battalion, 69th Coast Artillery (AA), was transferred without personnel or equipment to Fort Crockett, Texas. The personnel of the 69th was transferred to the 1st Battalion, 74th Coast Artillery (AA).

PRESIDENT ROOSEVELT'S VISIT

Nothing transcends in importance the visit of the Commander in Chief of the Armed Forces of the United States to a military post. On July 29th, Fort Monroe was

THE PRESIDENT INSPECTS THE DEFENSES OF THE CHESAPEAKE

Left to right: The President, Senator Morris Sheppard (Chairman, Senate Military Affairs Committee), Major General Delos C. Emmons (commanding GHQ Air Force), Brigadier General F. H. Smith (commanding Fort Monroe).

honored by the opportunity to play host to President Roosevelt for a brief period while he was making his inspection of the defenses of lower Chesapeake Bay. The 21-gun salute was fired as the President's yacht, the *Potomac,* approached the main wharf at Old Point. At 2:00 P.M. the President disembarked. The honors were sounded by the band of the 2d Coast Artillery. The President, in company with General Smith, proceeded to Wilson Park. The route was lined by sentinels of the 2d Coast Artillery and 57th Coast Artillery commanded by Lieutenant Colonel Manning M. Kimmel. The personnel of the following organizations was formed along the route: Students, Coast Artillery School, Colonel H. F. Nichols, commanding; 916th Coast Artillery (AA), Colonel E. C. Thompson, commanding; 74th Coast Artillery (AA), Major William Hesketh, commanding; 1st Battalion, 71st Coast Artillery (AA), Major E. W. Timberlake, commanding; C.M.T.C. trainees, Colonel Carl M. Deakin, commanding. The U.S.A. mine planter *Schofield* was tied up at the engineer dock for the occasion. At Wilson Park, Battery C, 2d Coast Artillery, Captain L. H. Brownlee, commanding, fired a 3-inch antiaircraft gun demonstration course. A hit on the sleeve reported by the pilot added to the effectiveness of the demonstration and to the credit of the organization. Battery D, 2d Coast Artillery, Lieutenant E. H. Walter, commanding, fired two demonstration courses with the 37-mm. antiaircraft battery. Battery B, 2d Coast Artillery, Lieutenant J. Alfrey, commanding, and Battery D, 74th Coast Artillery, Lieutenant E. N. Chase, commanding, displayed antiaircraft Searchlight and .50-caliber machine gun matériel, respectively. After the demonstration at Wilson Park, the President's party proceeded back to the old fort by way of Gulick Road, sea wall drive, and then through the old fort and on to Langley Field. The President's party returned to Fort Monroe at 5:25 P.M. after visits to Langley Field and Newport News. At the main wharf honors were again rendered and as the *Potomac* cleared the wharf the salute of 21 guns followed by the retreat ceremony was sounded.

Refresher Course

During the past two months each week has seen a new group of Regular and Reserve officers move into barracks at Camp No. 3 to pursue a one-month course of intensive instruction in antiaircraft gunnery and tactics. Except for an interlude in the late afternoon during which they have found the Beach Club a restful rendezvous, the students'

time and activities have been carefully accounted for and directed by the Coast Artillery School staff. Excellent results are being attained and a good foundation is being laid for the duties that these officers are soon to assume. In the course which started August 12th, were enrolled sixty-five graduates of the U.S.M.A. class of 1940. These officers, many of whom are temporarily separated from their brides to join the monastic life of the refresher student, will proceed to their permanent stations upon completion of the course about September 4th. Before beginning their studies at the School they received a brief course in battery administration under the direction of Lieutenant Colonel M. M. Kimmel. It is believed that the Class of 1940 will report to their first stations better prepared for the work they are to do than has any class in many years past.

71st Coast Artillery (AA)

On July 1st the 503d Coast Artillery (AA) was redesignated the 71st Coast Artillery (AA). Captain Fernstrom and three other officers started organization from a desk in post headquarters loaned by the plans and training officer. It was not until the arrival from Fort Hancock of a cadre of sixty-five men that training could begin under the direction of the battalion officers. A tent camp was established on the parade ground inside the old fort, and soon recruits who had been quartered with the 2d Coast Artillery began taking their places in the tent city. With the arrival of Major A. C. Spalding, and later, Major E. W. Timberlake the battalion took definite form, and by the end of the month was operating as an entity. On July 31st the battalion moved to Fort Story on the mine planter *Schofield*. The splendid progress made in this short period of time is a tribute to the officers and the enlisted cadre.

1st Battalion, 74th Coast Artillery (AA)

The 74th came into being on July 1st when the 504th Coast Artillery (AA) was redesignated. On the same date the personnel of the 2d Battalion, 69th Coast Artillery (AA) was transferred to the 74th to form the nucleus about which the battalion was to form. The cadre had been at Fort Story since June 1st and was made up of troops of the Panama Canal Detachment that had been in training at Fort Barrancas, Florida. Major Hesketh took command of the battalion upon its arrival at Fort Monroe. The barracks vacated by the 70th Coast Artillery (AA) were occupied and training of recruits was soon underway. The battalion is now up to full strength and has taken its place in the routine activity at Fort Monroe.

2d Coast Artillery

A word of praise is due the 2d Coast Artillery for the way it has borne its share of the work entailed by the mobilization of three battalions at Fort Monroe in the past month. Each battery quartered, fed, and supplied a number of recruits greater than its own strength. Men were sleeping in halls of barracks, on the porches, and even overflowing into tents set up in front of barracks. During this period guard and fatigue became a greater burden than ever and for some time only the 2d was able to furnish the personnel needed. Gun crews for the school and board firings were always on the job and details for the summer camps permanently detached.

1st Battalion, 57th Coast Artillery (TD)

From the Panama Canal Detachment which arrived at Fort Story on June 1st was formed the cadre of the 1st Battalion, 57th Coast Artillery (TD). The cadre moved to Fort Monroe on June 27th and soon Headquarters Battery, 1st Battalion and Batteries A and B had taken form. The battalion was rapidly recruited up to strength and was soon having regular gun drill and making preparations for target practice. Until their new equipment arrives the battalion is to man the old 155-mm. guns, formerly the property of the 51st Coast Artillery.

An Honorable Year

. . . Some who want universal training consider it a "dreadful necessity." I do not see it so. A necessity, yes. But for one who loves his country it is honorable to spend a year in training for its defense. . . .

Henry Cabot Lodge, Jr., in The American Magazine.

Hawaiian Separate Coast Artillery Brigade

BRIGADIER GENERAL FULTON Q. C. GARDNER, *Commanding*

LIEUTENANT COLONEL C. M. S. SKENE, *Chief of Staff*

MAJOR L. V. WARNER, *Adjutant General & S-1*

LIEUTENANT MILAN G. WEBER, *Acting S-2 & Gunnery*

LIEUTENANT COLONEL J. H. LINDT, *S-3*

LIEUTENANT COLONEL R. M. PERKINS, *S-4*

CAPTAIN I. H. RITCHIE
Com. and Engineer Officer

MAJOR J. C. BATES
Sec. Ath. Officer

LIEUTENANT G. C. ESSMAN
Chemical Warfare Officer

LIEUTENANT COLONEL R. S. BARR
Ordnance Officer

CAPTAIN W. K. NOEL,
Judge Advocate

COLONEL E. B. WALKER
Commanding Harbor Defenses of Pearl Harbor

COLONEL CHARLES K. WING
Commanding 64th Coast Artillery (AA)

LIEUTENANT COLONEL ADAM E. POTTS
Commanding Harbor Defenses of Honolulu

By Lieutenant Milan G. Weber

ADVANCED AA SEARCHLIGHT PRACTICES

Batteries A and E, 64th Coast Artillery, conducted a joint advanced searchlight practice on the nights of August 8th and 12th. The lights of the two batteries were located to form an all-around searchlight defense commanded by Lieutenant Colonel Edward H. Taliafero, Jr. Batteries, formed in three platoons, were commanded by Lieutenant Chester J. Diestel and Captain Frank T. Folk. All courses were flown under the direction of the brigade commander.

The batteries had no previous knowledge of the direction of attack. A total of eighteen attacks were made with two planes in each formation. The distance between the two planes varied between approximately 500 and 2,000 yards. The altitude difference was usually about 500 feet. Laterally the planes were about 500 yards apart.

Attacks came from all points of the compass at altitudes ranging generally between 12,000 and 15,000 feet. The speed of the planes varied on the different courses between 125 and 188 miles per hour. The planes glided on four of the courses. On all courses, one plane of the pair was camouflaged.

Pickups of both planes were made on all courses. Stereoscopic height finders were on hand for the practice and it was found that the illumination was generally sufficient to make stereoscopic contacts. There was a decided difference, however, between the camouflaged and uncamouflaged plane. Much progress was made toward the solution of the control problem in a searchlight defense consisting of a large number of lights. In this practice, the targets were transferred from one battery to another on all courses without an excess number of lights in action at any one time.

3-INCH AA GUN PRACTICES

Forty mobile 3-inch guns are lined up at the antiaircraft firing center on the west shore of Oahu and target practices are being conducted so as to make maximum use of all cooperative flying hours. Six day record practices and four night practices are being conducted by the 64th Coast Artillery and mobile units of the Harbor Defenses of Pearl Harbor. Lieutenant Colonel Marvill G. Armstrong and Major Harold T. Turnbull are in charge of safety and plane direction of preliminary tracking and practices. For all record practices, the plane is under the direction of the brigade commander who also imposes service conditions for the practices.

Service conditions imposed on antiaircraft record practices during the current year have included:

a. Wide variations in speeds, altitudes, and directions of courses without previous knowledge thereof by firing personnel.

b. Conduct of practices with director offset from the battery.

c. Opening fire with a minimum of tracking.

d. Conduct of fire with all personnel wearing gas masks.

e. Designation of casualties among key personnel during practices.

SEACOAST ARTILLERY TARGET PRACTICES

In July, Batteries A and C, 16th Coast Artillery, conducted two modified 155-mm. gun practices from Fort DeRussy, in lieu of their regularly assigned armament. Batteries D, E, and F, 55th Coast Artillery are now conducting high-speed 155-mm. gun practices from Sand Island and Fort DeRussy using the Navy high-speed target. These batteries also fired subcaliber practices against a high speed target.

Among the service conditions being imposed by the brigade commander for the seacoast practices are:

a. Changing base lines.

b. Changing from horizontal to vertical base.

c. Opening fire with a minimum of tracking.

d. Conduct of practice under simulated gas conditions.

e. Designation of casualties among key personnel.

f. Declaring lines of communication and time interval system out of action.

First Coast Artillery District

COLONEL RODNEY H. SMITH, *Commanding*
MAJOR ROBERT T. CHAPLIN, *Adjutant*

COLONEL ROBERT C. GARRETT
Commanding Harbor Defenses of Portland and Portsmouth

COLONEL MONTE J. HICKOK
Commanding Harbor Defenses of Boston

COLONEL T. H. JONES
Commanding Harbor Defenses of Long Island Sound

MAJOR GEORGE W. BRENT
Commanding Harbor Defenses of Narragansett Bay

MAJOR CHARLES N. BRANHAM
Commanding Harbor Defenses of New Bedford

Many Coast Artillery units from the district participated in the First Army maneuvers held in northern New York during August. Colonel Rodney H. Smith commanded the antiaircraft brigade, consisting of the 68th Coast Artillery; the 197th Coast Artillery, New Hampshire National Guard; and the 211th Coast Artillery, Massachusetts National Guard. Other Coast Artillery units furnished detachments to augment the various services needed to insure the functioning of the field forces.

On June 11th and 12th Colonel Smith inspected and reviewed the Harbor Defenses of Portland and the 68th Coast Artillery.

The Chief of Coast Artillery, Major General J. A. Green, inspected the Harbor Defenses of Boston, Portsmouth, and Portland on June 27, 28 and 29. While General Green was in Boston he was entertained by Colonel and Mrs. Smith with a dinner in his honor at the Algonquin Club.

The six harbor defense commands comprising this district have all received marked increases in personnel by assignment of Federalized National Guard units and by activation and recruitment of additional Regular Army units. This increase makes possible the manning of more existing armament and training for the use of new armament and equipment as it is received.

HARBOR DEFENSES OF PORTLAND AND PORTSMOUTH

By Captain C. G. Gibbs

The 68th Coast Artillery left for the First Army maneuvers in several serials, the last one clearing Fort Williams August 5. Colonel Franklin Kemble, recently transferred from Harrisburg, Pennsylvania, assumed command of the Harbor Defenses during the absence of Colonel Garrett with the 68th.

Battery A, 8th Coast Artillery, conducted its annual mine practice in August. The mine planter *Baird* arrived on August 7 under the command of Captain McLamb. An additional battery of the 8th has been organized with Lieutenant Monnette C. Ross in command. This battery will eventually be stationed at Fort McKinley.

A very successful CMT Camp, attended by 700 youths from all the New England States, was completed on August 3.

The 240th Coast Artillery, Maine National Guard, has concluded its annual summer encampment. Fog and bad

THE DISTRICT COMMANDER INSPECTS FORT WILLIAMS

The reviewing party, left to right: Colonel Smith, Colonel Garrett, Captain Moore, Colonel Gignoux, Colonel Meyer, Major Merrill, Captain Cleveland, Lieutenant McIntosh.

weather conspired to keep the regiment from firing target practices, but other valuable training was accomplished.

The organization of the 22d Coast Artillery is progressing and it is expected that it will be ordered to its new station, the Harbor Defenses of Portsmouth, in the near future.

Harbor Defenses of Boston

By Lieutenant H. D. Lind

The Harbor Defenses of Boston are expanding in keeping with the times. New batteries are being organized, and several additional officers and noncommissioned officers have recently been assigned. Harbor defense personnel has also been increased by the arrival of recruits for the additional organizations. Still further expansion appears to be in prospect.

Major General James A. Woodruff, commanding the corps area, accompanied by Colonel Hickok, Harbor Defense Commander, inspected Forts Banks and Heath on July 25th. Colonel Rodney H. Smith, the District Commander, inspected Fort Banks on July 18.

On August 10th, as President Roosevelt entered Boston Harbor aboard the U.S.S. *Potomac,* preparatory to an inspection of the Watertown Arsenal, the 9th Coast Artillery rendered the Presidential salute. A welcoming salute of nineteen guns by the 9th Coast Artillery also greeted Governor Eske Brun, governor of North Greenland, on his visit to Boston on July 9th.

Our target practices have finally been completed. Creditable results were obtained with the 6-inch and antiaircraft batteries and the highly successful submarine mine practice was completed without penalties of any kind. The test group of this excellent practice was planted on July 13th and the firing group on July 29th.

Owing to target practice demands on personnel, athletics for the line batteries have been necessarily limited. However, the medical department entered a baseball team in a Boston Industrial League and climaxed a season of consistently good playing by winning the championship.

Having returned from duty with the 1st Division during its maneuvers in Louisiana, Colonel Edward B. Dennis has resumed his duties as executive. The post recruiting drive is well advanced under Lieutenant H. D. Lind.

Also returned to Fort Banks, after a year's hospitalization at Walter Reed, is Captain N. A. Congdon, now post adjutant. Major Costigan joined the command on June 8th and Captain Strickland on August 12th. Other recent officer arrivals include Lieutenants Lind, Brown, Russell, Calarco, Tuttle, Milligan, Crowell, Bourdon, Bently, Durgin, Gaffney, Freedman, Roberts, and Slater. Scheduled to join are Major James L. Hogan, and Captain R. A. Edmonston, MC. Recent noncommissioned officer arrivals from foreign service are Sergeants Maltais, Rosseau, Sasser, and Pierce.

As results of the current expansion, the following first three grade appointments at Fort Banks have been announced: To master sergeant, Staff Sergeant William E. McCusker; to first sergeants, Sergeants Jack B. Pierce and S. P. Bienia; to technical sergeant, Sergeant Walter A. Rawlins; to staff sergeants, Sergeants Carmody, Gass, Dodge, Davis, and White.

A distinct loss to these Harbor Defenses was the transfer of Master Sergeant W. D. McHugh to the 77th Coast Artillery at Fort Bragg. For his eight years' excellent service as sergeant major of these defenses, this command expresses its appreciation and wishes him similar success with the 77th.

Harbor Defenses of Long Island Sound

By Lieutenant Joel T. Walker

June, July, and August brought many personnel changes, both temporary and permanent, along with considerable National Guard activity within the Harbor Defenses of Long Island Sound.

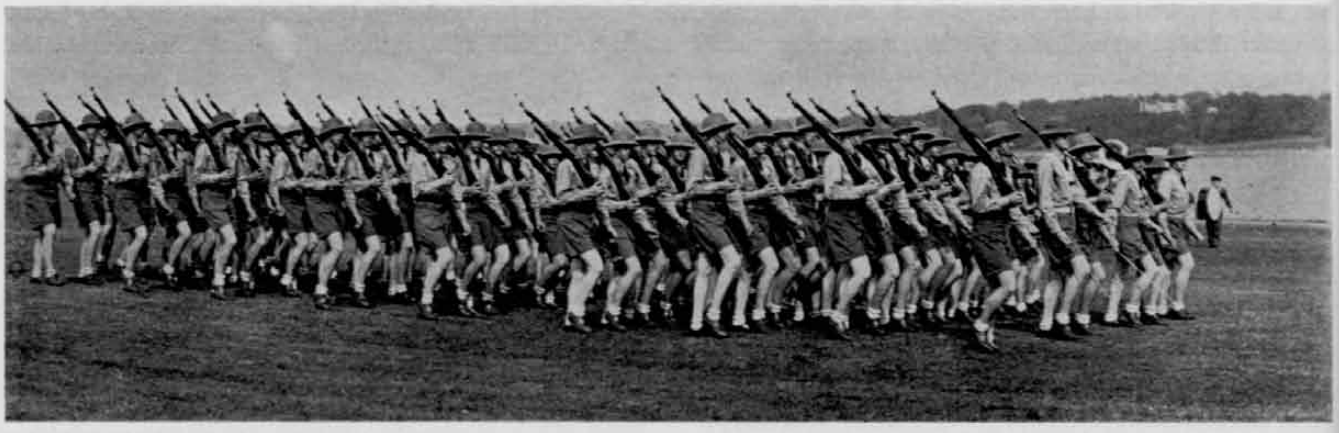
Four batteries (A, B, C, and D) of the 11th Coast Artillery have taken part in the First Army maneuvers. Lieutenant Colonel Hill accompanied the troops as executive of the antiaircraft brigade.

The nuclei for various newly activated Coast Artillery units have been furnished by cadres from the 11th Coast Artillery during the summer months. On July 12th the first cadre of twenty-eight men moved to the 22d Coast Artillery at Portsmouth, with temporary station at Fort Preble, Maine. On July 15th the next group of four staff sergeants moved to the 71st Coast Artillery at Fort Story, Virginia. On August 10th the last cadre of twenty-eight men left for the 23d Separate Battalion, Coast Artillery, Harbor Defenses of New Bedford, with station at Fort Rodman, Massachusetts.

National Guard training during the summer brought the 242d Coast Artillery (HD), Connecticut; the 208th Coast Artillery (AA), Connecticut; the 243d Coast Artillery (HD), Rhode Island; and the 241st Coast Artillery (HD), Massachusetts to this post for three weeks of active duty. The Corps Area Commander, Major General Woodruff, visited the post on July 31st and inspected the 243d Coast Artillery.

Many Reserve officers from points as distant as California and Florida have reported for active duty. Several of these officers have been ordered to the Coast Artillery School for the one-month refresher course, and have returned to be ordered on foreign service or to remain with the defenses.

The Harvard-Yale boat race in June furnished an enjoyable spectacle for the many officers and enlisted men and their families who made a special trip on the harbor boat to the Submarine Base on the Thames River where they witnessed this annual event. There have been a number of dances and dinner dances during the summer months given by National Guard units and the Officers' Club. During the few idle moments that have been available during the summer, the officers have sought recreation on the golf links, tennis courts and beach of the Hay Harbor Club located just off the reservation.



Battery E, CMTC, passes in review on Governor's Day at Fort Adams.

Harbor Defenses of Narragansett Bay

By Major Ephraim P. Jolls

The CMT Camp with eight Reserve officers and 900 trainees completed a month's training on August 3d, under the direction of Colonel Charles B. Meyer. The Regular Army staff of the camp commander included Lieutenant Colonel Evan C. Seaman, executive; Major Ephraim P. Jolls, adjutant; Major Lucas E. Schoonmaker, senior instructor; Major Edward G. Cowen, instructor; Captain Charles J. Odenweller, Jr., mess officer, and Lieutenant Lafar Lipscomb, Jr., supply officer.

On Governor's Day, August 1st, a reception was held at the Officers' Club, which was attended by over 300 guests.

Major Ola A. Nelson, Captain George L. Holsinger, and Lieutenants Orville W. Milliken, Victor J. MacLaughlin, and David O. McKoy, along with most of the enlisted men of the garrison, attended the First Army maneuvers.

Lieutenant William Y. McCachern, CA-Res, has returned after a short course at the Coast Artillery School. Lieutenant David Sternsher, CA-Res, is now receiving the same course of instruction. Staff Sergeant Hubert M. Smith has joined harbor defense headquarters after six years in Panama. Technical Sergeant Fred W. Aydlett has been transferred to Fort Bragg. Staff Sergeant Raymond A. Wesley, has been transferred to the Detachment 1st Ordnance Service Company at this station from Army Base, Boston.

A fine swimming beach was leased for the summer by the Officers' Club. A bath house was erected and an open-air stove built to provide for informal beach parties.

The post baseball team has made an excellent showing in the Sunset League in Newport. This is the first post team entered in this fast company in many years and every officer and enlisted man is proud of his team's showing.

Harbor Defenses of New Bedford

By Major Charles N. Branham

The Harbor Defenses of New Bedford are rapidly becoming the completely active command that only increased personnel could make possible. Two organizations, Headquarters Battery and Battery A, 23d Coast Artillery, have been activated and officers and enlisted cadres are here. Recruits arrive daily from the reception center at Fort Devens.

Captain John H. Kochevar arrived on August 1st from ROTC duty in Newark, Delaware, and has been appointed harbor defense adjutant and commander of Headquarters Battery. Lieutenant George V. Underwood reported for duty on August 1st from Hawaii and commands Battery A.

Four Coast Artillery Reserve officers have joined for one year's active duty. They are Lieutenants Richard L. Norton, John Y. Brightman, Frederick J. Lagasse, and Richard C. Carrera. Lieutenant Norton attended the September refresher course at the Coast Artillery School and Lieutenant Carrera is now a member of the class which began a similar course at the same school on September 16th.

Staff Sergeant Morris A. Crumpton arrived from Fort Hancock on July 19th and is now post sergeant major.

On August 10th an enlisted cadre of twenty-eight men of the 11th Coast Artillery arrived from Fort H. G. Wright.

With increased authorized strength came increased allotments of grades and ratings. New makes include the following: To first sergeant, Sergeant Birty F. Wilson; to staff sergeant, Sergeant Antonio J. Bahia; to sergeants, Corporals Manual Thomas, Edward J. Berry, Ransford E. Colbath, and Private First Class Leo Pelkey; to corporals, Privates First Class Edward J. Comeau, Slater E. Elkins, Laurier J. Bolduc, Andrew S. Matejek, Joseph H. Mathews, Liorre Maccarone, and Ludwick Sieczkowsky.

Fort Rodman has progressed a long way since the desolate scene on the evening of September 21, 1938, when hurricane water covered half the reservation and wind had demolished half the structures on the post. At that time a garrison of ten faced the terrific task of reconstruction and rehabilitation; now a garrison of more than 110 is geared for further growth and training in our mission of defense.

Corregidor

BRIGADIER GENERAL WALTER K. WILSON, *Commanding*

COLONEL FREDERIC A. PRICE, *Executive*

LIEUTENANT COLONEL L. J. BOWLER, *Adjutant General & S-1*

MAJOR S. MCCULLOUGH, *S-2* MAJOR W. C. BRALY, *S-3*

MAJOR L. R. CREWS, *S-4*

COLONEL R. P. GLASSBURN,
Commanding 59th Coast Artillery (HD)

COLONEL WILLIAM C. KOENIG
Commanding 60th Coast Artillery (AA)

COLONEL WILLIS SHIPPAM
Commanding 91st Coast Artillery (PS) (HD)

LIEUTENANT COLONEL P. DECARRE
Commanding 92d Coast Artillery (PS) (TD)

By Major S. McCullough

The months of June and July have ushered in the rainy season in royal style. After a higher than average rainfall in June of 14.08 inches, July came along with a record breaking performance of over forty-one inches. Of this amount thirty-five inches fell in the first ten days of the month which beats any record for many years past. Three typhoons, none of which passed near Corregidor, accompanied the rain. In spite of the heavy rains it is grand to see the vegetation and grass take a new lease on life and turn a lovely green again.

The indoor training season is in full swing. Troop schools are well attended and many soldiers are receiving training in motor transport, radio, searchlight and power plant, and electrical courses. The Chemical Officer is conducting a course for gas noncommissioned officers. Each regiment is carrying out a well planned schedule of officers' schools. A basic course for newly commissioned officers; a battery officers' course; and general courses for all officers are being held under the supervision of harbor defense headquarters. Each battery conducts its regular training schedule with emphasis placed on qualifying as many second, first class and expert gunners as possible.

Staff Sergeant Federlin conducted an eminently successful preparatory school for enlisted men who later took the examinations for entrance to the Coast Artillery School at Fort Monroe. Twenty-one of the original twenty-nine who took the examination left on the July transport to attend the 1940-1941 season of the school.

In the realm of athletics, bowling has held the center of the stage during the past two months. The bowling alleys are in operation on a full schedule for approximately thirteen hours each day. The duckpin season has recently been completed and the tenpin season is now in full swing. Staff B officers' team, composed of non-Coast Artillery staff officers walked away easily this year with the championship in the officers' division. Not to be outdone by the male members of the family, Staff B ladies' duckpin team also won the championship in the ladies' division. At present the tenpin tournaments have developed interesting races and it is evident that Staff B will have a much harder time to win at tenpins. Enlisted men's bowling results are reported under the regimental articles.

Two interesting boxing smokers have been presented recently by the local pugilists. One smoker was a Red Cross benefit sponsored by the Corregidor prison stockade and the Guard Battalion. Large crowds turned out to see some very exciting bouts.

Our rains have awakened king basketball from his dry season siesta and he is climbing back on his throne once again. The Fort Mills gymnasiums are the scene of bitterly fought basketball games each afternoon and evening as inter-battery schedules are being played. Many old faces are present among the cagers and transports have brought some likely material for the coming season. One recruit potential basketball star stands six feet six inches in his stocking feet; all he has to do is drop them in.

Since our last article, Lieutenant and Mrs. Richard Evey and Lieutenant and Mrs. J. D. Woods have welcomed new arrivals—both baby girls. Changes in officer personnel which are not covered in regimental articles occurring during the last two months are as follows: Arriving on the July transport for duty at Corregidor: Captain and Mrs. W. K. Ruth, MC, and Nurse B. M. Hill, ANC. Returning to United States on July transport: Lieutenant Colonel and Mrs. C. M. Thiele, CAC. Lieutenant Colonel and Mrs. R. B. Patterson, AGD, and family, Lieutenant Colonel and Mrs. Frank S. Matlack, MC, Lieutenant Colonel and Mrs. C. E. Cotter, CAC, and family, and Major W. F. Marquat.

59TH COAST ARTILLERY

By Major A. K. Chambers

With the advent of the rainy season and the resultant curtailment of outdoor activities, the regiment is concentrating on troop schools. Courses of instruction designed to qualify the student for any position ranging from second class gunner to commander of a provisional battalion are now in progress. The number of voluntary enrollees in these courses is indicative of the enthusiasm engendered by this phase of training.

Since our last news letter the inter-battery and inter-regimental volley ball and duckpin tournaments have been completed. Battery B won the inter-battery tournament in both volley ball and duckpins.

The inter-regimental volley ball series of three games between B-59th and D-60th was won by the latter after a peppy series.

The 59th won the duckpin series from the 60th by taking five games out of nine. In this series, Private Steve

Janicki, Battery B, scored high single with 144 and high triple with 390. High team total was 615.

Inter-battery tenpin bowling and basketball are now in full swing with eleven teams entered in each sport. Battery B leads in tenpins and Battery G in basketball. The competition is keen and morale is high.

Two of our most popular and able officers, Majors Robert W. McBride and John H. Fonvielle, returned to the United States on the July transport. "Tiny" goes to the Missouri National Guard with station at Webb City and John will join the 6th at Fort Scott.

Major Napoleon Boudreau joined on June 20th and is commanding during the temporary absence of Colonel Robert P. Glassburn.

Lieutenant Thomas W. Davis, 3d, arrived on the July transport and has been assigned to Fort Hughes.

Master Sergeant Roy L. Beck retired on June 30th and is now enjoying his well earned freedom of action by visiting various points of interest in the Islands. He plans on making his permanent home in the hills of old Missouri.

Arrivals on the July transport included First Sergeants Louis M. Hix and Jefferson E. Dunlap, Technical Sergeant (electrical) Carl S. Wolfe, and Staff Sergeant (sergeant major) Paul C. Harmon. Departing were First Sergeants Arthur O. Van Orsdel and Joseph W. Mixon.

60TH COAST ARTILLERY

By Major J. L. Hogan

The 2d Battalion has completed training some 350 Air Corps enlisted men from Nichols Field in the use of antiaircraft machine guns, and rifle firing. It is believed that these men are now capable of local defense of their air fields against low-flying aircraft.

With the indoor season in effect at the present time, all efforts have been concentrated on gunners' instruction and examination. However, when the weather has permitted, antiaircraft gun, machine gun, and searchlight drills have been conducted in preparation for the coming target practice season.

The July boat leaves us short in both commissioned and enlisted personnel, but the arrival of eighty-eight Air Corps recruits from this boat for training and temporary use as Coast Artillery will enable the regiment to carry on as usual. This additional training burden has resulted in a high standard of noncommissioned officer instructors being maintained in the regiment.

Since the last news letter several important changes have occurred in officer personnel of the 60th Coast Artillery. Lieutenant Colonel Alexander H. Campbell has been placed on detached service in Manila for duty with Headquarters Philippine Department as assistant to the Assistant Chief of Staff G-2.

Leaving the regiment on the July transport are Majors William F. Marquat and James L. Hogan, and Lieutenants Franklin G. Rothwell and Harry J. Harrison. Major Marquat has been on detached service with the Office of the Military Advisor, Commonwealth of the Philippine Islands. On July 24th, two days prior to the sailing of the transport *Grant*, Major Hogan received unexpected sailing orders from the War Department, and he has been furiously busy packing and straightening out other details incident to his departure.

The regiment gained Captain Lawrence A. Bosworth, who arrived on the transport *Grant*.

Since the last news letter the Philippine Department Baseball League completed its season, with the 60th Coast Artillery finishing in second place.

The athletic year for 1939-40 terminated on June 30th, with the Commanding Officer's trophy being awarded by Colonel W. C. Koenig, to Battery B, 60th Coast Artillery. This trophy honors the organization that has distinguished itself in athletics during the athletic year.

Bad weather causes the indoor sports to prevail. Bowling and basketball are holding forth with enthusiasm running high among the various organizations. Having completed the duckpin season, with Battery B carrying off the honors, a regimental team was organized to compete with the 59th Coast Artillery for the Post Championship (American Division). In the interesting matches the 59th keglers won the Post Championship.

The officers of the regiment are now performing on the local alleys and are offering stiff competition to potential champions.

In basketball Battery A, winner of the gonfalon for 1939, is setting the pace in the regimental league, closely followed by Battery D. In the last half of the season a hard fight is expected to take place between these two teams to determine who shall carry off the honors this year.

During cessations of typhoons, many other sports serve to engage the spare time of the athletically-inclined, golf and tennis being among the foremost.

91ST COAST ARTILLERY (PS)

By Major V. P. Foster

Troop schools, officers' schools, and gunners' instruction are in full swing during this wet season. The school schedule and courses have been carefully planned and given, resulting in increased value and interest.

During the past two months we have welcomed to the regiment Major Lloyd W. Biggs (Cavalry), who has decided to desert the horsey set for the cosmoliners, Captain Robert F. Haggerty, and Lieutenant Erven C. Somerville. Major Biggs is guiding the destinies of the 2d Battalion while Captain Haggerty and Lieutenant Somerville command F and B Batteries respectively.

Gains are not without their losses however. Major Napoleon Boudreau has been transferred to the 59th Coast Artillery. Departing on this transport are old standbys: Major Dean Luce goes to the Submarine Mine Depot. Captain Joseph H. Rousseau, Jr., to the Minnesota National Guard, and Captain John B. F. Dice to Fort Sheridan.

Athletic activities in the regiment during the past two months were varied, including baseball, volley ball, duck-

pins, tenpins, and basket ball. The regimental baseball team finished the Philippine Department League (Scout Division) with a .500 record—five won and lost. The result was not up to expectations but of the five games lost, three were lost by one run. Several new players were developed and it is believed the team will make a strong bid for the championship next year. In volley ball, Battery A, Lieutenant R. A. Smith, commanding, again won the championship but this year was closely pressed by Batteries B and G. Battery A defeated G in the final matches three to two, to nose out Battery B by one game. In the inter-regimental contest with the 92d Coast Artillery (PS), Battery A won handily in two straight matches. At the beginning of the rainy season athletes turned to duckpins with the usual high grade of bowling. Battery C, Captain Stennis, commanding, took the lead at the very start and held it to the finish with a winning percentage of .667. The regimental team lost to the 92d Coast Artillery (PS) by five matches to four.

The tenpins and basketball races began July 10th. To date Battery G is leading in the tenpins; while Batteries E, C, and A have each won one basketball game.

The athletic activities of the officers during the indoor season are mainly confined to duckpins and tenpins. Despite the highest team average—95.67 per man per game—of the competing teams, the 91st officers' team finished second to Staff B in the duckpin competition. At present, the tenpin tournament is under way and prospects are bright for a winning team.

92d Coast Artillery (PS)

By Major E. L. Barr

All officers and enlisted men of the regiment are now students of the military arts and science. Battery officers' schools and troop officers' schools are in full swing and the midnight oil is burning brightly. Gunner schools are in progress, and all the technical schools for the enlisted men are well attended.

The inter-battery duckpin tournament which closed on June 20th, has developed much keen competition and some excellent bowlers. The Guard Battalion won the championship with a percentage of .775, its closest competitor being Battery C. Battery D, last year's champion, was in fourth place. The 92d Regimental duckpin team won the post championship in the Philippine Scout Division by defeating the 91st Coast Artillery (PS), five to four in the games played July 2d, 3d, and 5th. The inter-battery tenpin tournament started July 10th, with the Guard Battalion, last year's champion in the early lead, closely followed by Battery C.

The officers' team, winner of last year's post tournaments both in duckpins and tenpins, is making a brave effort to duplicate last year's record.

During previous years, there was no keen competition in the inter-battery basketball tournaments owing to the fact that Battery C always had a very strong team. This battery won the inter-battery championship in four successive years, with only one lost game during that period. In the inter-battery basket ball tournament just started, we predict the story will be different because Battery C nearly lost its first game to Battery B.

Colonel J. F. Cottrell has been relieved from assignment to the 92d, assigned to Harbor Defense Headquarters and detailed as assistant harbor defense executive officer and harbor defense inspector.

Lieutenant and Mrs. Michael M. Irvine and Lieutenant George W. Croker are returning to the United States on the July 26th transport, Lieutenant Irvine will report to the Commandant, Coast Artillery Board, Fort Monroe, Virginia, as a member of the Board, and Lieutenant Croker has been assigned to the 78th Coast Artillery at March Field, California.

The regiment was pleased to welcome Lieutenant Colonel and Mrs. Octave De Carre, Lieutenant and Mrs. William Massello, Jr., Lieutenant and Mrs. Harry W. Schenck, Lieutenant and Mrs. Robert J. Lawlor, and Lieutenant and Mrs. Paul R. Cornwall, who arrived on the July 20th transport. Lieutenant Colonel De Carre assumed command of the regiment on the 20th. Lieutenants Massello and Cornwall will be detailed for duty at Fort Wint and will proceed to that post on July 30th. Lieutenant Schenck assumed command of Battery E in the Guard Battalion, Lieutenant Lawlor will command Battery B upon the departure of First Lieutenant Irvine on the 26th.

Guard Battalion

By Lieutenant G. H. Crawford

While indoor training, athletics and changes within the battalion have occupied our attention, stockade activities have also claimed their place.

Under the policy of the battalion commander there is constant effort to improve stockade conditions, and further a program of rehabilitation of prison inmates. During the recent post drive for Red Cross funds the Bilibid prisoners at Corregidor offered their service in putting on a benefit smoker, which was planned, executed, and to a great extent managed by prisoners.

The post responded generously in support and received forty rounds of excellent fighting for their money.

General Wilson presided at the ceremony opening the bowling alleys in the Stockade on July 21st.

These alleys are the result of six months work on the part of Major Olivares, and were furnished by the Insular Bureau of Prisons after the project had received the personal approval of Commonwealth President Manuel L. Quezon, and are in line with Lieutenant Colonel Martin's basic idea that a prisoner whose spare time is profitably or enjoyably filled will be a better prisoner and be released a better man.

Puerto Rico

BRIGADIER GENERAL E. L. DALEY, *Commanding*

By Lieutenant Peter S. Peca

Coast Artillery troops have spent the last two months in strenuous training and work. In addition to intensive field service, great emphasis has been placed on the repair and upkeep of motor vehicles.

On June 27th, the temporary barracks at Fort Buchanan were completed and were ready for occupancy. At that time the 51st Coast Artillery, less one battery, moved into these barracks. The other battery moved to San Cristobal.

On July 1st, the administrative set-up of Fort Buchanan was changed. Major George R. Burgess became the new post adjutant, and Lieutenant William G. Fritz took command of Battery B, 51st Coast Artillery. On July 4, A and B Battery, 51st Coast Artillery, took part with other Army units in a Fourth of July parade. Tractors and guns made an excellent impression on the public.

In connection with the augmentation of the Army, two new units were constituted and activated on August 1st. These are the Aircraft Warning Company and the Provisional Harbor Defense Battery. Cadres for each unit have been selected from organizations now stationed in Puerto Rico.

Lieutenant Colonel T. R. Phillips arrived in July and was assigned as assistant to G-2.

66TH COAST ARTILLERY (AA)

CAPTAIN J. E. MORTIMER, *Commanding*

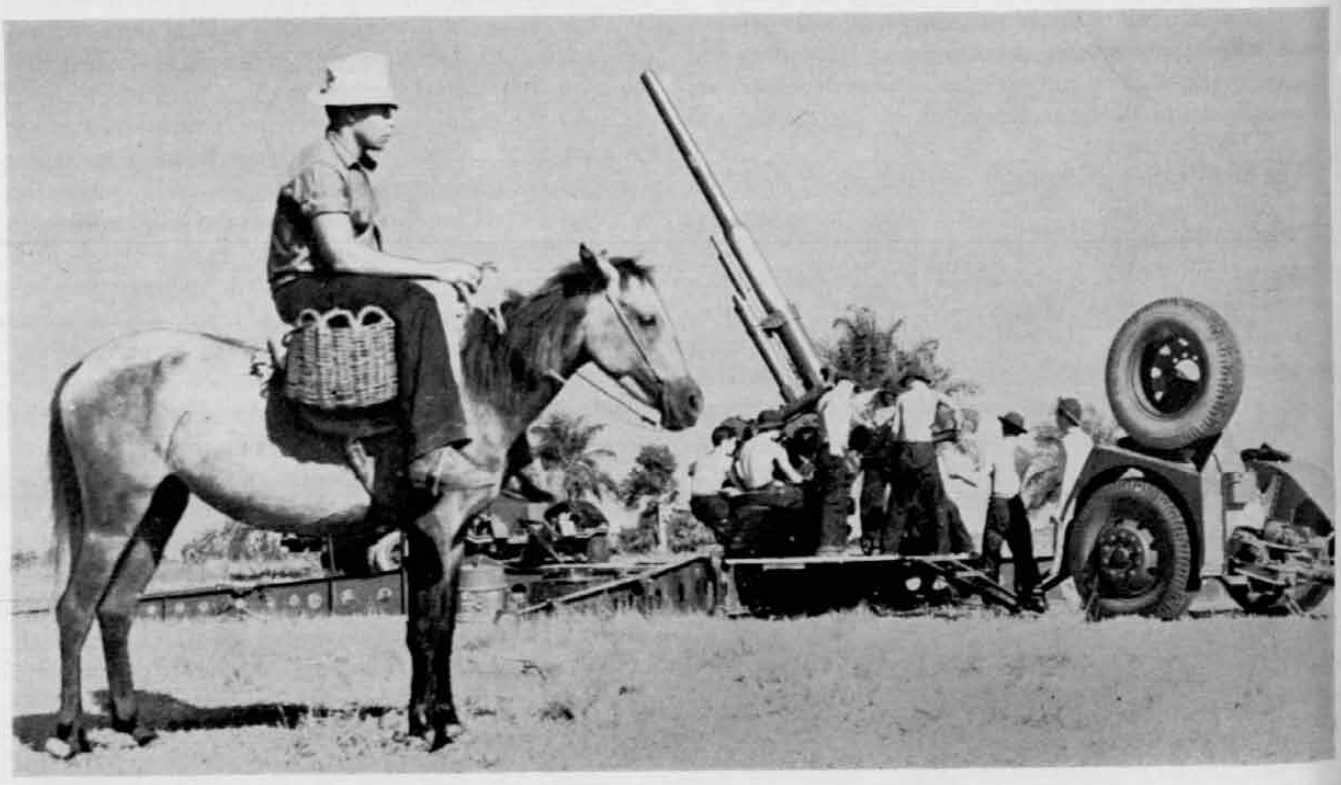
By Captain W. F. McKee

At this writing the department commander has just completed an informal inspection of the battalion, during which he expressed himself as being well pleased with the appearance and performance of the organization.

On August 6th, at 4:35 a.m., Call to Arms sounded and as we rolled out of our bunks we knew another alert was in progress and that we had again failed to "G-2" it. As yet no one is known to have guessed when an alert would be held. The problem, which was given by radio, called for distribution of our troops throughout the western third of Puerto Rico. Troops were required to feed themselves as members of small detachments, to maintain communication with battery headquarters and the latter in turn with Security Detachment Headquarters. The problem was solved successfully and aroused much interest. The Security Detachment commander received a special letter of commendation from the Commanding General for the work of the command during the alert. The 1st Battalion, 66th Coast Artillery, (AA), forms the larger part of the Security Detachment; the remainder consists of two companies of infantry.

Beginning August 19 Batteries B, C, and D, commanded by Lieutenants Schweidel, Totten, and Turner respectively, will fire 175 rounds of H. E. apiece. This ammunition remains from the 1939 allowance. Unfortunately, visual spotting will have to be used because previous firings of H. E. in this department have shown camera records to be of no value. Service conditions will be simulated as nearly as possible during the firing.

Borinquen Field is now the scene of tremendous activity. Thousands of men work for the quartermaster, while in-



Jibaro looking on as the new P.R. National Guard AA Battery receives instruction

fantry, coast artillery, air corps and service units are busily engaged in intensive training.

At present no quarters are available on the post, but it is hoped that some will be ready by the first of the year.

The swimming pool, which will be one of the largest in the Army, will soon be ready for use. A splendid golf course also is under construction.

51st Coast Artillery

Lieutenant Colonel B. L. Flanigen, *Commanding*

By Lieutenant O. K. Marshall, Jr.

With target practice season just around the corner, the regiment looks forward to its first practice in over a year. Many of the key men in the firing batteries, both of which shot "Excellent" practices at Fort Story in the spring of 1939, are now missing. Our first replacement recruits from the States are now being turned to duty. Despite these personnel shifts, nobody feels downhearted. The regiment is not only seeing "E's," but is also having dreams of Knox Trophy awards. Never let it be said that the 51st was pessimistic.

B Battery of the 51st has been teaching a brand new Coast Artillery National Guard outfit all the basic principles of seacoast firing. Encamped on the sand dunes of Camp Pieraldi, Lake Tortuguero (August 7-17), Battery B instructed the officers and men of the newly formed Battery A, 253d Coast Artillery (PRNG). The target was a rowboat which cruised up and down the low, seacoast lake. The guardsmen, in spite of language differences, picked up the basic principles quickly and demonstrated a fine aptitude for coast artillery work.

In coöperation with department security problems, the regiment operating as infantry, has taken part in several problems in and around San Juan. New methods of warfare, together with the objective of keeping the troops physically fit, have caused us to abandon our guns and take to the roads and fields in numerous security problem marches.

Present plans call for the regiment to move en masse to Borinquen Field for target practices. Though some further reconnaissance work is being done there, it appears that the positions on the west end of Puerto Rico will prove very nearly ideal for 155-mm. shooting. The high sheer cliffs of Punta Borinquen offer mobile artillery positions with unrivalled observation.

The completion of a swimming pool at Fort Buchanan has greatly improved the recreational facilities of the camp. As we are still operating very much under field service conditions, it is difficult to keep organized sports on a scheduled basis. The Fort Buchanan baseball team, built around a nucleus of 51st Coast Artillery players, has managed to play in various leagues. The teams are able to pick up games on short notice.

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Harbor Defenses of Puget Sound

Colonel James H. Cunningham, *Commanding*

By Major Charles M. Myers

During the past month the 14th Coast Artillery has furnished and sent away the following cadres for new regiments:

71st Coast Artillery	6
75th Coast Artillery	3
78th Coast Artillery	58
19th Coast Artillery	46

In addition, the harbor defenses have furnished 240 men for duty in connection with the Fourth Army maneuvers. These included an entire battery for railhead operation and various specialists; including fifty-seven truck drivers, twelve teletype operators and ten radio operators.

As a result, the Fort Worden garrison has been reduced temporarily to its lowest strength in many years.

The CMT Camp scheduled for July was cancelled at the last minute, owing to an outbreak of infantile paralysis in the counties from which most of the trainees were to come. Therefore revised plans had to be prepared over night for the training of the thirty-five Reserve officers who had been ordered to Fort Worden for CMTC duty. In addition, instruction was carried out for Corps Area Service Command Units No. 1914 and 1916, and another small group of Reserve officers who were ordered here for a special course of training. This training included a command post exercise involving problems that would arise in the event of mobilization. Several additional Reserve officers have arrived for one year active duty.

Major Clayton, Captain McGraw and Lieutenant Schmick, 14th Coast Artillery and Lieutenant Miller, CA-Res, are on detached service in connection with the Fourth Army maneuvers in the vicinity of Fort Lewis. Captain McGraw and Lieutenant Miller are with Battery D, 14th Coast Artillery, which is being used as a railhead battery, while Major Clayton and Lieutenant Schmick are on duty with the headquarters of the post commandant at Yelm.

The officer turnover is quite rapid. Major Cook, Captain Vickers and Lieutenant Ashworth have recently been ordered away. Major Cook goes to reserve duty at Lansing, Michigan; Captain Vickers and Lieutenant Ashworth go to the 75th Coast Artillery, Fort Lewis.

New arrivals include Captain Darrah from Hawaii and Lieutenant Chandler, a graduate of the West Point Class of 1940.

Coast Artillery Board Notes

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

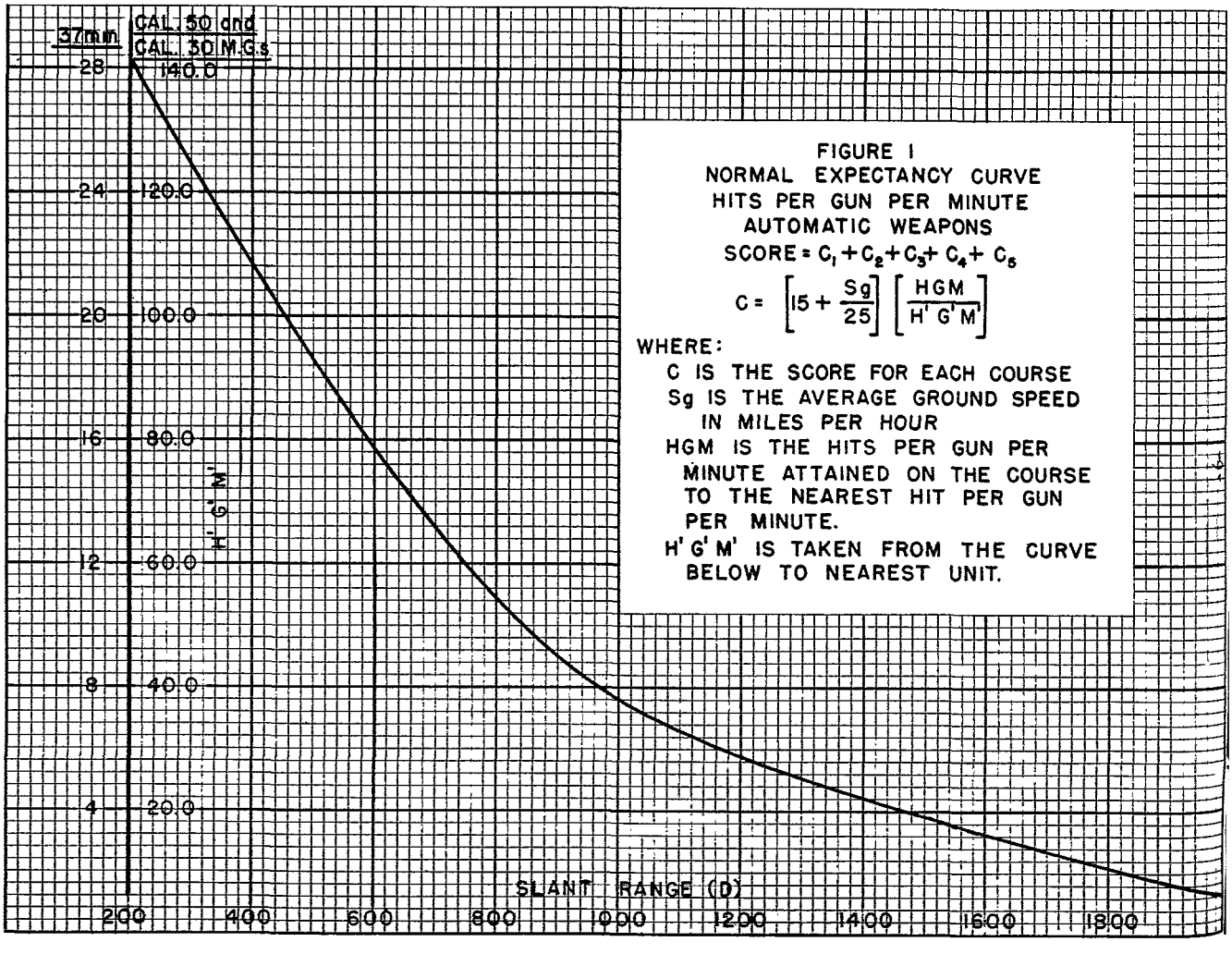
THE COAST ARTILLERY BOARD

COLONEL WILLIAM S. BOWEN, C.A.C., *President*

MAJOR FRANKLIN E. EDGECOMB, C.A.C.
MAJOR WILLIAM F. GERHARDT, Ordnance Department
MAJOR ROBERT W. CRICHLOW, JR., C.A.C.
MAJOR ROBERT H. KREUTER, C.A.C.
CAPTAIN CHARLES E. SHEPHERD, C.A.C.
CAPTAIN DONALD H. SMITH, C.A.C.
FIRST LIEUTENANT MICHAEL M. IRVINE, C.A.C.

General. During the past few months the Board has been engaged in testing the following equipment and material: sound-powered telephones; modified spotting board; lead computors for automatic weapons; two-station height finder; time-interval apparatus for sea-coast artillery and submarine mine equipment. The data obtained as a result of the tests and the conclusions and recommendations of the Board cannot be published at this time as most of the items considered are classified as restricted, confidential or secret.

Training Memorandum No. 1—Instructions for Coast Artillery Target Practice—1941. Since the last issue of



the JOURNAL the draft of proposed target practice instructions for 1941, prepared by the Board, has been approved by the Chief of Coast Artillery. Target practices for previous years were carefully studied to determine what changes, if any, should be made either in the method of scoring or the procedure prescribed. Particular attention was given to those 1940 target practice reports already received to discover whether the effect of new provisions in the 1940 instructions was beneficial and worthy of being continued in force. Specific departures from the instructions for the year 1940 are discussed below:

a. General. Paragraph 14 a (2) (*b*), TM 2160-35, which prescribes the forwarding of target practice reports without delay is modified to permit the target practice report to be retained sufficiently long in higher headquarters to enable a critical examination and analysis of the results.

b. Seacoast artillery.

(1) The instructions include a provision that target practice courses will include a maneuver of the target.

(2) K factors for the 3-inch, 6-inch DC, 8-inch railway, 10-inch DC and 155-mm. guns have been changed as follows:

	K in seconds	
	1940	*1941*
3-inch	6	4
6-inch DC	20	18
155-mm., Case II	20	15
8-inch railway and 10-inch DC	60	50

(3) The principal changes in the normal ranges prescribed for 1941 are:

	Normal range day firing (Yards)
6-inch and 155-mm. normal charge (when using coincidence range finder)	7,000
6-inch and 155-mm. normal charge (except when using coincidence range finder)	10,000
12-inch BC	20,000

c. Submarine mines.

(1) Two groups are now required for the test phase. Scoring for this phase will remain as for last year except for that the total score for this phase will equal the sum of the scores computed for each group separately divided by two. In other words the maximum score attainable in a mine practice remains at 150.

(2) Planting at the normal interval between mines has been resumed.

d. Antiaircraft artillery.

(1) The 1941 instructions provide that the primary assignment target practices for antiaircraft guns, automatic weapons, and searchlights shall be conducted during at least two periods which are separated by at least four months. The purpose of this provision is to cause antiaircraft organizations to maintain a high state of training throughout the year.

(2) In order to emphasize training for gun batteries on diving courses, the number of diving courses has been increased from one to two and the slope of dive increased from a slope of not less than 1 to 10 to a slope of not less than 1 to 5.

(3) No change has been made in the scoring formula for guns.

(4) The requirements as to number of practices for 37-mm. guns, and ranges and altitudes for courses comprising automatic weapons practices are as follows:

(*a*) For the year 1941 only, paragraph 47 *b*, TM 2160-35, is amended by the addition of the following:

"(4) Each platoon of 37-mm. gun batteries of antiaircraft regiments will fire the following day practices:

(*a*) One or more preliminary and one record service practice with caliber .30 machine guns mounted on adaptors on 37-mm. guns.

(*b*) One or more preliminary and one record service practice with 37-mm. guns."

(*b*) For the year 1941 only, paragraph 47 *c* (1), TM 2160-35, is changed to read as follows:

"(1) Antiaircraft machine gun batteries will organize and train three platoons of four machine gun squads each. Thirty-seven-mm. batteries will organize and train four platoons of two gun sections each."

(*c*) A service practice with 37-mm, guns will be fired with a platoon of two guns; the number of practices will be divided equally among the platoons.

(*d*) For the year 1941 only, the provisions of paragraph 47 *e* (1), TM 2160-35, are suspended. In lieu thereof the following will govern for all record service practices of antiaircraft automatic weapons batteries:

1. Two of the five courses of each practice will be fired at a target whose altitude is less than 350 yards. On at least two of the remaining courses the target altitude will be greater than 350 yards.

2. On at least one course of each practice the average slant range will be less than 500 yards. On at least two courses of each practice the average slant range will be between 500 and 1,000 yards.

3. For 37-mm. practices only, on at least one course of each practice the average slant range will be greater than 1,500 yards.

4. In any record practice in which the provisions of *1*, *2* and *3*, above, have not been fully complied with, the battalion commander will state the reasons therefor in his forwarding indorsement.

(*e*) In computing the hits per gun per minute attained for each course, the firing time (t_a) will be taken as not less than 10 seconds, except for night firing and when the average slant range is less than 500 yards.

(5) No change has been made in the score for machine gun practices. The scoring formula for 37-mm. is the same as prescribed in 1940 for machine guns. The value of H′G′M′ for 37-mm. in the scoring formula is

taken from the expectancy curve shown in Figure 1.

(6) For the year 1941 only, paragraph 47 *i* (3), TM 2160-35, is changed to read as follows:

"(3) If the target is shot down on any course and lost or lost from any other cause not chargeable to the battery personnel, the score for the course will be taken as the average of the scores for the other courses of that practice. Every precaution will be taken to prevent the loss of targets."

(7) No changes have been made in the 1940 instructions for searchlight practices other than that the practices will be conducted during two periods which are separated by at least four months.

Motorcycles for Coast Artillery. The Coast Artillery Board in collaboration with the Coast Artillery School recently studied the requirements for motorcycles which are now listed in tables of basic allowances.

The requirements of Coast Artillery organizations, which can be fulfilled satisfactorily by solo motorcycles, appear to be very limited. Operation of this type of motorcycle on wet or icy pavements, and through mud or deep sand, is considered to be very hazardous. Employment of this vehicle is somewhat restricted except under favorable weather and surface conditions. In some instances solo motorcycles have been found to have a limited usefulness in convoy control. However, in the opinion of the Board the hazards to the solo motorcyclist are so great in convoy control that such employment is not justified and other types of vehicles should be used for this purpose. It is believed that the usefulness of the solo motorcycles for Coast Artillery purposes is limited almost entirely to messenger service, and that the motor tricycle could perform such service with almost equal facility.

From a consideration of the requirements it appears that, in the majority of cases, passenger-carrying capacity above that of the solo type is essential for motorcycles assigned to Coast Artillery organizations.

It appears that motorcycles assigned to harbor defense, coastal frontiers and sectors may be operated for the most part over good roads and that a considerable need exists for motorcycle messenger service in the operations of these headquarters. For these reasons it is believed that not more than one-half of the motorcycles assigned to the above units properly could be of the solo type, and that the remainder should be motor tricycles. Although solo motorcycles properly may be employed for some Coast Artillery purposes, the adoption of the two different types of vehicles as a substitute for an existing single type is considered objectionable because supply and maintenance problems are further complicated by an increase in the number of vehicle types.

The Board is of the opinion that in a comparatively small number of instances solo motorcycles should be considered as suitable for Coast Artillery use and that tricycles are suitable in a great majority of cases. It appears that the motor tricycle probably can fulfill Coast Artillery requirements for solo motorcycles quite satisfactorily, and that the cost of supplying all motor tricycles would not exceed greatly the cost involved in supplying both solo and tricycle types.

The Board concluded that, if feasible, all motorcycles issued to the Coast Artillery Corps should be of the tricycle type.

Based on the report of the Board, the Chief of Coast Artillery recommended to the Quartermaster General that:

a. No action be taken in the matter of substituting solo motorcycles for motorcycles with side cars, as now authorized by Tables of Basic Allowances, Coast Artillery Corps.

b. Funds be set aside to permit the procurement, after adoption of a suitable model, of motor-tricycles for all units of the Coast Artillery Corps in quantities sufficient to meet the requirements for motorcycles with side cars, as now shown in Tables of Basic Allowances, Coast Artillery Corps.

Projects under consideration. Some of the major projects now being considered by the Board are: two new types of fire control equipment for automatic weapons; a new deflection device for seacoast artillery; special radio equipment; new antiaircraft artillery matériel; all-purpose signal equipment and ½-ton carry-all truck. Target practice reports for 1940 are being analyzed and data for Coast Artillery Memorandum No. 21 are being compiled. The Board is also preparing the following technical manuals:

4-225—Coast Artillery Orientation
4-235—Coast Artillery Target Practice
4-245—Preservation and Care of Seacoast Matériel
4-240—Meteorology for Coast Artillery.

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Coast Artillery Orders

(Covering period July 1 through August 31, 1940)

Colonel Robert W. Collins to retire November 30, 1940.

Colonel William M. Colvin to retire November 30, 1940.

Colonel Walker K. Dunn, to Instructor, Connecticut National Guard, West Hartford.

Colonel James S. Dusenbury, to retire, December 31, 1940.

Colonel John L. Holcombe, to Philippine Department, sailing New York, September 14.

Colonel Lloyd P. Horsfall, to Headquarters, Seventh Corps Area, Omaha, Nebraska.

Colonel William C. Keonig, to Instructor, New Hampshire National Guard, Concord.

Colonel Allen Kimberly, to Instructor, Delaware National Guard, Wilmington.

Colonel Ralph M. Mitchell, to 4th Coast Artillery District, Fort McPherson.

Colonel Frederick A. Mountford, to Panama Canal Department, sailing San Francisco, January 17, 1941.

Colonel William R. Nichols, to Fort Mason.

Colonel Harry R. Pierce, to 76th Fort Bragg.

Lieutenant Colonel Albert A. Allen, to Athens High School, Athens, Georgia.

Lieutenant Colonel Aaron Bradshaw, Jr., to Instructor, New York National Guard, New York, N. Y.

Lieutenant Colonel Robert D. Brown, to Instructor, New York National Guard, New York, N. Y.

Lieutenant Colonel Clarence E. Cotter, to Office of the Chief of Coast Artillery, Washington.

Lieutenant Colonel Henry C. Davis, Jr., to Instructor, Oregon National Guard, Salem.

Lieutenant Colonel Cyril A. W. Dawson, to 9th Coast Artillery District, Presidio of San Francisco.

Lieutenant Colonel Nelson Dingley, III, to Instructor, New York National Guard, Buffalo.

Lieutenant Colonel Avery J. French, to 2d Coast Artillery District, New York, N. Y.

Lieutenant Colonel Felix E. Gross, promoted Colonel, August 17, 1940.

Lieutenant Colonel James L. Hayden, retired, to active duty, University of California, Berkeley.

Lieutenant Colonel Dale D. Hinman, to 71st, Fort Story.

Lieutenant Colonel George F. Humbert, promoted Colonel, August 17, 1940.

Lieutenant Colonel Harold R. Jackson, to station at Boston, Massachusetts.

Lieutenant Colonel George R. Meyer, GSC, promoted Colonel, August 17, 1940.

Lieutenant Colonel Martin J. O'Brien, to 63d, Fort MacArthur

Lieutenant Colonel Randolph T. Pendleton, to 10th, Fort Adams.

Lieutenant Colonel Jesse L. Sinclair, to Panama Canal Department, sailing New York, November 19, 1940.

Lieutenant Colonel Cedric M. S. Skene, to 9th Coast Artillery District, Presidio of San Francisco.

Lieutenant Colonel Claude M. Thiele, to 77th, Fort Bragg.

Lieutenant Colonel Robert J. Van Buskirk, to 10th, Fort Adams.

Lieutenant Colonel Berthold Vogel, to 20th, Fort Crockett.

Lieutenant Colonel Robert H. Van Volkenburgh, to 78th, March Field.

Lieutenant Colonel Wade W. Rhein, to 52d, Fort Hancock.

Major Carl R. Adams, promoted Lieutenant Colonel, August 7, 1940.

Major Nyal L. Adams, promoted Lieutenant Colonel, August 29, 1940.

Major Harry S. Aldrich, to 78th, March Field.

Major Clyde C. Alexander, promoted Lieutenant Colonel, August 17, 1940.

Major Albert A. Allen, promoted Lieutenant Colonel, July 1, 1940.

Major George B. Anderson, to Quartermaster Corps.

Major Granger Anderson, to Instructor, Coast Artillery School.

Major Sam W. Anderson, promoted Lieutenant Colonel, August 29, 1940.

Major Clare H. Armstrong, promoted Lieutenant Colonel, July 1, 1940.

Major Marvil G. Armstrong, promoted Lieutenant Colonel, July 1, 1940.

Major Charles E. Atkinson, promoted Lieutenant Colonel, August 9, 1940.

Major Edward Barber, to General Staff Corps.

Major Harry C. Barnes, Jr., to 3d, Fort MacArthur.

Major Ernest B. Barrows, promoted Lieutenant Colonel, July 26, 1940.

Major James C. Bates, promoted Lieutenant Colonel, August 29, 1940.

Major Coburn L. Berry, to Instructor, Minnesota National Guard, Mankato.

Major Coburn L. Berry, promoted Lieutenant Colonel, July 26, 1940.

Major Thomas J. Betts, to General Staff Corps.

Major Thomas J. Betts, promoted Lieutenant Colonel, August 29, 1940.

Major Philip F. Biehl, promoted Lieutenant Colonel, August 7, 1940.

Major George Blaney, promoted Lieutenant Colonel, July 26, 1940.

Major Elmer R. Block, FA, to 69th, Fort Crockett.

Major Maitland Bottoms, promoted Lieutenant Colonel, August 19, 1940.

Major Napoleon Boudreau, promoted Lieutenant Colonel, August 17, 1940.

Major Benjamin Bowering, promoted Lieutenant Colonel, July 1, 1940.

Major Louis J. Bowler, promoted Lieutenant Colonel, July 26, 1940.

Major Aaron Bradshaw, Jr., promoted Lieutenant Colonel, July 1, 1940.

Major William G. Brev, promoted Lieutenant Colonel, August 7, 1940.

Major James D. Brown, promoted Lieutenant Colonel, August 8, 1940.

Major Oliver B. Bucher, promoted Lieutenant Colonel, August 18, 1940.

Major Lathrop R. Bullene, to 2d Coast Artillery District, New York, N. Y.

Major Geoffrey C. Bunting, to 78th, March Field.

Major Nathaniel A. Burnell, 2d, to General Staff Corps.

Major Alexander H. Campbell, promoted Lieutenant Colonel, July 1, 1940.

Major James T. Campbell, promoted Lieutenant Colonel, August 9, 1940.

Major William R. Carlson, to 68th, Fort Preble.

Major Homer Case, GSC, promoted Lieutenant Colonel, August 18, 1940.

Major Albert C. Chesledon, promoted Lieutenant Colonel, July 1, 1940.

Major Francis L. Christian, promoted Lieutenant Colonel, August 29, 1940.

Major Lawrence L. Clayton, promoted Lieutenant Colonel, August 18, 1940.

Major Hugh McC. Cochran, promoted Lieutenant Colonel, August 18, 1940.

Major Frederic W. Cook, promoted Lieutenant Colonel, July 26, 1940.

Major Edward G. Cowen, to 22d, Fort Constitution.

Major James L. Craig, promoted Lieutenant Colonel, August 18, 1940.

Major Leonard R. Crews, promoted Lieutenant Colonel, August 29, 1940.

Major Evans R. Crowell, promoted Lieutenant Colonel, August 29, 1940.

Major Leon C. Dennis, promoted Lieutenant Colonel, August 8, 1940.

Major Harold P. Detwiler, promoted Lieutenant Colonel, August 18, 1940.

Major James G. Devine, promoted Lieutenant Colonel, August 7, 1940.

Major Donald L. Dutton, promoted Lieutenant Colonel, July 1, 1940.

Major Franklin E. Edgecomb promoted Lieutenant Colonel, July 26, 1940.

Major E. Carl Engelhart, to Philippine Department, sailing San Francisco, October 8, 1940.

Major Fenton G. Epling, promoted Lieutenant Colonel, August 7, 1940.

Major William D. Evans, promoted Lieutenant Colonel, August 7, 1940.

Major Bonner F. Fellers, to assistant military attaché, Madrid, Spain.

Major Archibald D. Fisken, to Instructor, New York National Guard, New York, N. Y.

Major Archibald D. Fisken, promoted Lieutenant Colonel, August 18, 1940.

Major Kenyon P. Flagg, to Instructor, New York National Guard, Rochester.

Major Christian G. Foltz, promoted Lieutenant Colonel, July 1, 1940.

Major Valentine P. Foster, promoted Lieutenant Colonel, July 26, 1940.

Major Russell T. George, promoted Lieutenant Colonel, August 7, 1940.

Major Manly B. Gibson, promoted Lieutenant Colonel, August 29, 1940.

Major Walter J. Gilbert, promoted Lieutenant Colonel, July 26, 1940.

Major John L. Goff, to Panama Canal Department, sailing New York, August 29, 1940.

Major Walter R. Goodrich, to Instructor, District of Columbia National Guard, Washington.

Major Arthur W. Gower, to 76th, Fort Bragg.

Major Arthur W. Gower, promoted Lieutenant Colonel, August 18, 1940.
Major Donald B. Greenwood, promoted Lieutenant Colonel, July 26, 1940.
Major Douglas M. Griggs, promoted Lieutenant Colonel, August 9, 1940.
Major Henry F. Grimm, promoted Lieutenant Colonel, July 1, 1940.
Major Vernal W. Hall, promoted Lieutenant Colonel, July 26, 1940.
Major Morris C. Handwerk, promoted Lieutenant Colonel, August 29, 1940.
Major John H. Harrington, promoted Lieutenant Colonel, July 26, 1940.
Major Charles S. Harris, promoted Lieutenant Colonel, August 29, 1940.
Major Hugh N. Herrick, promoted Lieutenant Colonel, August 29, 1940.
Major Charles W. Higgins, promoted Lieutenant Colonel, August 29, 1940.
Major Ralph E. Hill, to 4th, Fort McPherson.
Major Ralph E. Hill, promoted Lieutenant Colonel, August 29, 1940.
Major Clifford D. Hindle, promoted Lieutenant Colonel, August 9, 1940.
Major James L. Hogan, to 9th, Fort Banks.
Major Daniel H. Hoge, to 8th, Fort Preble.
Major Lewis A. Hudgins, promoted Lieutenant Colonel, August 29, 1940.
Major Willard W. Irvine, promoted Lieutenant Colonel, August 7, 1940.
Major Albert M. Jackson, to 2d Coast Artillery District, New York, N. Y.
Major Albert M. Jackson, promoted Lieutenant Colonel, August 7, 1940.
Major James P. Jacobs, promoted Lieutenant Colonel, August 9, 1940.
Major John J. Johnson, to 21st, Fort Du Pont.
Major Allison W. Jones, promoted Lieutenant Colonel, August 7, 1940.
Major Creighton Kerr, promoted Lieutenant Colonel, July 1, 1940.
Major Joseph P. Kohn, promoted Lieutenant Colonel, August 7, 1940.
Major Rolla V. Ladd, promoted Lieutenant Colonel, July 26, 1940.
Major William F. Lafrenze, to 6th, Fort Winfield Scott.
Major William F. Lafrenze, promoted Lieutenant Colonel, August 8, 1940.
Major John T. Lewis, promoted Lieutenant Colonel, August 18, 1940.
Major Frederick Lofquist, promoted Lieutenant Colonel, August 17, 1940.
Major Leroy H. Lohmann, promoted Lieutenant Colonel, July 1, 1940.
Major Percy S. Lowe, to station at Falmouth, Massachusetts.
Major Porter P. Lowry, promoted Lieutenant Colonel, August 7, 1940.
Major Dean Luce, to Submarine Mine Depot, Fort Monroe.
Major Leroy Lutes, promoted Lieutenant Colonel, July 1, 1940.
Major Edward B. McCarthy, promoted Lieutenant Colonel, August 9, 1940.
Major Thomas C. McCormick, FA, to Panama Canal Department, sailing New York, October 8, 1940.
Major Samuel L. McCroskey, orders to Army War College revoked.
Major Samuel L. McCroskey, promoted Lieutenant Colonel, August 18, 1940.
Major Riley E. McGarraugh, to 77th, Fort Bragg.
Major Hubert A. McMorrow, promoted Lieutenant Colonel, August 7, 1940.
Major Oscar D. McNeely, promoted Lieutenant Colonel, August 29, 1940.
Major Frank J. McSherry, to General Staff Corps.
Major Frank J. McSherry, promoted Lieutenant Colonel, August 18, 1940.
Major Harold C. Mabbott, promoted, August 9, 1940.
Major Robert N. Mackin, to Instructor, New York National Guard, New York, N. Y.
Major Robert N. Mackin, promoted Lieutenant Colonel, July 26, 1940.
Major Howard S. MacKirdy, promoted Lieutenant Colonel, August 9, 1940.
Major William R. Maris, promoted Lieutenant Colonel, August 7, 1940.
Major William F. Marquat, to Instructor, California National Guard, Long Beach.
Major William F. Marquat, promoted Lieutenant Colonel, August 7, 1940.
Major Stanley R. Mickelsen, GSC, promoted Lieutenant Colonel, August 18, 1940.
Major Bryan L. Milburn, to General Headquarters, Washington, D. C.
Major Bryan L. Milburn, GSC, promoted Lieutenant Colonel, August 29, 1940.
Major John D. Mitchell, to 22d, Fort Constitution.
Major Lawrence C. Mitchell, GSC, promoted Lieutenant Colonel, July 1, 1940.
Major John M. Moore, to U. S. Military Academy, West Point.
Major Maurice Morgan, promoted Lieutenant Colonel, August 7, 1940.
Major Joe D. Moss, to 70th, Fort Moultrie.
Major James B. Muir, Jr., to Instructor, Minnesota National Guard, St. Cloud.
Major James B. Muir, Jr., promoted Lieutenant Colonel, August 8, 1940.
Major John G. Murphy, promoted Lieutenant Colonel, August 18, 1940.
Major Howard H. Newman, to 67th, Fort Bragg.
Major Don R. Norris, promoted Lieutenant Colonel, July 26, 1940.
Major George R. Owens, promoted Lieutenant Colonel, August 7, 1940.
Major Thomas R. Parker, to Panama Canal Department, sailing San Francisco, January 17, 1941.
Major Thomas R. Parker, promoted Lieutenant Colonel, July 26, 1940.
Major George A. Patrick, to Instructor, South Carolina National Guard, Greenwood.
Major Harry E. Pendleton, promoted Lieutenant Colonel, August 29, 1940.
Major Thomas R. Phillips, promoted Lieutenant Colonel, August 17, 1940.
Major Harry R. Pierce, promoted Lieutenant Colonel, July 1, 1940.
Major Joshua D. Powers, promoted Lieutenant Colonel, July 1, 1940.
Major James G. Renno, to 20th, Fort Crockett.
Major George W. Ricker, to Coast Artillery School.
Major George W. Ricker, promoted Lieutenant Colonel, August 18, 1940.
Major Carroll G. Riggs, promoted Lieutenant Colonel, August 18, 1940.
Major Isaac H. Ritchie, to Instructor, Coast Artillery School.
Major Kenneth Rowntree, promoted Lieutenant Colonel, July 1, 1940.
Major Paul W. Rutledge, promoted Lieutenant Colonel, August 29, 1940.
Major Warren C. Rutter, to General Staff Corps.
Major William Sackville, promoted Lieutenant Colonel, July 1, 1940.
Major Lucas E. Schoonmaker, promoted Lieutenant Colonel, August 9, 1940.
Major Logan O. Shutt, to 77th, Fort Bragg.
Major Henry H. Slicer, promoted Lieutenant Colonel, August 7, 1940.
Major Joseph C. Stephens, promoted Lieutenant Colonel, August 29, 1940.
Major Wilfred H. Steward, to Instructor, Connecticut National Guard, Bridgeport.
Major Edmund H. Stillman, promoted Lieutenant Colonel, August 8, 1940.
Major Andrew P. Sullivan, to 76th, Fort Bragg.
Major William H. Sweet, promoted Lieutenant Colonel, August 7, 1940.
Major Francis S. Swett, promoted Lieutenant Colonel, August 18, 1940.
Major Edward H. Taliaferro, Jr., promoted Lieutenant Colonel, July 26, 1940.
Major Edward W. Timberlake, to 71st Fort Story.
Major James R. Townsend, promoted Lieutenant Colonel, July 26, 1940.
Major Frederick L. Topping, promoted Lieutenant Colonel, August 17, 1940.
Major Donald C. Tredennick, to Instructor, Coast Artillery School.
Major Robert M. Van Buskirk, promoted Lieutenant Colonel, August 7, 1940.
Major Arthur W. Waldron, promoted Lieutenant Colonel, August 18, 1940.
Major Webster H. Warren, to Instructor, Washington National Guard, Seattle.
Major Webster H. Warren, promoted Lieutenant Colonel, August 29, 1940.
Major Fred B. Waters, to 19th, Fort Rosecrans.
Major Thomas L. Waters, to 68th, Fort Williams.
Major William W. Wertz, to station at Miami, Florida.
Major William W. Wertz, promoted Lieutenant Colonel, August 29, 1940.
Major Leon A. White, to 76th, Fort Bragg.
Major Ellis V. Williamson, FA, to 2d Coast Artillery District, New York, N. Y.
Major Austin M. Wilson, Jr., to Instructor, Coast Artillery School.
Major C. Forrest Wilson, to Instructor, New York National Guard, New York, N. Y.
Major Walter J. Wolfe, to 5th, Fort Hamilton.
Major Volney W. Wortman, to 57th, Fort Monroe.
Major Fred J. Woods, to 7th, Fort Hancock.
Major Courtney P. Young, to Panama Canal Department, sailing Charleston, December 30, 1940.
Captain Harry S. Aldrich, promoted Major, July 1, 1940.
Captain William I. Allen, promoted Major, July 1, 1940.
Captain George B. Anderson, QMC, promoted Major, July 1, 1940.
Captain Granger Anderson, promoted Major, July 1, 1940.
Captain George M. Badger, promoted Major, July 1, 1940.
Captain Edward Barber, GSC, promoted Major, July 1, 1940.
Captain Wayne L. Barker, promoted Major, July 1, 1940.
Captain Albert S. Baron, to 18th, Fort Stevens.
Captain Laurence W. Bartlett, promoted Major, July 1, 1940.
Captain Russell E. Bates, to 19th, Fort Rosecrans.
Captain Russell E. Bates, promoted Major, July 1, 1940.
Captain Sylvan Berliner, to 76th, Fort Bragg.
Captain Robert W. Berry, to Office of the Chief of Staff, Washington, D. C.
Captain Charles N. Branhan, promoted Major, July 1, 1940.
Captain William I. Brady, promoted Major, July 1, 1940.
Captain Howard E. C. Breitung, promoted Major, July 1, 1940.
Captain Kenneth M. Briggs, orders to student, Coast Artillery School revoked.

Captain Lathrop R. Bullene, promoted Major, July 1, 1940.
Captain George R. Burgess, promoted Major, July 1, 1940.
Captain Edwin F. Burguson, CA-Res., to active duty, MacDill Field.
Captain Nathaniel A. Burnell, 2d, promoted Major, July 1, 1940.
Captain John R. Burnett, promoted Major, July 1, 1940.
Captain Virgil B. Cagle, CA-Res., to active duty, MacDill Field.
Captain James B. Carroll, promoted Major, July 1, 1940.
Captain Milo G. Cary, promoted Major, July 1, 1940.
Captain John F. Cassidy, promoted Major, July 1, 1940.
Captain Edwin W. Chamberlin, to General Staff Corps.
Captain George A. Chester, to 77th, Fort Bragg.
Captain Paul W. Cole, promoted Major, July 1, 1940.
Captain Ben E. Cordell, promoted Major, August 7, 1940.
Captain James M. Coston, CA-Res., to active duty, Maxwell Field.
Captain Robert W. Crichlow, Jr., promoted Major, July 1, 1940.
Captain Charles H. Crim, promoted Major, July 1, 1940.
Captain Frank J. Cunningham, promoted Major, July 1, 1940.
Captain Lee A. Denson, Jr., promoted Major, July 1, 1940.
Captain Pierre B. Denson, to 69th, Fort Crockett.
Captain Ray E. Dingeman, promoted Major, July 1, 1940.
Captain Frederick B. Dodge, Jr., promoted Major, July 1, 1940.
Captain William H. J. Dunham, promoted Major, July 1, 1940.
Captain Henry H. Duval, promoted Major, July 1, 1940.
Captain John W. Dwyer, promoted Major, July 1, 1940.
Captain Dean S. Ellerthorpe, promoted Major, July 1, 1940.
Captain Hamilton P. Ellis, promoted Major, July 1, 1940.
Captain E. Carl Engelhart, promoted Major, July 1, 1940.
Captain John M. England, promoted Major, August 7, 1940.
Captain Richard A. Ericson, promoted Major, July 1, 1940.
Captain John H. Featherston, promoted Major, July 1, 1940.
Captain Bonner F. Fellers, promoted Major, July 1, 1940.
Captain Girvelle L. Field, promoted Major, August 7, 1940.
Captain Lester D. Flory, promoted Major, July 1, 1940.
Captain John H. Fonvielle, to 6th, Fort Winfield Scott.
Captain John H. Fonvielle, promoted Major, July 1, 1940.
Captain Karl C. Frank, to 19th, Fort Rosecrans.
Captain Karl C. Frank, promoted Major, July 1, 1940.
Captain Charles W. Gettys, promoted Major, July 1, 1940.
Captain Gerald G. Gibbs, to 8th, Fort Preble.
Captain James R. Goodall, promoted Major, July 1, 1940.
Captain Sanford J. Goodman, to 6th, Fort Winfield Scott.
Captain Edgar M. Gregory, promoted Major, July 1, 1940.
Captain Porter T. Gregory, promoted Major, July 1, 1940.
Captain William E. Griffin, promoted Major, July 1, 1940.
Captain John L. Goff, promoted Major July 1, 1940.
Captain Clem O. Gunn, promoted Major, July 1, 1940.
Captain Franklin K. Gurley, promoted Major, July 1, 1940.
Captain Earl Y. Harpole, CA-Res., to active duty, Lowry Field.
Captain Joseph E. Harriman, promoted Major, July 1, 1940.
Captain Paul A. Harris, promoted Major, July 1, 1940.
Captain John Harry, promoted Major, July 1, 1940.
Captain Melton A. Hatch, promoted Major, July 1, 1940.
Captain Frederic L. Hayden, promoted Major, July 1, 1940.
Captain George F. Heany, Jr., promoted Major, July 1, 1940.
Captain Donald B. Herron, to Instructor, Minnesota National Guard, Mankato.
Captain Donald B. Herron, promoted Major, July 1, 1940.
Captain Hobart Hewett, promoted Major, July 1, 1940.
Captain John I. Hincke, to 71st, Fort Story.
Captain Glen E. Hofto, CA-Res., to active duty, Quartermaster Corps Reserve.
Captain William G. Holder, promoted Major, July 1, 1940.
Captain James F. Howell, Jr., to 78th, March Field.
Captain John J. Johnson, promoted Major, July 1, 1940.
Captain Francis B. Kane, promoted Major, July 1, 1940.
Captain Paul B. Kelly, GSC, promoted Major, July 1, 1940.
Captain Edward A. Kleinman, promoted Major, July 1, 1940.
Captain John H. Kockevar, to 23d Separate Battalion, Fort Rodman.
Captain Robert H. Kreuter, promoted Major, July 1, 1940.
Captain Robert H. Krueger, promoted Major, July 1, 1940.
Captain Donald D. Lamson, promoted Major, July 1, 1940.
Captain William S. Lawton, promoted Major, July 1, 1940.
Captain Lyman L. Lemnitzer, promoted Major, July 1, 1940.
Captain Hubert DuB. Lewis, to 76th, Fort Bragg.
Captain George J. Loupret, promoted Major, July 1, 1940.
Captain Dean Luce, promoted Major, July 1, 1940.
Captain William J. McCarthy, promoted Major, July 1, 1940.
Captain Frank C. McConnell, promoted Major, July 1, 1940.
Captain William C. McFadden, to 69th, Fort Crockett.
Captain William C. McFadden, promoted Major, July 1, 1940.
Captain Stanley McGee, CA-Res., to active duty, Air Corps.
Captain Donald McLean, promoted Major, July 1, 1940.
Captain William L. McPherson, promoted Major, August 7, 1940.
Captain John H. Madison, promoted Major, July 1, 1940.
Captain Emmor G. Martin, to 57th, Fort Monroe.
Captain Clarence M. Mendenhall, Jr., promoted Major, July 1, 1940.
Captain Wilmer B. Merritt, promoted Major, July 1, 1940.
Captain Harry F. Meyers, promoted Major, July 1, 1940.
Captain John D. Mitchell, promoted Major, July 1, 1940.
Captain Paul K. Monaghan, to active duty, Quartermaster Corps.
Captain John M. Moore, promoted Major, July 1, 1940.
Captain Lyman Ellis Morris, CA-Res., to active duty, Air Corps.
Captain Joe D. Moss, promoted Major, July 1, 1940.
Captain Thomas W. Munford, promoted Major, July 1, 1940.
Captain Harry Myers, CA-Res., to active duty, Office of the Adjutant General, Washington, D. C.
Captain Halvor M. Myrah, promoted Major, July 1, 1940.
Captain Ola Nelson, promoted Major, July 1, 1940.
Captain Kenneth H. Newton CA-Res., to active duty, Quartermaster Corps.
Captain George F. Nichols, promoted Major, July 1, 1940.
Captain Arthur B. Nicholson, promoted Major, August 7, 1940.
Captain Douglass G. Pamplin, promoted Major, July 1, 1940.
Captain George F. Peirce, to 8th, Fort Preble.
Captain John H. Pitzer, promoted Major, July 1, 1940.
Captain John 'E. Reierson, promoted Major July 1, 1940.
Captain James G. Renno promoted Major, July 1, 1940.
Captain Herbert C. Reuter, promoted Major, July 1, 1940.
Captain Isaac H. Ritchie, promoted Major, July 1, 1940.
Captain Joseph H. Rousseau, Jr., to Instructor, Minnesota National Guard, St. Cloud.
Captain Joseph H. Rousseau, Jr., promoted Major, July 1, 1940.
Captain Clarence E. Rothgeb, to 6th, Fort Winfield Scott.
Captain Samuel Rubin, promoted Major, July 1, 1940.
Captain Ralph W. Russell, promoted Major, August 7, 1940.
Captain Warren C. Rutter, promoted Major, July 1, 1940.
Captain Hazen C. Schouman, CA-Res., to active duty, Coast Artillery School.
Captain Cortlandt Van R. Schuyler, promoted Major, July 1, 1940.
Captain William B. Short, promoted Major, August 7, 1940.
Captain Logan O. Shutt, promoted Major, July 1, 1940.
Captain Joe F. Simmons, promoted Major, July 1, 1940.
Captain John C. Smith, to 77th, Fort Bragg.
Captain Perry McC. Smith, promoted Major, July 1, 1940.
Captain Charles Edwin Snyder, Jr., CA-Res., to active duty, Instructor, Coast Artillery School.
Captain Alba C. Spalding, promoted Major, July 1, 1940.
Captain Henry E. Strickland, to 9th, Fort Banks.
Captain John E. Strong, CA-Res., to active duty, Coast Artillery School.
Captain Guy H. Stubbs, promoted Major, July 1, 1940.
Captain J. Foxhall Sturman, Jr., promoted Major, July 1, 1940.
Captain Andrew P. Sullivan, promoted Major, July 1, 1940.
Captain Francis C. Sweeney, to Coast Artillery Board for training.
Captain Arthur R. Thomas, to student, Quartermaster School.
Captain Ernest B. Thompson, promoted Major, July 1, 1940.
Captain Harry F. Townsend, to 76th, Fort Bragg.

Captain Donald C. Tredennick, promoted Major, July 1, 1940.

Captain Harold T. Turnbull, promoted Major, July 1, 1940.

Captain Howard J. Vandersluis, promoted Major, July 1, 1940.

Captain Carl B. Wahle, promoted Major, July 1, 1940.

Captain Everett C. Wallace, to 78th, March Field.

Captain Edgar R. C. Ward, orders to student Coast Artillery School revoked.

Captain Thomas L. Waters, promoted Major, July 1, 1940.

Captain William A. Weddell, to 70th, Fort Screven.

Captain Arthur E. Wilson, promoted Major, July 1, 1940.

Captain Auston M. Wilson, Jr., promoted Major, July 1, 1940.

Captain C. Forrest Wilson, promoted Major, July 1, 1940.

Captain Daniel McC. Wilson, to 13th, Fort Moultrie.

Captain Walter J. Wolfe, promoted Major, July 1, 1940.

Captain Charles M. Wolff, promoted Major, July 1, 1940.

Captain Robert J. Wood, to 2d, Fort Monroe.

Captain Fred J. Woods, promoted Major, July 1, 1940.

Captain Joy T. Wrean, to 77th, Fort Bragg.

Captain Courtney P. Young, promoted Major, July 1, 1940.

Captain Layton A. Zimmer, to 20th, Fort Crockett.

Captain Michael Zofchak, CA-Res., to active duty, Instructor, Coast Artillery School.

First Lieutenant George T. Anton, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

First Lieutenant Edward T. Ashworth, to 75th, Fort Lewis.

First Lieutenant Bert H. Backstrom, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

First Lieutenant Wallace D. Barlow, CA-Res., to active duty, Office of Assistant Secretary of War.

First Lieutenant Frank B. Bentley, Jr., CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

First Lieutenant Severin R. Beyma, to Office of Chief of Ordnance.

First Lieutenant Frank A. Bogart, to 67th, Fort Bragg.

First Lieutenant Stockton D. Bruns, CA-Res., to Philippine Department, sailing San Francisco, October 8.

First Lieutenant Harry W. Bues, Jr., CA-Res., to active duty, Office of the Adjutant General.

First Lieutenant Edgar N. Chace, orders to student, Coast Artillery School revoked.

First Lieutenant Raymond C. Cheal, to 76th, Fort Bragg.

First Lieutenant Stanley J. Cherubin, to 67th, Fort Bragg.

First Lieutenant Evan P. Clay, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

First Lieutenant John E. Condron, CA-Res., to active duty, Mitchel Field.

First Lieutenant Edward C. Crist, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

First Lieutenant George W. Croker, to 78th, March Field.

First Lieutenant James B. Douglass, CA-Res., to Panama Canal Department, sailing Charleston, September 7, 1940.

First Lieutenant Walter F. Ellis, to 3d Coast Artillery District, Fort Monroe.

First Lieutenant Robert H. Fitzgerald, to 6th, Fort Winfield Scott.

First Lieutenant Charles S. Fletcher, Jr., CA-Res., to Maxwell Field.

First Lieutenant John G. Geisel, CA-Res., to active duty, Jefferson Barracks.

First Lieutenant Max S. George, to 77th, Fort Bragg.

First Lieutenant Bernard A. Gilman, CA-Res., to Panama Canal Department, sailing New York, July 23, 1940.

First Lieutenant Thomas H. Harvey, to 76th, Fort Bragg.

First Lieutenant Ralph G. Hendrickson, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

First Lieutenant Morris Heart, CA-Res., to active duty, Jefferson Barracks.

First Lieutenant Marcellus E. Jones, CA-Res., to Panama Canal Department, sailing Charleston, September 7, 1940.

First Lieutenant William H. Jordan, to 5th, Fort Hamilton.

First Lieutenant Maxwell M. Kallman, to 78th, March Field.

First Lieutenant Robert H. Kessler to 76th, Fort Bragg.

First Lieutenant Calvin B. Leek, to active duty, Instructor, Coast Artillery School.

First Lieutenant Hubert duB. Lewis, orders to student, Coast Artillery school revoked.

First Lieutenant Lafar Lipscomb, Jr., to Panama Canal Department, sailing New York, October 8, 1940.

First Lieutenant Francis A. Liwski, to 6th, Fort Winfield Scott.

First Lieutenant Eugene E. Lockart, to 13th, Key West.

First Lieutenant George E. Louttit to active duty, Quartermaster Corps.

First Lieutenant John B. McCluskey, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

First Lieutenant Henry G. McFeely, to 78th, March Field.

First Lieutenant Lawrence K. Meade, FA, transferred to Coast Artillery Corps, June 25, 1940.

First Lieutenant Thomas McG. Metz, to 67th, Fort Bragg.

First Lieutenant Robert W. Molloy, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

First Lieutenant Charles F. Monteith, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

First Lieutenant Robert F. Moore, to 61st, Fort Sheridan.

First Lieutenant John E. Murphy, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

First Lieutenant John G. Nelson, to 2d, Fort Monroe.

First Lieutenant Russell M. Nelson, to 74th, Fort Monroe.

First Lieutenant Milton L. Ogden, to 77th, Fort Bragg.

First Lieutenant Reinhart W. Perlowski, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

First Lieutenant Joseph B. Price, CA-Res., to active duty, Langley Field.

First Lieutenant Jabus W. Rawls, Jr., to 77th, Fort Bragg.

First Lieutenant Charles L. Register, to staff and faculty, Ordnance School.

First Lieutenant Alvin D. Robbins, to 77th, Fort Bragg.

First Lieutenant Sam C. Russell, to Fort Monroe.

First Lieutenant John J. Stark, orders to student Coast Artillery School revoked.

First Lieutenant George V. Underwood, Jr., to 23d Separate Battalion, Fort Rodman.

First Lieutenant Charles M. Wantuck, CA-Res., to active duty, Jefferson Barracks.

First Lieutenant George J. Weitzel, orders to student, Coast Artillery School revoked.

First Lieutenant Perry F. Wendell, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

First Lieutenant H. Bennett Whipple to 21st, Fort Du Pont.

First Lieutenant Charles G. Young, to 77th, Fort Bragg.

First Lieutenant James L. Zipf, CA-Res., to Panama Canal Department, sailing Charleston, September 7, 1940.

Second Lieutenant John E. Aber, to 69th, Fort Crockett.

Second Lieutenant Henry H. Arnold, Jr., to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant John E. Arthur, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Ernest M. Bailey, to Panama Canal Department, sailing Charleston, September 7, 1940.

Second Lieutenant William E. Barkman, CA-Res., promoted First Lieutenant, August 29, 1940.

Second Lieutenant Harold H. Barnes, CA-Res., to Hawaiian Department, sailing September 19, 1940.

Second Lieutenant Raymond H. Bates, to 68th, Fort Williams.

Second Lieutenant Kenneth Howard Bayer, to 13th, Fort Barrancas.

Second Lieutenant George J. Bayerle, Jr., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Charles L. Beaudry, to 2d, Fort Monroe.

Second Lieutenant Woodrow Bell, promoted First Lieutenant, July 19, 1940.

Second Lieutenant Emery E. Bellonby, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant William J. Bennett, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Marshall L. Biggs, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Joseph Bigos, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Irvin S. Birnbaum, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Jules N. Biron, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Charles T. Biswanger, Jr., to 75th, Fort Lewis.

Second Lieutenant LeRoy F. Boozer, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Alfred L. Brassel, to 62d, Fort Totten.

Second Lieutenant Henry R. Brewerton, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant William J. Brian, CA-Res., to active duty, Maxwell Field.

Second Lieutenant Thomas G. Bricker, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Chester K. Britt, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Gerhard E. Brown, to 62d, Fort Totten.

Second Lieutenant Oscar M. Brumfiel, to 70th, Fort Screven.

Second Lieutenant Stephen M. Byars, Jr., CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Donald M. Callahan, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Lloyd W. Canfil, CA-

Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant George D. Carnahan, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant Richard T. Cassidy, to Panama Canal Department, sailing San Francisco, August 20, 1940.

Second Lieutenant William D. Chadwick, Jr., to Panama Canal Department, sailing Charleston, December 30, 1940.

Second Lieutenant Homer B. Chandler, Jr., to 14th, Fort Worden.

Second Lieutenant Philip R. Cibotti, Jr., to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Leon L. Clarke, Jr., to 52d, Fort Hancock.

Second Lieutenant William L. Clay, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant Charles F. Coffey, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Joseph M. Cole, Jr., to Allen Hancock College of Aeronautics, Santa Maria, California.

Second Lieutenant Robert L. Colligan, Jr., to 11th, Fort H. G. Wright.

Second Lieutenant John Edward Conner, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant John B. Coontz, to Panama Canal Department, sailing San Francisco, August 20, 1940.

Second Lieutenant Robert G. Cooper, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant John B. Corbett, promoted First Lieutenant, August 15, 1940.

Second Lieutenant William C. Craig, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant George W. Croker, promoted First Lieutenant, July 3, 1940.

Second Lieutenant Augustus J. Cullen, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Henry A. Cunningham, Jr., to 63d, Fort MacArthur, Calif.

Second Lieutenant Dabney C. Davis, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Paul C. Davis, to 77th, Fort Bragg.

Second Lieutenant William C. Davoll, CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Robert J. Delaney, to 65th, Fort Winfield Scott.

Second Lieutenant Dan Arnold Delano, to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Frank A. DeLatour, Jr., to 69th, Fort Crockett.

Second Lieutenant John S. Diefendorf, CA-Res., to active duty, Quartermaster Corps Reserve.

Second Lieutenant Anthony J. DiSalvo CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Howard F. Dunlap, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant John J. Egan, CA-Res., to active duty, Langley Field.

Second Lieutenant Glenn P. Elliott, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant Albert D. Epley, to 7th, Fort Hancock.

Second Lieutenant Jack C. Evans, to 65th, Fort Winfield Scott.

Second Lieutenant George R. Fay, promoted First Lieutenant, July 26, 1940.

Second Lieutenant Harlan B. Ferrill, to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Sydney G. Fisher, to 61st, Fort Sheridan.

Second Lieutenant Thaddeus P. Floryan to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Alfred J. Floyd, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Richard H. Fraser, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant Max Gerard, CA-Res., promoted First Lieutenant, July 2, 1940.

Second Lieutenant Charles M. Gilbert, to 70th, Fort Moultrie.

Second Lieutenant William J. Gildarf, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant William Kethley Gillmore, to 13th, Fort Barrancas.

Second Lieutenant Kenneth Glade, to 6th, Fort Winfield Scott.

Second Lieutenant Chester E. Glassen, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Thomas F. Gordon, to 74th, Fort Monroe.

Second Lieutenant Gilford D. Green, to 71st, Fort Monroe.

Second Lieutenant Elmer E. Hallinger, to 74th, Fort Monroe.

Second Lieutenant Lynn V. Halstead, CA-Res., to Panama Canal Department, sailing New York, July 23, 1940.

Second Lieutenant Rolland W. Hamelin, to 61st, Fort Sheridan.

Second Lieutenant John S. Harnett, to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Leonard W. Hattox, CA-Res., promoted First Lieutenant, August 23, 1940.

Second Lieutenant Charles V. Haven, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Louis E. Heiman, Jr., CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant William E. Heinemann, to 62d, Fort Totten.

Second Lieutenant Peter A. Helfert, CA-Res., promoted First Lieutenant, August 2, 1940.

Second Lieutenant James T. Hennessy, to 6th, Fort Winfield Scott.

Second Lieutenant Harold Donham Higgins, to 68th, Fort Williams.

Second Lieutenant Ralph O. Hill, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Ralph O. Hill, promoted First Lieutenant, August 22, 1940.

Second Lieutenant Theodore L. Hoffmann, Jr., to 65th, Fort Winfield Scott.

Second Lieutenant William F. Horton, to 68th, Fort Williams.

Second Lieutenant Bergen B. Hovell, to 18th, Fort Stevens.

Second Lieutenant Harry Hunegs, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Leroy Hutchins, CA-Res., promoted First Lieutenant, August 9, 1940.

Second Lieutenant Ernest B. Jones, to 67th, Fort Bragg.

Second Lieutenant William M. Kasper, to 13th, Fort Barrancas.

Second Lieutenant Marvin K. Kauffman, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant James J. Kelly, Jr., to Panama Canal Department, sailing New York, December 28, 1940.

Second Lieutenant John A. Kendall, CA-Res., to active duty, Maxwell Field.

Second Lieutenant John D. Kieth, CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Ronald M. Kolda, to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Michael Kuziv, Jr., to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Raymond J. LaRose, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Milton D. Lederman, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Joe W. Leedom, Jr., to 67th, Fort Bragg.

Second Lieutenant Taylor B. Lewis, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant William E. Lewis, Jr., CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Everett DeW. Light, to 63d, Fort MacArthur.

Second Lieutenant James Lotozo to 11th, Fort H. G. Wright.

Second Lieutenant Anton Lottal, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Joseph D. Lubin, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Edison A. Lynn, Jr., to 70th, Fort Moultrie.

Second Lieutenant Leonard F. McGreevy, 2d, CA-Res., to Panama Canal Department, sailing Charleston, September 7, 1940.

Second Lieutenant Joseph D. McKenzie, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Edward W. McLain, promoted First Lieutenant, July 3, 1940.

Second Lieutenant George B. Macaulay, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant Robert N. Mackin, 3d, to 75th, Fort Lewis.

Second Lieutenant William C. Mahoney, to 71st, Fort Story.

Second Lieutenant Paul J. Maine, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Arthur G. Malone, to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Salvatore J. Mancusco, to Panama Canal Department, sailing New York, December 28, 1940.

Second Lieutenant William H. Markham, CA-Res., to Philippine Department, sailing San Francisco, California, October 8, 1940.

Second Lieutenant Clarence T. Marsh, Jr., to 62d, Fort Totten.

Second Lieutenant Troxell O. Mason, to 74th, Fort Monroe.

Second Lieutenant Marvin H. Merchant, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Henry A. Miley, Jr., to 2d, Fort Monroe.

Second Lieutenant Druid L. Mills, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Ralph E. Miner, to 75th, Fort Lewis.

Second Lieutenant Robert A. Moffett, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Samuel C. Mohler, Jr., promoted First Lieutenant, August 27, 1940.

Second Lieutenant Otho A. Moomaw, promoted First Lieutenant, July 3, 1940.

Second Lieutenant James M. Moore, to 61st, Fort Sheridan.

Second Lieutenant Paul D. Morehouse,

CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Harry E. Morrill, CA-Res., to active duty, Mitchel Field.

Second Lieutenant William H. Neill, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant John G. Nelson, promoted First Lieutenant, July 3, 1940.

Second Lieutenant Donald K. Nickerson, to Panama Canal Department, sailing New York, December 28, 1940.

Second Lieutenant Robinson R. Norris, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant John A. O'Brien, to 65th, Fort Winfield Scott.

Second Lieutenant James N. Olhausen, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Carl Inglwald Olsen, CA-Res., to active duty, Quartermaster Corps.

Second Lieutenant Nicholas Oncha, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Roy Owen, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant Herbert E. Pace, Jr., to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant John B. Pattison, Jr., to 76th, Fort Bragg.

Second Lieutenant Roger B. Payne, to active duty, Maxwell Field.

Second Lieutenant Otis O. Perkins, CA-Res., to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant Warren R. Pierson, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant Carl H. Pipkin, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Robert Gray Platt, to 61st, Fort Sheridan.

Second Lieutenant Richard T. Pullen, Jr., CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Kenneth W. Ramsey, CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant William R. Rainey, CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Jabus W. Rawls, Jr., promoted First Lieutenant, July 3, 1940.

Second Lieutenant Herbert E. Rice, to 11th, Fort H. G. Wright.

Second Lieutenant Albert P. Richards, to 71st, Fort Story.

Second Lieutenant Harmon P. Rimmer, to Panama Canal Department, sailing San Francisco, August 20, 1940.

Second Lieutenant Lyman H. Ripley, promoted First Lieutenant, July 3, 1940.

Second Lieutenant William H. Roedy, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant Ralph N. Ross, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Louis Rotar, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Leondis J. Redwine, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Melvin R. Russell, to 78th, March Field.

Second Lieutenant Graham C. Sanford, to Panama Canal Department, sailing San Francisco, August 20, 1940.

Second Lieutenant William W. Saunders, to Allen Hancock College of Aeronautics, Santa Maria, Calif.

Second Lieutenant Henry J. Schutte, Jr., CA-Res., to Philippine Department, sailing San Francisco, October 8, 1940.

Second Lieutenant Wendell B. Sell, to Hawaiian Department, sailing San Francisco, August 15, 1940.

Second Lieutenant George W. Shivers, to 69th, Fort Crockett.

Second Lieutenant Morris L. Shoss, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Woodrow B. Sigley, to 61st, Fort Sheridan.

Second Lieutenant Stephen Silvasy to 63d, Fort MacArthur.

Second Lieutenant Harry T. Simpson, Jr., to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Page E. Smith, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant Vallard Cassius Smith, to 65th, Fort Winfield Scott.

Second Lieutenant John T. H. Spengler, to Hawaiian Department, sailing New York, October 15, 1940.

Second Lieutenant David Sternsher, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Chester G. Stewart, CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Lynn C. Stonier, CA-Res., to Hawaiian Department, sailing San Francisco, September 19, 1940.

Second Lieutenant William J. Stricklin, Jr., CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Roy A. Tate, CA-Res., to Panama Canal Department, sailing Charleston, September 7, 1940.

Second Lieutenant John C. Tredennick, to 2d, Fort Monroe.

Second Lieutenant Joseph E. Treadway, CA-Res., appointed Regular Army.

Second Lieutenant Hugh J. Turner, Jr., to 13th, Fort Barrancas.

Second Lieutenant Eustace J. Wallace, Jr., CA-Res., to Puerto Rican Department, sailing New York, September 7, 1940.

Second Lieutenant Everett H. Ware, to 6th, Fort Winfield Scott.

Second Lieutenant George B. Webster, Jr., to 6th, Fort Winfield Scott.

Second Lieutenant Robert I. Wheat, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Frederick G. White, to Panama Canal Department, sailing San Francisco, August 20, 1940.

Second Lieutenant Floyd E. Wiley, to Panama Canal Department, sailing New York, July 23, 1940.

Second Lieutenant William F. Williams, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Harry L. Wilson, Jr., to 70th, Fort Moultrie.

Second Lieutenant James W. Wingate, CA-Res., to Panama Canal Department, sailing New York, August 28, 1940.

Second Lieutenant Landon A. Witt, to Panama Canal Department, sailing New York, September 14, 1940.

Second Lieutenant John MacN. Wright, Jr., to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Jules D. Yates, to Philippine Department, sailing New York, September 14, 1940.

Second Lieutenant Stephen Dana Young, to 8th, Fort McKinley.

☆ ☆ ☆

The Contributors

EDWARD L. BERNAYS is a well-known public relations counsel. During the World War he served with the United States Committee on Public Information in South America and at the Paris Peace Conference. He is the author of *Crystallizing Public Opinion* and *Propaganda.*

MAJOR JOHN H. BURNS was editor of our contemporary the *Infantry Journal* from 1938 until his untimely death two months ago. He wrote "The American Professional Soldier" as a chapter in a book he had in preparation.

LIEUTENANT AVERY M. COCHRAN, Infantry, is a graduate of the West Point Class of 1932. As you will gather from his article, he is now on duty in Alaska.

CAPTAIN BURGO D. GILL, Coast Artillery Corps, is a frequent contributor to the JOURNAL and other periodicals. He came to the Coast Artillery in 1928 after service as a second lieutenant of Field Artillery that began in 1925. Captain Gill is on duty with the 61st Coast Artillery.

MAJOR GENERAL SIR JOHN HEADLAM, KBE, CB, DSO, DSM (US), British Army Retired, has had over fifty years of artillery experience. He entered the service in 1883, attaining the grade of major general in 1915. During his services in India and the South African campaigns he was twice mentioned in dispatches and received the DSO. During the World War he was wounded in action and mentioned in dispatches four times. General Headlam received the United States Distinguished Service Medal for outstanding services as head of the British Artillery Mission to the United States during the World War. He is the author of *History of the Royal Artillery from the Indian Mutiny to the Great War* of which two volumes have been published.

HAROLD LAMB, the noted biographer of Ghengis Khan and Tamerlane, spent the earlier days of his writing career on various newspapers and magazines. After his World War service with the 7th Infantry, New York National Guard, he turned his talents to the study of Asia. He tells us that he wrote *Ghengis Khan* in six weeks and followed that with *Tamerlane.* He says further "I like to walk, and to walk away from people —especially when they begin to talk. They talk so much these days. Being little known by most people, I've been told several times that I should read newly published books by Harold Lamb."

MAJOR ARTHUR B. NICHOLSON, Coast Artillery Corps, entered the service from civil life in 1923 as a second lieutenant of Coast Artillery. He is a graduate of the Coast Artillery School Battery Officers' Course (1931) and the Air Corps Tactical School (1939). He holds the degrees of B.S.E. (C.E.) and M.S.E. from the University of Michigan. Major Nicholson is stationed at Mitchel Field where he is on duty with the Air Defense Command.

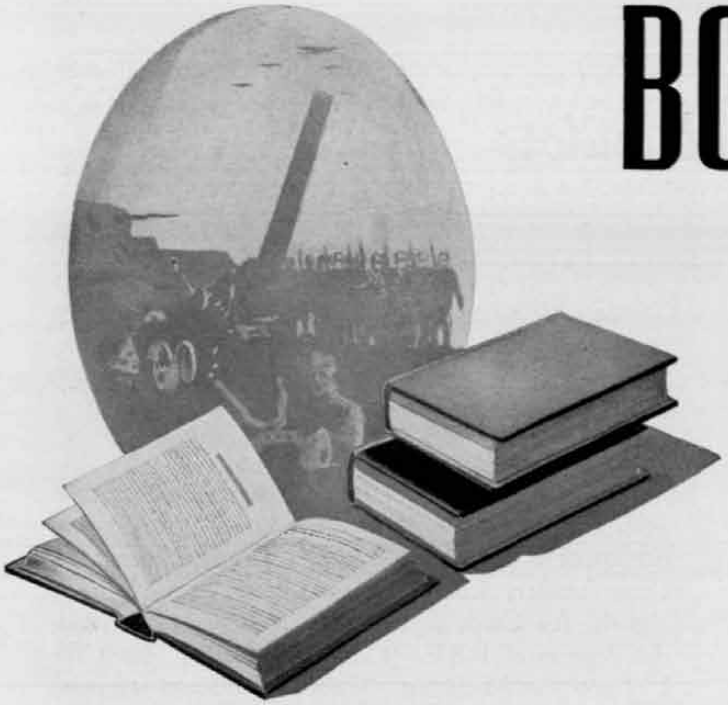
PROBUS is the pseudonym of a well-known Infantryman.

BRIGADIER GENERAL F. H. SMITH, is a native of Ohio. Graduating from the Military Academy with the Class of 1903, he was appointed a second lieutenant, Artillery Corps. With the exception of the World War period when he served as a colonel of Field Artillery, all his service has been with the Coast Artillery. General Smith is a graduate of the Coast Artillery School Field Officers' Course (1922), the Command and General Staff School (1923) and the Army War College (1925). He has had several tours of duty with the War Department General Staff and now commands the 3d Coast Artillery District and the Coast Artillery School at Fort Monroe. General Smith has been decorated with the Purple Heart.

CAPTAIN V. C. STEVENS, Coast Artillery Corps, was born in Pennsylvania. After World War service in the S.A.T.C. he entered the Military Academy in 1920 and graduated with the Class of 1924 as a second lieutenant, Coast Artillery Corps. Captain Stevens is a graduate of the Coast Artillery School Battery Officers' Course (1933) and the Quartermaster Corps Motor Transport School (1934). He is an instructor in motor transportation at the Coast Artillery School. His hobbies are the miniature camera and gardening.

W. A. WINDAS is a free lance feature writer who makes his home in Hollywood, California.

BOOK REVIEWS



Looking Squarely at the News

WAR PROPAGANDA AND THE UNITED STATES. By Harold Lavine and James Wechsler. New Haven: Yale University Press, 1940. Published for the Institute for Propaganda Analysis. 355 Pages; Illustrated; Index. $2.75.

The authors of this book have undertaken the difficult task of looking with a jaundiced and impartial eye on every piece of propaganda and near-propaganda, from whatever source, which has impinged upon the United States since the present war began. In the face of propaganda of every sort, it behooves a military man, no matter how strong his sympathies may be for one side in the present conflict, to do his best to evaluate correctly and impartially all that he hears over the radio and all that he reads in newspapers, magazines, or books. For this reason, *War Propaganda and the United States* is an important book to the military reader.

The book contains a review of propaganda during the World War. This part of the book is inadequate for the reader who wants a full survey of the propaganda of those days. The reader who wants such background would do much better to turn to Lasswell's *Propaganda Technique in the World War* or Mock's and Larsen's *Words That Won the War*. But the bulk of the present book, which deals with present-day propaganda, is well done and the subject matter appears to be as impartially treated as anyone could wish.

In their final chapter entitled "Midstream" the authors of *War Propaganda and the United States* summarize the situation as they saw it a very few months ago:

> In the fog of war all that the nation (the United States) could hope to do was to maintain a minimum of sanity, to distinguish valid claims from grandiose oral promises, to read between the lines of communiqués and clarion calls alike. Ultimately it might nevertheless decide to fight, but it would then do so without romantic vision manufactured for the duration of the war only. And pending its decision it would not be stampeded by faith or loyalty. It would not interpret a London despatch describing Nazi bases in South America as pure evidence that such bases existed; neither would it accept at face value Hitler's assurance that his designs were strictly European. It would not regard the blueprint of a New World Order drafted by liberal Englishmen as anything more than a hoax; and it would not succumb easily to the notion that all Naziism wanted from the world was *Lebensraum*. Above all it would understand in reading war propaganda, that the great question might not be merely: is it true? but: why was it issued?
>
> Was any nation capable of lie detection on the scale now demanded?
>
> The answer was not clear as these lines were written. . . . All that could be said with certainty, as the first summer of war approached, was that the United States was already a maelstrom of conflicting propaganda; that the tempo of the propaganda effort was being speeded up . . .; and that, in so turbulent an atmosphere, the discovery of truth would be a hazardous venture. Ideas would be crucified, passions would rise, epithets would fill the air: "pro-German," "pacifist," "Communist," on the one side, "British agents," "warmongers," on the other. Some would be roughly accurate; many would not be, as is frequently the case with one-word descriptions. . . .
>
> The answer might be found, if at all, . . . in a clear-headed attempt to understand the war and its origin, and to visualize its possible course. Few were the observers in May, 1940, who felt able to prophesy that such an appraisal would take place. . . .

This gives an idea of the viewpoint from which *War Propaganda and the United States* was written, and indicates its value to the military reader who is already versed in G-2 methods of evaluating information of the enemy. The fish has a cold glassy eye, but under the water he sees clearly, even when the waters are somewhat muddy. We can all see things better if we learn, at least occasionally, to look through the murk of the present situation with an eye something like that of a fish.

The Preliminaries

WHY EUROPE FIGHTS. By Walter Millis. New York: William Morrow & Company, 1940. 272 Pages; Index. $2.50.

This book of Mr. Millis is not in the same category as his previous writings. In it, he appears to have set himself only one task. That task is to present a clear and accurate account of world happenings during the twenty years preceding the World War.

The author has done an admirable job. Any military reader who feels the need of clarifying his background on the present war can well turn to this book. It contains well-written factual material and the author does not try to emphasize any particular slant on the war or the approaches to it.

Plea for Support of the Allies

DEFENSE FOR AMERICA. William Allen White, Editor. New York: The Macmillan Company, 1940. 205 Pages. $1.00.

In this forcible book a group of fourteen distinguished Americans state the reasons why they believe the United States should give every support to the Allied nations short of war. As William Allen White writes in his introduction to the book, "this book is exactly what it seems, not more, not less. It is an attempt to face the realities of the European war from the viewpoint of the United States and its future. The contributors come from all walks of American life . . . they speak for many groups and callings."

How strongly Mr. White and the other authors of this book feel about the national defense is best indicated by the following further quotation from Mr. White's introduction:

> . . . We have all but heard the roaring guns. The drones of the hungry bombers almost reach our ears from the headlines . . . And I wish to declare here with all the earnestness I can command, that we are not looking at a movie! We are looking at something that sooner or later will come to our door. We are looking from afar at something that we shall have to face at home. Not this year, probably. But eventually we must meet and conquer the inner evil forces in the heart of man that are rising just beyond our American horizon.
>
> For what we are witnessing is not what you think it is. It's not tanks and flaming gas and powder and shot and shell and dynamite. Not all nor chiefly. The materials and munitions of war, the rages of battle are merely symbols, the outer form of a devastating idea, the challenge of a philosophy. We and our ancestors for at least two thousand years have been building that philosophy slowly around the earth into a social order here in Europe and America. That social order has been erected upon the theory that it pays to be kind,

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that the good neighbor is the prosperous man in the long run, that lying and deceit are a blight upon human relations, that force is not so desirable as a cement for a stable civilization as reason is . . . And now I fear the hour has struck. Maybe war itself will not touch us. But under social and economic pressure we may know the rigor of body and mind that our fathers knew. And we too, may walk as millions of our kind are walking the highways of Europe, hungry and cold and homeless. We, too, may know the bitter bite of winter's wind. We may find our hands twisted with unaccustomed toil. We may find some dugout in a hillside and thank God for its shelter . . . I repeat—it may not be war. But there are other dislocations of society, there are other ways to wreck the established order than war. . . .

. . . So I suppose one may say that our front line trenches are stretched across any horizon where men are fighting for truth, truth that makes them free. And every battle of men struggling for truth is a part of our war. . . .

A Hasty Preview

M-DAY: IF WAR COMES, WHAT YOUR GOVERNMENT PLANS FOR YOU. By Donald Edward Keyhoe. New York: E. P. Dutton & Company, 1940. 96 Pages. $1.00.

M-Day is a preview, written in Sunday-supplement style, of what, six months ago, John Q. Citizen could expect to happen to him in the event of war. The idea of such a book is certainly sound, but this one has the marks of a hasty job prepared for a probable prewar market.

The book is chiefly helpful in that it describes a large number of specific cases, showing in turn what is likely to happen to many classes of citizens and non-citizens in the event of a national emergency. It takes you to the cities and towns and into the industries of the country, there to find the men and women and to show what part they may be expected to play if war should come.

The book would have been much better if there had been less of slapdash about it. True, it is more accurate than many of the articles that have been appearing recently in the press and in magazines on military topics. Instead of writing his book in the style of such articles the author would have done better if he had taken as his model some of the simply written pamphlets which have been issued by various government agencies during the past few years and which there is reason to believe have brought genuine results.

The manner in which National Defense has developed since the author wrote his book changes to some extent the sequence of events laid down in *M-Day*. Even a few months ago, however, such a book could not be prepared except by using a possible declaration of war as the point of departure.

Industrial Mobilization for War

MOBILIZING CIVILIAN AMERICA. By Harold J. Tobin and Percy W. Bidwell. New York: Council on Foreign Relations, 1940. 257 Pages; Index. $2.75.

In *Mobilizing Civilian America* the authors attempt to show how the United States can best use its resources if war should come. They recount briefly the industrial planning of the United States in the World War and then outline the developments of the Industrial Mobilization Plan of the War Department.

The work of these authors is carefully done and covers every angle of industrial mobilization. The appendix contains industrial mobilization plans as revised in 1939. There is also a complete bibliography of the latest materials.

An Expert on the Rifle

THE HUNTING RIFLE. By Colonel Townsend Whelen. Harrisburg; Stackpole's Sons, 1940. 458 Pages; Illustrated; Index. $4.75.

Writing in a breezy readable style, Colonel Whelen, who has been a student and user of hunting rifles for more than fifty years, presents a thorough development of his topic.

The first half of the book is devoted to matériel. Here the author covers elementary ballistics, basic designs, types and models, and ammunition, and goes into further detail regarding barrels and breech actions, stocks, iron sights, and telescope sights. This first part of the book concludes with chapters on custom-built rifles and cartridges, and on binoculars and other accessories.

The second part of the book is devoted to marksmanship and consists of some 200 pages of instructive comment and discussion written from the viewpoint of an author who knows beyond all question what he is talking about. The book contains many clear illustrations and is a fine job of printing and binding.

For Any Man Who Buys An Old Weapon

THE GUN COLLECTOR'S HANDBOOK OF VALUES. By Lieutenant Charles Edward Chapel, U. S. Marine Corps (Retired). San Leandro, California: Published by the Author, 1940. 220 Pages; 32 Plates. Cloth, $3.00; paper, $2.00.

Only a genuine collector of guns could review this book and do it justice. It does not, however, take a collector to see its real value.

The Gun Collector's Handbook of Values contains hundreds of accurate descriptions and illustrations of pistols, revolvers, and guns and shoulder arms of all types which have been produced in the United States. Each detailed description concludes with a statement of the author's estimate of the value of the weapon. The values given are for "good" and "fine" condition. The book also contains thirty-two excellent plates illustrating in halftone the

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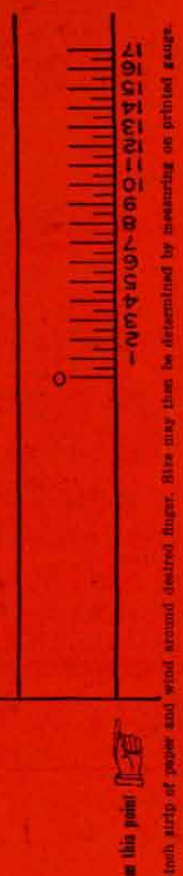

firearms described. There is also a chapter on personalities in the antique-arms trade and a bibliography of much interest.

Even to a reviewer—and for that matter to any other reader—who has no expert knowledge on old weapons, this book is full of fascinating material.

✓ ✓ ✓

A Readable Review of 1939

THE UNITED STATES IN WORLD AFFAIRS IN 1939. By Whitney H. Shepardson and William O. Scroggs. New York: Harper & Brothers, 1940. 404 Pages; Index. $3.00.

These authors tell the story of the part taken by the United States in world affairs during the year 1939 in a most readable fashion. Though what they have prepared is a serious reference book they have not, in their writing of it, stuck to the usual style of such works. They use plenty of color in their language and their book forms one of the easiest ways in which any reader could review the year.

The United States in World Affairs in 1939 also contains a carefully selected bibliography of several pages and about a hundred pages of appendixes containing the more important official documents of the year, and a summary of the trends in American public opinion during the year taken from the Gallup poll. There is also tabular matter and a chronology of important events affecting America's foreign relations during the year which covers some forty pages.

As events crowded rapidly upon us day after day during such a year as 1939, it was hardly possible to keep the situation of the world continuously in clear perspective. Messrs. Shepardson and Scroggs point out in their book, how, for example, the radio brought the tremendous events of Europe right into our living rooms whenever we wanted to "twist a round knob on a square box." With the news bursting upon us so fast and so frequently during each day, there is more reason than ever now for good yearbooks to be issued. This is a distinctive type of yearbook—one that you can sit back and read, not merely a dry recital of the facts of the year. *The United States in World Affairs in 1939* is a book to be recommended to anybody, who wants to find out whether what he remembers of last year is anywhere near what actually happened.

✓ ✓ ✓

Three Men

THREE PORTRAITS: HITLER, MUSSOLINI, STALIN. By Emil Ludwig. New York: Alliance Book Corporation, 1940. 127 Pages. $1.50.

In this small book Emil Ludwig, in his customary running style, gives us a colorful account of Hitler, Stalin, and Mussolini. His summary of the three dictators is well worth the time of any reader.

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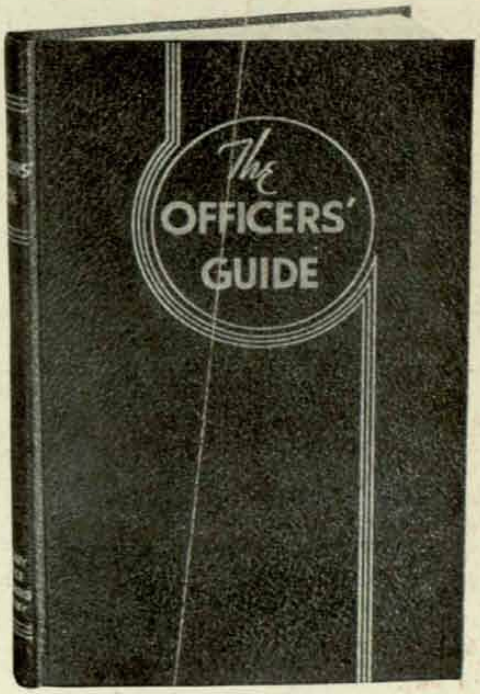

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