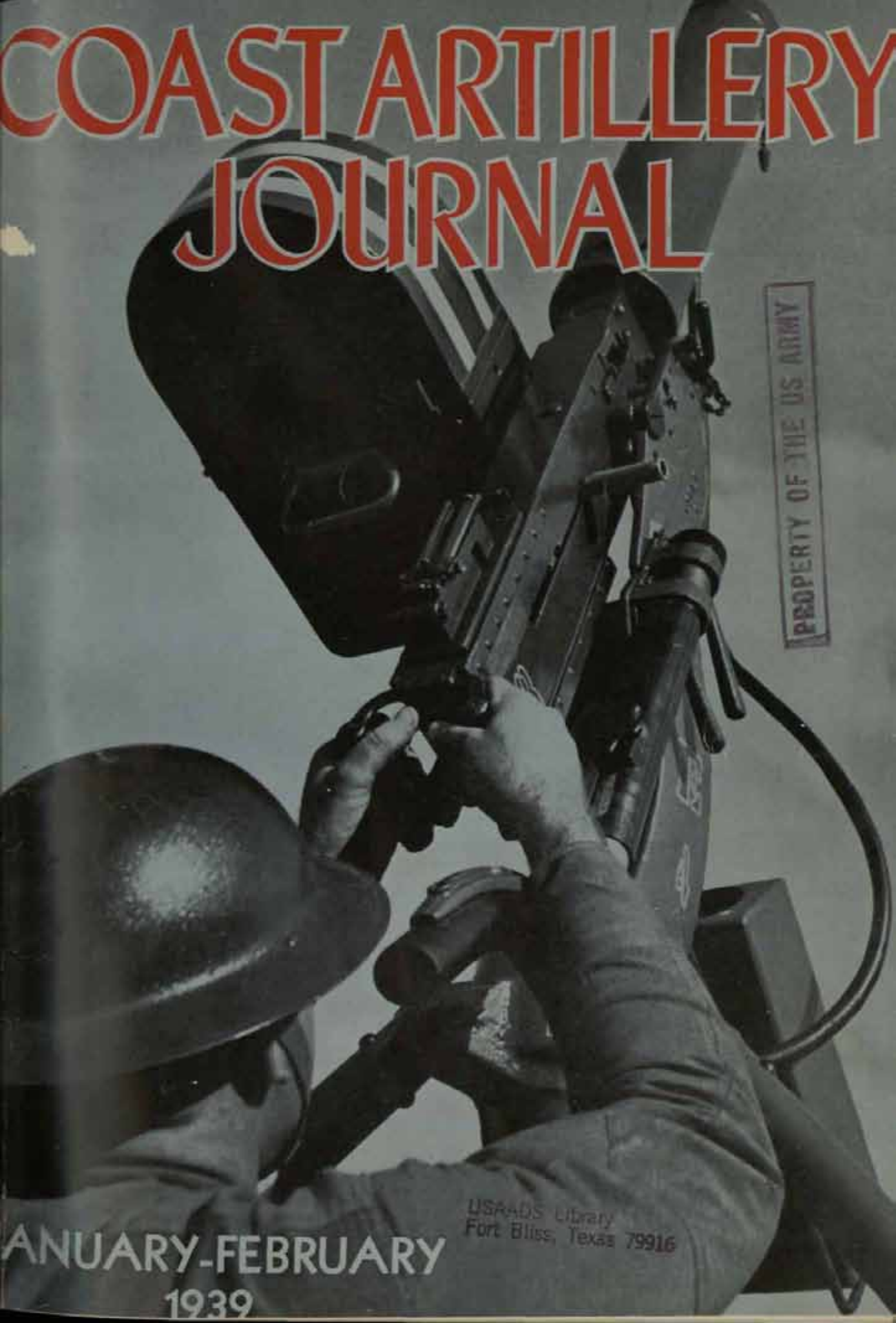
COAST ARTILLERY JOURNAL



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THE COAST ARTILLERY JOURNAL

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The Backbone of Sea Power

By MAJOR E. M. BENITEZ, Coast Artillery Corps

Bases are the indispensable foundation upon which the superstructure of naval offensive is raised.—MAHAN.

In June, 1938, President Roosevelt signed a bill authorizing the largest peacetime naval building program in American history. This measure adequately provides for the modernization and strengthening of the fighting forces at sea and will give the United States Navy the power to deter the enemy from our shores, thus minimizing the danger of aggression by a foreign country. The American Institute of Public Opinion completed a nation-wide survey in January of this year and the public showed its confidence and faith in the Navy, by approving the President's recommendations by the overwhelming majority of over three to one.

The Coast Artillery, after years of waiting, has been finally allotted a sum sufficient for the procurement of approximately 330 modern antiaircraft guns and other vital items of antiaircraft equipment, such as searchlights, sound locators, directors and heightfinders, without which modern antiaircraft artillery would be little more effective than the proverbial popgun.

For the sake of national security the authorization of the sum of $1,200,000,000 for the first line of defense, is a far-sighted measure, because in these days when violations of treaties are so frequent and nations wage war without any formal declaration, a strong and efficient navy is our greatest insurance and guarantee of peace.

If an appropriation commensurate with the naval building program had been made for the modernization and extension of the *defenses* of important harbors in the United States, the security of which are vital to the Navy and essential to the life of this nation, the program for the rejuvenation and strengthening of the American blue-water fleet would have been complete. The appropriation authorized for antiaircraft equipment was twenty-three million dollars, slightly less than two per cent of the

THE 1938 PRIZE ESSAY

amount authorized for the modernization of the Navy and is less than one-half the amount that experts consider necessary to provide enough antiaircraft equipment for immediate requirements upon mobilization. The United States antiaircraft coast defenses, considered the weakest link in the chain of national defense, are now provided with an antiaircraft equipment that is entirely inadequate to meet the most urgent needs for the protection of those bases and vital objectives without which, as it will be demonstrated in this study, the American Navy would forfeit its freedom of action and could thereby be prevented from accomplishing its mission. As Admiral Schofield has so clearly stated, "The Navy is keenly interested in the efficiency and adequacy of coastal fortifications. It knows that it can never pursue its proper rôle unless the important coastal cities are defended against an attack by way of the sea."[1]

Sea Power

Since the infancy of civilization sea commerce has largely controlled the economics and strength of nations. Sea trade and traffic bring wealth, profits and prosperity; but this advantage also subjects a nation to the envy of competitors who are apt to resort to discriminatory measures, and even to violence, to divert this trade to their own benefit. Thus, a strong and efficient armed force must be provided for defense against attack and has made it essential to protect sea commerce by means of *Sea Power*.

Communication by sea has always been easier and cheaper than by land. Water lanes have always been used extensively for the transport of commodities. Since the dawn of history, commercial routes have been subject to depredations, either by pirates or by rival countries.

The Island of Crete, one of the earliest sea powers, possessed a great naval and commercial fleet; but she lost her commanding position after the destruction of her naval forces in 1400 B.C. The military genius of Thutmose III, the first great general of history, made Egypt a world power. This great Pharaoh built a powerful navy, moved against the extraordinarily rich coastal cities of Phoenicia and subjugated them, thus making Egypt the world's first mistress of the seas. Rome gained command of the sea after the First Punic War, when she succeeded in placing a powerful fleet in the Mediterranean; and after the Third Punic War and the destruction of Carthage's naval forces, Rome had no rivals to dispute her sea supremacy, and became the supreme world power of that epoch. In modern times, England undoubtedly more than any other country, symbolizes the enduring example of sea power. A trading and colonizing nation, her commerce has been created, assisted and jealously guarded by a powerful fleet, and history shows that England has always resorted to war whenever her preëminence in world trade has been seriously threatened.

In order to provide adequate insurance for the protection of commerce and to guarantee the existence and continuance of the benefits that are derived from sea commerce, a nation must necessarily possess *Naval Power*.

Since, as so aptly expressed by Patrick Henry, "there is no better way of judging the future but by the past," a brief reference to the pages of history in order to determine to what extent naval power has influenced the growth of the United States is appropriate, because "History is the mighty Tower of Experience, which Time has built amid the endless fields of bygone ages."[2]

Naval Power

Before the Revolution, American seaport towns were villages, and naval establishments and military depots were unknown. The harbors of Boston, New York, Philadelphia and Charleston had been protected by a few insignificant earthen forts; at the outbreak of the Revolutionary War, the sparse population and long coast line enabled the mother country to use the ocean for her base, and to operate where she wished until the French appeared on the scene. However, a small work of palmetto-logs in Charleston harbor, under Colonel Moultrie, decisively repulsed the attack of a British fleet of two frigates and six sloops of war, in 1776, and thus taught the American people the value of fortifications. The battle lasted upward of ten hours and its result gave a local respite from the calamities of war for two and one-half years.

The successful outcome of the Revolutionary War can be attributed to a certain extent to the coöperation and assistance of the French Navy, which was strong enough to drive the British ships from the mouth of Chesapeake Bay in 1781, rendering the British General Cornwallis helpless, and forcing him to surrender at Yorktown.

After the Revolution, Congress disbanded the Navy and sold its ships. In 1812, this state of affairs further weakened by the policies of Jefferson, made possible the capture of the poorly defended Fort Washington, the advance on the Capital and the burning of the White House, the Treasury and other public buildings.

The Confederates lost the Civil War, largely because the Federal Navy established such a tight blockade that the exportation of cotton was curtailed to the extent that it could not provide enough money for the prosecution of the war. The capture of New Orleans and Mobile, while not as spectacular as Gettysburg or Sherman's march to the sea, were deadly blows that aided materially in strangling the Southern cause.

At the outbreak of the World War, Germany had a navy which in quality equalled that of any other nation. But, it was not large enough to take the offensive and, except for the undecided battle of Jutland, was forced to hide under the guns of Heligoland for the duration of the war. German commerce virtually disappeared and the navy, outside of its ruthless submarine warfare, accomplished practically nothing.

Napoleon's dreams of an invasion of England ended when Nelson destroyed the French and Spanish Fleets at Trafalgar in 1805. Like Napoleon, Germany had at the

[1] *Naval Strategy and Tactics with Special Reference to Seacoast Fortifications.*

[2] From the Introduction to the *Story of Mankind*, by Van Loon.

Figure 1

outbreak of the World War the most powerful and perfected military machine in the world; yet was not capable of fighting a victorious war. Had she possessed a navy strong enough to allow her to carry on more world commerce, the outcome of that great struggle might have been different.

On July 15, 1780, George Washington wrote to his friend Count de Rochambeau: "In any operation and, under all circumstances, a decisive naval superiority is considered as a fundamental principle, and the basis upon which every hope of success must ultimately depend."

Today, Germany and Italy, for example, have excellent air forces and well-oiled mechanized and motorized armies, but they lack supplies of raw materials and do not command a naval strength comparable to that of Great Britain and France.

Nations at war are in peril of being eventually starved into submission, regardless of their great military machines, if not properly supported by commerce.

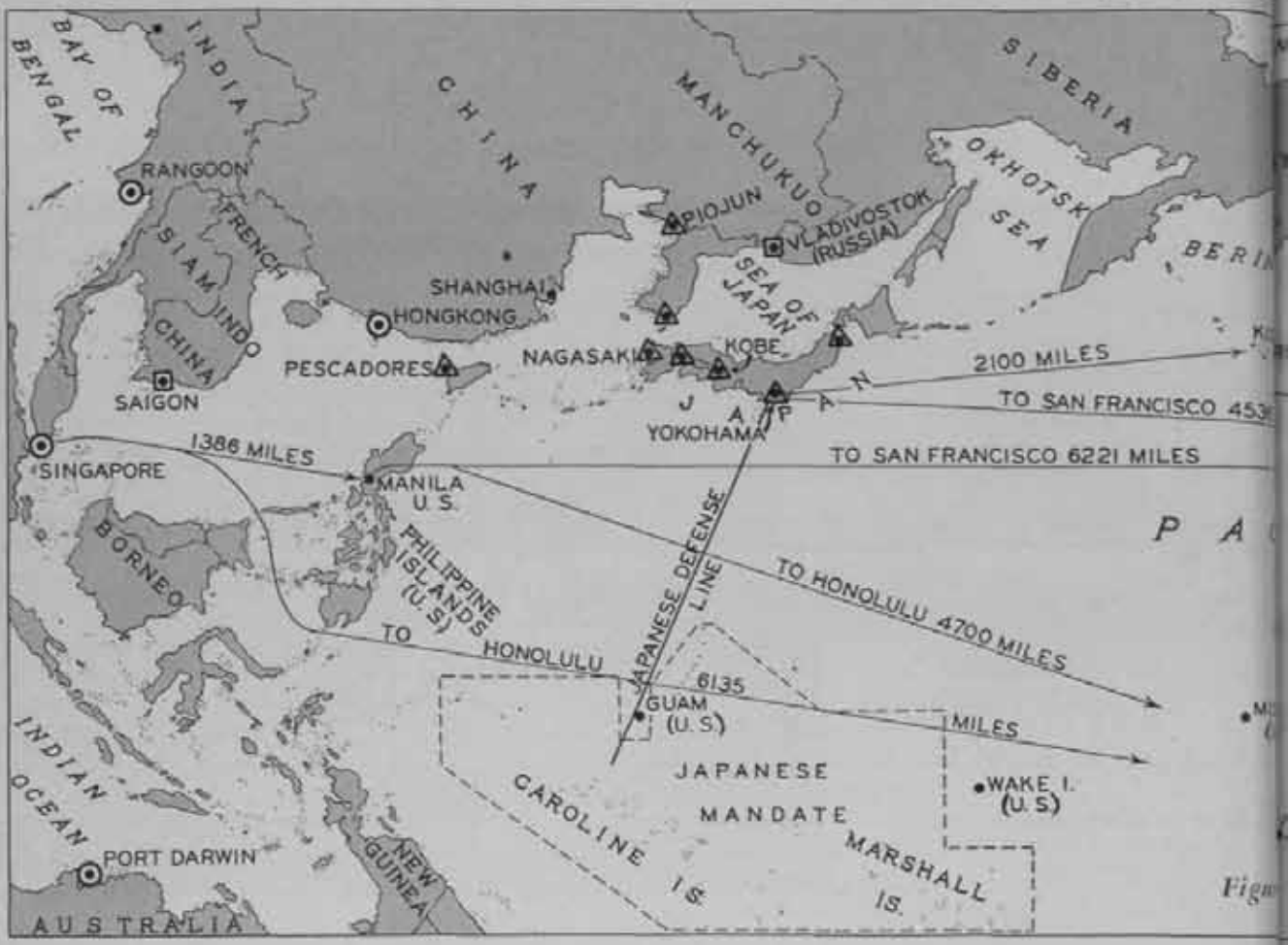
A strong and efficient navy, capable of bombarding and blockading the enemy's harbors, before the fight can be brought to our shores as the British did in 1812, must have mobility, because as Mahan wrote, "a fleet whether it be of the sea or of the air, is definitely leashed to its cruising radii or flying fields." This mobility, which constitutes the essence of naval action, is provided by suitable *Bases*.

Naval Bases

Mobility, in a naval sense, does not mean merely the ability to move, but also the capability of a naval force to steam to the theater of operations and function thereat without having to depend upon distant resources, nor to be compelled to detach units to guard its lines of communications. Modern navies, therefore, must have bases from which to be supplied with fuel, munitions and food and to which they may return for repairs and for general overhauling. In the light of history a navy is an organization that consists of three closely-welded vital elements: men, ships and bases.

A valuable base must be strategically situated, must be large enough to contain a large force of both warships and transports and must also contain the necessary facilities and resources to maintain the offensive energy of the fleet.

The British Empire covers one-fifth of the world's surface; there are altogether about 9,000 merchant ships to be protected by the Royal Navy over 85,000 square miles of ocean and in all parts of the world. The Empire is far-flung and, therefore, vulnerable. Realizing this weakness, Great Britain has spotted at such strategic points as Hong Kong, Singapore, Port Said, Gibraltar and others, bases for her fleet and she has thirty-one outlying stations, covering nearly every important sea lane on earth. For example, at the heart of the richest colonial area in the world stands Singapore, the great imperial fortress guard-



ing British colonial wealth in the Far East. Two drydocks capable of taking any ship in the world are available, essential repair facilities have been established, emergency landing fields constructed and unassailable defenses have been built at a cost of over $40,000,000. In short, within eight years, England has converted a vast area of jungle and swamp into one of the most powerful bases in the world. Singapore, today, serves warning to the world that Great Britain is ready to protect her interests in the Far East.

The British fortified bases and the British garrisons that hold them secure in the absence of the Fleet are considered an integral part of the Royal Navy. Nelson is instinctively associated with sea fights, but it should not be forgotten that he lost an arm seeking the capture of Tenerife and, later on, lost an eye at the siege of Calvi in Corsica, before finally losing his life at Trafalgar. The fleets of Nelson and Rodney were limited in range by the supplies they carried and the well-known axiom that there can be no blue-water navy without bases is still the controlling policy of Great Britain today.

The Balearic Islands (Figure 1), now dominated by Italy, have great strategic importance and cause considerable uneasiness in Europe at the present. They not only lie close to the British route to the Far East, but they also lie athwart the Mediterranean life-line between France and her North African possessions. French colonial forces must be ferried from Oran, in French Morocco, and from Algiers in Algeria, to Marseilles, across the Mediterranean, through the waters of the Balearics.

Bases have so influenced the naval policy in the Mediterranean, that Hector C. Bywater, recognized naval expert, advises the British Government to concentrate on the Cape route, believing that the Mediterranean will be too dangerous in case of war. A glance at the map (Figure 1), shows that Britain has no longer unchallenged control of that sea. British sea power is still dominant in Europe although the old saying "Britannia rules the waves," is not so certain today as it was years ago.

A chain is no stronger than its weakest link and a fleet is no more powerful than its bases. A base is, therefore, necessary to support offensive action. Its defenses, as illustrated by Singapore, must be so impregnable as to allow naval forces to proceed safely and quickly to sea to face and engage the enemy in battle.

In case of war waged against the United States one of the enemy's primary objectives will be the sea ports, the loss or destruction of which would not only throttle sea traffic, but also afford facilities for landing troops and supplies on the coast. These key establishments must be fortified and must be so securely defended, that the Navy will be free to move into whatever theater it may be required to fight and thereby obtain freedom of strategic movement.

Modernization and strengthening of the Navy sh

gests a similar procedure in connection with vital harbor defenses which rely in a large measure upon the guns of the Coast Artillery Corps for their security. With two coasts to defend, in spite of the facilities for rapid transit that the Panama Canal offers, it is doubtful whether this country will ever have a navy large enough for simultaneous offensive action on both oceans. Necessarily, it will mean offensive in the Pacific and defensive in the Atlantic, or vice-versa; and strong harbor defenses become more important than ever, so that the back yard can be kept closed while the defeat of the enemy is being accomplished at the front door. A fortified base is peaceful and harmless, except when sheltering a powerful fleet; it then becomes the catapult that launches an irresistible projectile and enables a powerful fleet not only to protect its own seacoasts, but to attack vigorously the commerce and exposed coasts of an enemy.

Naval Situation in the Pacific

The true situation in the Pacific is seriously misrepresented on the maps commonly seen which are drawn on the Mercator system. Figure 2 is a map taken from U. S. Coast and Geodetic Survey Chart 3080, 1921, constructed on the transverse polyconic projection, which gives as accurate a representation of the area as is possible on a flat surface. Some distortion is unavoidable on any flat map of so large an area; but this chart gives a much closer representation of the facts than any other available projection. This map gives a substantially correct picture of the actual relationships as they exist on the face of the globe, and brings out many points that are not ordinarily understood.

Instead of facing each other, Japan and the west coast of the United States lie very nearly end-to-end along the air-line or "great circle" route between Yokohama and San Francisco. Panama is nearly on the same line, some 3,000 miles straight beyond, which is to say, *behind* San Francisco. The great British naval base at Singapore, sometimes suggested as a possible base for American operations in the Far East, is about the same distance straight on beyond or behind Yokohama. Panama and Singapore are just about as far apart as is possible to be, for they are almost exactly opposite each other on the globe. For the United States to use Singapore as a base against Japan would be as logical as for the French to use Stockholm as a naval base of operations against Berlin. Should Japan attack Panama, she would be forced to make a long detour leaving on her own flank and rear the American bases at Pearl Harbor, San Diego and San Francisco. A Japanese base at Mazatlan, Mexico, would be closely flanked by American positions. On the other hand, Japan's own defensive line hangs like a curtain across American routes to Manila, China and Singapore. Running from Yokohama through the Bonin Islands to the Ladrones and the Carolines, this

line posseses great strength, particularly if equipped to base aircraft and Japan's ocean going submarines. Our situation in the Pacific can be better understood by a careful study of this map.

Security of Harbors

The principal sea ports of the United States have been so often considered secute against attacks from overseas that the American public is apt to overlook the fact that this enviable situation can exist only when the defenses are so impregnable that an enemy realizes the futility of ever attempting their capture. In the history of amphibious wars, right down to Dardanelles days, ships of the line have continually attacked forts. A review of the wars since the beginning of the present century presents a series of landing operations, including both successes and failures.

The Russo-Japanese War, 1904-1905, consisted of continued and successful landings by the Japanese and no less than four armies totalling a million men, were embarked and landed on the Korean Peninsula, to isolate Port Arthur and, finally, in Manchuria, for the decisive operations that culminated in the defeat of the Russian armies.

The Italo-Turkish War, 1911-1912, was also an overseas expedition. Landings were made at Tripoli, Tobruk, Derna and Bengasi, at the very beginning of the hostilities. In May, 1912, came the landing of Lequio's expeditionary corps at Sidi-Said and Ameglio's Corps on the Island of Rhodes, to be followed in June by the landing of Camerana's expeditionary corps at Du Scerfa which led to the occupation of Misurata.

The successful landing of the Spaniards under General Primo de Rivera, at Alhucemas on September 8, 1925, prefaced the capture of Malsumi Heights at the point of the bayonet against Abd-el-Krim's fierce warriors and made possible the advance of the Spanish cavalry upon Adjir. The victory at Alhucemas was a deadly blow to the Moorish chieftan and the fortunes of war never again smiled on him.

During the World War, although control of the sea was not complete, the Allies carried out several operations which included the British landings at Antwerp and Ostend, the Italian landings at Albania and Salonika and the landings on Gallipoli. The Germans, in turn, occupied the Baltic Islands. All these expeditions, although costly in men and matériel, were successful, with the exception of Gallipoli, which might also have been so, had the Allied Command not committed such a large number of serious blunders.

The Spanish Civil War and the Sino-Japanese War serve further to emphasize the continued importance of sea power. Superiority at sea has enabled Franco to transport thousands of men from Morocco and to bring in supplies from the outside world, also to establish a blockade of the Loyalist coast which has done much to give the Insurgents marked military advantages. In the Far East, Japan's absolute domination of the seas has enabled her, not only to invade China, but to send warships up China's rivers and to land troops at will along the Chinese coast. Without assured command of the sea, she could never have undertaken her big invasion of the Asiatic continent.

The great improvement of aircraft in recent years and the development of smoke screens may give some nations the assurance for greater success in naval attacks than in the past. The tests of war have exposed the futility of bombardment against strong fortifications; but, if it were known that these harbors were not bristling with guns, naval attacks would undoubtedly become common and ships would bombard harbors at short ranges with but little danger to themselves, as in the case of the Japanese attacks against the Woosung forts defending Shanghai, the Kiangyn forts defending Nanking and the Red Lion forts defending Kiukiang in the upper Yangtze. For harbor defenses to be effective, therefore, they must possess great power, the primary object of which is, as General Brind states, "to deter the enemy from attacking or bombarding the vulnerable points that it is designed to protect; in fact, to make the game not worth the candle."

Defense of Harbors

The specific mission of the Coast Artillery is to attack enemy vessels by artillery fire and submarine mines, and to attack enemy aircraft by artillery fire from the ground. To carry out this mission, Coast Artillery is organized into seacoast and antiaircraft artillery. The essential characteristic of the Coast Artillery is fire power, primarily against naval or air targets. Its principal weapons are:

The Cannon
The Antiaircraft Machine Gun
The Submarine Mine

"A harbor defense and landing attack," wrote Major General John L. Hines when Chief of Staff, "may be divided into three different phases, which will merge more or less rapidly one into the other. The first will be the long distance phase—the aircraft and submarine phase—during which the hostile fleet will be out of range from shore batteries; the second phase will be the naval attack; and the third phase will be the landing attempts and the land attacks."

Coast defense, as understood today, includes all tactical dispositions and operations having as their main objectives the effective meeting of any attack that may be made or attempted on a coast. The major elements that enter into coast defense are:

The Naval Forces
The Harbor Defenses
The Mobile Forces of the Army

In general, it may be stated that landing operations on a scale large enough to form the basis of an invasion will be made, first, within striking distance of a harbor where suitable facilities exist or can be improvised for unloading artillery, heavy materials and supplies. Secondly, there should also be communications leading from the landing place towards some vital area—either commercially or politically—of the invaded country. An enemy may ef-

fect a beach landing, but before a real invasion can be started, he must secure a harbor that will provide anchorage for his fleet and transports.

Strong reserves, motorized and mechanized, located at a suitable distance in rear of the seacoast, will prove invaluable. With the coöperation of the Navy, air force, radio service and shore patrols, it is possible today to locate the bulk of hostile troops and thus enable this highly mobile reserve of pronounced striking power to meet the enemy at any point that he may have selected for landing.

The defense of a coastal frontier is an army problem, which requires the closest coöperation of troops of all arms and services. The rôle of the Coast Artillery in this class of warfare is particularly important, furnishing a powerful support by its fire against naval vessels, a function which no other arm is capable of executing so effectively. But, the use of the combined arms in coast defense is beyond the scope of this study which will be limited to a discussion of the rôle of Coast Artillery within the harbor defenses, and the armament required for the defense of an important harbor which is essential to the fleet, or whose possession by an enemy might open the way to a hostile invasion.

The general mission of harbor defenses as given in the Coast Artillery *Field Manual* is "to protect our important coastal cities and naval bases against capture or damage by enemy warships, conserving them for use by our own forces and denying them as bases of operations for invading forces, and thus free our mobile land and sea forces for the performance of their true functions; and to provide security against naval attack to our merchant shipping when in home ports."

The defense of each locality presents a study in itself. In general, an important sea port well defended, implies:

1. The effective obstruction of all water approaches against the enemy, but leaving free entrance and exit for friendly vessels.
2. Gun fire protection for these obstructions.
3. Illumination of the zone of obstructions by night.
4. So heavy a fire of modern, high power, long range guns over all the approaches as to defy the most powerful fleet.
5. An effective antiaircraft defense of long range batteries and essential harbor defense installations.
6. Aircraft support.
7. Warning system.
8. Gas defense.
9. Naval coöperation, particularly torpedo boats, ready to sally out and carry the war to the enemy when favorable opportunity occurs. These ships will add powerfully to the defenses.

This requires an armament comprising fixed and mobile seacoast artillery, contact and controlled submarine mines, nets and other obstructions, mine casemates, fire control stations, fixed and mobile searchlights and fixed and mobile antiaircraft artillery with the necessary equipment.

The dispositions of coast fortifications are governed by the nature and shape of the harbor entrance and of the harbor itself, while their resistance to an attack by sea depends particularly upon the strength of its seacoast gun, underwater and antiaircraft defense. An adequately fortified harbor, therefore, requires guns of a range, equal at least, to that of the biggest gun afloat. Nelson's guns heaved shot at a distance of about a mile and a quarter, but naval ranges have increased considerably in recent years. For instance, at the battle of Tshushima in 1905, the range varied from 4,300 to 6,500 yards; at the battle of Coronel in 1914, the German squadron under von Spee, opened fire on the British at about 11,000 yards; in turn, the British under Admiral Sturdee, opened fire on the German squadron off the Falkland Islands, at 16,000 yards; the initial range of the Dogger Bank action in the North Sea on January 24, 1915, and at the battle of Jutland on May 31, 1916, was approximately 19,500 yards. It is reasonable to expect that future battles will be fought at still longer ranges.

This means that the defense of a well defended harbor must be built against a background of 16-inch guns. The fixed 16-inch seacoast gun hurls a 2,400-lb. projectile over twenty-five miles to the sea, one of the swiftest things that mankind has ever put in motion. Released at a pressure of 40,000 lbs. to the square inch, in a heat that can melt diamonds or boil carbon, the projectile travels through the air at a rate of twenty-seven miles per minute, so fast that no human eye can follow its flight, reaching the mark ahead of its sound. This long range cannon is equal to and probably superior to the heaviest ordnance now carried by the latest battleships, possessing an astounding accuracy that makes it more than capable of holding off an attack by sea and of covering the debouchment of friendly naval forces. The number of batteries of this type of weapon that will be required depends upon local conditions; but a vital harbor must possess, at least one battery that will constitute the backbone of the primary armament. This long range armament should be reinforced by 14-inch railway guns, 16-inch howitzers and 12-inch mortars to furnish the greatly desirable high angle fire, 12-inch barbette batteries and 8-inch railway guns, to be further augmented by mobile units, both railway and tractor, as circumstances may require. These mobile units, when attached to harbor defenses, become an integral part of the harbor defense organization and should be so grouped and emplaced as to support or supplement the fire of the fixed armament. Smaller caliber guns—6-inch and 155-mm. modified for fire against naval targets—possess considerable range and sufficient fire power making them effective weapons against transports and destroyers and are very valuable for the protection of mine fields. They are also capable of breaking up landing parties in small boats at ranges beyond the power of the field guns of other arms.

Submarine Mines

Controlled submarine mines constitute an effective passive means of defense and are essential in harbor defense.

They are used to close such portions of harbor entrances as lead to channels required for use of friendly naval forces and commercial shipping, or which include a debouching area required by the naval forces. They should be placed in such numbers that hostile ships cannot pass them in safety, and that the explosion of one shall not damage its neighbors nor render them inoperative. Controlled mines, being electrically controlled from shore, are the most perfect type and have the great advantage that they may be rendered harmless to friendly shipping or fired at will, while the contact mine[3], on the other hand, once planted is dangerous to friend and foe alike. Mines contain explosives capable of sending the largest ship to the bottom of the ocean in a few moments. Since the Civil War, the defense of harbors by means of submarine mines has received great attention and has been closely studied; today, every nation having a seacoast to defend has a well developed system.

As already stated, mine fields must be protected. Night operations offer the greatest possibilities of success against mines, due to the poorer visibility. Hence, searchlights properly emplaced are required for the illumination of the mine fields. Rapid fire batteries constitute the principal means of protection against sweeping and countermining, which the enemy must undertake before his ships can be brought in with any degree of safety. With the new equipment available, it is believed that sweeping operations will be extremely hazardous and it is doubtful whether they can even be conducted at all.

In nearly every case, the channels leading to good harbors and important establishments are sufficiently restricted in width to permit the effective use of mines. Narrow passages, like the Dardanelles, are particularly suitable for mine defense as demonstrated in the World War. The forts and mobile shore batteries made sweeping by day practically impossible, while night sweeping was too uncertain. The Allied Fleet made its grand attempt to force the Straight on March 18, 1915, but it was unsuccessful and was forced to withdraw after having sustained heavy losses. The battleships *Bouvet, Irresistible,* and *Ocean* were sunk by mines, while the *Inflexible* was seriously damaged. On the following day Admiral Guepratte sent the following telegram to the Commander of the French Navy: ". . . In short, in the intense artillery duel, the advantage would have gone to the Allied fleet, if the mines had not destroyed the equilibrium."

The necessity of an efficient submarine mine defense is fully appreciated by all nations. With the adoption of the single conductor system, characterized by efficiency and simplicity, it is believed that the United States submarine mine defense system is second to none in the world today.

Antiaircraft Artillery

Thirty-five years ago on a cold, wind-swept beach near Kitty Hawk, North Carolina, Orville Wright nosed his frail kite-like craft into the wind and made the first successful journey into the air. Six years later the Wright Brothers delivered to the United States Government the first military airplane and by 1910 almost every nation had taken the first steps in the development of military air forces. By 1914, military flying machines had been tested not only under peacetime conditions, but also in actual fighting at Tripoli, and in the Balkans.

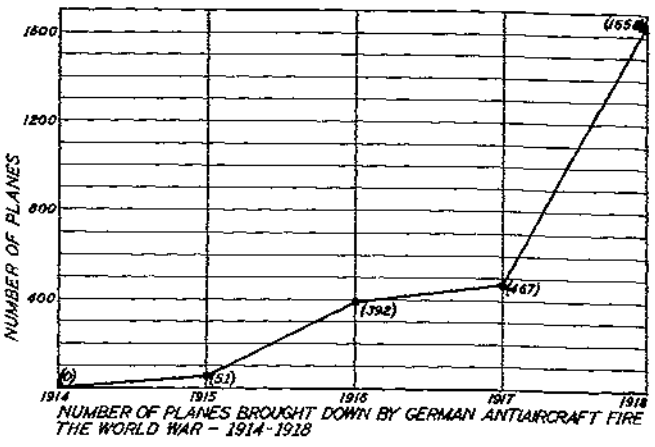


Figure 3

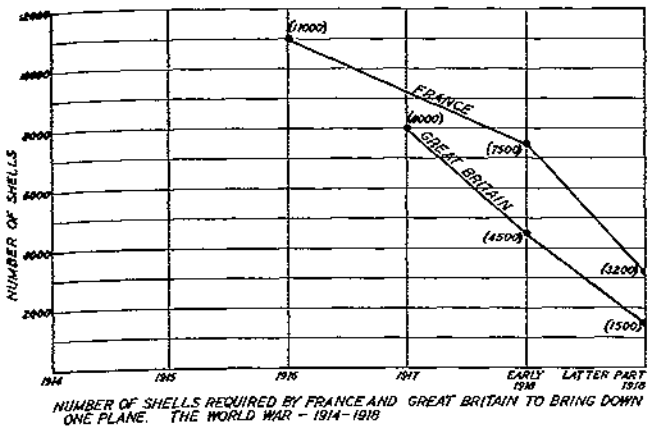
At the outbreak of the World War, the principal belligerents had an air force which, although mechanically imperfect, had already shown that aviation had great potentialities in war. As the war progressed, military craft and equipment were rapidly improved and air forces expanded to almost unbelievable proportions. For example, the United States Air Service increased from 1,200 men at the outbreak of the war to nearly 200,000 men at its end.

On the other hand, the World War caught these nations totally unprepared, in so far as antiaircraft *defense* was concerned. At the beginning of the War, the antiaircraft matériel used was very crude, practically all the equipment had been designed for other arms and adapted, through necessity, to antiaircraft artillery, for which it proved to be totally unsuitable. Fire control devices were very deficient and the rate of fire of the guns was so slow that targets were out of range before many rounds had been fired.

The increased military importance of aviation led to the development and perfection of antiaircraft artillery and brought a better understanding of the means and methods of employment. Improvements of weapons and expansion of antiaircraft defense were gradually made until by November, 1918, the number of antiaircraft guns had increased tremendously, while their efficiency also kept apace with the numbers. At the time of the Armistice, the ratio of the planes brought down by antiaircraft to the number destroyed by aircraft in the French, German, British and Italian Armies was one to four. It is interesting to note that in the present Spanish Civil War the situation has been reversed in favor of antiaircraft artillery.

It must be borne in mind that the effectiveness of antiaircraft artillery is measured by the degree to which it prevents or defeats hostile aerial activity directed at ground elements rather than by its destruction of aircraft. De-

[3]The Navy is responsible for the contact mine.



NUMBER OF SHELLS REQUIRED BY FRANCE AND GREAT BRITAIN TO BRING DOWN ONE PLANE. THE WORLD WAR – 1914–1918

Figure 4

terring an enemy from bombing an important objective, compelling him to change his course or to fly at such an altitude that reconnaissance and bombing operations are ineffective, are accomplishments of great worth.

After the World War, aviation continued its rapid improvement in tactics and technique with which antiaircraft artillery kept pace. Fire control systems were improved, new devices tested and observation instruments were perfected to match the rapid strides of aviation.

The wars in Spain and China are teaching military fliers the world over a new respect for antiaircraft fire from the ground. In Spain, a large number of planes have been brought down by fire from the ground and aviators have carefully abstained from coming close to vital areas defended by antiaircraft artillery. The very best antiaircraft guns are the Krupp weapons sent in with German crews and observers to watch them in action. These precision arms of European manufacture, are in the hands of Insurgent troops and this fact has accounted for the absence of news dispatches telling of Loyalist raids over cities held by Franco, while there have been innumerable Insurgent raids over Government targets. Dr. Helmut Klotz, formerly an officer in the German Navy, and now an observer with the Government forces with which he is in sympathy, writes in his book *Les Lecons Militaires de la Guerre Civile en Espagne:* "It is noted that Spanish experience shows that the number of planes shot down by antiaircraft artillery has been far larger than those destroyed in aerial combat, the reason being partly in the improvement in ground defense since the World War—although neither side in Spain is as well equipped as other European nations—and partly because the high speed of the modern plane has made aerial duels difficult." Reliable reports agree that plane casualties in Spain as a result of ground fire have been extremely heavy. In China, it is also reported that most of the Japanese air casualties have been as a result of antiaircraft fire.

In short, these two wars, which have been utilized by so-called neutral nations as a testing laboratory of modern equipment, have shown that "Archie" has kept in step with aviation, that antiaircraft artillery today is not the hit-and-miss weapon scorned and ridiculed by aviators during the early days of the World War, but a powerful and effective antidote to air attack.

The effectiveness of modern antiaircraft fire has been thus established. In addition to guns of medium calibers designed to fire at elevations of more than 2,200 yards, the Insurgents are using a 20-mm. (.8 inch) automatic gun of great mobility, firing 200 rounds per minute with an effective altitude of 2,000 yards. A battalion of three batteries of six guns each, can thus hurl into the air a barrage of 3,600 rounds per minute covering a space 300 yards wide. This antiaircraft artillery will be indispensable in the antiaircraft defense of a nation.

The characteristics, means and methods of antiaircraft artillery have undergone a fundamental change since the World War. Muzzle velocities and effective ranges have been almost doubled. In contrast with the improvised methods and crude instruments and devices of those days, antiaircraft artillery today is equipped with devices which provide the necessary speed, accuracy, volume, precision and maximum effectiveness. The future will probably see still further improvements in all these factors as well as in power and mobility.

Fixed fortifications, in general, are not as suitable heavy bombardment targets as airdromes, large supply and ammunition depots, naval bases and similar establishments. However, should the United States fleet be defeated or be compelled to take shelter in a fortified harbor under the protection of the shore defenses, those long range primary batteries then become a vital objective, because primarily it is the fire of their guns that holds aloof the battleships and thereby prevents the bottling up of the fleet and further damage by bombardment while undergoing repairs. It seems probable that under such circumstances a determined enemy will make an energetic effort to destroy or neutralize those long range batteries by air attack. Consequently, overhead protection—turrets or casemates—against fragmentation bombs and gas should be provided. It is also conceded that seacoast installations are excellent targets for attack aviation and low flying bombers. Antiaircraft guns and machine guns, with the necessary accessories, are therefore, essential in harbor defenses for the protection of those long range batteries and establishments against air attacks. The larger guns of Heligoland were emplaced in turrets and, in addition, antiaircraft protection was provided.

It is disclosing no national defense secret to state that at present the United States has developed splendid antiaircraft artillery weapons—the equal of any in the world. Army antiaircraft units of today are fully capable of accomplishing the expected protection, if equipped with the necessary modern matériel, namely, antiaircraft searchlights, sound locators, directors and height finders, without which the most modern guns would prove to be of little value. As a post of war development, we have the .50-caliber machine gun with a rate of fire of from 500 to 600 shots per minute; the 37-mm. full automatic high-powered gun, a heavy machine gun which fires a 1¼-lb. shell at a rate of over 100 shots per gun per minute; the

3-inch antiaircraft gun, and the somewhat heavier 105-mm. both of which have a vertical range equal to the maximum range at which airplanes are visible. In addition, there are modern height finders, sound locators, directors and other fire control devices which can do everything but think and have eliminated all guesswork. In short, it can be said, that an adequate number of these guns can stand off any air attack that comes within range. It would be desirable to have a gun somewhat heavier than the 3-inch, something like the German 88-mm. or the British 3.7-inch; but, American antiaircraft artillery matériel is excellent in quality, deficient in quantity.

In summary, a vital harbor defense includes fixed and mobile seacoast artillery, controlled submarine mine nets and other obstructions, and fixed and mobile antiaircraft artillery. The backbone of the fixed armament is the 16-inch seacoast gun around which the seacoast gun defense is built, supported by the 16-inch howitzer, the 14-inch railway gun, the 12-inch Barbette gun, 12-inch mortar and other guns of lesser caliber. The main rapid fire weapons are the 6-inch and the 155-mm. gun, modified for firing on moving targets. This armament should be reinforced by mobile units, depending upon strategical and tactical considerations; harbor defenses may also have infantry, field artillery or air corps organizations attached to provide local defense against attacks from land and sea, or to furnish information of approaching enemy vessels and to assist in fire control. Fast, light torpedo boats—the cavalry of the sea—hovering in swarms around strategic bases ready to aid in repelling the attack of a great battle fleet, will be very useful in coast defense as scout and combat vessels. Using the twin strategem of surprise and speed, "mosquito fleets" can readily make effective thrusts, especially at night, against ships lying at anchor or cruising unsuspectingly on the seas. Recent improvements in gasoline engines have given a new life to this type of vessel, which promises to be a most valuable adjunct to coast defense.

The Coast Artillery Weapons

Coast Artillery weapons are either reinforcements or extensions of well tried out ideas, which have shown their effectiveness in the mortal test of war and which justify the popular saying in the Corps, "if the target is under water, we turn it over to our submarine mines; if it is on the surface, our big guns know what to do with it, and if it is in the air our antiaircraft guns and machine guns will bring it down." The oldest weapons have proved their effectiveness throughout history, while the newest arm—the antiaircraft artillery—has shown in modern war on the battlefields of Spain that it can bring down the enemy and that, if available in sufficient quantities, it possesses that same deterrent power against air attacks that seacoast artillery possesses as regards naval action.

Naval vessels are built for action against each other, that is, for naval action rather than for combat against harbor defenses. The fire of the naval forces lacks the high angle gun that is strongly represented in coast artillery. The land gun with all the advantages of a steady platform, extensive fire control and communication system, protection, concealment and ample ammunition supply, has always had a decisive superiority over the gun afloat. Napoleon said, "a gun ashore is worth ten at sea," while Mahan writes, "ships are unequalled matched against forts," and history proves the great wisdom evoked by these two great masters. The words of that old rhyme still apply:

A single archer from a wall
A hundred foes forfends;
And so the military art
A fortress recommends.

After the battle of Jutland, the German Fleet returned to Heligoland, where it remained unmolested until the end of the war. Those coast defenses held at bay the powerful Allied fleet, regarded as the greatest armada ever assembled. Such defenses are as valuable today as they were twenty years ago. There is still no fleet afloat that can stand off and trade punches with modern harbor defenses with any hope of success.

From the standpoint of national defense, the United States needs a strong navy, a fleet possessing freedom of movement, capable of concentrating, seeking out and engaging the enemy in battle upon the high seas. It can do so only if our important harbors and naval bases are secure. As expressed by Major General Gulick, Chief of Coast Artillery in 1931, in an address at the graduation exercises of the Coast Artillery School, "as long as ships can carry guns and airplanes, an efficient system of harbor defenses, supplemented by mobile, railway and antiaircraft artillery will be essential." Or, as so accurately stated by President Taft in an address before the Naval War College in 1909, "for the protection of our coasts, we need fortifications not merely to protect the salient points of our possessions but we need them so that our Navy will be footloose."

On September 1, 1938, the Navy Department announced that a temporary Atlantic squadron consisting of fourteen ships of its newest warcraft—seven 10,000-ton light cruisers and seven destroyers—would be formed immediately. In case of a conflict in Atlantic waters, the strategic importance of Boston, Narragansett Bay, Long Island Sound and Chesapeake Bay, for example, is self evident. Any of these places, properly defended, would afford a safe refuge to the whole fleet and to commercial vessels and would also be a natural base for offensive operations.

The successful accomplishment of the mission of the Navy, which consists in the defense of our shores against foreign aggression, the guarding of American interests on the high seas and the enforcement of national policies, depend to a large extent upon the Coast Artillery, because "In naval warfare, coast defense is the defensive factor, the Navy the offensive."[4] Coast defense is, therefore, a measure of naval strength and well defended harbors are a vital asset to naval warfare. The Navy and outlying fortifica

[4]Mahan.

tions go hand in hand, and a potent fleet requires a strong, modern and efficient Coast Artillery to provide the defense nucleus of those important bases which constitute the *Backbone of Sea Power*, that element so essential to the safety, life, prosperity and happiness of the American people.

Conclusion

Are the harbor defenses of the United States adequate to support the new, modernized fleet? At present there are a very small number of modern antiaircraft guns available, and only four active regular army antiaircraft regiments and ten National Guard units, all at peace strength, the latter provided with machine guns only. The antiaircraft defense of London alone consists of hundreds of guns, machine guns, searchlights and balloons, with an effective force of a corps of 100,000 men, in addition to units of the Royal Air Force!

Manufacture of antiaircraft guns is now carried on only at Watervliet and Watertown Arsenal, both of these plants being Government owned and Government operated. In an emergency, a private plant would not be able to begin production of antiaircraft guns and equipment for probably a year or even longer; yet, it is generally conceded that in case of war the first big blows will come from the sky. This makes it necessary for antiaircraft defenses to have at least the personnel and equipment that will be needed on M-day. Moreover, nations are aware of the great resources and capabilities of this Republic and and if the emergency comes they will probably strike quickly to cripple the nation before it has had opportunity to make further preparations.

On September 12, 1938, the German seaplane *Nordstern* arrived at Port Washington, Long Island setting a new record of 13 hours 35 minutes for the 2,397-mile flight from the Azores. This plane has a cruising radius of 3,107 miles when catapulted from especially fitted mother ships. Commercial transport planes can be converted into powerful military craft. It is reasonable to suppose that within a few years New York, Washington and other American cities on the Atlantic seaboard will be vulnerable to attack by special long range bombers.

Antiaircraft equipment in this country, according to General Malin Craig, Chief of Staff, "is at present entirely inadequate to meet the most urgent needs for protection of vital objectives on or adjacent to our coasts." The Secretary of War in his latest annual message to the President, says, "We lack sufficient antiaircraft artillery to provide properly for the defense of vital areas. I hope that sufficient funds may be made available to permit the orderly procurement of sufficient modern equipment for all the antiaircraft regiments of the Regular Army and National Guard and for a sizeable reserve for emergency use. A good start has been made, but much more is needed in armament and other equipment to provide for the effective defense of our vital harbors."

It may be concluded, therefore, that unless further appropriations are voted in the very near future for the procurement of antiaircraft equipment and for the augmentation and modernization of harbor defenses in general, and action taken to provide the necessary personnel which will guarantee an effective defense for bases, a vulnerable point will exist in the new navy, which an alert enemy will not fail to detect.

Harbor defenses must be ready in the early days of the war, they must be manned by sufficient personnel, and the matériel, both antiaircraft and seacoast, must be as modern and as efficient as that of any other nation. Moreover, it is a wise expenditure that assures the effective employment of an armament whose power is unique among military weapons in that it is defensive and cannot possibly be used as a threat of aggression toward any other nation. Preparation is more than half the battle, "the readiness is all." In a major war, antiaircraft defenses may be engaged almost immediately at the opening of hostilities, and it would be very desirable to be ready, because using again the words of Napoleon, "An army should be every day, every night, every hour, ready to offer all the resistance of which it is capable."

The Navy continues to be the First Line of Defense, the sea will always remain the world's major highway, our maritime frontiers will continue to be critical frontiers and coast fortifications must ever be adequate, in order to insure the mobility of the fleet at sea and the static integrity of harbors and bases behind the fleet.

On July 14, 1938, President Roosevelt, speaking at Treasure Island, San Francisco, said that the fleet was "not merely a symbol, but a potent ever-ready fact." This implies that harbor defense should similarly be more than a mere symbol of preparedness; it should be a powerful national defense weapon, the *Backbone of the Fleet*. Let us not forget that in that battlefield of gigantic dimensions, "the Coast Artillery holds the Front Line, the Seacoast. No Man's Land is the Ocean washing our shores."

Admiral William D. Leahy, U. S. Navy

The Navy And the Coast Artillery

By Admiral William D. Leahy, Chief of Naval Operations

As interest in national defense quickens and defensive armaments are increased by the essential needs of the time, it becomes even more necessary that the closest cooperation be maintained by the Army and the Navy. Land force and sea force each has its allotted task in war, but one may envision many joint operations where complete cooperative effort is essential to victory.

Statesmen and diplomats are concerned with the national policies and the adequateness of the diplomatic machinery. But the size of the Army and the size of the Navy; the suitable arms for the Army and the types of ships for the Navy—with organization, equipment, and training—are matters that the armed services advise upon, recommend, and plan to coördinate. At no time in our peacetime history have military and naval matters been of such conspicuous prominence, and at no time has it been more important that the two services plan the problems of joint concern with meticulous attention.

The Navy of the United States must be maintained for two general reasons; one is the prevention of war; the other is to wage war efficiently so that, if forced upon us, war may be brought to a close as quickly as possible.

In order to wage war efficiently and because of the first line position of the Navy as far as our country is concerned, it must be prepared to operate on a moment's notice. Technical developments have so advanced in naval war that more expensive mechanical equipment is required than used by other arms. This equipment must be kept up to date because of the necessity for instant readiness.

Let us not forget the general principles that Clausewitz gave as the principal objects in war:

(a) To conquer and destroy the enemy's armed force.

(b) To get possession of the material elements of aggression, and of the other sources of existence of the hostile army [navy].

The Navy will give prompt attention to these two principles at the outbreak of hostilities. In a defense of the shores of this continent, it is assumed that the Navy will at the propitious time, take the offensive with a decision to contain or destroy the enemy's fleet. In such operations from our own shores or outlying possessions, the Coast Artillery will, in most situations, be in a position to render the Navy great assistance. Not only by virtue of position does the Coast Artillery protect and defend vital strategic

continental and island areas, but by antiaircraft defense, mine fields, and heavy ordnance it will provide a haven of refuge for the Fleet—a comparatively safe anchorage for supply, overhaul, and relaxation. The importance of the control of the air is also a major factor in the defense of any naval base.

When a fleet takes the offensive, the matter of the protection of distant bases becomes most vital. An adequate fleet will stand between the home shores and the enemy, but the distant base is a springboard for attack and penetration into enemy infested areas. At this point supply ships, tenders, and other auxiliaries will require maximum protection as the fleet operates at a distance from the advance base. The principal factors of such a base are position, resources, and strength.

Hawaii by virtue of geographic location commands a potentially important strategic position in any conflict in the Pacific, while Puerto Rico has that position in the Atlantic with reference to the Panama Canal and the southern United States. Both are capable of having resources and strength added to what they now have. In Hawaii at this time, the strength of the Coast Artillery combined with the available air detachments of the Army and Navy determines how secure the Islands are as a fleet base, and may determine to an incalculable degree the success of operations over large Pacific areas. It is well known that Corregidor has been a major consideration in every defense study of the Philippines.

The Fleet may make distant sweeps and even engage a major portion of the enemy at a great distance from its base, but it will eventually have to rendezvous where supply, overhaul, and fueling, may be secured. The German base at Tsingtau held out for more than two months in 1914 without any help from sea forces. This may possibly happen to some of our most important strategic locations.

Air strength will figure conspicuously in any defense of an advanced base. With variations, because of the new air arm, the old principle that the great military engineer, Marshal Vauban, applied to the building of fortifications holds good today—the center of resistance must be removed from the citadel itself to the outer defenses. Air now takes an essential part in the outer defenses. But even if our air defense should fail, a modern base must be so protected by antiaircraft guns and heavy ordnance that it can stand for a reasonable time an attack in force from surface vessels and bombing planes. *A navy cannot keep the sea for an indefinite time. It must return sometime to a protected base.*

The modern shore ordnance, and its protection from aircraft should be able to hold a base for some time, even should command of the air be unfortunately lost.

These few observations are contributed mainly to emphasize the interdependence of the Army and Navy in a possible phase of the defense of a nation. War cannot be over-simplified or fought with a set of dogmatic rules, because most situations are difficult to gauge and they swiftly change. Yet we do know that an intelligent understanding by both services of the general problems that confront each service; strict attention to the lessons of the past; the preparation of joint plans that envision every conceivable situation—if all these things are done, then we may be reasonably assured of success in any or all interrelated operations. Our strength lies in an enlightened understanding of the common task.

The complete coöperation of the two national defense Services which exist at the present time promises continued improvement in both common understanding and in our combined efficiency.

Heavy Cruisers in Close Formation

BLACKOUT

By
Lieutenant Milan G. Weber
Coast Artillery Corps

In dealing with the problem of blacking out cities to defend them from air raids, we are concerned not only as soldiers but also as citizens. The passive defense—which informed military opinion holds to be a sound measure—while primarily the problem of the civilian, needs military organization and instruction. Therefore, it is the soldier's duty to take the lead in training his fellow countrymen to cope with the menace from the skies.

It is vitally necessary to blackout cities or towns within an area where an air attack is likely to come. From the air above a city in darkness, it is far more difficult to locate vital industrial establishments, railroad facilities, power plants, waterworks, and like targets. Random bombing may still be possible, but during a blackout the bombing of predetermined vital points is largely a hit-or-miss affair.

Even the most skilled air navigator must check his charted course by locating occasional known points. Just how large a target area he can reach by dead reckoning alone and bomb effectively is not known for all cases. This problem of size-of-target-to-be-located *vs.* distance-flown-by-dead-reckoning depends upon weather, the skill and training of the individual navigator, the accuracy of his instruments, and other variable factors.

To check his charted course the navigator usually makes observations on celestial bodies, cities, towns, railroads, or waterways. As a general rule, a celestial "fix," because the limited size of charts used in airplanes, is accurate to about five miles. For long flights this fair degree of accuracy is valuable, but for actually locating the target at the end of the flight additional information is needed. Cities, towns, railroads, or waterways must be spotted from the air. But blackout the cities and towns and many of these checkpoints are definitely wiped out. Thus, blacking out holds a definite place in the scheme of national defense.

But there is another good reason. It is a well-known fact that bombardment aviation, once started on a mission, never lands with a bomb load. The danger in such landings is all too apparent. So, if the bomber is unable to find his assigned target he will drop his bombs somewhere before returning to his base. A most likely place for this is the area he sees that displays the most lights. Hence, in time of war it behooves every city or town to blackout as dead black as the next.

Blackout tests are common enough to the harassed residents of Europe's cities, but in our country we have seen but two. The first furnished an evening's sport to a relatively small community on Long Island last year. This article deals with the other—the large-scale tests that took place in North Carolina last October.

Let us turn back to a few weeks before the antiaircraft artillery and the Air Corps met for their first extended joint exercises. By the closing weeks of September, an aircraft warning service was completely organized, and each civilian county chief had his observation posts established in the eight-mile squares within his county. A warning net[1] serves two purposes—one military and one civil. The military reason for a warning service is, of course, to get timely notice of approaching enemy aircraft so that our own pursuit aviation may have enough information—and time—to intercept the bombers. The other reason is to give maximum protection to the civilian communities in the area. A plan for notifying towns and cities of a blackout would be in itself a plan for spreading a warning of enemy aerial activity, both day and night. Since plans for using the warning net for the information

[1] *Warning net:* An intelligence service manned mainly by citizens who report the presence of aircraft to a higher echelon. The work of the citizens is sometimes supplemented by military listening posts equipped with sound locators.

of friendly pursuit aviation had already been worked out, both basic functions of the aircraft warning service were tested to a somewhat limited extent in North Carolina. The primary purpose of the North Carolina blackout, however, was to determine the problems involved in darkening an extensive area through voluntary cooperation from citizens under procedures adapted to American conditions and institutions.

A large-scale blackout, moreover, would give the Black air force an opportunity to test itself under wartime conditions. True, the Air Corps had already demonstrated that it could locate the liner *Rex* several hundred miles at sea. But locating a cleared field a mile and a half square in the middle of a darkened area is a lot harder than finding a single, large, contrasting spot in a vast area of blue sea. In other words, airplanes could be some miles off of their course and still spot the *Rex*. Not so with a dead-black target in the center of a sea of blackness.

Furthermore, the exercises gave an opportunity to educate the citizenry in their part in modern warfare. Creating an interest in warning nets and blackouts directed the public mind toward the entire subject of passive defense.

Planning for the blackout did not begin until the aircraft warning net had been completely organized. Hence we had the advantage not only of the interest already aroused in the area but also of being able to use the warning net organization for effecting the blackout.

On September 26 the defense commander called a meeting of county chiefs of the counties located within a fifty-mile radius of Fort Bragg. At this meeting the blackout problem was explained. The county chiefs were enthusiastic, and were unanimous in the belief that all cities and towns within

The residents of a darkened village listen for bombers overhead.

A police sergeant continues routine entries by candlelight.

their counties could be blacked out, and made many valuable suggestions.

After this meeting, as word of the proposed blackout spread, county chiefs outside the fifty-mile radius heard about the plan. They asked, and in some cases insisted, that they be allowed to experiment in their own communities. As a result the blackout was extended to include all cities and towns within the aircraft warning-net area, roughly to a line about forty miles from the Atlantic. It was not believed that timely warning of the approach of aircraft could be obtained outside of this area without adding a naval patrol.

Cities and towns along the border of the warning net area were not blacked out, in order to insure that the Black force would confine its operations to the required area.

A letter to the county chiefs crystallized the informal instructions and suggestions made earlier at the conference. This letter also went to all mayors or other officials who requested it. It turned out to be a popular piece of literature. There were many requests for additional copies.

Members of the defense staff travelled over the whole blackout area interviewing the county chiefs and local officials working on the project. As in the organization of the warning service, personal contact paid dividends for it was found that many civilians—just like Army officers—do not read form letters, but will work hard and enthusiastically after a personal interview.

The county chiefs were asked to give the defense commander the name and telephone number of the person in each town who would get the necessary action started to effect the blackout of his town. The telephone companies were then notified of these names and telephone numbers.

Radio and telephone were the two means used to notify the various communities of the hour of the blackout when the time came. The general blackout signal was transmitted by long-distance telephone direct to Station WPTF in Raleigh. This station immediately interrupted its regular program and announced, "Message from defense commander: *Blackout immediately*."

Radio station WFTC at Kinston was notified by the blackout chief at that place. This chief had been warned by telephone in accordance with the telephone-notification plan described in the following paragraphs.

The Carolina Telephone & Telegraph Company took the lead in coördinating the various independent telephone companies involved in notifying blackout chiefs. The plan of telephone notification was as follows: The defense commander sent the blackout signal by teletype to the three zone message centers located at Fayetteville, Wilson, and New Bern, and to the pursuit airdrome at Knollwood Field near Southern Pines. Each center had certain local telephone calls to make, including one to the chief operator in its own city. Chief operators then notified other points. The entire plan of telephone notification is shown on the accompanying schematic diagram. Other towns which blacked out, not shown on the diagram, depended solely upon the radio for notification.

In getting the plan under way, each county chief first got in contact with the mayor or city manager and the leading citizens of each town in his county. Since a blackout depends entirely on coöperative action, the good will of all was necessary. He obtained the mayor's consent to pull the switches to turn off all street and other city-controlled lights. In many towns the mayors issued proclamations calling on all agencies, such as police and fire departments, to take special assisting and precautionary measures during the blackout, and requesting the coöperation of all members of the community.

The county chiefs then got in touch with merchants, factory owners, and other business men in order to get their coöperation. They made these contacts at meetings of Chambers of Commerce, Rotary, Lions, Kiwanis, and other civic clubs, and of merchants' associations and similar organizations. Merchants, restaurant owners, filling-station proprietors, and other business men were asked to turn off all lights showing on the street. Factory owners voluntarily turned off all lights near the windows of their plants. In some cases they shut down their plants completely during the emergency period.

Motorists travelling the city streets were requested to pull up to the side and turn off their lights while the blackout was in effect. Householders were asked to pull down their shades, close blinds or shutters, close outer doors, and extinguish porch and other lights visible from the street.

One of the blackout cities, Goldsboro, asked for and received the coöperation of passenger trains coming into the city during the period of blackness. Shades on the trains were drawn while they were in the city.

The defense commander discouraged pulling the main switches of a city or town to turn out all lights simultaneously. There were several reasons for this. First of all the blackout effort was entirely coöperative—there was no "ordering" of anything or anybody. The defense commander wanted to determine how well the citizens would work together in a passive defense measure of this kind. Pulling main switches would defeat this end. According to newspaper reports, a glaring example of failure to get such coöperation recently happened in a small town in Denmark. Before a proposed blackout during antiaircraft maneuvers, business men grumbled, and pacifists bought fireworks to discharge during the blackout. But in North Carolina nothing of this sort happened. The people themselves accomplished all that was done.

Moreover, it would not be wise from a technical standpoint to pull the main switches. It would unnecessarily interrupt many of a city's essential activities. When lights are individually controlled operations can continue in hospitals, elevators can run in public buildings, refrigeration units can be kept cold, and all necessary engines and generators can be kept running.

Each city and town had its own local system of notifying the people. Usually the fire siren blew a predetermined number of blasts. Other signals included ringing church

The heart of the world's largest city by daylight. With the city in darkness it would be quite difficult for bombers to locate vital installations.

bells, blowing factory whistles, and flickering electric lights. In one case, a fox call was sounded.

Most of the darkened cities also had an efficient system of checking to insure that instructions were being followed. This included a patrol of all streets by Boy Scouts and similar organizations. Usually, too, official local observers were stationed at the highest point overlooking the town. Any resident or business proprietor whose lights were visible was immediately notified by telephone or courier.

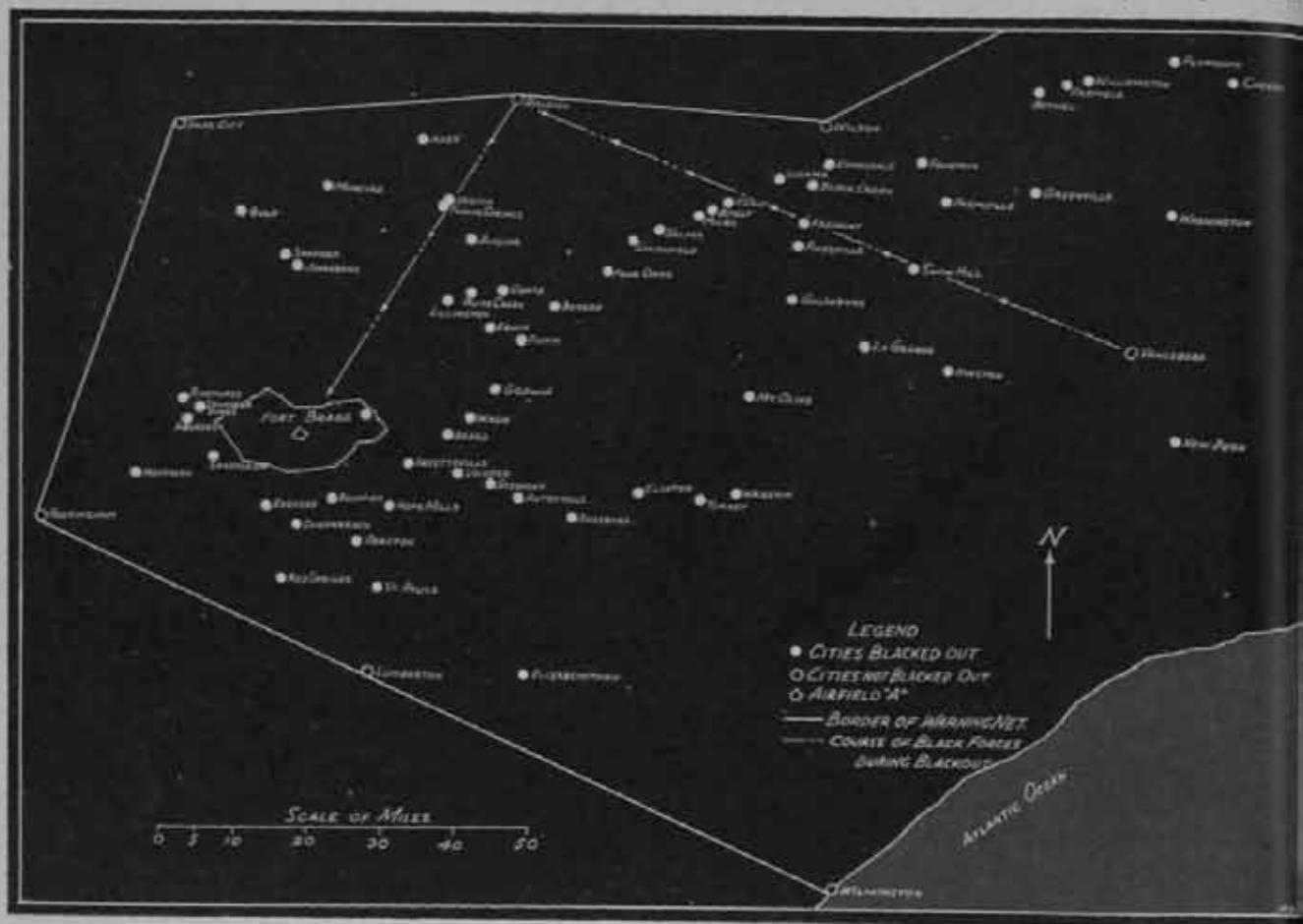
Newspaper publicity was withheld until October 10, three days before the blackout. From then on publicity material was generally released to reach the headlines on the day of the blackout. County chiefs usually arranged for publicity with local newspapers. Specific instructions, as well as the local signals, were covered in these articles.

Newspapers read by some 750,000 people carried definite instructions for the blackout. Many papers ran editorials and feature stories coveting additional phases of passive defense. Besides this, of course, the blackout made the front page throughout the nation. The war scare in Europe was doubtless a big aid to interest.

An especially important method of insuring that the whole populace was acquainted with the instructions was the notification of all school children. There are many people in small towns who do not take—or who do not read closely—their local newspaper. School children in graded and high schools, in colored schools and white, were urged to pass the word around. The interest and enthusiasm on the part of these youngsters helped the blackout surprisingly.

We were fortunate in dealing with the radio stations in the area. One station, WPTF in Raleigh, was heard throughout practically the entire area. This station, supplemented by WFTC in Kinston, reached more than ninety-five per cent of the radio listeners. Both stations helped greatly by broadcasting advance publicity and by interrupting their regular programs to give the signal upon notification by the defense commander.

Some cities called attention to the blackout in printed handbills placed in store windows and distributed from door to door on the day of the blackout. Various patriotic



The Blackout Area

citizens and organizations paid for both printing and distribution.

One purpose of the operation was to determine how well the American people would voluntarily coöperate in testing out a passive defense measure in peacetime. The measure of success achieved is attested by the fact that sixty-six cities and towns blacked out—all of them by voluntary coöperation, none by coercion.

Moreover, when it is realized that the blackout took place during the height of the tobacco season and in the midst of the cotton ginning time as well, the sacrifices that must have been made by the people are plain. Anyone who has ever passed a tobacco warehouse at seven o'clock at night during the selling season knows that at this time the warehouse is a beehive of activity. On this activity thousands of people depend for livelihood. Yet all tobacco warehouses in the blackout cities were promptly darkened.

Cotton ginning plants run twenty-four hours a day and an enormous amount of machinery turns over during one of those hours. Merely to stop and start the machinery runs into considerable expense, not to mention paying employees while idle. But most of these plants shut down during the blackout.

Furthermore, the time set for the blackout—7:00 to 7:45 PM—is the height of all activity on the "Broadways" of towns and cities. Restaurants, cafés, and theaters are doing their peak business. People are milling through the streets. For the benefit of window-shoppers all stor windows are ablaze with light. The North Carolin crowds were larger than normal because of the tobacc buyers and sellers who had come to town for the tobacc auctions on the morrow.

Under such conditions blacking out meant more tha minor personal inconveniences. It meant giving up th most valuable hour of a day's trade at a most profitabl time of the year. This in many cases, meant the loss o hard-earned money by those who could ill afford it. Th evidence of such public spirit in sixty-six cities and town is proof that the American way definitely challenges tha "isms" of other countries.

On the day of the blackout, the weather was unfavor able enough to make it dangerous for the Black force t operate from its Langley Field base. It seemed probabl that it would be necessary to call the blackout off. Th commanders of both the Black and the Blue forces wer most anxious to proceed, however, and it was decided t minimize the chances of danger by moving the Black forc that afternoon to Pope Field at Fort Bragg, and have t operate from there instead of from the normal and more distant base at Langley Field. Arrangements were also made to return with the minimum of delay to Langley Field before the weather conditions became even more unfavorable.

The "enemy" airplanes took off from Pope Field, and

flew eastward as far as Vanceboro, a distance of some 110 miles. At about the time of their arrival at Vanceboro, the blackout signal was flashed to all concerned. The bombers turned and flew not toward the target, but towards Raleigh, a large city some ninety miles distant which was not blacked out because it was on the border of the maneuver area. From Raleigh the bombers headed toward the target less than fifty miles away.

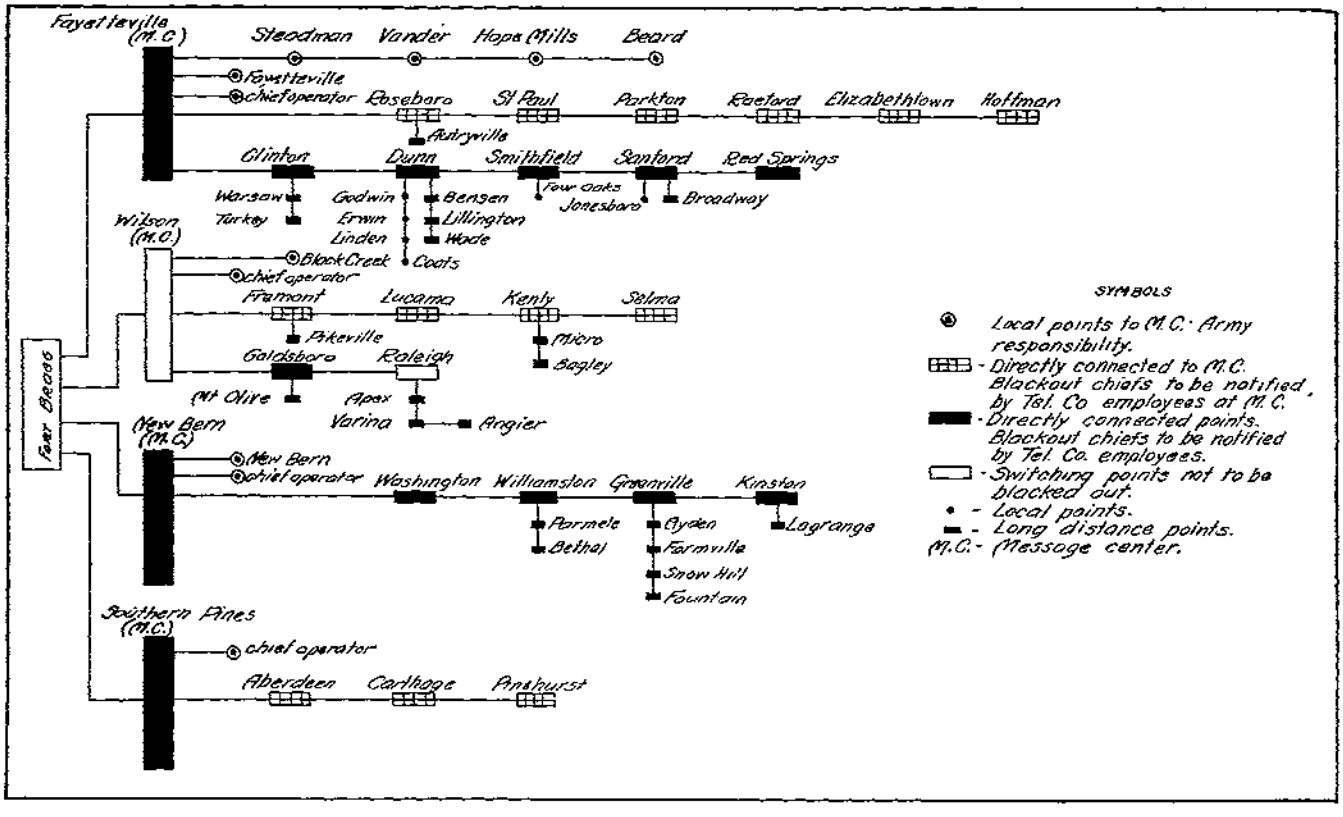
It is not known yet if the experience gained enabled the "enemy" to determine whether or not definite vital points in darkened towns or cities can be located or identified. All observers say that with a few minor exceptions the blacked out towns were *black*. Certainly the targets would not be easy to bomb accurately. Whether vital establishments such as waterworks, railroad yards, and power plants, could have been bombed with any greater accuracy than that obtained by random bombing is a moot question.

Aside from city or town visibility, air observers reported that traffic on roads was seen from the air. This was more or less expected by defense headquarters since no attempt had been made to curtail or darken traffic. The restrictions on automobile traffic in general was limited to urging automobile drivers to blackout as they came into a town. One defect in this procedure may be mentioned. When several roads marked by automobile lights suddenly end in blackness, a town is evidently located in the vicinity. The blackness was conspicuous in itself as the focal point of several roads.

Although it is doubtful that the limited traffic on North Carolina roads (with the exception of through highways) would be sufficient to enable navigators to chart courses in darkness, this difficulty nevertheless must be studied. There are several solutions which come to mind. The automobile radio is certainly a medium for notifying tourists on the road. On receipt of the signal, the motorist could pull to the side of the road and turn off his lights. This method would probably require patrolling the highways to insure compliance. Another possibility is to notify key citizens along all main routes. These men—farmers, filling-station attendants, or other residents—upon being warned, could stop traffic in their localities and ask motorists to comply with blackout instructions.

Both solutions call for stopping traffic. This might not be feasible, perhaps, especially in the more thickly populated sections. In these parts traffic could be detoured to little-known country roads to confuse the enemy airmen. Experiments should also be made in the use of slotted,

While searchlights scour the sky, flares released by bombers float slowly to earth.



Plan of Telephone Communication

canvas, or other similar covers for automobile headlights to hide the lights from the air. It is understood that in certain European countries motorists must carry such covers.

Air observers also reported that some of the cities and towns could be spotted simply by the dearth of lights. In other words, rural areas not blacked out presented an irregular pattern of occasional scattered lights, whereas the towns were totally black and presented no pattern at all. This may seem strange. But with the efficient system of checking up on stray lights that many of the towns had, there is no doubt that many of them were blacker than the country round about. Whether the answer here lies in blacking out the rural districts or in deliberately allowing a few lights to remain on in the towns is debatable.

All cities and towns were notified by telephone within two minutes after the defense commander gave the signal, "*Blackout immediately.*" Radio broadcast, of course, was heard instantly. Owing to the limitations which will necessarily be placed on commercial broadcasting in time of war and to the comparative ease of interference by powerful enemy stations operating on the same frequency, it is believed that no plan for a blackout should dispense with telephone notification.

The average time for effectively blacking out a city or town was from two to ten minutes, depending upon its size. This time includes that used in checking on stray lights. The time would probably be considerably reduced by practice.

In the preliminary study of the blackout, thought was directed to blacking out certain towns near Fort Bragg and keeping other towns lighted up in order to set a pattern before the aviator similar to that he would ordinarily see, but actually set off a number of miles in order to throw him off his course. This idea was finally discarded for several reasons. It was believed that in wartime, cities or towns would hesitate to keep their lights on at all when an air raid was imminent because of the danger of getting the bombs if the enemy couldn't find its assigned target. Furthermore, the pattern of cities and towns near Fort Bragg did not lend itself readily to such a plan. Besides, since a large-scale blackout had never been attempted in this country, it was felt that the simplest plan was the best one.

In order to further simplify the procedure as much as possible, all cities and towns were blacked out simultaneously. This would probably not be the general case in time of war. Then, our coastal frontiers will probably be divided into districts depending upon the distance from the sea and their position in a north-and-south line. Within such divisions, the defense commander need blackout only those districts over which the enemy planes are flown. All other districts could maintain normal activity.

It has been definitely proved that the American people are interested in the defense of their homes. It remains for us, both as soldiers and citizens, to maintain that interest. Modern war seems to have reached a stage in which attacks on industry and the adjacent civilian population are the rule rather than the exception. Passive defense measures are therefore necessary. Army officers of all branches will probably be called upon, at least in the early stages of a war, to guide their fellow countrymen in these measures.

PALESTINE

SOME ASPECTS of the MILITARY PROBLEM

By Major William Yale, Military Intelligence Reserve

The roots and causes of current events in Palestine, which have created a condition that borders on anarchy and has forced the introduction of martial law, lie in the conflicting nationalistic hopes, desires, aims and purposes of the Arab and the Jew. Although Jewish nationalism began to take political form in the Zionist Movement in the last decade of the nineteenth century, Arab Nationalism only began to manifest itself politically after the Turkish Revolution of 1908. However, it had little effect upon the Palestinian Arabs before the World War, for they did not begin to develop an active nationalistic movement until 1919. Then the Arabs became conscious of the significance to them of the partition of the Arab lands by the Paris Peace Conference and of the import of the Balfour declaration concerning the establishment of a national home for the Jewish people in Palestine.

These two nationalistic movements are not confined to Palestine, they are neither local nor parochial; they are international in scope. Because of widespread dispersion of the Jewish people in every part of the world, Zionism is a world-wide phenomenon inextricably bound up with international politics. Because the vast majority of the Arabs live beyond the boundaries of Palestine, Arab nationalism also has wide ramifications that are manifest in all Arab-speaking regions: Transjordania, Syria, the Iraq, Arabia, and even in Egypt and North Africa. Furthermore, because a large percentage of the Arabs are Moslems, the struggle of Palestinian Arabs has significant repercussions throughout the far more extensive world of Islam. The conflict between Jew and Arab over Palestine has precipitated a situation which taxes the imperial genius of British statesmanship and places an extremely delicate and arduous task upon the British military leader.

This article will not discuss the complicated cultural, racial, religious, political and economic factors of this problem; nor will it express any judgment in regard to the rights of either Jew or Arab or the justice of either cause. Its sole aim is to present some of the factors which enter into the military problems of maintaining law and order in Palestine.

No understanding of the task thrust upon the British Army is possible without a knowledge of the unique geographical and climatic conditions in the Holy Land. Palestine is a small country, about the size of New Hampshire—90 miles wide by 120 miles long. Maintaining law and order in so small an area would superficially, appear to be reasonably easy for a modern military force of 25,000 men, aided and supported by a comparatively efficient police force. And such would be the case were it not for the singular topography of Palestine.

From Gaza in the south to Mount Carmel in the north stretches a fairly level coastal plain with no significant rivers to impede transport. This maritime plain, whose southern portion is known as Philistia, and its northern, the Plain of Sharon, is not over fifteen miles wide at its greatest width, averaging perhaps not more than ten miles

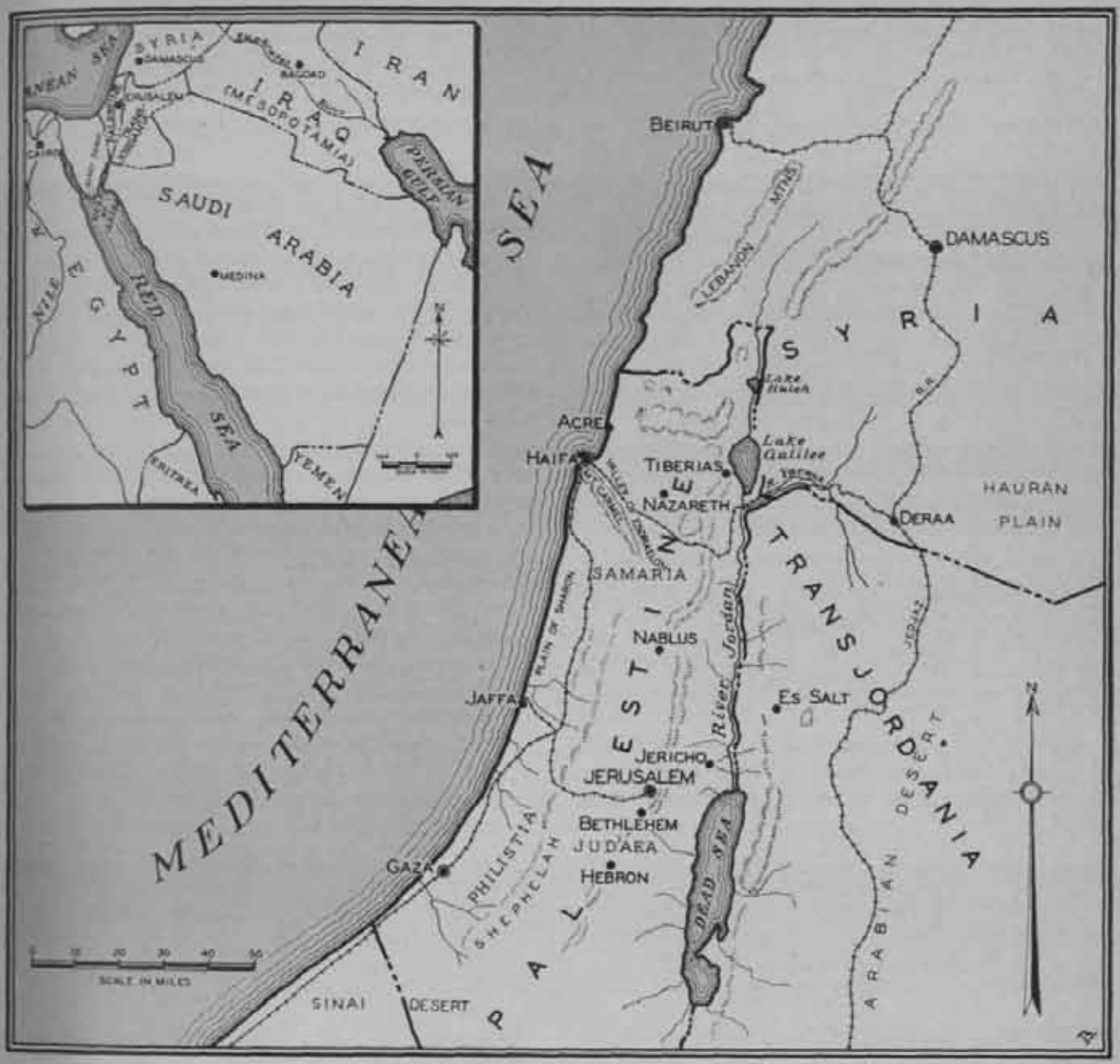
It rises gently from the coast and attains an altitude of 600 feet above sea-level. From the coastal plain rise the Shephelah or low, rolling hills of grey limestone, barren save for olive orchards and vineyards among which lie small fields of grain. These foothills extend inland for ten miles and their eastern crests reach an altitude of 1,500 feet giving way to the rugged mountain ranges of Judaea and Samaria whose peaks are over 3,000 feet above sea level. Among these winds a narrow and irregular plateau—the Judaean table-land. From the coast line to the plateau the distance varies from thirty air-miles as a minimum to forty-five as a maximum, with a rise in altitude to 3,000 feet from plain to plateau.

The central range and plateau has a width of not more than fifteen miles. The eastern slope of the mountains is precipitous, barren, rugged, and is cut into irregular valleys and ridges, not by erosion but by fault lines. It is a wilderness of rock: desolate and forbidding. Twenty air miles east of the central range, lies the Jordan Valley 1,000 feet below sea-level. Through the center of the valley flows the Jordan River which cannot be forded in its lower reaches during the rainy season. The floor of the valley on either side of the river slopes from mountain ranges and is eroded by wadies into steep and narrow gullies which make part of the valley difficult for manoeuver, though the piedmont slopes are easily traveled by wheeled transport and cavalry. East of the Valley of the Jordan lies the mountain range which divides Palestine from Transjordania. A west-east cross-section of Palestine, almost seventy miles in extent, shows variations in altitude from sea-level to 3,000 feet above the sea, to 1,000 feet below sea-level, to 3,000 feet again! A maritime plain, a central mountain range, a sunken valley, an eastern mountain range run north and south in parallel lines.

South of the Philistian Plain, the Sinai Desert stretches along the coast to the Egyptian boundary—a no-man

These are Jewish troops organized for protection against Arab raids.

An open freight car has been transformed into a traveling machine-gun nest for use in patrolling the railroads. The Royal Engineers are also experimenting with a land mine-sweeper—a small heavily weighted trolley to precede trains and take the brunt of mine explosions.



Palestine

land of shifting sand dunes. South of the central range, a semi-arid shingle desert extends to the Gulf of Akaba, a land of barren hills and valleys, where nomads roam with flocks of sheep, goats and camels. The Judaean range, itself a fortress, is a succession of steep mountains, in which nestle Arab villages each an isolated strong point inaccessible save on foot or horseback. These tiny fortresses which lie along the western crest of the Judaean range are the peasant centers of Judaea. On the plateau, strung along a highway like beads are the cities of Judaea and Samaria: Hebron, Bethlehem, Jerusalem, and Nablus.

The eastern slope of the range is a rocky wilderness inhabited by nomads, a rugged pasture land for Bedouin tribes, which move from these desolate slopes to the Jordan Valley and to the shores of the Dead Sea with the change of seasons.

The Plain of Sharon, which is the northern segment of the maritime plain, is shut off from the northern part of Palestine by a mountain spur extending west from the Samarian hills to the sea-coast south of Haifa. There, like a crusader castle, rises the height of Mount Carmel. Three famous historic passes lead through this Western spur to the Valley of Esdraelon, a rich agricultural plain which stretches from the crescent bay between Haifa and ancient Acre to the pass that connects Esdraelon from the Valley of the Jordan just south of Lake Galilee. These passes are gateways both to the Central Range and to the maritime plain and have played an important rôle in the military history of Palestine.

North of Esdraelon rise the hills of Galilee, with Nazareth perched on their southern slopes. These are the foothills of the Lebanon Mountains in Syria which rise to

British soldiers searching Arabs at the Jaffa Gate entrance to Jerusalem.

Protected by Jewish and British Police, residents of Jaffa's Jewish quarter remove their belongings from pillaged and burned houses.

crests over 7,000 feet in altitude beyond the boundaries of Palestine. To the east of the Galileean hills lies Lake Galilee, 600 feet below sea-level, and Lake Huleh farther north. Lake Galilee and Huleh are shut off from the table-land of southern Syria by rugged hills which at their summit give way to volcanic badlands bordering the Hauran Plain in Syria.

The climate of Palestine is as varied as its topography. The maritime plain is sub-tropical, a fruitful land with a climate somewhat similar to that of southern California. The Judaean highlands are cold and bleak in the winter months; heavy snowfalls are not unknown, though infrequent. The summer months are hot and dry. The Jordan Valley is a raging furnace well-nigh intolerable to the white man during the summer, but delightfully balmy during the winter. The eastern range has a more severe winter than the Judaean table-land.

Palestine's variety of climate is astounding. In following the road from Jaffa past Jerusalem through Jericho to Es Salt in Transjordania one can, in not more than four hours, pass through three climatic zones. All of Palestine has a long dry season lasting usually from March to November, and a short rainy season of four months.

The main lines of communication in Palestine run north and south, east and west. Two main highways, one along the crest of the central mountain range, the other along the maritime plain, connect southern with northern Palestine. Two road arteries traverse the Holy Land from west to east. One, the Jaffa-Jerusalem-Jericho Highway extends eastward into Transjordania. The other, the Haifa-Nazareth-Tiberias Highway goes along the west shore of

Galilee, to cross the Jordan south of Lake Huleh and then winds into the Hauran plain of Southern Syria.

A railway line from Egypt across Sinai links Cairo with the Jaffa-Jerusalem railroad. It continues northward along the maritime plain through the Samarian hills to Haifa. The line east from Haifa crosses Esdraelon and the Jordan Valley, and climbs to Deraa through the canyon-like Valley of the Yarmuk, made famous by the exploits of Colonel T. E. Lawrence. Deraa is a junction point on the Jejaz railroad from Damascus to Medina.

The nature of some of the Palestinian cities makes the reëstablishment of order difficult. Bethlehem, Jerusalem, and Nablus, in particular, are ancient cities built for protection against attack. The old parts of these cities are medieval, with narrow, slippery, cobbled alleys, across which are flung flying buttresses from houses of massive masonry, as impregnable as forts. The bulk of the Arab population lives in veritable fortresses in these older sections of the cities.

The villages in the mountains of Judaea, Samaria, and Galilee are ancient strongholds perched on or near the crests of mountain peaks, on sites selected centuries ago for their strategic advantage. Many of them can only be reached by footpaths and donkey trails; few can be approached by surprise. An enemy can be seen for miles, hours before he can reach the villages. These, too, are mountain fortresses.

The rocky, barren eastern slopes of the central range and the bleak shingle plains of southeastern Palestine are the home of nomadic tribes which live in black camel-hair tents. The mobility of these tribes is truly astonishing: they are here today and gone tomorrow. They offer refuge to those who flee the forces of law and order of the settled regions. Independent, unruly, they have for centuries defied organized government, which can do little more than prevent their depredations against the peasantry. These tribes are in contact with the Arab tribes of Sinai, Arabia and Transjordania. Those who are their friends can be transferred from tribe to tribe far beyond the reach of police or military power. The men of these tribes are armed. They learn to shoot in early youth and many of them are excellent shots.

In the north the Galileean hills give way to the rugged foothills of the Lebanons, a mountain fastness in French-controlled Syria where British troops cannot trespass. These hills are a convenient refuge and a gathering place for marauding bands, which can be hidden and supplied by sympathetic Syrian Arabs.

To the northeast, across the boundary in Syria, lie the volcanic badlands and the rich Hauran dotted with many villages. These also are hiding places for rebel bands difficult for French authority to control, even though they have the will to do so.

East of the Jordan lies the range rising from the Valley of the Jordan and the Dead Sea. These mountains are the roaming grounds of tribes, which come into Palestine in the winter and retire to Transjordania in the summer. In their inaccessible hills, traversed only by mountain trails, save for the highway from Jericho to Es Salt, marauders can escape from pursuit and prepare to strike again. East of the mountains a shingle semi-arid region stretches north through Syria to the Euphrates, east to the Iraq, and south to Central Arabia. Here, too, Arab tribes roam in utter freedom from control. Mounted on fleet horses and racing camels, these tribes can raid Palestine if they so desire.

With these features of the land in mind it is not difficult to understand why 25,000 troops find it no easy task to quell an uprising that has popular support from city dweller, peasantry and nomad.

A great diversity of arms is needed to bring the Arab rebellion under control. Along the railroads, armored trains must patrol to prevent the tearing up of tracks and the blowing up of bridges and culverts. On the highways, armored cars make the rounds of the main roads to protect traffic and to rush reserves to threatened regions. In the ancient cities, only infantry can be used. So intermingled are the dwelling houses and sacred shrines of Christian and Moslem that the use of artillery is simply out of the question. Rifle and machine-gun fire is ineffective against thick walls of masonry. Rebels must be hunted from house to house in a tedious search.

Although airplanes are useful in scouting, giving warning of raids, and in dispersing marauding bands they are of little use at night when the raiders gather for attack. The rebels wear no uniform and are not easily distinguished from peaceful Arab natives. It is not good policy to fire indiscriminately on Arab nomads and peasants who may be on honest missions. Nor is it politic to bomb villages, crowded with women, children, and non-combatants. The air force is distinctly limited by the guerrilla warfare the Arabs wage. There are no munitions depots, nor supply trains to be bombed—the Arab needs no lines of communications open to aerial attack.

Most of the villages can be reached only by infantry and cavalry. And if the Arabs refuse to do battle, they disperse rapidly long before the British troops reach the village. There, more often than not, the troops meet frustration, finding only women, children, and harmless peasants busy at their daily tasks. A search of the village for arms and rebels in hiding is usually fruitless. Such may be the end of an exhausting day's march. And while the troops are engaged in a bootless expedition, bands of rebels may be attacking distant settlements, blowing up bridges, tearing up rails, or hurling home-made bombs at passing traffic.

In the nomadic lands, infantry is virtually useless, and always at a disadvantage. Cavalry, aided by scouting and bombing planes, is necessary for pursuit or attack in the semi-arid pastoral lands of the nomads. In the southeast, light armored cars can also be used, but the territory in which they can operate is strictly limited. In the mountains to the east, cavalry is the only effective arm.

The British can control the flow of arms and munitions through the Mediterranean ports of Palestine, but traffic in arms to Arabia from Italian Eritrea and French Somali-

These are a pair of bandits, captured by the Royal West Kents, being brought into Tulkarum Station.

land across the Red Sea is practically beyond British control. The smuggling of war supplies from Africa to the Arabian tribes is an old established business which will be difficult to check as long as there are buyers and sellers.

From the Iraq across the nomads' land of northern Arabia between Mesopotamia and Transjordania, Britain is helpless to prevent the flow of arms and munitions. She can, however, eventually check the import of war material to Iraq via the Persian Gulf. The traffic in weapons and ammunition from Transjordania and Syria will be hard to stop as long as there are those ready to supply the Palestinians with what they need.

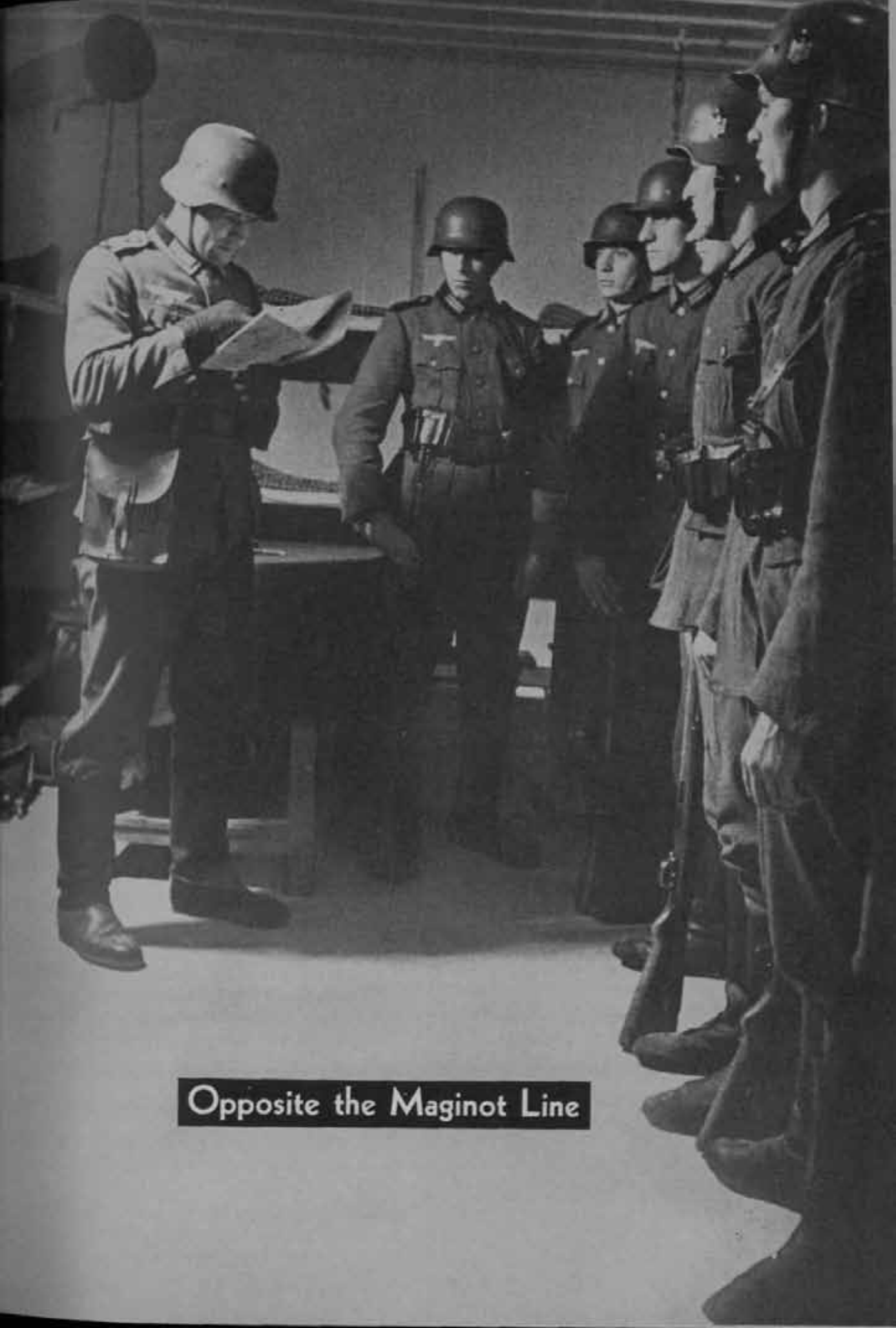
The munitions problem is international. An Anglo-Italian pact might help check the supply of war material to Arab rebels. An agreement with Germany might also stop a flow of arms at its source. The French, though they face a very serious problem of their own in Syria, might in cooperation with the British exert a more effective control over the arms traffic across the Syrian-Palestinian frontier. France might, although again it would entail unpleasant reactions among the Syrians, act more vigorously against the Palestinian bands which seek refuge in Syria.

Conclusion

There is no question but that with sufficient forces and diversified arms the British can restore law and order to Palestine. The inconvenience and losses from uprisings and rebellion will have their effects on the Arab middle classes in the cities. The rebels will be worn down in time. But this will not solve the problem.

As long as the Arabs of Palestine remain opposed to Jewish immigration, the British will be faced with an extraordinarily difficult problem of administration if they do not limit that immigration. The Arabs in neighboring territories look upon Palestine as part of the "Arab Lands." They are becoming more and more nationalistic. Inevitably they will be sympathetic to the Palestinian Arabs. And as long as these are discontented and dissatisfied with the situation in Palestine, they will receive encouragement and help from the more ardent Arab nationalists in other countries.

The problem is basically political rather than military. Military force alone cannot solve it. Its only task is that of restoring order and maintaining it so that statesman and diplomat may again try to find a solution satisfactory to both Jew and Arab.



Opposite the Maginot Line

Along the French border the Germans ... building a counterpart barrier of steel ... concrete. The boundary of the "secu... zone" is studded with signs that forbid ... picture-taking and only allow travel ... the roads to bona fide residents of the ar...

At the time of the Munich tension all available units of the Labor Corps—a totalitarian version of the CCC—were pressed hastily into service for work on the barrier.

The wooded regions along the Rhine get plenty of barbed wire. Here it is being strung by soldiers and the Labor Corps.

Even little-frequented country roads come in for their share of barbed wire. The men at work on this section of the Rhine barrier are soldiers. Although on a working party, each man carries a gas mask and other service paraphernalia.

Concrete blocks, notched to receive steel rails, are used as road blocks against tanks. The laborers appear to be civilians working under military supervision.

Rows of concrete-and-steel pyramids, four to six feet high, wind over the hills. They are designed to "belly" tanks.

While the work on t barrier was being rus pictures like these we released to show the pe ple that the field arm was still on the fr

These machine gunners were photographed in "foxholes" and "emplacements" near the Rhine.

Antitank guns are always much in evidence in and about German infantry units. The one on the left is emerging from a hastily-built dugout. The right-hand gun is being rushed into position during a drill.

These pictures were taken within an underground fort on the barrier. The forts are said to be equipped with running water, electric lights, and plumbing.The two soldiers are members of the communicationsunit of an infantry regiment.

Notice the soldier, extreme right, cleaning a boot pulled over the leg of a stool. The stools are an instance of Teutonic thoroughness—they were designed with boot-cleaning in mind. Moreover, stool legs are detachable, furnishing the soldier a club with which to belabor mud-stiffened field boots.

The generals left the room feeling subdued.

BONAPARTE IN ITALY

By FLETCHER PRATT

I: THE CAMPAIGN OF SPEED

Paris and the Frontier of Italy. To 21 Ventôse, An IV (March 12, 1796).

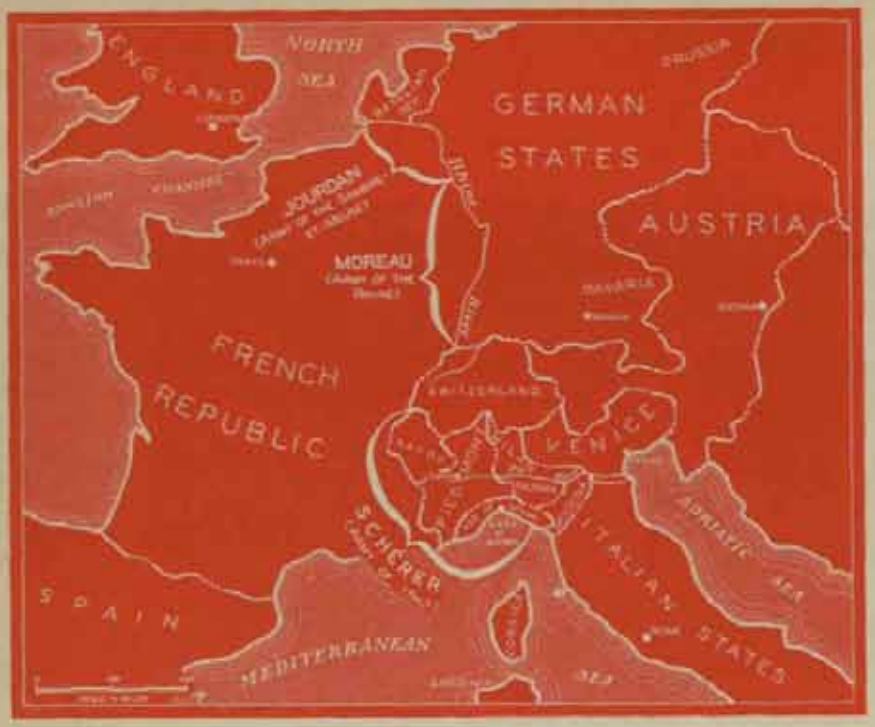
I

"I happened to be at the office of the General Staff in the Rue Neuve des Capucines when General Bonaparte came in. I can still see the little hat, surmounted by a pick-up plume, his coat cut anyhow, and a sword which, in truth, did not seem the sort of weapon to make anyone's fortune. Flinging his hat on a large table in the middle of the room, he went up to an old general named Krieg, a man with a wonderful knowledge of detail and the author of a very good soldiers' manual. He made him take a seat beside him at the table, and began questioning him, pen in hand, about a host of facts connected with the service and discipline. Some of his questions showed such a complete ignorance of some of the most ordinary things that several of my comrades smiled. I was myself struck by the number of his questions, their order and their rapidity, no less than by the way in which the answers were caught up, and often found to resolve into other questions, which he deduced in consequence from them. But what struck me still more was the sight of a commander-in-chief perfectly indifferent about showing his subordinates how completely ignorant he was of the various points of a business which the youngest of them was supposed to know perfectly; and this raised him a thousand cubits in my opinion."

In Carnot's also, for Carnot knew of it. Carnot knew everything that touched the military service of the indivisible republic. From his height among the dusty chandeliers of the Luxembourg, the hook-nosed ex-captain of engineers, who had cashiered himself that generals might not have to take orders from a man of lower rank, spied like an eagle along the lines where France lay camped against Austria. They spread from the German Ocean to the Genoese, from the North Sea to the South, interrupted only where Switzerland kept the peace of the snows. The left of that line was sure; there the terrible regiments of the Sambre-et-Meuse marched to immortality under stout old Jourdan, who had marshaled them at Fleurus when Carnot himself led into the flaming muskets with his hat under his arm. The center held a promise of great deeds; here stood the Army of the Rhine, best and strongest of the nation, ready to strike toward the Austrian home dominions under the orders of Victor Moreau, the nation's ablest officer.

Illustrated by Howard Williamson

But the right was weak; Barthélemi Schérer clutched desperately at the hills by the Ligurian Sea, and every week lost a post to the Austrians and their allies of Sardinia-Savoy, plodding onward, dogged and graceless. The Army of Italy starved, for there were no tracks by which supplies might ride the passes and English cruisers cut the routes by sea; they froze, having no wood or overcoats among the rock-ribbed hills; they died, flinging bare bodies against the overwhelming artillery parks of the Allies. The Committee of Public Safety had sent Schérer there in early summer; fat, amiable, handsome, dirty, good enough in argument to talk his way through a stone wall—here was the man to rouse the army's fainting spirits. But



Map 1: Europe in 1796

they dragged him down before he could lift them up; when Carnot wrote "March! No useless repose!" "Strike, and strike hard," or "Attack, attack, attack, without ceasing," he replied with lists of the commissary stores he did not have, and spoke of the difficulty of maintaining his cordon of defense without sufficient guns. The man was besides an inveterate detail-chaser; had no head for sweeping, audacious movements, could not see an inch beyond the next mountain crest, must have a plan of campaign tailored to his measure before he dared stir.

Carnot called Bonaparte to draw it; had known that young man for over a twelvemonth, which was *Auld Lang Syne* in the compressed life of the Revolution. Was he not the friend of the younger Robespierre? He was; he was also the officer who had made that excellent geographical survey of the Riviera region during the *An II* (1793-4), which the organizer of victory had been using ever since. "I have a little captain," the Director used to tell intimates when he was still a member of the Committee of Public Safety, before there was a Directory, "who knows more of war and Italy than any man in the army." Then came Vendémiaire and the artillery; the little captain strode through its cannon smokes to the center of the stage and flung back his cloak on a general's uniform; and Carnot ordered him to draw a plan for the war in the south.

> The King of Sardinia [wrote Bonaparte] has fortresses at the issues of all the Alpine gorges that lead into Piedmont. To penetrate Italy by forcing the Alps, one or more of these strong places must be taken. But the roads do not permit the movement of siege artillery and beside are covered with snow during three-quarters of the year. It is therefore necessary to turn the Alps and enter Italy precisely at the point where these high mountains fail and the Ligurian Apennines begin. We now hold Savona, a seaport and a place of much strength; a metalled road leads from it through the Apennines to Carcare, Millesimo and Ceva. By penetrating Italy along this line we may succeed in separating the Sardinians and the Austrians, for from Ceva we menace both Milan and Turin; the Sardinians will have to cover the latter, which is their capital, the Austrians the former, which is their base.
>
> Let the Army of Italy march on Ceva and force the entrenched camp there. This operation must precede every other, no matter in what direction. A horrible mistake has been made in not assaulting the place long ago. Our possession of it is alone enough to force the court of Sardinia to make peace; and once we get hold it they will have to come against us in double strength to make us let go.

Old Schérer stared aghast at such a scheme of wild adventure. He had been brought up in the Austrian service, where war was made by the formula of advancing on a widespread front, a *cordon*, the whole army abreast across miles of country, each unit supporting the next. They taught him never to campaign when it was cold, or rained, or the supplies did not come up; never let the enemy get across your flank, never fight without adequate artillery.

"Seize supplies in Piedmont" one note to the plan of campaign bade him. "No splendid success can be obtained on the Italian front except by operating during the winter," declared another, and above all, the plan itself, the wholly unacceptable plan, ordered him to turn his flank and rear to the Austrian cordon while he marched on Ceva. He called in his division commanders for a conference; they felt the same way he did about it, all but two of them—a stocky man with bright beady eyes under a shock of curled hair named Masséna, dark enough to found a legend of Jewish birth, and the giant Laharpe, who boffed his words through a waterfall of mustache.

Discount Laharpe; he is known as "the Grenadier of the Republic" and must maintain his repute for furious courage in the face of all reason. Discount Masséna too: an old mountain smuggler, he actually enjoys climbing like a goat among these passes where the Alpine winds torture black olive trees before a background of perpetual snow. Discount them; write back to Paris that "the man who drew this plan must certainly be insane. I can only suggest, Citizen Director, that he come here and try to execute it in person."

Bonaparte was in Carnot's cabinet on the very day the letter reached Paris; he struck the paper and his eyes flashed. "Ah, if I were there," he cried. "I'd stand those Austrians on their heads for you!"

"You shall go," said the organizer of victory. Before the twenty-fourth hour he had discovered a juicy inspectorship perfectly suited both to the talents and the avarice of the retiring commander; before the thirty-sixth hour the

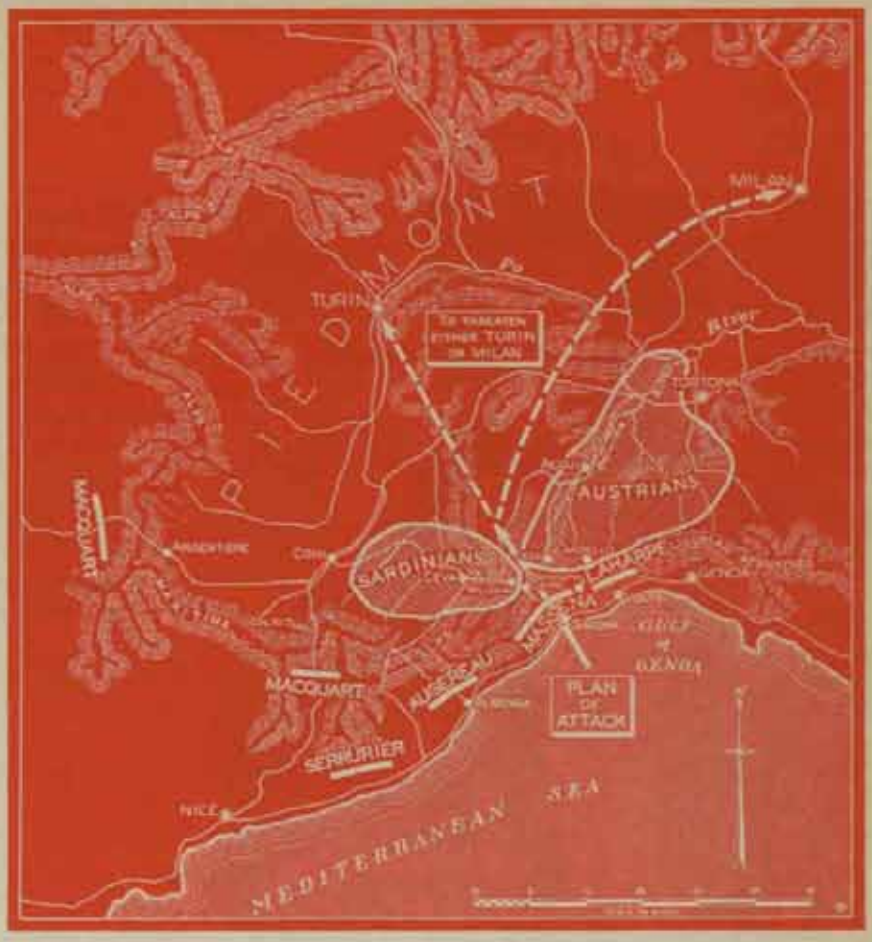
nomination of Bonaparte to the Italian command has been proposed, seconded, and carried by the Directory.

The opposition journals said it was given on the condition that the new general relieve Barras of the mistress he was anxious to discard.

Whether this was true or not, Bonaparte did marry her just one week later, at the *mairie* of the 2d Arrondissement of Paris, at ten in the evening, by the light of two guttering candles. The *maire* had been routed from his bed without time to dress his hair; he looked half asleep. The bride brought her notary to attest the documents, one Raguideau; while she primped before the ceremony in a side room, he protested against the imprudent alliance—"How can you marry a soldier who has no belongings but his cloak and his sword?"—and she, doubtless somewhat of the same opinion, but knowing that Bonaparte sat just beyond the open door, could only answer with a vague wave of the hand.

The witnesses were Bonaparte's aide and a servant on his side; on hers, Barras and Tallein the orator. An inferior affair; when it was over, the newly married pair did not even crack a bottle of wine, but drove straight to the little pavilion in the Rue Chantereine, where Fortuné, the poodle, received them with an epithalamion of growlings and bit Bonaparte in the leg when he tried to get in bed.

They had one day together; on the next the new commander of Italy was following drumming hoofbeats to the frontier and the war. With him rode Murat, who had brought the guns from Sablons on the night of Vendémiaire. "You have no aide of the rank of colonel," the Gascon pronounced, after thrusting into the commander's cabinet on the last day, and slapped his chest till everything jangled. "I will therefore accompany you."



Map 2: Carnot had ordered a plan

The Frontier of Italy, 7-22 Germinal, An IV (March 27-April 12, 1796)

I

Every army long in active service develops a special tradition. That of Italy was commingled Jacobin republicanism and devotion; in the atmosphere provided by which the appointment of General Puss-in-Boots, who had won his reputation in a street riot and his command in a marriage bed, could not but be distasteful. It was therefore into a circle of glower that Bonaparte walked at the headquarters in Nice, followed by the strapping Murat and his junior aide, a young artillerist named Marmont, handsome, aristocratic, groomed to the eyelashes.

Old Schérer was there to turn over, surrounded by the divisional officers—Masséna, Laharpe who could have put the new chief in his pocket; Cervoni; Kilmaine with sideburns and Celtic wit; a stiff, correct man, well turned out, with a face like a melancholy horse, who would be Serrurier; a burly desperado of swaggering gestures, feathered like an Indian chief—Augereau; Stengel of the cavalry; batrachian visage, limbs that seemed assembled from a stock of spare parts, hairy knuckles—that was Berthier, the staff man, the map expert.

Heedless of Kilmaine's amusement and the half sneer on Augereau's face, Bonaparte sat down and began to explain the detail of his plan in crisp, kindling sentences. He had already received Berthier's report of strength and knew where the troops lay. Division Macquart on the extreme left was to be the army reserve, holding the passes Col di Tenda and Argentière against a possible counterstroke from the Sardinians through the Alps; ride them hard, be active, to attract their strength in that direction, to the extreme right of the allied line. Our extreme right is Division Laharpe, with its back to the coast. Push toward Voltri, Laharpe, while a formal request is made on the Genoese Senate for passage through their territories; this will set the Austrians worrying about their extreme left and split them farthest from their Sardinian friends. Division Masséna, next in line, now concentrated round Savona, will strike straight through the hills by Carcare, Millesimo, Monte Zemola, on Ceva. . . .

MURAT

"You have no aide of the rank of colonel," the Gascon pronounced, and slapped his chest until everything jangled. "I will therefore accompany you."

Masséna interrupted with some point about those mountain tracks he had followed since childhood; was snapped off with word and glance so deadly sharp he almost threw up an arm to protect his face.

Division Augereau, now far down beyond Albenga, would march fast along the coast road, and at Savona swing left into the pass behind Masséna; Laharpe leave a small rear guard toward Voltri and follow the other two in. This would provide a striking force of three divisions in that pass, all marching on Ceva, at whose gates Division Serrurier would join them, coming from its position on the coast south of Augereau's line by way of the subsidiary pass Ormea-Garessio, and bringing the heavy artillery. . . . It would be about this point that Augereau flung back his Horus-head and rapped out objection; he got the same as Masséna, flash like a fencer's riposte, and a grin spread slowly across the countenance of Kilmaine, whose Irish inspiration made him the only man in the group capable of understanding.

The striking force will thus be in position on the weakened allied center at the point where Sardinian lines met Austrian; that that point is a high saddle, a watershed from which the streams flow east, east by north, northeast and north to join the Po, with mountains unclimable between. The cordon system requires Austria to have a column in each valley, moving parallel; as each of these columns arrives at the hub of the wheel, the base of the fan, we will smash it in the face with the whole striking force. Our weak point is our extreme right; here Laharpe must sweep across the front where the Austrians gross is concentrated. To protect him the striking force must first fall on Montenotte, in the cut of the River Erro, the outermost spoke of the fan.

Headquarters, which have not left Nice city since the war began, will be moved out to Albenga, close behind the fighting front. The administration have considered themselves as on a permanent post and have busied themselves more with the comforts of life than with the good of the army; they will be replaced. The shortages of stores and guns will be remedied. The Directory had sent down only two thousand pieces of gold, but each general will receive a proportionate share of this amount and such bills on Genoa bankers as are required for the pay department.

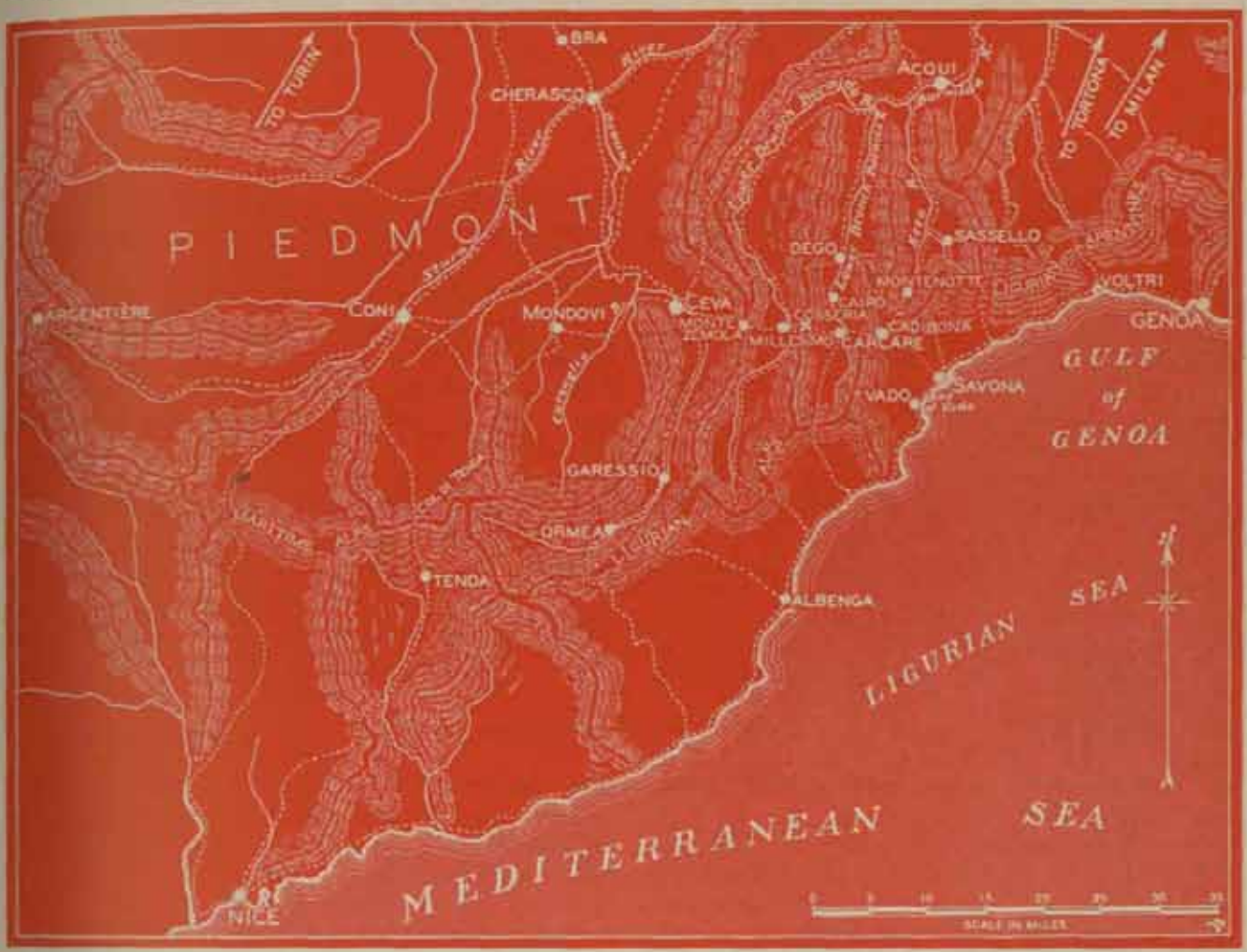
The generals left the room feeling subdued; as they reached outer air, Augereau drew a long breath, and with the freedom from constraint of a man so brave he can afford to confess fear, remarked to Masséna, "That little bastard of a general actually scared me."

"Me too," replied the mountaineer.

II

A.E.I.O.U.—*Austriæ est Imperium Orbis Universo*—was the proud device of the Empire, and the Empire itself a mechanism for the distillation of universal experience, past and present, in the service of universal empery. It was pedestrian, like all systems of thought by compromise, like them also, courageous, wise, catholic, and tough. The Austrian soldiers put up their hair in queues with pomatum and powder, marched in white coats, were rated recruits till they had done ten years' time, and not considered canny enough for active service till they had turned the fortieth year. On the field they maneuvered like figures from a Nürnberg clock, right-dress, left-dress, and perfect cadence across the column of battalions, halting to fire, then taking exactly eight paces through the smoke before the next volley from their flintlocks. "Well-drilled and compact infantry, advancing in close formation under the protection of their guns, can never be stopped," said one of their commanders; his men had the confidence of old experience and this certitude. They were well fed and well paid; they did not have to march late, far, or fast; their movements were covered by an artillery service rated the best in Europe.

Beaulieu was their general in Italy; he was a man of seventy-two, who had campaigned all across Europe from the Belgian plain to the Hungarian and the Giant moun-



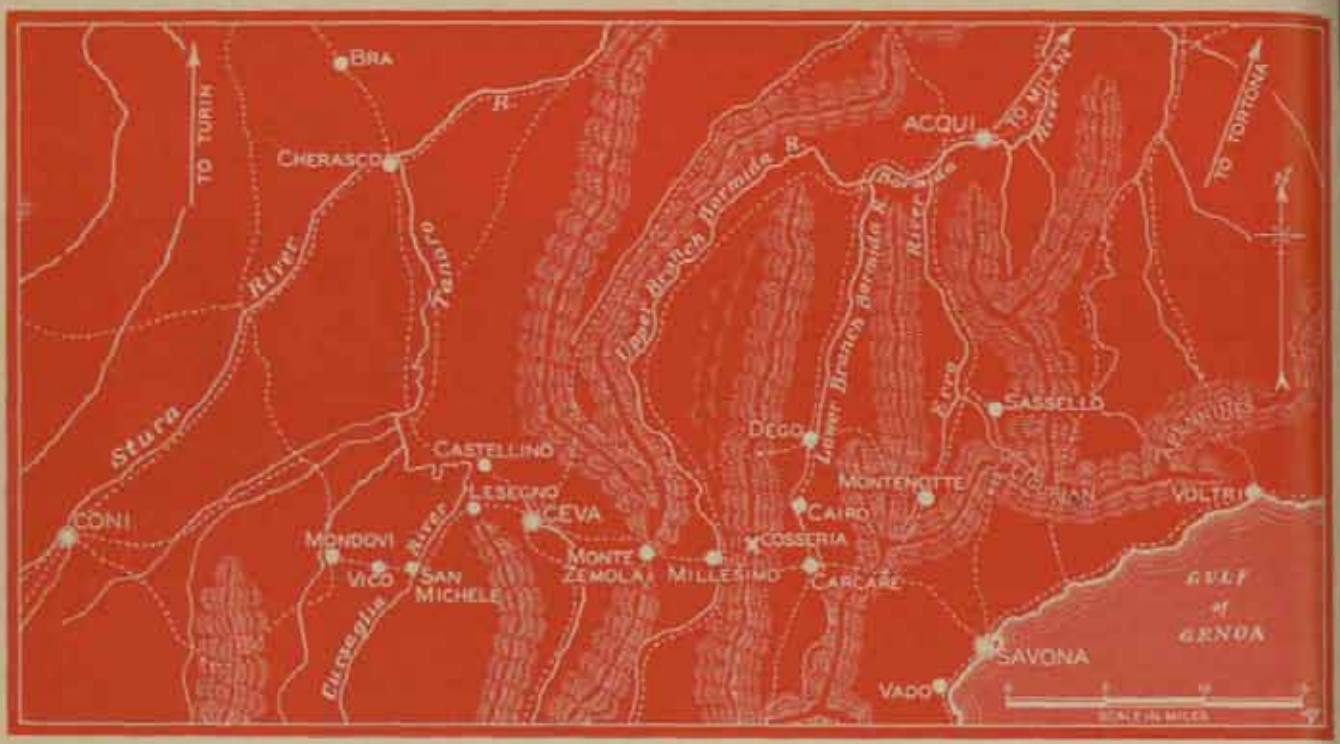
Map 3: The Ligurian Alps

tains to the Apennines. Thirty-seven thousand men were under his standards, so that he outnumbered Bonaparte by 2,000 without thinking of his ally, Colli of Sardinia, who had 25,000 more; and the united artillery of the two stood at 150 pieces against the French 60. The Aulic Council, or Supreme War Conducting Committee, in Vienna had worked out his general strategic plan, which was to seize Genoa, opening communications with the English fleet, and with naval help, hustle the French along the Riviera back to Nice. The news of Laharpe's push toward Voltri and Bonaparte's demand on the Genoese Senate fell in happily with this. The latter permitted Beaulieu to invade the republic in order to preserve its neutrality, the former over-extended the French line with its back to the sea and its front a prolongation of the line of communications, permitting him to split off and destroy a wing.

Accordingly he shifted his balance leftward, toward Genoa. His Division Sebottendorf was to attack the French in Voltri, pinning Laharpe there and attracting reinforcements out to that extreme flank. His Division d'Argenteau should scale the most easterly of the fan valleys, that of the Erro, pass through Sassello and Montenotte, slide briefly down the coastal slope to Savona, there rupturing the French center and trapping their right wing.

On April 8 he issued his orders; on the 9th the divisions were in motion, Sebottendorf driving in on the French vanguards among the heights round Voltri, carrying everything before him. On the 9th also d'Argenteau pushed through Sassello and next morning struck French pickets in the lesser Montenotte, called Montenotte Inferior. Three kilometers upstream was Montenotte Superior; there a slash of fresh earth showed the enemy had thrown up a redoubt across his path. D'Argenteau deployed, formed line to carry the place out of hand, and before entering upon the attack had biscuits served out to his men. The artillery was not up yet.

Out among the hills where wind-wracked trees leaped from the rocks among patches of dirty spring snow, there was a crescendo of outpost bickerings and the men of Division Laharpe began to feel Austrian pressure in the heights above Voltri. The line here was a false one, established last winer by order of a civilian army commissioner; Laharpe's men retired, taking what toll they could by skirmisher fire. Masséna at Savona ranked his men for the coming drive and was heartened by the arrival of eight thousand new muskets; a flotilla of sloops came along the coast with 36 guns aboard, mostly old



Map 4: Savona to Mondovi

pieces of assorted caliber, scraped from the dustiest corners of Toulon arsenal, but guns that would shoot.

A note from the general accompanied them. The sloops were to be held at anchor in the Bay of Vado with their cargoes aboard, so the Austrians would not hear of their coming till the hour of action struck. On the morning of April 12th Bonaparte followed the guns in. Masséna was out on an inspection, so the commander sat down to read reports and question the officers fresh from the front. A messenger had just come in from the upper Erro, where Colonel Rampon of the 31st demi-brigade had been assaulted in the redoubt of Montenotte Superior by Austrian forces estimated at an entire division. Three terrific attacks had been delivered on the previous afternoon; in the intervals Rampon had gathered the officers of his little band with them sworn on his sword to die rather than yield the post. They were yet victorious as evening came, but nearly all wounded or dead; might not be able to get through another day. The road through the pass from Carcare to Millesimo was not metalled after all; it would be difficult to transport artillery along it. Laharpe was on the march. Augereau close in and ready.

At two Masséna arrived; the generals embraced and Bonaparte sat down to read the reports of Pico the spy, which the divisional leader was carrying in his pocket. They contained late and extremely detailed information of the Austrian strength, plans and movements. After he had gone through them Bonaparte sat for a long time before the table, still as a bronze figure of a general, with his lank hair falling around his sharp, fine features. The afternoon closed down; at five there was heard from the distance the shock of cannon, then more, peal on peal from the mountains. An officer whispered that the Austrians had brought up their artillery to cannonade Rampon; Bonaparte lifted his head and began to issue marching orders for the great adventure as fast as two secretaries could take them down.

Le Jour de Gloire est Arrivé

The Ligurian Hills, 22 Germinal — 7 Floréal, An IV (April 12-26, 1796)

I

A thunderstorm came up during the evening and boomed among the summits; through it Bonaparte climbed a projecting peak near Carcare under guidance of the *curé* of Cadibona. Off to his left Division Augereau was marching toward Cairo on the Lower Bormida, in the widest of the fan-valleys and that most suitable for troops, down which a good and direct road ran to the Austrian advanced base at Acqui. At the general's feet Division Masséna shouldered past toward Dego, farther down the same valley. By morning both would be past the flank of D'Argenteau's head of column in the neighboring Erro gorge; Masséna was to turn east short of Dego, could be trusted to find a track through the hills against one flank of that Austrian column while Laharpe struck it from the other.

Dawn broke clear after the tumultous night; Laharpe's bugles screamed through the first level light and he came storming in on D'Argenteau's left flank, clouds of skirmishers in front, dense columns disorderly, hoarsely singing their *Ça ira* behind, while what was left of Rampon's little thousand joined them. One did not surprise the whitecoat veterans; they were up, in line, steadily holding head against Laharpe at eight o'clock when the

first elements of Division Masséna began to percolate through the hills onto their right rear. D'Argenteau, heavily involved with Laharpe, retreated far enough to narrow his front and detached Roccavina's brigade against the newcomers. Just then Masséna's gross arrived, putting eleven or twelve thousand French on the field against D'Argenteau's 6,500. Roccavina was wiped out in the effort to hold the new attack; Masséna got through into the Inferior Montenotte, planted artillery in the streets and grenadiers on the rooftops, cut the Austrian retreat. Laharpe broke their weakened line in front; by half past nine D'Argenteau was flying down the Erro, leaving a thousand dead and over a thousand prisoners, his divisional organization a wreck, himself wounded.

From his mountain top Bonaparte looked down on how the battle went; by nine he had a message on the road switching Augereau leftward against Millesimo, the nearest post of the Sardinian cordon, with half Masséna's men to follow him in. Laharpe and the rest of Masséna were ordered across the hills on Dego, keypoint of the lower Bormida. Take it, said their orders, levy a contribution of 10,000 livres, all the mules and brandy in town. By ten there was a bulletin, an order of the day:

> *Vive la République!* We attacked 13,000 Austrians on the heights of Montenotte this morning. The Republicans were completely victorious; the enemy lost 6,000 men.

It was read to the moving columns; despite their half-a-night of marching, the ragged battalions picked up their feet and began to sing. All afternoon Augereau's vanguard was forcing the gorges round Millesimo; at early dawn of the 13th of April over 10,000 of them hit less than 5,000 of Provera, the commander of Sardinian Colli's leftmost division. The Sards were smothered with hardly a stand. Provera sent half his men back to Ceva, the concentration point for his army; with the rest and eighteen guns he threw himself into the old robber-baron castle of Cossena. It dominates the road, and the heavy guns that alone could beat it down were with Division Serrurier, far to the left, beyond two mountain chains. Bonaparte, riding with the heels of the advance, ordered an infantry assault to clear the obstacle out of hand. It failed; he put the men in again through the long-shadowed twilight, but though a brave young brigadier named Joubert this time got into the lines with seven men before being wounded and his supports killed, this was a failure also; Cossena held. The general masked the castle, drove Division Augereau on past through the night to ruffle up the Sardinian effort at relief, and ordered the reserve back to support Masséna against Dego.

The Austrians there were the normal Dego detachment of Beaulieu's cordon, with D'Argenteau and his remnants, come back from the point where Bormida and Erro roads join, 6,000 men with 30 guns. Masséna and Laharpe struck them in the afternoon with 9,000. The whitecoats stood up like heroes, the losses were terrific on both sides and twice the French storming columns were beaten back. Weight told in the third push; the Austrian right broke, their whole line went to pieces with 3,000 men and all the cannon lost, just as the last musket cracked into silence away westward at the gates of Cosseria.

Masséna's men had only half a night to rest on their victory; before day they were on their way to join Augereau, and though their eyes were caving into their heads from sleeplessness, they drove through the early hours willingly and cheering, for this rabble that had never known victory was winning, winning, winning. Austria was knocked out; the fan spokes held stout against her; Sardinia must be crushed now before Colli could fully concentrate, and every private knew it.

Grenadiers are a special cast; and are proud of it.

II

The Austrians were not knocked out; not even aware they had been badly hurt, so sluggish flowed the nerve-stream of their being. The eighteenth-century war which Beaulieu knew conceived of cordon inside military cordon like the multiple skins of an onion. Let the outmost shell be punctured; one concentrated around some fortress in the circle next inward and struck the enemy a full-on blow in battle as he came riding in, disordered by the road troubles inevitable in advance. On the afternoon of April 12 Division Sebottendorf crashed through the outpost line round Voltri and found the place empty of French; by night Beaulieu had both this news and that of D'Argenteau's defeat on the heights of Montenotte the same morning. To the Austrian this meant that Bonaparte was establishing a new cordon, running through Savona, Montenotte, Carcare, with its left flank drawn back to Ormea, looking to an advance down the Erro.

Acqui was the central strong point of his own next inner cordon, the spot where the fan-rivers united after wanderings. He immediately began concentrating there for a counter-stroke. The detachments from the main Bormida valley were ordered in, reserves from as far back as Milan ordered out; Sebottendorf was also to fall back there through the hills from Voltri. The link between Sebottendorf and D'Argenteau had been furnished by a division of Serb and Hungarian troops, hardy mountain men under Wukassovich, himself a Serb. Let them take the hill-tracks from Sassello to Dego, there meeting more artillery sent out from Acqui. This would make a strong forward concentration in the gateway of the hills, through which Beaulieu could presently debouch with his whole force to rupture the new French cordon or from which he could stab the back of a renewed Gallic advance. Wukassovich, a good soldier, would take over general direction from D'Agenteau, "a miserable bungler with a head too big for his body, only fit to make warfare in the boudoirs of women."

In another world, in another age, the plan was sound. But Beaulieu slept a night on it in the comfortable manner of his time; his whitecoats did not, could not, march without sleep, on *eau de vie* and glory; and their roads were bad. Sebottendorf was late coming through the hills from Voltri; the artillery from Acqui so tardy reaching D'Argenteau in Dego that they met only the foam of his second defeat, with Masséna harrying the stragglers.

Meanwhile Wukassovich pressed slowly on. At two in the morning of April 15, the 26 Germinal, one of his scouting parties reached the outskirts of Dego and found the French in possession. They were men of Meynier's command, troops of the general reserve, who had followed Masséna into Dego, dispersed to loot and gone to sleep drunk. Wukassovich roused his regiments, got them into formation, and at three o'clock, stormed into the town, breaking up Meynier and taking 700 prisoners. French in Dego argued more French somewhere near; Wukassovich set to work at once on the service of security and by ten in the morning had each of the six hills that surround Dego crowned with a redoubt.

III

Provera had no water in Cosseria Castle and his last ammunition had been spent repulsing the assault of the evening before. When daybreak of the 14th came with no sign of relief from Colli and the mountain echoes throwing back gun-shots that grew ever fainter toward Millesimo, he beat the chamade.

That was the day of Masséna and Laharpe in Dego; toward evening the victual wagons began to come through Carcare and toward the next dawn, the vanguard of Masséna's victorious men, shivering in their rags and the night-cold, but cheerful. It would be hardly light when an aide galloped along the column; at six he found Bonaparte near Millesimo, told him of Meynier wrecked and Wukassovich in Dego.

There was something like a panic among the staff, all of them men so much older in years and knowledge of the rules of war than their commander—this was the fruit of military futurism, whisper, whisper, the law is inevitable, cramps down with double force on those who for a time evade it, whisper, we are flanked, cut off, whisper. Bonaparte only tightened his pale lips, snapped out an order transferring Meynier to permanent base duty, and rode down the column of weary, shambling men, reversing their direction for a tramp back to Dego over those miles of mountain paths down which they had just come.

By noon he had them round the place, with some of Laharpe's as well, ranking in a vale of terraced vineyards and little patches of grove among the mountains; by two o'clock they were ready, an attack was launched at every point against and between Wukassovich's redoubts. It could not be driven home against the Serbs; Bonaparte rode forward, rallied the men and sent them in again. An adjutant named Lanusse led one column, with his hat elevated on the point of a sword; they got into a redoubt, took it, then stopped in a boil of disorganized victory, but another mass of men swept past, right into and over the Austrian center. Wukassovich's little division, only 3,500 to begin with, was destroyed, and the nearest organized Austrians remaining were with their general back at Acqui.

From a hilltop Bonaparte had marked that last wave of assault and the soldier who led it, out in front of the column, leading them like a bell-wether. "Who is that man?" he demanded; being told it was Major Lannes, replied that he was Colonel Lannes henceforth and turned rein for the saddle of the watershed.

IV

Colli, the parade of whose hyphenated names would fill a small paragraph, was of birth exalted as an Alp, but extremely young, thirty-six, for command in his service, which was, like the Austrian, one of age. Deeply read, but

nor in war, a philosophical fighting man whose specialty was the arrangement of multifarious detail, the end product of the cordon system. No one could conduct a retreat (which demands just his quality of unhurried precision) much better than he, who had won his rank with a famous retirement though the Col de Fenestrelles in '94; and no one was much worse in an attack, which requires always a spirit of happy improvisation.

When Augereau broke his lines at Millesimo, he lost his communications with the Austrian ally but not his head; gave orders for a concentration at Ceva, and prepared to defend himself stoutly. But he did not think of counter-attacking Augereau, and he concentrated at cordon-system speed, which brought the calendar to 16 before he was ready. That morning Bonaparte had blown a message across the hills to Division Serrurier in the Tanaro valley; that afternoon Serrurier attacked Ceva, drums beating, men in perfect line and step and silence, for Serrurier was a textbook officer of the old school who did not like the new flash tactics. There was only one answer to a textbook movement against a textbook intrenched position, and Serrurier got it, a bloody repulse. He tried again and again, the textbook three times, before lying down for the night; but as he gave up, the hills east round Ceva began to crackle with musketry, then north farther extending, an endless circle of fire, and Augereau came riding in through the red twilight, with Masséna hard behind.

Serrurier's heavy artillery had come and was beginning dully to boom; it would be about this time that a rider reached Colli by the long circuit round the hills, saying Beaulieu was badly smashed, with 10,000 loss and his remaining men so scattered through the hills he had but 16,000 under hand in Acqui, unfit for operations at the moment. Ceva, then, was a death-trap; Colli stayed in the town just long enough to parry a blow delivered by Augereau in the first ardor of his advance, then abandoned his post and setting out rear guards, began a slow, orderly retreat through Lesegno, San Michele and Vico. He was heavily outnumbered, and if he followed the other line of retirement, down the east bank of the Tanaro and across the foothill spurs toward Austrian support he might be cut off by the left from the national capital at Turin, which it was his first duty to cover.

V

The hill road reaches high point on the shoulder of Monte Zemola; from here streams and sight flow away in every direction. The main guard climbed it on April 16th, less than 96 hours from the opening of the campaign with the attack on Rampon's redoubt. In that time they had marched some sixty-seven miles up and down angles a few degrees removed from the perpendicular, with almost no sleep and insufficient food; every man had been through at least two battles and some of Masséna's under the rain of fire in five. But now they stopped a moment to gaze, where the sweep of the road threw the Alps behind them, "those gigantic barriers, glistening with snow and ice, girdling the horizon," while at their feet, Tanaro and Bormida and many other rivers flowed fast away into blue-green distant plains. "Hannibal forced the Alps," said Bonaparte to his staff, "but we have turned them"; his men tossed muskets and shouted, hurrying down the gradient toward Ceva.

They had the town on April 17th. Division Laharpe was brought in from the rear and sent down the Mombarco gap of the Upper Bormida as flank guard against the cowed Austrians. The little force of cavalry came up to take the advance across Tanaro into more open country with bluff Stengel of Alsace leading them, a good soldier and a stout, not strong on brain, but with much experience. He located Colli behind the next stream, the Cursaglia, which runs narrow and swift through deep-incised banks, and on the night of 19th April Bonaparte, who had ridden in with Division Masséna, hatched a plan for the double envelopment and destruction of the Sardinians. Division Masséna was to drive straight ahead across the river against Colli's center; Division Augereau to go downstream a pace to Castellino, cross by fords which maps and local men said lay there, and strike the enemy's left flank, while Division Serrurier moved upstream, through the bridge and village of San Michele onto his right rear. Timing would be automatic, the hours needed for the two flanking marches being just enough to let Masséna's drive bear psychological fruit, attracting the Sard reserves to the center.

Day came drab and the battle went drab, too. Fords there might be at some times of year, but not in this freshet-ridden spring, so that neither Augereau nor Masséna could drive their attacks home. Colli, the good defender, worked out Bonaparte's plan for himself early in the day; drew men from his left and rushed them to San Michele. They arrived just as Serrurier's main body got across the bridge, before they could deploy, and to make matters worse the French vanguard, two demi-brigades of light infantry that should have taken up any such surprise shock, were dispersed in search of plunder. Serrurier was too good in discipline to be utterly broken by anything, but his division was badly mauled and thrown back across the river with heavy loss. Victory for the white and green.

Bonaparte's position was still so precarious he could not take no for an answer, no matter how many men he lost, or how much the sound ones needed rest. "I will control these bandits or cease to command them," he ground, sending down orders for looters to be shot, and instantly planning another battle for the morning, a wide sweep round the Sardinian left, with Augereau crossing far downstream.

Before the armies clashed Colli was on the road again, back to Mondovi, where his engineers had meanwhile finished another intrenched camp like that at Ceva. He had no relish to face the two-to-one French numbers in a planned battle from whatever position, sought only to slow the hurricane pace of their rush—time dripped in his arteries, the map burned in his brain, it would be April 26, a week, at Bra or Cherasco, before the slow Austrian

ally could bring his columns round the hills to join. He wished to fight and run, strike and dodge.

But could not with infantry dodge fast enough to escape Stengel's horse, who came crashing into his rear guard at Vico on the 21st of April by Colli's calendar, 2d Floréal by Bonaparte's. Colli must stand or face route; did stand, on a line from Mondovi to Vico, longer than he had planned or hoped, but sustained by redoubts. Bonaparte was on the field with Divisions Masséna and Serrurier. The key of the position was on the left, a fort and hill; he sent Serrurier against it, while the brash young revolutionary officers who did not like the old man for his aristo birth and bearing stood ready to laugh him out of his generalship when his outmoded attack failed, as it had failed at Ceva and San Michele.

Sure enough, he formed in three solid columns, battalion front, equidistant, perfectly dressed and keeping pace; himself took station before the central mass with a simple stick in his hand and while the drums beat rataplan, walked straight forward into the blaze of Sardinian fire. Forward and forward; men dropped, but not old Serrurier; forward, till the Sards could no longer bear the menace of the inexorable bayonets with fierce-eyed Gauls behind and the stiff antique figure ahead. They broke, they fled, Mondovi was won, and Bonaparte threw Stengel's cavalry into a pursuit. They got too far; Colli struck back with his own horse, both numerous and good. Stengel collapsed from his mount, shot through the chest, dead; the French began to break up, when out of nowhere Colonel Murat of the staff appeared, standing in his stirrups, swinging a saber and shouting. The 20th Dragoons rallied round him, a press of broken squadrons followed, he led a counter-charge that broke the Sards in turn and one day later Colli sent in to ask an armistice.

VI

It was a trick. He had lost nearly two thousand men at Mondovi, with all his provision magazines, and the fighting power of his army was dwindling under constant retreat. But the strongest of his successive cordons, the most useful for defense of the northeast running rivers, the Stura, was still his, with big Coni holding one end, big fortress Cherasco the other. The difficulty was in the length of line between the two—long, longer than he could watch. The Austrians would be needed to help him hold it in a week, and he hoped to gain that week with paper where metal had failed. When Bonaparte's flag came with the reply that truce with Sardinia ran with his humor, Colli named the Baron di la Torre to talk terms, the greatest expert on etiquette in Piedmont, who would drag the negotiations through morasses of punctillio while the armies rested.

Unfortunately for Colli the armies did not rest. Already on the night of the battle Bonaparte had ordered Division Macquart, far back at the French gate of the Col di Tenda, through that pass against Coni. Augereau's whole division, part of Masséna, part of Laharpe, were flung toward Cherasco down parallel roads; Serrurier went by forced marches westward toward the center of the Stura line, and when the generals protested that this was advance across too wide a front, inviting counter-attack, "I may lose battles," cried Bonaparte, "but I do not lose minutes!"

On April 25th, the French divisions were circling round Cherasco with the outpost fire chattering. There was no food in the place; Colli pulled out, across the Stura. The next morning Bonaparte rode in, and before di la Torre could reach his headquarters, had snatched from the Sardinians the bridgehead beyond the stream.

Di la Torre did his best, but all the heart went out of him, and the other Sardinians, too, when word came from Beaulieu that he could not arrive for another four days, and then with only 20,000 men. They signed a temporary treaty, giving the French Coni, Cherasco, Tortona, free passage through the King's territory for troops and supplies, such stores as they might need, and the Sardinian army to be disbanded.

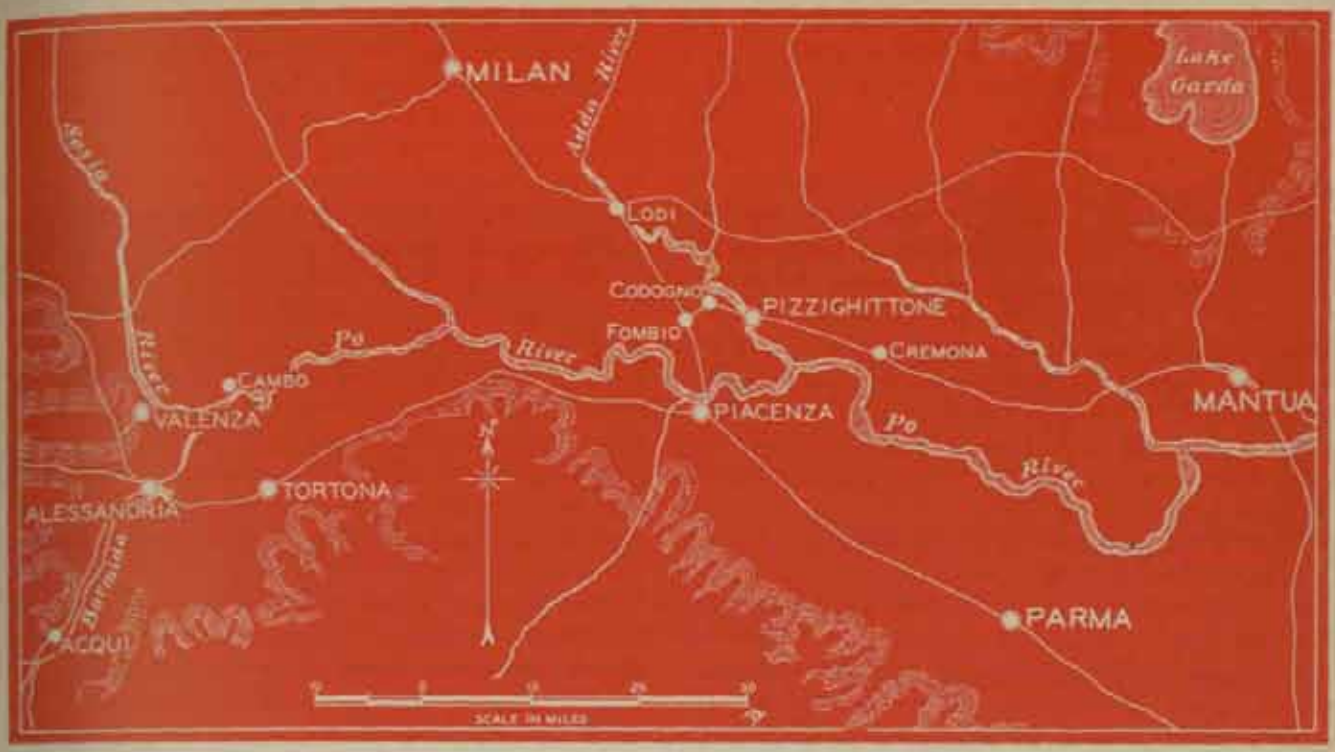
VII

Soldiers!

In fifteen days you have won six victories, taken twenty-one battle standards, fifty-five cannon, several fortresses; you have made fifteen thousand prisoners and killed or wounded ten thousand men. Deprived of everything, you have supplied yourselves with all. You have won battles without artillery, crossed rivers without bridges, made forced marches without shoes, and camps without bread. Only republicans, soldiers of liberty, could bear what you have borne. Thanks be to you, soldiers! Your victories presage more splendid triumphs still.

But, soldiers, you have accomplished nothing, since so much remains to be accomplished. Neither Turin nor Milan are yet yours. Since you have done so much the country has the right to expect still greater things of you; will you justify her hopes? Doubtless the greatest obstacles have already been passed; but there remain cities to take, rivers to cross, battles to win. Will your courage soften? Are there those among you who would find it preferable to return to the Alps and Apennines, there to suffer in patience the insults of those military slaves? No; there can be none such among the victors of Montenotte, of Millesimo, of Dego, of Mondovi. All burn to carry afar the glory of the French people; all desire to humble those proud kings who have dared to form the design of laying us in fetters; all wish to dictate a glorious peace; all, wish to return to their homes to say with pride, "I was of the Army of Italy!"

Friends, I promise you this conquest; but there is a condition you must swear to fulfill, and that is to respect the peoples you deliver; to repress the horrible pillaging in which indulge some wretches encouraged by the enemies of the republic. Proclaim, then, to the peoples of Italy that the army of France comes to break their chains; that the people of France are the friends of all peoples; that they can come in confidence to the pro-



Map 5: The Valley of the Po

tection of our banners, where the property, the religion and the customs of others will be respected. We make war as generous enemies, for we make it only against the tyrants who enslave.

BONAPARTE.

Read from the tribune of the brigade, 7 Floréal (April 26).

BRIDGE OF THE RAINBOW

Lombardy, 10-21 Floréal, An IV (April 29-May 10, 1796).

I

The Po flows east, deep as Mississippi, wide as Nilus. Along its southern bank lay the neutral Parman duchy, where flourished in lazy elegance art and the manufacture of cheese. From north through the Austrian Milanese, Alpine affluents fall into the great river, parallel, rapid, each a military obstacle more formidable than a range of mountains in the hands of a cordon-system army; for the time needed to get artillery across any of these streams is nicely matched by the time defense requires to concentrate at that same point.

Beaulieu stood in these vertical river corridors at the dawn of May, with his communications arching back across the bridges to the great base and fortress of Mantua, fetter of Italy—stood 26,000 strong of all arms, including a great force of cavalry, doubly useful in these flatlands—stood, and snarled at his generals, who twitted him about not knowing how to execute retreats—stood, and helped the generals bicker by correspondence with the Aulic War Council in Vienna. "I have no adjutant," wrote D'Argenteau, "and must spend all my own time answering this paper-storm of directives and requests for reports. Why the devil doesn't the Aulic Council dismiss us officers and send orders to the soldiers direct if it wishes to make war in such a fashion?"

Yet Austria was of high heart; her chances of victory were excellent. Bonaparte had no more than 35,000 fronting the Po and the first of the northern rivers, Sesia, or just about the proportion that gave the smaller army equality while acting defensively on such terrain. Equality; and Beaulieu had by analysis discovered something that made him better than equal, to wit, the spot where the French meant to cross the Po. On May 1 there was a little fight with a Gallic vanguard in the village of Cambo; they were Laharpe's men, and on one of them, taken prisoner, was found a set of orders concentrating Bonaparte's fighting divisions around Valenza. News letters from Turin said the fourth article of the armistice terms with Sardinia gave the French a free crossing at the same point, and an admirable spy of Piedmont had brought in a copy of an order from General Bonaparte to the Governor of Alessandria, asking that food for a division be sent up to Valenza, while peasants told of French engineers knocking down houses in the town to get bridge beams. Valenza, Valenza—the most likely place on military grounds, since crossing there would save these hurrying invaders a long march up the Sesia. Beaulieu could catch the ribbon-head of their advance in a vise, crush it with cavalry; it was only necessary that he conceal . . . he poised like a boxer, foot forward, hand drawn a little back, ready to strike.

II

At that same hour, 6th of May, Bonaparte was riding along the southern bank of the Po toward Piacenza in

Parma as though all the devils of hell were after him. He was accompanied by six battalions only, but men chosen from the whole army for their legs. Claude Dallemagne commanded them, a big man from Hainault, who had fought in the American war, famous as a leader of charges; brave Lanusse was there and the new Colonel Lannes, small, blond, fidgety, conveying an impression of strength beyond his size. The troops had been told only that their mission was secret; by the very names of their commanders, all the stormy petrels of battle, they knew it was dangerous; and it was required of them to march forty-four miles in thirty-six hours. Even Kilmaine's cavalry dragged behind such a pace; when a man dropped there he lay, and none turned a head, but out of three thousand not twenty had fallen when they reached Piacenza at day on the 7th.

The Parman governor handed over his keys, a few cannon shot dispersed the Austrian picket on the north bank, and Lannes crossed first on a shuddering raft, while Lanusse hunted out an old ferryboat that would hold twenty men and some horses. By two in the afternoon Dallemagne's little band was across and marching; Kilmaine in Piacenza and beginning to cross; Division Laharpe, furiously driven by its commander, just coming down the slope into the city; Division Augereau less than ten miles behind, Division Masséna four hours behind Augereau. Three-fourths of the French army had shot round the Austrian front onto their rear in as swift a cycloid as a fork-tailed swallow's flight, while Serrurier maintained the elaborate bluff of forcing a passage at Valenza according to the forms of the old wars.

If it were that simple Beaulieu's communications were gone and he destroyed; but the surprise had modifiers that sucked its blood like leeches. First and worst, Bonaparte had pleaded in vain for engineers, both rank and officer; Paris had given him nothing but stupid peasant laborers and a respectable civilian commander named Maubert, who could not understand that a bridge ready in an hour, though it tumbled down tomorrow, was worth twenty finished next week that stood for eternity. There was no pontoon train; Maubert was three days getting trestles up at Piacenza, which could even then bear nothing heavier than cavalry. Second, Brigadier Andréossy of Laharpe's had spied a flotilla of boats coming down the Po with 500 Austrian sick; could not resist the temptation to capture them, both for the boats' sake and the prisoners, so that their escort gave Beaulieu some preliminary warning of French in the dukedom, marching downstream at hot speed. Third, the picket on the north bank were light-footed Neapolitans, who lost no time in fighting but carried the news of the French irruption straight to headquarters.

Beaulieu changed balance and made a wild lunge in the direction of Piacenza to counter the blow from the rear, sending the nearest available men, 5,000, half of them cavalry. Wukassovich would have been the leader for such a job, but he was far up the Sesia; the Austrian had to send his general of reserve, Liptai, following him up with 2,200 more men under a General Schubirz, and himself coming along behind both with 8,000 more, while the division commanders north of headquarters were directed through Lodi and across the Adda to Cremona.

The Austrians, fear clutching at their hearts, outdid themselves marching; late on the afternoon of May 7th, Liptai struck Dallemagne's detachment north of Fombio and drove it in. He might have gone on and held the crossing where few French had yet reached the north bank, but being a reserve commander, slow and cautious, camped instead. All night the French marched and toiled; in the morning Dallemagne came back to Fombio, but now with Kilmaine's horse and Laharpe's whole division to back him. Lannes led the attack, which burst like a tempest on Liptai's flank and swept him from the field, with half his force killed or taken. Laharpe pursued till dark, bivouacking at Codogno; in the night Schubirz came along the same road and struck the French outposts. Laharpe mounted a horse and rode out to see what was toward; on the way in, his own men, spying tall shapes against the skyline, blazed out with their muskets and killed him. In the night and confusion Beaulieu got safe to Pizzighitone with the troops under his personal command.

III

Next night, the night of the 9th of May, Marmont, the young artilleryman, Bonaparte's friend, came riding into the camp on the north bank with a blown horse, after a mission to Turin. The general expressed satisfaction at his report and told him to take command of the 7th Hussars. Charge along the highway for Lodi, he said; ride over everything in your path; we must have the town before another day.

Division Sebottendorf of the Austrians was even then escaping across the Adda through Lodi; their outguard south on the main road was a battery with some Esterhazy dragoons in support, against whom Marmont galloped at loose rein. The cannon missed once in the dust-cloud and never got a chance to fire again, but Marmont's horse stumbled over one and pitched him heavily. When he came to himself the 7th had already turned round one of the guns and blown the city gate from its hinges; hussars and Esterhazys were fighting it out with the saber through the streets, the French winning and people yelling at them from upper windows.

Dallemagne was right on the heels of the horse; before noon Augereau and Masséna had reached the town with their divisions, and Bonaparte himself, who rode to the river bank. A wooden bridge left the walls of the town to stride across the Adda, resting itself on a sandy island midway. It was three hundred feet long, wide enough for a single cart, and Marmont's hussars had come on so furious fast that the Austrians were not permitted to burn or break it. They had done next best; Bonaparte could count fourteen cannon drawn up to sweep the narrow pass, with long lines of infantry in support.

In the mess at Codogno following Laharpe's death two nights before, the French scouting service had altogether

missed the march of Beaulieu and his phantom 8,000 to Pizzighitone; Bonaparte thought he had before him on that opposite bank the whole Austrian army. Crossing in their teeth would be a desperate business, but "I needed some bold stroke to set a special stamp on my deeds; I resolved to astonish the enemy by so daring an operation." The cavalry he sent upstream to find a ford and reach for the Austrian flank; the artillery was run forward, wheel to wheel, to answer the Austrian guns; the grenadiers of all the brigades massed behind the town walls, and at seven under the westering sun, dashed onto the bridge at the run, six abreast. *Vive la République!*

The Austrian guns went off like a single thunderclap, then again and again, into the smoke with canister. The head of the column was blown to bits; the rear, unable to move through the wounded and that storm of war, recoiled. But Dallemagne who had led them, miraculously unhurt, was there to make a rally; Bonaparte and his staff rode down, and as he did so, Berthier with frog-lips working, seized a standard and threw himself into the storming column; Masséna was among them with a musket like a private, and Lannes. Some carabineers of the 4th had worked their way along the bridge timbers to the island and to holes under the bank from whence they opened a murderous sniper-fire just as the column, without any word of command surged forward again, officers and privates all together. They went right through that sheet of flame from the Austrian artillery, up among the guns, bayoneting the cannoneers at their pieces. Sebottendorf's infantry line broke; his reserve broke; when he tried to cover his retreat with the cavalry (where night would have done better), he lost most of that to Division Masséna, which had followed the storming column.

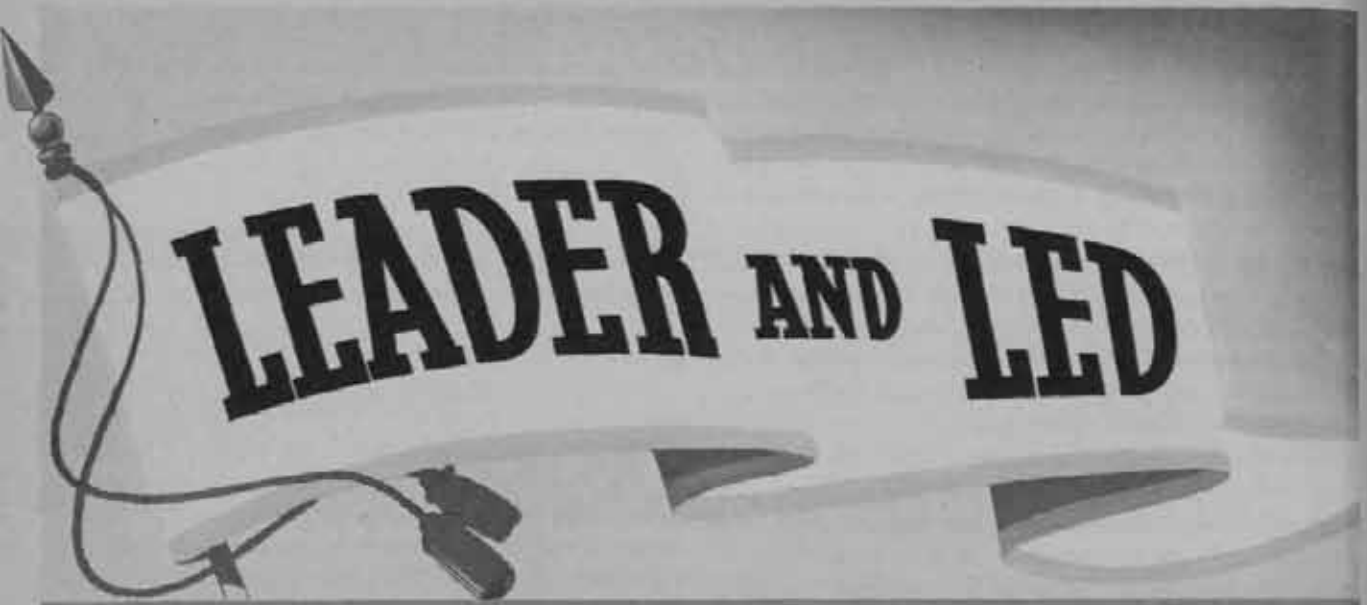
IV

Grenadiers camp apart from soldiers of the line. They are special caste; proud of it; hold little councils around the campfire, at which officers who have shown the right stuff are declared elected of their number; had thus coöpted Laharpe for his size and fighting spirit in the old days among the Alps—Laharpe and no other general. That night of Lodi as Bonaparte rode through the lines, they were murmurous and the words one could make out were, "There he goes—that's him—our little corporal of grenadiers."

Bonaparte: "Well, Marmont, what do you think they are saying in Paris?"

Marmont: "They must be wild with delight."

Bonaparte: "They have seen nothing yet. No one in this age so far has dared to think on the grand scale."



LEADER AND LED

By Major Thomas R. Phillips, Coast Artillery Corps

The commanders of large units in our army in war will attain their high places with hardly an opportunity for observation or experience in their lofty ranks. They will have known professional soldiers and small units and will have led them in the safe exercises of peace. But leadership of citizen soldiers and large units, in the danger and urgency of battle, is a task of a different and more difficult nature. The duties and practices of the professional officer handling professional soldiers in peace not only do not prepare him for leadership in war, but in all probability burden him with a baggage of custom and theory that inhibits the development of whatever innate quality of leadership he may possess.

In our two great wars, the Civil War and the World War, the leadership of masses of civilian soldiers was a problem that baffled the majority of officers. It is to be noted that the larger part of the outstanding leaders of the Civil War—Grant, Sherman, McClellan, and Stonewall Jackson, for example—had left the Army and returned to it again from civil life. Some American officers, wrote Colonel G. F. R. Henderson of this conflict, could get as much out of volunteers as out of veteran troops. Others, who did not understand the prejudices and traits of the volunteers, never acquired their confidence, and despite their ability otherwise, failed in every operation they undertook. With Regulars these commanders would probably have been successful. With volunteers they fell from disaster to disaster. It is not sufficient to bring volunteers under military law, continues Colonel Henderson. It takes something more than the rules and regulations that govern a professional army to win and hold the confidence of citizen soldiers and make them steadfast under circumstances of danger, difficulty, and hardship.

Hancock, one of the most successful corps commanders in the Union Army, never sneered at volunteers. He made them feel by his evident respect, his warm approval of everything they did well, that he regarded them just as fully soldiers as if they belonged to his old Regular regiment. He knew with what assiduity, patience, and good feeling, what almost pathetic eagerness to learn and to imitate, the Volunteers of 1861 sought to fit themselves to take part in the great struggle. He saw that it was of extreme importance to develop self-respect and self-confidence in these regiments and to lead them to think that they could do anything and that they were the equals of anybody. But Hancock was not a mere drillmaster; he loved his men, understood them thoroughly, and was therefore fit for high command.

The return after the Civil War to a little professional army was a return to the psychology of leadership that had existed before it. In the World War the identical problem confronted us again in full force; the solution was not happy. According to a writer in *The American Legion Magazine:* "Our Regular Army disciplinary system is mainly responsible for the fact that universal military training has not become a part of the law of the United States. The discharged men carried first-hand information about army methods into thousands of homes. They told

The substitutes for leadership on which the professional too often depends cannot be used in war

of the perpetual clicking together of heels, the incessant and wearisome saluting, of the overdone enforcement of deference toward officers of whatever grade, of the martinet's insistence upon the minutiae of useless and senseless observances, of the too-frequent lack of human touch in dealing with the bewildered men in the ranks. The system has produced many fine administrators, but the few genuine leaders developed under it have risen in spite of and not because of the training given them."

The problem will confront us anew when once again we must have a citizen army. For once again we have returned to the ancient practices of the professional army and the small unit. Army regulations on discipline remain unchanged, in all essential respects, from those of 1821, and those were copied from the regulations of the noble and peasant army of royal France of 1788. In theory, man is the one unchangeable element in war. But as man's social life changes, so must the relation between leader and led be modified. Wellington remained convinced until his death that only flogging could develop a disciplined army. Rochambeau wrote in his memoirs that the whip is the sinew of all discipline. Flogging was forbidden in the United States Army in 1813, yet fifteen years later an officer was tried by court-martial for having a soldier flogged so severely that he was unable to perform duty for nine days. True, we no longer practice such methods and to that extent admit that man's attitude has changed. But other customs remain, equally ancient, equally inapplicable today, and they will undermine our effort to lead the literate, intelligent, independent, and eager young American in the next war.

War brings not only the citizen soldier with his civilian outlook, but also enormous numbers of men. The procedures of the peacetime company or the post commander supply no lessons of leadership to officers catapulted into high command. As Foch said of the leaders of the French Army of 1870, "They were superb generals in peacetime, fine soldiers, who knew everything except war." In short, they were generals completely without experience in handling men by tens of thousands.

The newly elevated generals react according to their character. This one swallows his saber, as the French put it, and spends his time making routine inspections and weighing out punishments. That one thinks his lofty place demands untouchability and withdraws into godlike seclusion. Others remain what they were—company commanders, now, of divisions. A few—a very few—discover, develop, and use the techniques of mass leadership and are rewarded with devotion that knows no bounds—that stops at no sacrifices.

It is easy to belittle the differences between the leadership procedures of the small professional army and those needed for large commands. The average officer is unaware that there are any. But it is these differences that lie between success and disaster. "In times of peoples' armies and totalitarian warfare, [wrote Ludendorff] the officer will fulfill his task only if he has a clear notion of the basis upon which the unity of the people and discipline rest. In these qualities the old school of officers was lacking, for the officers lived apart from the people. That these officers were ignorant of the people's way of thinking and knew only national and monarchic principles was a consequence of the conditions of that time. That this was not enough, the result of the War showed clearly."

In France, after 1870, when the nation adopted compulsory military service, it took twenty years, says General Tanant, for the army to modify its methods of leadership to accord with the mentality of the citizen soldier. It took another fifteen years before enlightened, paternal, and affectionate leadership became general in the French Army. In our own army we have the enormously difficult and hardly comprehended problem of making this same change within a few months after the outbreak of war. If we fail, the Army will again deserve and receive the hatred of its soldiers as they go back to their homes and will again struggle for years against an antipathy that it does not understand.

There is a technique of leadership of large commands and of civilian soldiers and it can be acquired by all in some degree. When he reaches high command the educative process of the leader is over. The general must lead with the personality and character he is then endowed with. But then, if ever, he needs in addition a technique of leadership to guide him in his unexplored domain. If he has none he fails, and the next war's Blois will be filled with such failures. The great leaders of the past developed their methods through trial and error. Politicians of all ages have learned the technique of popular leadership by the same process. The leader in modern war will not have the time and opportunity; but the psychologists of today have clarified the problem of mass leadership for him and the methods are no longer the secret of the occasional genius.

Of leaders and leadership there are many definitions. Perhaps the clearest is one that limits the function of leadership to the moral sphere in the exercise of command. The exercise of command involves:

Leadership: The imposition, maintenance, and direction of moral unity to our ends. This is similar to the definition given on the efficiency report.

Generalship: The tactical or strategical direction of operations.

Management: Staff functioning, administration, and supervision.

Many substitutes for leadership work well in peace. A good administrator can have a well-turned-out command without ever approaching the qualities of leadership. Fear of punishment is effective in peace; in war the guardhouse may be a reprieve from death. Supervision can be carried out in peace to the last trifling breach of uniformity; in war, the battle, when joined, must be turned over to subordinate leaders. Supervision and punishment, primarily functions of management—substitutes for leadership in peace—are not available or are only partially usable in war. The professional officer, too frequently in peace, depends upon

these substitutes for leadership which in war he cannot use.

Leadership is the most important function in the exercise of command. Generalship and management, to a large degree, can be entrusted to a competent staff. But the eyes of the men are always turned upward and no one can exercise leadership for the commander. "Technique and tactics," Foch said, "that is the business of staffs. The leader, himself, should furnish the spirit and the morale." And he adds that neither clairvoyance not energy suffices for the leader; he must also have the power of communicating the spirit that animates him to his command. He should know his men, love them, and maintain between them and himself the mutual confidence that is more indispensable in a national army than in a professional army.

Military leaders fall into three principal classes:

(1) *The Institutional Leader,*[1] who exercises control by virtue of his rank or position; that is, by the established prestige and legal authority attaching to his office. All army officers are institutional leaders.

(2) *The Small-Group Leader,*[2] who acts on individuals. He is represented in the army by the captains, lieutenants, and noncommissioned officers.

(3) *The Mass Leader,*[2] who impresses and dominates because of his character, his understanding, and his ability to mold and control the minds of large groups without intimate personal contact. All regimental and higher commanders should be mass leaders.

The institutional leader issues orders in accordance with his legal authority and expects them to be obeyed because of legal impulsion. His moral superiority exists in his rank and position, not in himself. Such a leader may maintain and build up a thoroughly coherent group. To do so he must be punctilious about dress, drill, formal discipline —in a word, about all the symbols of authority, and in this he will be right psychologically. Thus a man may get to a position of leadership who lacks the personal qualities either to dominate or to understand his men, yet may make a very considerable success of it, at least in peace, provided he recognizes his own limitations and suits his methods to them.

Institutional leadership is a system of leadership. It substitutes prestige of position for prestige of personality. It is implicit in a professional army. It permits frequent change of leaders without injury. There are no means in a peacetime army of selecting mass leaders, so a system of leadership must be depended on. Unfortunately, the system fails to develop capable mass leaders; it apparently hinders their development. The complete flowering of the institutional leader is the antithesis of the mass leader, who is self-assertive and original, and endowed with a high degree of initiative. He cannot help but be a thorn in the sides of many among the superior institutional leaders who predominate in a hierarchical organization. Institutional leadership, gone to decay, breeds that lowest form of mili-

[1]Term used by Bartlett and Coste. See bibliography.
[2]Terms used in *Psychology and Leadership*, C&GSS, 1934.

tary life—the martinet. In the growl of one colonel, "I have been taking it for thirty years, and now I am going to dish it out," is summed up all the repressions and decay of institutional leadership.

The small-group leader deals with men as individuals. He concentrates on individual psychology. Given the knowledge and desire to understand his men and take care of them, his problem in winning their confidence and devotion is simple. He is in close daily contact with them and has every opportunity to demonstrate his worthiness of their trust and his capacity to lead them. As the years go by, however, he accumulates a mind full of small-group ideas and small-group methods, which, if persisted in when he reaches high command, may be actively harmful. We have all seen senior officers who have never left behind them the interest and methods of the company commander.

Mass leadership itself is nothing new. What is really new is the psychologists' recognition of the mentality of the mass and their researches into methods through which masses of men can be influenced. In certain nations propaganda ministries sway whole peoples at will by appeal to mass psychology. All great military and political leaders have been mass leaders, able to arouse the devotion and enthusiasm of their followers. It was of such that the maxim was coined that leaders are born, not made. And like many over-simplifications this one has in it only a portion of truth. For modern psychologists have paved the way to make this type of leadership a science. From their studies a technique of mass leadership can be developed, and actually has been developed in the political field. Thus these methods of mass leadership are available to all with the intelligence to use them. With the enormous armies of today, composed largely of civilians, mass leadership methods are essential to the conduct of war.

Institutional leadership and the institutional type of discipline has succeeded admirably in the past with professional armies. It works well with the peacetime army, because we have time to change the habit patterns of our men, to condition them to the soldierly ideals and prides of the professional. With the hastily trained national army there is not time to modify character to the pattern we desire. The ruthless attempt to do it in a short period, with too small a nucleus of professionals to give the example, arouses fear, resistance, hatred, and suspicion. All the new soldier's earnestness and anxiety to learn can be turned into cynicism and distrust if he is subjected initially to a commandership that appears to have no other object than to harass him with a thousand petty restraints. It was our uninspired institutional leadership that created the distrust of the military system in our World War army which today still blocks civil understanding of its fine ideals and high purposes.

The mass leader must know the minds of his men. A knowledge of psychology will help him. But more than psychology is the understanding that comes from contact and sympathy with his men. The older psychologists pictured the mind as divided into conscious and instinctive parts and listed a large number of instincts. The analytical psychologists admit an instinctive basis, and add the unconscious filled with fixations and complexes which they believe are the key to many of our actions. The behaviorists deny the existence of instincts and call the unconscious the "unverbalized," and make a pretty good case for their contentions. But regardless of the disagreements of psychologists concerning the origin of impulses of human behavior, all of them agree that man is characterized by certain behavior patterns. In our effort to utilize universal human tendencies it matters little whether we call these behavior patterns instincts, that is, inherited pattern reactions, or whether we consider them to be learned pattern reactions.

In his methods of influencing the led, the leader capitalizes on the human tendency to form groups. On the lower level are appetite and instinct groups. On the higher level the groups are based on interest, sentiment, and ideals. Such groupings are not necessarily physical; that is, in the form of crowds. The twelve thousand officers of the Army are an "interest and ideals" group. The group once formed has a definite group mentality. In *Psychology and Leadership* are listed the characteristics of the group or herd instinct, as: intolerance of opinions that differ from those of the group; fearfulness of solitude; sensitiveness to the habits and customs of the group; subjection to the opinions of the herd; susceptibility to leadership; relations with his fellows dependent upon his recognition as a member of the herd; and heightened suggestibility. All of these group characteristics can and must be used by the leader.

His first problem is the development of group feeling and unity. Since man instinctively is a herd animal the development of group allegiance is simple. Let men with a common cultural background live together and work toward a common end, and they will automatically identify themselves with the group. When to this are added an identifying uniform and certain group passwords, symbols, and ideals, such as the military salute, military insignia, and military traditions, the solution is complete. "The historic fame of any military body," Hindenburg wrote, "is a bond of unity between all its members, a kind of cement which holds it together even in the worst of times." The process is hastened by drills and parades. In modern armies the primary value of drill lies in the development of group spirit. It has no other magic. The type of obedience and discipline taught by drill has small application on the battlefields of today. When men have been long in the lines and are consequently disorganized, no other method equals close-order drill in restoring group spirit. It is the visible symbol and shared actuality of the group in action with all of its members and leaders working together.

Since the soldier group is not a natural one but is formed deliberately with a definite end in view, group interests, sentiments, and ideals must be given to it. These we have in the form of all the historic virtues of the soldier: patriotism, loyalty, pride, obedience, courage, self-sacrifice, and discipline. In the professional army these ideals have con-

tinuity. They are absorbed, rather than deliberately implanted, and the process is slow. In the citizen army they must be intentionally and consciously inculcated. If they are not, then in place of them must be put the iron discipline of legal authority. Discipline is defined as control gained by enforcing obedience. But how much more desirable, how much simpler, to give the soldier proper group ideals, so that authority comes from within the men themselves and they act through morale rather than discipline.

One American World War general, when still a colonel commanding a Regular Army unit, often collected his regiment to talk to his men. He would narrate from the regimental history a story of heroic action in battle. Then he would ask the question, "Who was responsible for this victory? Who actually deserves the credit?" Some assured private primed with the answer would get up and reply, "The private soldier, sir." Other questions would follow, all designed to bring out the same type of answer. It was thus that he developed the pride and sense of importance of his men, their individual responsibility for the success of the regiment in battle. This was a subject close to this commander's heart and one that he never failed to emphasize. Although his assemblies were deliberately stage-managed, there was no insincerity in them. That was his method of implanting group ideals. What his regiment did in battle later on proved how well his method worked.

This commander's method was that of suggestion. Each soldier, inside of himself, hoped to be as heroic as the examples his colonel cited, and when the test came he was. The quality in a leader that gives potency to suggestion is earnestness. Earnestness is an emotional quality that is transmitted from mind to mind. Constant affirmation and repetition of ideals will plant them forever if done with sincerity. Reason and right have little influence compared to suggestion and earnestness. The earnestness of Huey Long gained for him his position and his place in the hearts of his followers, not the logic by which he hoped to share wealth. The commander who fails to make use of suggestion and affirmation neglects one of the primary tools of leadership.

Group pride and confidence in the capacity of the group are developed through group accomplishment. But accomplishment must be reasonably gradual. The self-confidence of a green regiment can be ruined by a march beyond its capacity. "Unattainable demands prejudice the trust in the leaders and shake the spirit of the troops." (German FSR). The leader who does not know the capacity of his group and gives his men tasks beyond their capacity destroys its morale. "No man is more valiant than Yessoutai," said Genghis Khan, "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 such things. *That is why he is not fitted for high command.*" And of Sir John Moore's failure in the same respect, Wellington said, "He was as brave as his own sword, but he did not know what man could do or not do." French field service regulations are explicit that the capacity of green troops should be estimated prudently and that they should be supported energetically. In the World War our GHQ appreciated the importance of this. In the attack of the 28th Infantry at Cantigny, the first attack of the regiment and the first wholly American attack, no chances were taken of failure. The operation was rehearsed on similar terrain in the rear. Its success was essential, not only for the morale of the regiment, but to insure confidence in the entire American Army. The same reasons kept Chaumont from sending partially trained men into battle. An early failure would have been disastrous to morale. And again at St. Mihiel no chances were taken of failure.

A classic example of a means used to develop group pride is the statement of a captured German colonel published in orders to the entire 1st Division in the lines.

"I received orders to hold my ground at all costs [it read.] The American barrage advanced toward my position and the work of your artillery was marvelous. The barrage was so dense that it was impossible for us to move out of our dugouts. Following the barrage closely was the infantry of the 1st Division. I saw them forge ahead and I knew that all was lost. . . . Yesterday I knew that the Division was opposite me and I knew that we would have our hardest fight of the war. The 1st Division is wonderful and the German Army knows it. We did not believe that within five years the Americans would develop a division like the 1st. The work of its infantry and artillery is worthy of the best armies in the world."

The patness with which praise is distributed equally between infantry and artillery leads one to believe that the German colonel's statement had been re-written for publication. It is unlikely that this would occur to the men. It contained the kind of praise they wanted to believe, and coming from an enemy, it was ever so much more welcome. One can imagine the redoubled efforts they made to live up to their reputation on the other side of the line.

And just as the right orders to troops can raise their morale to the highest pitch, so can the wrong ones depress it. An example of a wrong way is the following extract from a division order. The division had been in the lines for its first month. The troops had fought bravely; they had suffered five hundred casualties and were proud of their accomplishments:

* * *

2. The character of the service which the Division is now about to undertake, demands enforcement of a stricter discipline and the maintenance of a higher standard of efficiency than any hitherto required of us.

3. From now on the troops of this command will be held at all times to the strictest observation of that rigid discipline, in camp and upon the march, which is essential to their maximum efficiency on the day of battle.

4. This order will be read by all organization commanders to the men of their command.

By command of .....:

Official. *Chief of Staff.*

"This order will be read to all troops."

How would the men receive this order? Here was a scolding from the division commander. The men doubtless thought they had already done wonderfully. What did "rigid discipline" mean to them? Probably to stand at attention and salute every time they turned around. What they needed and deserved instead from their leader was praise. They had performed splendidly under new and terrible conditions. If laxity in formal discipline had resulted from a month in the lines it could be restored promptly by a little drill. This absence of understanding on the part of their general of the state of mind of his men might have wrecked the morale of the division. He had simply not found the way to their hearts.

In contrast to this can be placed General Mangin's order to the Americans of his command in July, 1918:

Officers, noncommissioned officers, and soldiers of the III U. S. Army Corps:

Shoulder to shoulder with your French comrades you have thrown yourselves into the battle of the counter-offensive which commenced July 18th.

You went into it like a celebration.

Your magnificent courage overturned the surprised enemy and your indomitable tenacity arrested the offensive of fresh divisions.

You have won the admiration of your brothers in arms.

American comrades, I am grateful for the blood shed on the soil of my country.

I am proud to have commanded you in such days and to have battled with you for the deliverance of the world.

MANGIN.

Note, too, that this order was signed by Mangin, by the higher commander himself, not merely "by command of So-and-So," and somebody else as chief of staff, and somebody else as official, to dilute its import as a personal communication from the chief. Nor did it contain that useless and typical paragraph about reading the order to the troops.

One can search the pages of history, the general orders of Napoleon and the orations of the ancients without finding a finer, more direct and manly message than that delivered to the 1st Division on October 29, 1918. The division had suffered more than seven thousand casualties between October 4 and October 11. The men had expected to have a month in a rest area, but were ordered back into the Meuse-Argonne battle:

Memorandum for Members of the 1st Division

It will be well for us to bear in mind at all times and especially upon the eve of active operations, the following:

1. That we are the first assault division of the AEF.

2. That we have, on four battlefields, always taken all objectives assigned to us.

3. That we have gone through the best German troops for a total of thirty kilometers and have never surrendered an inch of ground to the enemy.

4. That for every prisoner, we have taken over one hundred Germans.

5. That the above record has been due to the pride and spirit of each individual member of the Division who, each in his own place, has given to his country his entire effort of heart, mind and body.

All men need and seek a leader. Confidence, respect, and affection are given to him instinctively. The com-

mander who manages to arouse distrust and dislike in his group has accomplished almost a miracle of false leadership. That it is so often done indicates not that it is hard to avoid doing, but that there is a fundamental falsity in many of our conceptions of leadership. "Hero worship is the deepest root of all. No nobler feeling," Carlyle wrote, "than this admiration for one higher than himself dwells in the breast of man. It is to this hour, and at all hours, the vivifying influence in Man's life."

Here is another behavior pattern made to order for the leader. In childhood humans turn to a parent for care and solace. This desire for a superior to whom they can turn never leaves them. It expresses itself by hero worship, by constant seeking for guidance, by faith-giving to political messiahs, and in an army, by love and devotion to the superiors who understand and fill this human need. Many a soldier has risked his life to protect a loved leader. Lee's men pleaded with him to remove himself from danger. One of Napoleon's most effective means of inspiring his men was to threaten to go into battle at their head. A flag in his hand, he charged the bridge at Arcole at the head of his grenadiers, and at other times retired from dangerous places only on the demand of his soldiers. In bivouac at Austerlitz he announced: "*Soldiers*, I will hold myself far from the fire if, with your accustomed bravery, you carry disorder and confusion into the ranks of the enemy. But if the victory is uncertain for an instant, you will see your Emperor expose himself to the first blows."

The problem of the military leader is to transfer the tendency to hero worship to himself. He must supply the care and guidance to his men that every human seeks and thus makes an associative shifting of allegiance from the father image to himself. The first step is unremitting care for his men. "An officer must likewise find a way to the hearts of his subordinates and gain their trust through an understanding of their feelings and thoughts and through never-ceasing care for their needs." (German FSR)

Our own *Manual for Commanders of Large Units* emphasizes the same attitude: "His first object should be to secure the love and attachment of his men by his constant care for their well-being. The devotion that arises from this kind of attention knows no bounds and enables him to exact prodigies of valor on the day of battle."

There is no inconsistency in this and the obligation to perform the most arduous and dangerous of duties. Nor is it inconsistent with the exaction of rigid discipline, nor even with extreme severity. Love and care for the men, performance of duty, and discipline must march arm-in-arm.

The leader of large commands has a difficult problem in getting close to his men. He must plan deliberately and make occasions to share the dangers and privations of his lowest subordinate. This requires showmanship and is quite a different matter from the problem of the small-group leader in daily contact with his men. It also requires practice.

Not even Napoleon was born a leader. Marshal Marmont declared that the Army of Italy received him without confidence and almost with derision. His early efforts at haranguing his men were laughed at. He had first to learn the chords to play upon; but he did learn. It was not long until his men wept with rage when he reproached them. And never was a general as religiously listened to. When he spoke, and this was frequently, he carried the enthusiasm of his troops to the highest pitch. The men gathered around his proclamations and orders of the day and learned them by heart. He made the emotional chords vibrate—words of action always, no vain rhetoric, no fancy speech, and above all, no pompousness. Whenever he could he explained his intentions and maneuvers to his men. And always he declared his love for them—"My soldiers are my children."

No general in the Union Army received such unbounded devotion as McClellan. He forged the army with which Grant won the Civil War, and it remained a marvelous army as commanders followed him in rapid succession, even after defeats that would have ruined most armies. An idea of his methods can be gained from the letters of Private Henry Sproul. On June 5, 1862, after his regiment had been in action, Sproul wrote home: "General McClellan sent his thanks to us and said if we got into action again, he would be with us."

He did this throughout his army. He went among the men; he strove to feed them well and organize them so that they would surely be victorious. Six weeks later, after the retreat down the Peninsula, Sproul wrote home:

"I suppose people blame General McClellan, but they need not blame anyone but themselves. It was their fault for not sending him reinforcements, when he called for them and needed them so badly. But no, they must leave him and his men to be slaughtered by overwhelming numbers. I see in the papers that it is the cry to recall. It would be the means of destroying the army, for there is not a soldier here but that loves him more than his own life. There is not one but would be willing to lose his own life for him. If they do recall him I think it will raise a mutiny in the army."

Personal appearances before troops can be done badly and react unfavorably. Invariably these failures are due to a lack of understanding the soldier. One of our major generals in France wanted his men to know who he was. His troops were marching to the front through a village in a heavy rain. He struck a pose on a balcony overlooking the route of march. No one paid any attention to him. He shouted, "I am your general! I am General So-and-So." The men could not hear him and did not know him. They only saw someone in uniform on the balcony waving his arms and saying something. Naturally they hooted and called back at him and this was taken up along the line of march. Needless to say they later learned who it was and his prestige with his men was not helped.

Then there was the general who came to make an inspection of a brigade. The review was called for 7:00 AM. Some of the men left their billets, twelve miles distant, at

1:00 AM to get to the review on time. Seven o'clock and no general, and rain kept falling. Noon, and still no general, and the subordinate commanders held him in such terror they wouldn't let the men leave ranks to eat. At three in the afternoon an aide came down the line in a motorcycle splashing mud indiscriminately and said that the general had come and gone. Every man who was in that brigade still carries his hatred of that general and of the Army. The object of the inspection was not only to look over the troops but to give them a chance to see the commander to whom they looked for leadership. It failed in both objects. And it destroyed all confidence and affection for the general.

We may consider here, too, the dress of a commander. We are wont in peace to ascribe extreme importance to his outward appearance. But just how much does it count? General Grant had but one coat at a time, regarding it fondly as an old friend. He preferred his coats made so that he could wear them either side out, and he did wear both sides out before he ever discarded one. He was indistinguishable, except for his insignia, from a cavalry private. Mangin, who spent from daylight till noon daily in the trenches, was always immaculate. He avoided the communicating trenches in going up to the front, and walked across country so that he wouldn't soil his clothes. In contrast, Pétain was plainly dressed, more often than not, in a soldier's overcoat. An encounter between the two, when both were brigade commanders at the time of the retreat from Belgium, shows all the difference between the two manners. As the two generals prepared to eat beside the road, Pétain, stumbling with fatigue, drew from a paper sack a piece of cold meat, some bread, and a piece of cheese. Mangin's orderly, on the contrary, laid linen on an improvised table and brought a hot filet of beef, fried potatoes, salad, and a bottle of wine. "How can you do all that?" demanded Pétain. "Don't you know we are at war?" "That is precisely why I need to be well nourished," responded Mangin. "I have been at war all my life and I have never felt better than at present. You have been fighting for fifteen days and you are almost dead. Follow my advice and nourish yourself decently."

But after the failure of the disastrous offensive of April, 1917, the last drop of water which made the vase of discontent overflow into mutiny, it was to Pétain that France turned to restore discipline. Thanks to his patience, his intelligence, his kindness, and his profound knowledge of the human heart, he reëstablished order in a short time. He attacked the true cause by getting close to the men, talking to them, showing them by acts of judicious organization that they would find moral support in him. The Poilu understood him at once and gave him his heart.

Napoleon also dramatized himself in his appearance before his men by wearing the clothes of a simple soldier. Around him were arranged his staff and his marshals in gold braid and lace. When he appeared with his worn coat, the legendary little hat on his head, distinguished by a deliberate and exaggerated simplicity, he appeared to his men like one of the heroes of antiquity. It is what is inside the heart of the leader, not what clothes the outside of his body, that arouses the devotion of the led. Georges Bonnet, the present Foreign Minister of France, writing as a private in the lines in 1915 about the motives behind deeds of extraordinary heroism, stated, "This one acts because he adores his family and would be glorious for them; that one because he finds himself with comrades from the same village and will not abandon them at any cost; *a third because he has a good commander who has known how to make himself understood and loved.*"

The leader of large commands must make himself a part of his group in the minds of his men. He does this by identifying himself with their activities. The smart politico campaigning for the farm vote enters a cornhusking contest. He wears galluses and goes without a tie. He identifies himself with the farmer and thus proves his right to act as their spokesman. The military leader does the same thing on a higher plane. He must exhibit the qualities that he demands of his soldiers—courage, fortitude, loyalty, and discipline. If he shares the soldier's hardships and dangers he has gone two-thirds of the way to the soldier's heart. He has also to prove his courage and this he must do deliberately, making the opportunity or seizing it when occasion arises. The favorite picture of Grant during the Civil War was the one in which he was sitting on a log, smoking a cigar, shells bursting all around as he calmly wrote a dispatch, while two soldiers nearby remarked, "Ulysses don't scare a bit." General Buck was never absent when his men were in danger or distress. He prowled the trenches day and night. With his tremendous vitality and the courage of a lion, he shared and more than shared the dangers and hardships of the men. He was as tough as they had to be and they idolized him. But is that the place for the general in battle? Or should he be back in a dugout putting pins in maps?

Blaise de Montluc, writing in the 16th Century emphasized: "When the battle is hot at some place, if the leader does not go there, or at least some distinguished man, the men will . . . only complain that they are being sent to their death."

Men have not changed since. General Barbot, when he was reproached by his staff for endangering himself replied, "I awaited this reproach. In principle you are entirely right, but one should never be absolute. In the present situation I estimated differently. The place of the division commander, whenever he is able, is, on the contrary, in the center of his Poilus who are in the first line. The situation is excessively grave. It is necessary that the chiefs of the tactical units from the smallest to the largest, do not spare themselves and give the example. And finally there is the question of morale, which at this moment has never been more important. The Poilu is happy to see that there where the shells are falling, *each takes his chances regardless.*"

General Barbot was placed in command of the 77th Division on September 1, 1914. In a few weeks he became the idol of his officers and men. Tall, thin, wearing the

coat of a simple soldier, an Alpine beret on his head, he was to be found everywhere where his presence could exalt the will to conquer. The day he took command, on la Chipotte Ridge, charged with protecting the withdrawal of the Army of Alsace, it is said that he covered the withdrawal with his own body. At the end of October, when Arras seemed lost, he refused to abandon it, and the city was saved. He passed his days and long hours of his nights in the first lines. He talked with his men, knew how to find the words that temper the will and exalt the courage. This simplicity of attitude, Pétain said, far from diminishing his prestige, engendered a community of thought and unified in the same affection the men who pursued the same end and were exposed to the same dangers. In the eyes of his soldiers he lived for three things only: for his country, for his men, and for victory. True to his principles General Barbot, less than a year later, in another exceedingly grave situation, fell in the first line in the midst of his troops.

Mangin, too, never spared himself. Telling of an operation he said, "My leading battalion pushed ahead. After some hesitation I decided the pear was hard and sounded the charge. But it was too soon, the men had to be pushed, certain fractions were hesitating. My troopers, on whom I had counted to threaten the rear of the enemy, whom I thought small in number, had disappeared. It was by pushing the men ourselves, the generals fifty yards behind the line of riflemen, that we carried the first houses. Evidently it was not our proper place, but it was the place indicated by the state of our troops and the dispositions of the enemy, thus it was good. The élan was given by example and they went in one rush from one end of the village to the other."

And what do the men think of this kind of a general? Henri Detheil, a private in the division, wrote home after Mangin had taken command: "At last we have a leader. After having had at our head a walking ruin, we actually have one of the best generals in the French Army. Young, intrepid, a lucid mind, inspiring the men, charging at their head when necessary—always in the first line under fire at difficult times. There is a man, there is a leader, and we are all joyful to serve under him."

It is not only the men, but the subordinate commanders of all grades who have to be supported by the presence of the superior. On the 27th of May, 1918, General Duchesne, in command of the French Sixth Army, had received the German attack on the Chemin des Dames. His troops disappeared like mist before him. In the days of the battle and following, no word of encouragement, no sight of the higher command came to him. On such occasions the commander looks rearward, searches for moral support there where he should find it, from his superiors, who alone can aid him morally and materially. The first higher commander to visit him was Premier Clemenceau, and it was from him that General Duchesne received the encouragement he needed.

General Mordacq, Clemenceau's military adviser, remarked in telling of this incident, that it is not only when everything goes well that a leader should visit his subordinates; it is especially at critical moments, and Duchesne was in such a case. Mordacq said that he remembered General Barbot at the opening of the war, always at their sides when everything was cracking; but in contrast, during the first attack, in Belgium in April, 1915, neither his division nor his corps commander ever appeared as far forward as Mordacq's command post.

With some noteworthy exceptions, the American commanders in the World War did not spend much time in the lines. A single general was killed—an indication of the extent to which those high in rank were endangered. This, of course, was not from any lack of personal courage, but because they did not, as a rule, have capable staffs to whom they could delegate their responsibilities. Frequently, too, it was because the higher command ordered them to remain at the end of a telephone line. In contrast, at the single battle of Antietam in September, 1862, on the Union side there were six generals killed, including two corps commanders, and ten were wounded. On the Confederate side five generals were killed and six wounded, a total of twenty-seven general officers killed and wounded in one battle. But the leadership was superb. With leadership by proxy, or from a safe distance, this battle could have been a disaster for either side.

It is obvious that man is not led by reward or punishment. He cares more for the opinion of his group than for either. He will risk his life for a loved commander, for a comrade, for the respect of his organization, but not for fear of court-martial. Nevertheless, rewards and punishments are necessary adjuncts of leadership. Good leadership will make the need for punishment infrequent. An organization can be ruled by punishment in peace, but a commander who so rules is not a leader, he is a jailer. He can establish the appearance of discipline, but it is not a discipline for war, since that discipline depends upon abnegation. On the field of battle the awakening will be hard and it will be at the price of human lives. The more perfect such discipline appears the more dangerous it is, for one is tempted to attribute to an organization that looks good, a fighting value much higher than its real worth.

Punishment should be reserved for the repression of the incorrigible, for those who shun their duty, and for those who do not wish to bend to discipline. Punishment given to many indicates a lack of moral superiority in the commander. When, in battle, any punishment less than death is a reprieve from dangerous duty, what lever of leadership remains to the commander who has depended on it?

Reward like punishment should be prompt. A word of praise from a respected commander is a reward. Many Americans saw the bucketsful of medals being carried up to French organizations in the lines, to be awarded on the next day after heroic actions. But all recommendations for decorations for Americans had to be passed upon by a board at GHQ—a board exceedingly slow in acting. For

the Distinguished Service Cross it approved about five thousand recommendations and disapproved an equal number. But four-fifths of those awarded were not approved until the war was over and so lost all value as stimulants to morale. The French were more generous, distributing between fourteen and fifteen thousand decorations among the Americans, but these were put on official ice until after the Armistice.

The leadership of peace, as we practice it, has little relation to leadership in war. Because tasks are not severe, the routine of institutional leadership and the substitute discipline of law and punishment suffice. Once again, should we go to war, we are unprepared psychologically to lead the citizen soldier. In the future, greater armies than those over which our colors flew in the Meuse-Argonne will be constituted. The soldiers will come straight from civil life and to civil life they will return. It is vital that we recognize that these troops without the traditions, habit patterns, and training of Regular soldiers require leadership different from the professional. Upon our splendid institutional foundation must be built a leadership of understanding and mutual trust and mutual sacrifice. Only by knowing the nature and purpose of institutional leadership, and its limitations, by studying the methods of great leaders, by studying and applying the researches of modern psychologists, can we prevent the decay of leadership in our hands into the stupidities of the martinet, and prepare ourselves to lead the great armies of citizen soldiers of the future.

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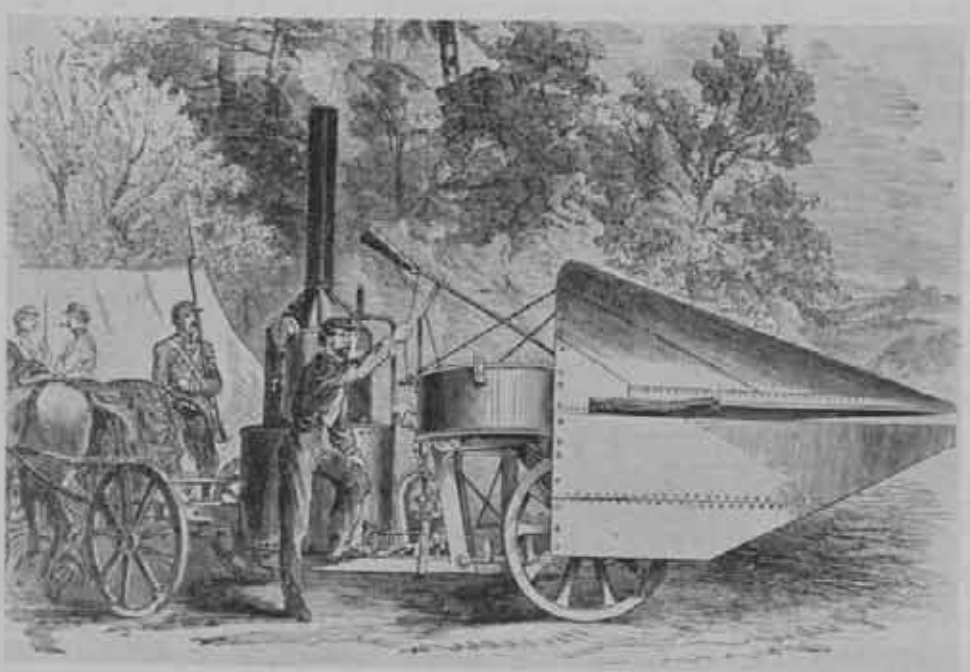


The Winans Steam Gun

THIS WAS ONE *of the several steam-driven centrifugal force guns experimented with during the Civil War. Somewhat resembling a fire engine, this remarkable piece of ordnance was really an early attempt to produce a machine gun. It consisted of a steel barrel into which bullets were fed from a revolving drum controlled by several valves, and was designed to fire at the rate of 300 rounds per minute.—Journal of the American Military History Foundation.*

Fort Bragg Firing Exercises

By Captain E. W. Chamberlain, Coast Artillery Corps

About noon, October 18, 1938, Battery C, 2d Coast Artillery, fired a final string of .50-caliber machine-gun bullets at a sleeve towed over Snow Field and the Fort Bragg firing exercises were over. The public address system bellowed "March Order" for the last time and some 2,000 officers and men who had been in camp for six weeks turned their thoughts toward home.

On August 31 the first of the advance parties had rolled into Fort Bragg and gone into camp; by nightfall of September 8 there had been concentrated at that station the greatest number of Coast Artillery troops and the largest amount of Coast Artillery matériel ever assembled in the continental United States for a peacetime exercise. This concentration included practically every Regular Army antiaircraft artillery organization stationed east of the Rockies.

Preliminary Preparations

Early in June, 1938, Brigadier General Fulton Q. C. Gardner, who commanded the antiaircraft brigade at Fort Bragg, was ordered to temporary duty in the Office of the Chief of Coast Artillery in connection with the preparation of plans. In general, the approved program provided for firings designed to furnish data dealing with controversial points which cannot be covered adequately in normal target practices. All practices were to be fired under service conditions as nearly as possible.

General Gardner, with his staff, arrived at Fort Bragg on August 1 and at once started detailed local preparations. Because of the limited time it was necessary that a great deal of the preliminary work be over before the arrival of the advance parties on September 1. Much of this work, such as the reconnaissance for and selection of battery, searchlight, and director positions, spotting stations and listening posts—although normally the battery commander's function—was performed by the brigade staff during August to save time and prevent duplication of effort.

After extended reconnaissance, it was decided to locate the gun firing point on Plank Road at the southern edge of the reservation (Figure 1). This position gave a field of fire generally to the north so that a minimum amount of interference from the sun might be expected. A field of fire of 2,060 mils was obtained.

A second gun firing point, to be used in the problems involving the conduct of fire on a single target simultaneously by two batteries, was located on McClosky Drive approximately 5,000 yards to the north and east of the main firing point. The field of fire here was considerably restricted as it was but 1,400 mils.

Searchlight positions selected were those which would be occupied by units during the joint exercises. These positions formed a complete 360-degree defense about a defended area located in Snow Field. Listening posts were generally established on radial lines running through lights in the outer ring; platoon sectors were those which would obtain during the joint exercise. The command post of the searchlight commander was located on top of Gaddy's Mountain, the high ground to the northwest of Snow Field which afforded excellent observation of the entire defense.

Arrival of Organizations

All advance parties had arrived by the morning of September 2. During the week that followed they completed

much of the work incident to making ready the campsite and preparing the firing range.

The work on the firing range included surveying the necessary base lines; clearing the firing points; constructing spotting dugouts, and safety and control towers; installing camera stations and laying communications. To prevent duplication of effort a task system was adopted, each advance party being assigned tasks commensurate with its strength. Because searchlight practices were to be conducted from the positions occupied during the joint exercises it was necessary immediately to install the extensive searchlight communications net.

The main bodies of the participating regiments—the 61st, 62d, and 69th Coast Artillery—and a detachment of Headquarters Battery and Battery A and C, 2d Coast Artillery were all on hand by dark on September 8. Intensive final preparations were then made for the firing scheduled to start Monday, September 12.

A total of five B-10 reconnaissance (old bombardment) and two O-46 observation airplanes were made available by the War Department. One of the B-10's and both O-46's were normally based at Pope Field, Fort Bragg. The other four B-10's, with double crews, were furnished from Mitchell, Scott, Brooks and Patterson Fields. The B-10 from Patterson was equipped with an experimental 7,000-foot towing windlass.

After aerial reconnaissance and preparation of maps to enable towing pilots to fly the courses with minimum ground direction the target courses were laid out.

The towing schedule was arranged so that a standby airplane was always available in the event that target trouble grounded the regular towing airplane. In addition, overlapping missions were scheduled so that a relief airplane was able to go on course immediately its predecessor was ordered off course, thus minimizing delays incident to changing targets. Two-way radio communication was maintained between the firing points, the towing airplanes and Pope Field. Direct wire communication was also available between the firing points and Pope Field. An Air Corps liaison officer acted as assistant to the director of firing and directed the movements of the airplane.

The acquisition of complete and accurate records presented quite a problem, but was solved by establishing a brigade records and statistical section. This section consisted of the officer in charge; a record section; a statistical section; and various sub-sections headed by an officer.

The sub-sections of the record section included the O-1, O-2, O-3 and spotting sub-sections. Included in the sub-sections of the statistical section were the developing, projecting, plotting, computing and analysis sub-sections.

For both gun and machine-gun firings two flank stations were provided. In the case of gun practices these stations included details and equipment for taking both visual and camera records. Both flank stations took records on every course so that two sets of data were always available, one to be used as a check against the other as well as insurance that no courses would be lost from the flank. At the O-1 station for the guns duplicate camera set-ups were provided, i.e., a primary camera which obtained the normal records and a standby camera tracking and ready to start shooting at once in the event of failure of the primary camera. Duplicate camera posts were installed in the rear of each battery directing point, O-1 details moving to each position in turn.

Owing to the mass of records to be handled and the great number of reports to be prepared, the statistical section was organized into groups of specialists (the sub-sections as noted above) each of which performed one part of the

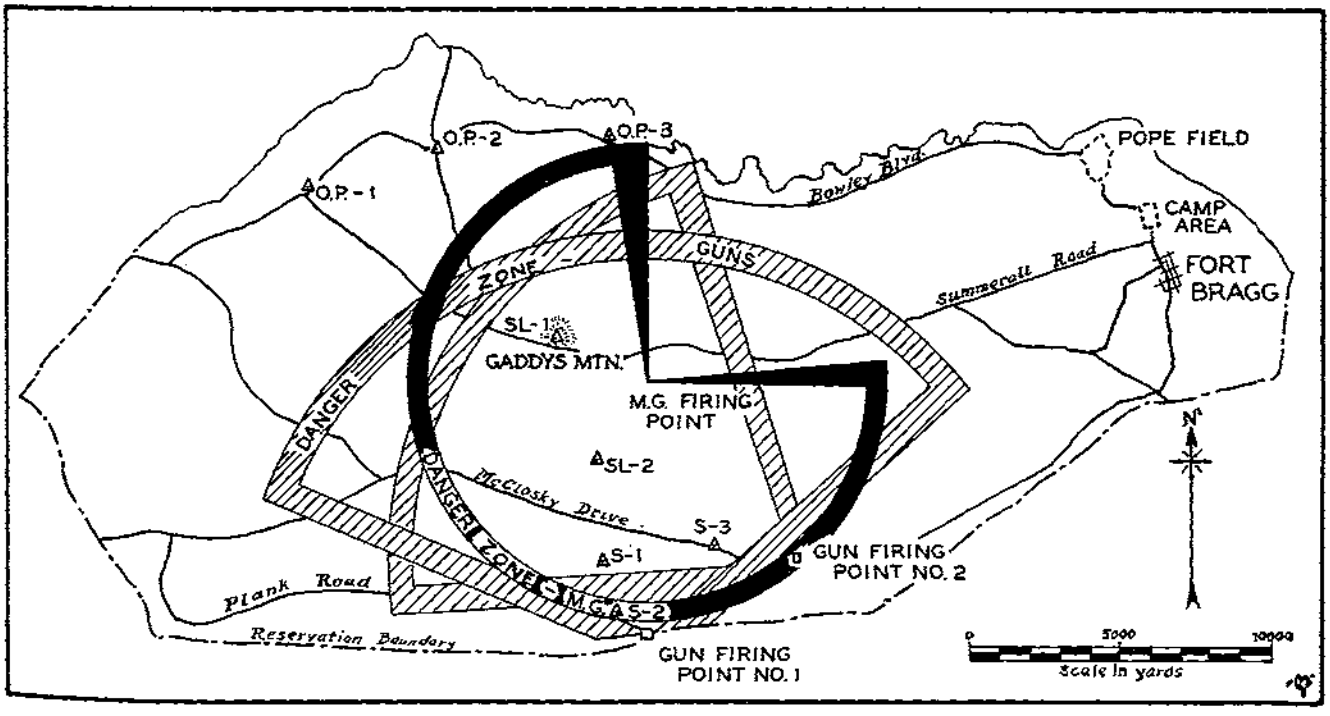
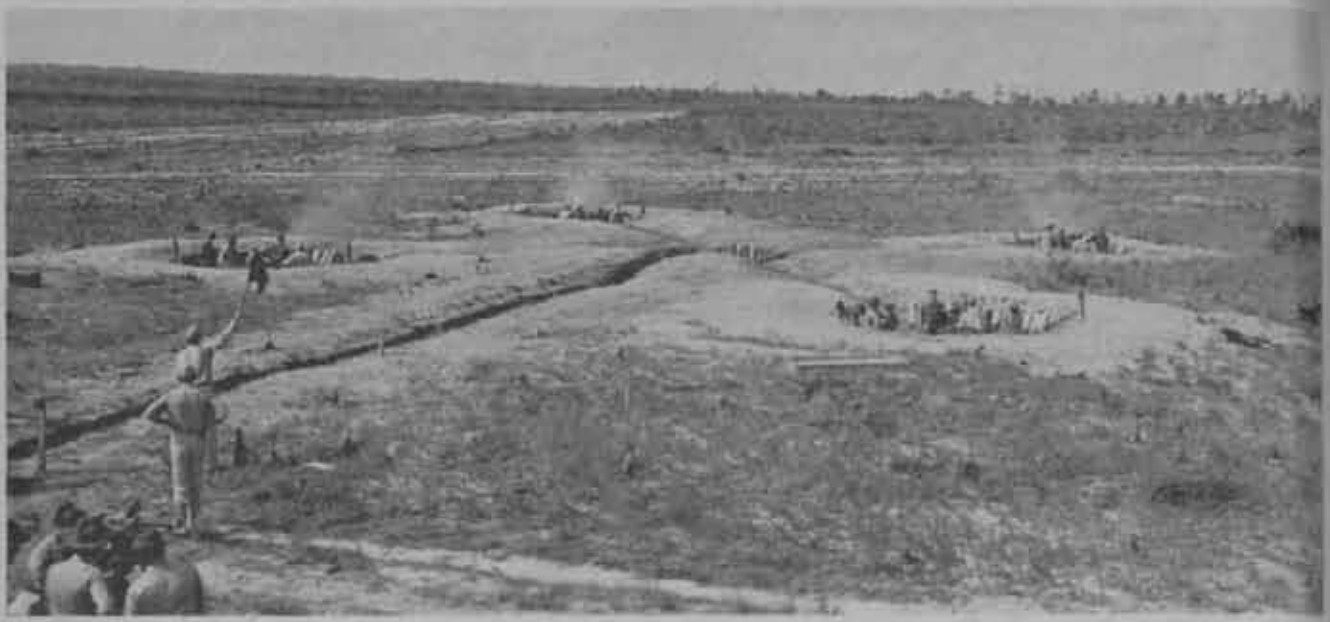


Figure 1



General view of the machine-gun firing point—Snow Field—as seen from the safety and control tower.

analysis. Each group therefore became expert in its work thus cutting down the time necessary for the preparation and analysis of reports. Shifts were organized so that throughout both the firing exercises and the joint exercises this section operated on a twenty-four hour basis.

Gun Practices

The approved program provided a total of seven problems. Each consisted of one or more practices designed to furnish information covering various types and methods of fire. In general, all practices simulated service conditions to a greater degree than is common in the normal record target practice. Guns were fired from a square formation instead of from a line, the individual pieces being emplaced on the corners of a square roughly fifty yards on a side. Four guns were used in a majority of the problems. The use of four guns, instead of two, coupled with a limited ammunition allowance and the added dispersion introduced by the disposition of the guns, complicated the adjustment problem considerably.

Battery personnel had no warning as to the type of course or the direction of approach of the target for any problem. Once a problem began the firing battery was required to fire on each course cleared by the chief safety officer. Any course not fired on was lost to the battery.

Except in the preliminary practices in Problem I, all range spotting was handled either by observers located in dugouts (equipped with periscopic instruments) within the field of fire or by stereoscopic observers using height finders located at the battery positions. A total of five dugout spotting stations were used, these stations being designated as SL-1, SL-2, S-1, S-2 and S-3 (See Figure 1). SL-1 and SL-2 were so located that they occupied the approximate positions that would be occupied by searchlights in the outer and intermediate searchlight rings respectively, had the firing battery formed a part of a normal 360-degree area defense. S-1, S-2 and S-3 were normal battery spotting stations located at varying distances and directions within the field of fire. Map orientation only was used for the instruments.

Spotting details were permanently assigned to each station and each observer spotted all courses, a record being kept of his spots so that an analysis of the comparative value of the locations of the spotting dugouts could be made at the end of the practices. The spotting communication net was such that by simple switching arrangements at each director position, the range adjusting officer could select the spotting station best suited to each course. There was no attempt to withhold fire until all spotting stations had located and were tracking. The batteries were prepared to use stereoscopic sensings in the event that none of the spotting stations were able to get on the target.

Three additional observers were stationed in positions corresponding approximately to those which normally would be occupied by observers of the antiaircraft artillery intelligence service in an area defense. Wire communication was not established between these stations and the firing point because of the distances involved. Instead, observers with field glasses were instructed to keep a time record of any spots observed so as to permit later analysis of the effectiveness of spotting performed from such stations.

Figure 2 shows the layout at the main gun firing position on Plank Road. The director of firing, who was also chief safety officer, exercised general control of the firing from the control tower. He was in direct telephone communication with the assistant safety officer (stationed in rear of the battery), the battery commander of the battery firing, the air liaison officer, and the range officer or his assistant who was located at the range guardhouse. Upon report that the range was clear and that the towing airplane was on course, a red streamer was hoisted at the control tower and the battery was free to proceed with the

practice as soon as a local clearance had been given by the assistant safety officer. The assistant cleared the battery as soon as the target entered the field of fire and observers signalled that pointing was safe.

All gun batteries (C, 2d; B, 61st; B and C, 62d, and B, 69th) participated in Problem I which consisted of one combined calibration and trial shot problem, one trial shot problem, and one preliminary practice at a towed sleeve. All batteries were on the line and ready to fire at 6:30 AM on September 12. Despite poor visibility and an unfavorable ceiling calibration problems were completed during the forenoon and the remainder of the day devoted to drill. The weather was also poor on the 13th but the trial shot problems and the preliminary practices were finally disposed of by late afternoon.

The gun batteries also participated in Problem II which was fired during the morning and early afternoon of the 14th. This problem was designed to furnish experience and determine the feasibility of conducting fire during the daytime when using the fuze range pattern method for spotting and range adjustment. A total of 120 rounds of shrapnel per battery was allotted, three courses per practice being fired on. Somewhat lower altitudes than desirable had to be accepted owing to poor visibility; slant ranges were medium to long.

Problem III, fired by Battery B, 69th, started in the late afternoon of the 14th but could not be completed because of cloud interference. This problem demonstrated and tested an emergency system of fire control for 3-inch guns, already described in the COAST ARTILLERY JOURNAL. Problem IV, designed to test the practicability of the fuze range pattern method at night, was scheduled to start at 7:30 on the night of the 14th. Clouds held up fire until about 9:30 PM when the sky cleared and the towing plane was ordered on course. The firing for that day was completed just before midnight. Batteries B and C, 62d, each fired one practice of three courses, 132 rounds of ammunition being allotted per practice and the method for conduct of fire being the same as that prescribed for the daylight fuze range practices. Immediately after the end of these two practices the two 62d batteries, who had completed their scheduled firings at the main gun firing point, picked up their guns and moved them back to camp, preparatory to going into position at gun firing point No. 2 on the following day.

During the morning of September 15 Battery B, 69th completed that part of Problem III which had not been fired the day before and in addition fired the four courses scheduled for Problem VI. This latter problem was designed to test the practicability of adjusting gun fire when no information was available to the battery concerning range deviations other than that which could be furnished by observers in searchlight positions. A total of four courses were fired on, a total of 160 rounds of ammunition being allotted; spots were received only from spotting stations SL-1 and SL-2.

Problem VII was scheduled for the afternoon of the 15th, with all batteries except B, 69th scheduled to participate. This problem required that two batteries, located with respect to each other as they would be located when forming a part of a 360-degree area defense, both fire on a common target at the same time. B and C, 62d, located

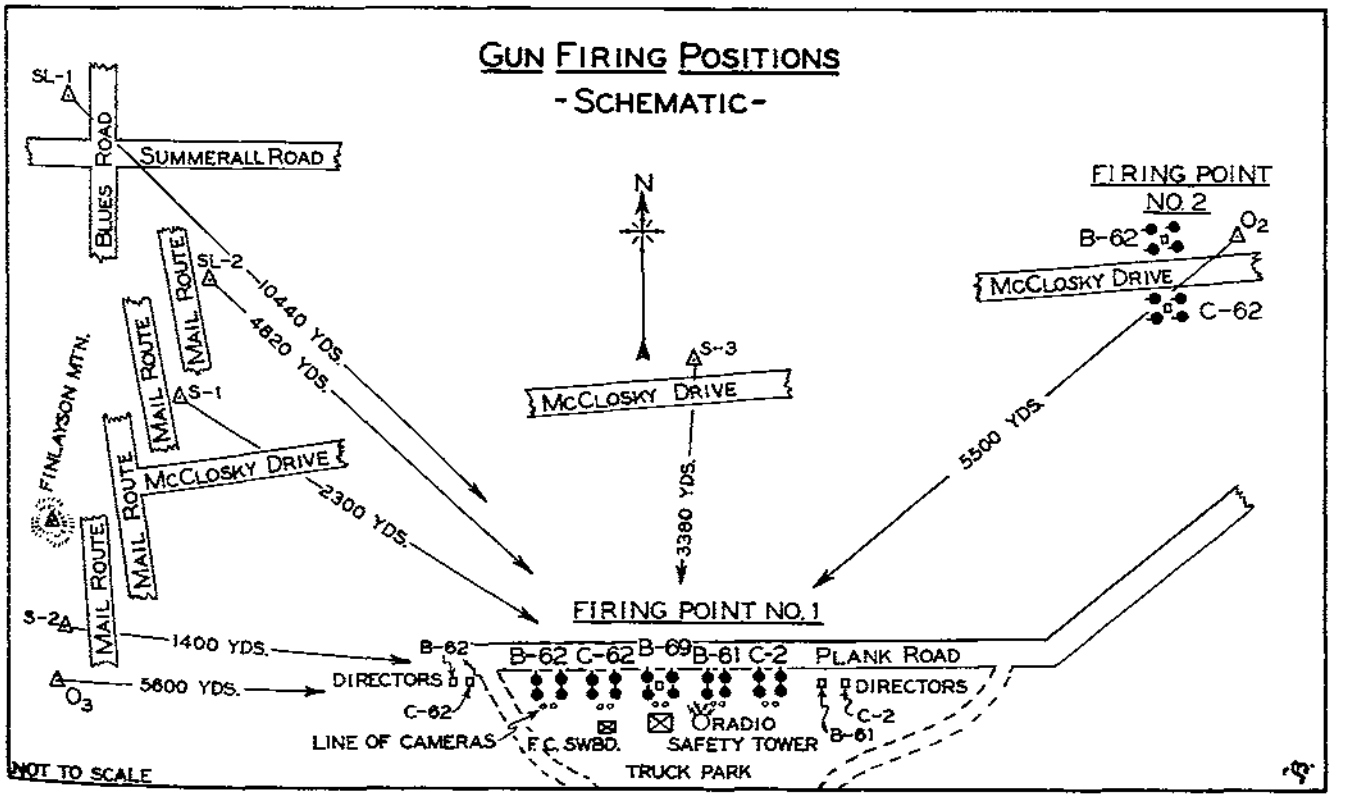


Figure 2

Platoon from 29th Infantry firing at towed target—Snow Field.

at gun firing point No. 2 on McClosky Drive, were scheduled to fire, with C, 2d and B, 61st located at the main firing point. One hundred and ninety-eight rounds of shrapnel, furnished from the Chief of Coast Artillery's pool, were allotted to the 62d batteries because this ammunition had been specially loaded to give a black burst. This, it was hoped, would permit the two batteries to differentiate their bursts for adjustment purposes. There was great difficulty in maneuvering the towing airplane on such a course that the target would be both within range and within the common safe field of fire of the two batteries at the same time. After numerous delays one course was fired. However, owing to the fact that the fire of one battery was momentarily held up for safety reasons no intermingling of bursts occurred—the final round from one battery bursting prior to the first round from its companian battery. Clouds were now drifting in so rapidly that attempts to complete this problem had to be given up and it was postponed until the next day.

Problem V began about 9:00 PM on the night of the 15th. This problem consisted of a night practice by Battery C, 2d, and B, 61st. The weather was far from ideal as the sky was full of scattered clouds and visibility was extremely bad because of a heavy ground haze. The ground haze so handicapped the searchlights that numerous courses were lost because the lights could not illuminate the sleeve. Battery B, 61st, completed its practice satisfactorily, but Battery C, 2d, completed only three of the four scheduled courses before a swiftly lowering ceiling forced the towing plane down so low that further fire was unsafe. The practices of Problem V were intended to furnish data relative to the conduct and adjustment of fire at night when using forward spotters and the angular unit method of adjustment.

Batteries were at the firing point and ready to fire by 6:30 AM on the 16th but by mid-morning it was apparent that no firing would be possible that day because of a heavy overcast and a low ceiling. Therefore it was decided to postpone further gun firings until after the joint exercises were over. It was also decided to go ahead with the machine-gun firings, as scheduled, because it was necessary to complete as much firing as possible before the joint exercises began as towing planes from other corps areas would not be available after that time.

Space does not permit a detailed discussion of all of the lessons learned but a summary of the conclusions of General Gardner in his final report will be of interest to all Coast Artillerymen. This summary follows:

Fire may be satisfactorily conducted when guns are disposed on the four corners of a square approximately fifty yards on a side. The shock of discharge offers no appreciable inconvenience either to adjacent gun crews or to range section personnel located within the center of the gun square. Fire adjustment is more difficult with such disposition of the guns but is by no means impossible. The number of hits normally obtained with guns disposed in line may be expected to decrease when the guns are disposed in a square formation. But the added dispersion should increase the probability getting hits on a maneuvering target.

All batteries, except B, 69th, used their directors in positions offset approximately 250 yards from the guns. Effective fire can be thus conducted and the battery commander's loss of direct control over some elements of the battery is more than compensated by greater concealment and protection afforded to his fire control elements. The emergency system of fire control for 3-inch guns used in Problem III is workable and furnishes reasonably accurate deflections. The chief objection to this equipment is that it has a larger number of instruments and requires a greater number of operators than is wholly desirable.

Spotting, for range adjustment purposes, is possible from any position in the field of fire from which both target and bursts can be clearly seen. Excellent spotting was obtained from both the SL-1 and SL-2 stations thus indicating that observers in searchlight positions, when a 360-degree area defense exists, could—all other things being equal—furnish information to the gun battery in their sector which would permit range adjustment. However, certain other considerations such as communications difficulties, quality of missions for searchlight personnel, and lack of control by the gun battery commander over the training of an important part of his team, lead to the belief that reliance should be placed upon battery spotting stations instead. Spotting from positions corresponding to those which would be occupied by observers in the anti-aircraft artillery intelligence service was not feasible because of the distances involved. All observers in these

General Sunderland (left) and General Gardner (center) inspecting machine-gun fire control equipment.

positions reported that they were never able to distinguish the target although bursts could be seen part of the time.

The results of these firings indicated that three spotting stations, located on rays approximately 120-degrees apart, should be able to furnish adequate data to permit range adjustment under all likely conditions. Such stations should be located not farther than three to four thousand yards from the battery; and orientation data, taken from a reasonably good map, is accurate enough. Either the fuze range pattern method or the angular unit method of adjustment may be used with stations so located. Although the Fort Bragg firings did not indicate that the angular unit method possesses inherent advantages over the fuze range pattern method, allowance must be made for the fact that mil deviations were measured using dug-out spotters—a periscopic instrument—with which the accurate tracking of the target was considerably more difficult than is the case when a BC telescope or similar instrument is used. Therefore inaccurate tracking produced inaccurate spotting when such spotting required the reading of mil deviations. This condition was not present to the same degree when spotting was done by fuze patterns since the pattern itself furnishes the measuring stick and an accurate track is not essential as long as the pattern and target remain within the field of the instrument. Stereoscopic spotting was found considerably less accurate than either of the other two methods but not so inaccurate as to afford no aid at all.

Fuze range pattern firings indicated that the use of a constant spread, obtained by mismatching the pointers on the fuze indicator a constant amount regardless of the fuze range or quadrant elevation being used, is preferable to the use of a variable spread. The use of a constant spread requires the range adjusting officer to use a variable fork in applying adjustment corrections. This is simple and easy to do if an adjustment chart has been prepared in advance. Best results are obtained when firing with the fuze range pattern method if gun crews are trained to fire the first four shots as a salvo, thus insuring a clearly defined initial pattern. The more nearly gun crews can be trained to fire subsequent shots at about the same rate the longer the patterns will retain their identity and the more certain adjustment will be. It appears likely that the most hits will result if the spread is removed after four or five shots per gun in order to cut range dispersion.

The special ammunition designed to give black bursts to help differentiate fire when two or more batteries are firing at a common target was disappointing. Although the bursts from the specially loaded TNT ammunition appeared slightly different from bursts of normal shrapnel, the difference was not pronounced enough to permit battery observers to pick out their own bursts with certainty. The small amount of two-battery firing was inconclusive largely because of the limited time available. The difficulties inherent in maneuvering a target into a common safe field, together with the restrictions imposed by safety considerations, are such that these practices can only be accomplished when the time factor is not important.

Therefore it was decided to abandon further attempt to conduct this problem at the conclusion of the joint exercise. The remaining 3-inch ammunition was reallotted to the five batteries so that each could fire a more or less conventional target practice in October. Such practices would be a control and would be of considerable help to evaluate the results of the September practices, particularly with reference to the effect that the simulated service conditions had had upon the performance of the batteries.

Machine-Gun Practices

The approved program provided for a total of five machine-gun problems, each to consist of from six to sixteen separate practices. These problems were designed generally to afford experience in and furnish data relative to fire conducted under the following conditions: (1) when the guns of a platoon are disposed on the corners of a square, approximately twenty yards on a side, and emplaced in pits; (2) when a platoon is required to meet successive attacks that appear suddenly and approach from widely differing directions; (3) when a platoon is required to meet night attacks from unilluminated planes; (4) when two platoons fire on a common target at the same time; (5) when central control equipment is available to a platoon; and (6) when no means of control, other than individual tracer, is available to a platoon. Battery E, 61st, E and F, 62d and E, 69th Coast Artillery were scheduled to fire these problems.

A diagram of the organization of the firing position is shown in Figure 3. All practices fired before the joint exercises took place, were fired from the same position, each battery occupying the firing point in turn. For caliber-.50 practices the new T25E2 mount, modified to a minimum safe elevation by a safety stop was used, together with the 45-inch barrelled machine guns issued to Battery C, 2d Coast Artillery. The first caliber-.30 practices fired

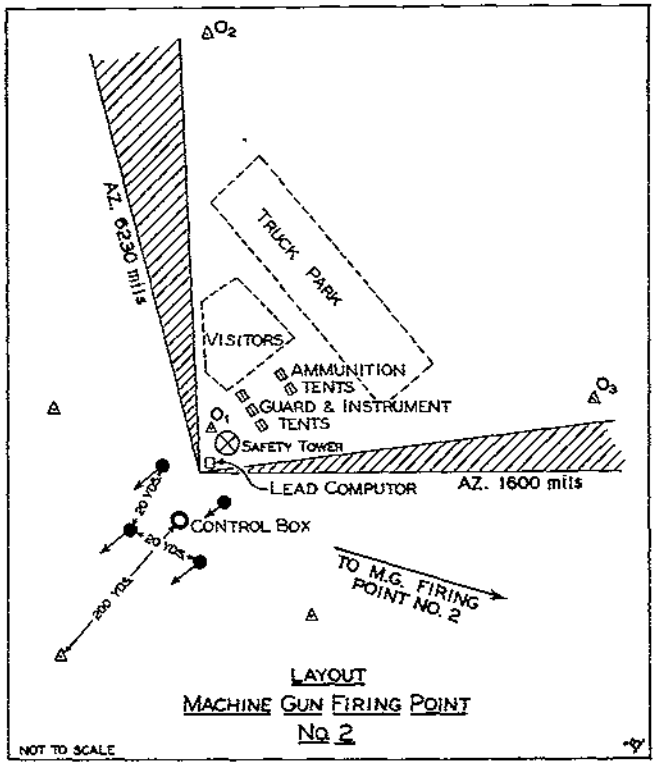


Figure 3

used the same mount fitted with adapters, each organization furnishing its own caliber-.30 guns. Poor ammunition was responsible for a considerable number of stoppages during these first practices. Since it was found that the use of the T25E2 mounts hindered clearing the stoppages, the remainder of the caliber-.30 practices were fired from the M2 mounts. This, coupled with the replacement of much of the faulty ammunition, improved the rate of fire.

Four courses constituted a practice for the September firings. Each course differed from its predecessor and a large variety of courses were possible owing to the 270-degree field of fire. Insofar as possible, each course represented a type of attack that might be expected under war conditions; ranges and altitudes varied for different practices and organizations were not warned what type of course to expect. In the September practices B-10 bombers were used exclusively for towing, with the result that high target speeds were obtained. Type B-12 high speed targets were used and targets were dropped at the end of each practice. Painted bullets were employed to differentiate between hits obtained on successive courses.

Each of the four machine-gun batteries completed two practices of Problem I on September 17. This problem was designed to test the relative effectiveness of central control and individual tracer control when engaging targets at long range. Battery E and F, 62d Coast Artillery used individual tracer control throughout; Battery E, 61st and E, 69th used central control, leads being determined from the Frankford Arsenal lead computor. This lead computor, together with the central control equipment proper, has been described in an earlier issue of the JOURNAL. Both batteries employed flank and forward spotters to assist in fire adjustment, these spotters utilizing open pits approximately 200 yards in front of the firing point for shelter.

No further firing was possible until September 21st, because heavy rains and low ceilings prevented firing on the intervening days. Firing began at 7:30 A.M. on the 21st. Courses were difficult on this morning since an extremely high wind was blowing and the towing plane had trouble in staying on course. Speeds varied widely on successive courses and mancuvering, rather than rectilinear, courses were common. Despite the bad weather the remaining practices of Problem I were completed.

The weather was much better on September 22 when all batteries entered upon Problem II. This problem was designed to test the effectiveness of individual tracer control when used against targets at medium and short ranges. Caliber-.50 practices were completed during the morning—each battery firing two practices—concluding all caliber.-50 firing scheduled before the joint exercises. Caliber-.30 practices began in the afternoon and Problem II was completed despite the stoppage trouble.

On September 23 the T25E2 mounts were taken out of the pits and M2 mounts substituted thus permitting each battery to use its own calber-.30 guns. During the day, each of the four batteries fired its two caliber-.30 practices scheduled under Problem III, a problem designed to test the effectiveness of the caliber-.30 gun as a local defense weapon against low flying surprise attacks. These practices completed the machine-gun firing scheduled for September. Problems IV and V were deferred until October to permit organizations to complete preparations and training for the joint exercises.

As was the case with the gun firings, a study of the September results indicated that it would be advisable to cancel Problems IV and V. The first of these problems provided for night practices against an unilluminated target and the second provided for fire against a common target by two platoons disposed as they normally would be in an area defense. The ammunition, originally allotted for these problems was accordingly reallotted to permit Battery E, 61st; E and F, 62d; and E, 69th Coast Artillery to fire two normal caliber.-30 practices using individual tracer control. In addition, enough caliber.-50 ammunition remained to permit Battery C, 2d Coast Artillery to fire four demonstration practices using the central control equipment. This organization was picked because it had manned the central control equipment during the extensive tests conducted by the Coast Artillery Board earlier in the year.

The caliber-.30 practices were fired during the late afternoon of September 17. Five courses constituted a practice and courses were all crossing and rectilinear. Batteries used their own matériel, with the guns disposed in line with normal target practice distances. On the following morning Battery C, 2d Coast Artillery fired demonstrations from the pit positions used during the September firings, using similar courses. During this same morning members of the Coast Artillery Board conducted a demonstration using the two new 37-mm. guns which had re-

The statistical section at work.

cently been tested. Shortly after noon a platoon of the 29th Infantry from Fort Benning demonstrated the use of infantry weapons against low flying attack aviation. This demonstration concluded the Fort Bragg firings.

General conclusions, resulting from the machine-gun firings, may be summarized as follows:

The disposition of guns on the four corners of a 20-yard square gave gunners no inconvenience after they had become accustomed to being shot over. Neither did the emplacement of the guns in pits interfere with the actual service of the guns. It appears probable that in war such emplacement would give considerable protection without any loss of efficiency. Members of the gun squad, other than the gunner, are afforded complete protection against fragments and machine-gun bullets most of the time; the gunner is afforded protection to some degree.

It is difficult to determine what—if any—adverse effect the displacement of the guns had upon fire control. Vertical adjustment of the tracer stream appeared rather erratic during some practices—this was more noticeable in the general case where individual tracer control was used than where central control was used. However, there seems no good reason for attributing this increased dispersion to the displacement of the guns since in individual tracer control each gunner supposedly watches and adjusts his own fire.

Local defense machine guns, using individual tracer control, can effectively meet successive attacks coming from different directions provided that successive targets do not follow at too short an interval. Individual tracer control was found ineffective at long slant ranges but was highly effective at slant ranges within about 700 yards. This fact, coupled with the flexibility, simplicity and speedy handling of individual tracer control makes this an ideal method for local defense weapons.

Central control is considerably more effective at long ranges than is individual tracer control. This is particularly true at ranges beyond the burnout point of tracers. However, central control requires highly trained operators.

Searchlight Practices

The program provided for four searchlight problems, totaling nine practices for each of the four participating searchlight batteries—A, 61st; A, 62d; A, 69th; and A, 2d Coast Artillery. As has been mentioned, searchlight batteries were to occupy their joint exercise positions for these practices, the platoon sectors conforming. Since six platoon sectors were to be used, organization control and organizational identity was lost to some degree—some sectors had lights of two different regiments assigned. The original plans had not contemplated loss of organizational identity although all organizations had been scheduled to conduct their practices jointly as a part of a 360-degree defense, proper credit being assured to each battery through a careful system of record taking.

Searchlight practices began the night of September 17th and, weather permitting, were conducted each night thereafter, until the end of September. It was found impracticable to conduct competitive practices because meteorological conditions at Fort Bragg vary widely. For instance, while one sector enjoyed favorable weather another sector had a heavy rain. Moreover, lack of landmarks for use as suitable starting points made it difficult for towing pilots to provide missions equitable to each sector. The searchlight organizations, as a whole, had had little intensive searchlight training and were not prepared for formal practices.

Since the success of the joint exercises depended in large part upon the efficiency of the searchlight defense it was decided to devote the entire period before the exercises to intensive searchlight training. This training was placed under direction of the searchlight defense commander.

Conclusion

No better summation of the results of the Fort Bragg exercises can be made than that contained in the final report of the commanding general of the brigade. This summation follows:

> In terms of hits obtained the Fort Bragg firings were disappointing. In terms of experience gained it is believed that these firings were of incalculable value. As far as is known no firings, involving so many different organizations, and conducted under such rigorous conditions, have previously been attempted in this country. The difficulties which will be encountered under service conditions were forcibly brought home to all concerned and it is felt that officers and men alike left Fort Bragg with a new appreciation of the part they must perform if antiaircraft artillery is to accomplish its assigned mission successfully. . . . these firings aroused fresh enthusiasm toward the seeking of new and better solutions of the many antiaircraft problems and such enthusiasm is bound to be reflected in better gunnery. . . .

The Fort Bragg firing exercises of 1938 should be only the forerunner of many similar firing exercises.

37-mm. guns in action at Snow Field.

Essay Competition Results

The JOURNAL is happy to announce the decision of the judges in the 1938 U. S. Coast Artillery Association Prize Essay Contest. They have declared "The Backbone of Seapower," by Major E. M. Benitez, Coast Artillery Corps, the winning essay. Major Benitez is the recipient of the two-hundred dollar award and his essay gets the lead position in this issue of your magazine.

Two essays receive honorable mention. These are "Antiaircraft Preparedness," by Captain J. R. Lovell, Coast Artillery Corps, and "Fire at Maneuvering Aircraft," by Captain G. A. Chester, Coast Artillery Corps. The authors have received one-hundred dollar prizes and their essays will appear in forthcoming numbers of the JOURNAL.

Major Benitez, winner of the first prize, was born in Puerto Rico. He first entered the service January 5, 1917 as a second lieutenant, Puerto Rican Regiment of Infantry. During the World War he attained the temporary grade of captain which he held until April 15, 1919. He was appointed to the permanent grade of captain on July 1, 1920 and was transferred to the Coast Artillery Corps the same date. All his subsequent service has been with the Coast Artillery. Major Benitez holds the degree of M.E. from Ohio State University (1914) and is a graduate of the Coast Artillery School Battery Officers' Course (1922), and the Coast Artillery School Advanced Course (1929). He is a member of the General Staff Corps Eligible List, having graduated from Leavenworth in 1931. At the moment Major Benitez is on duty with the staff of the Command and General Staff School, Fort Leavenworth, where he is the assistant editor of The Command and General Staff School *Quarterly*—our contemporary which is devoted to the higher military learning and the review of current military literature.

MAJOR E. M. BENITEZ

Captain J. R. Lovell, Coast Artillery Corps, who won honorable mention with his essay, "Antiaircraft Preparedness," is a native of Iowa. He first entered the service as a private, Signal Corps, August 4, 1920, winning an appointment as a cadet, United States Military Academy in 1923. Graduating with the Class of 1927, he was appointed a second lieutenant, Coast Artillery Corps and has served with that arm to date. Captain Lovell is a graduate of the Coast Artillery School Regular Course (1937). He is now assigned to duty as a student, the Command and General Staff School, Fort Leavenworth, Kansas.

CAPTAIN J. R. LOVELL

Captain G. A. Chester, Coast Artillery Corps, who also wins honorable mention with his essay, "Fire at Maneuvering Aircraft," was born in New Jersey. He accepted appointment from California as second lieutenant, Field Artillery on September 11, 1925. Transferred to the Coast Artillery Corps on September 30, 1925, all his subsequent service has been rendered with that arm with the exception of a brief tour with the Air Corps in 1928. Captain Chester holds the degree of A.B. in C.E. from Stanford University (1930). He is a graduate of the Coast Artillery School Regular Course (1936) and the Advanced Technical Course (1937). At present he is serving as librarian, the Coast Artillery School, Fort Monroe.

CAPTAIN G. A. CHESTER

The judges for the 1938 contest were Colonel Godwin Ordway, U.S.A. Retired, Colonel Robert Arthur, Coast Artillery Corps, and Colonel J. B. Bennett, Coast Artillery Corps Reserve.

The judges declared themselves more than impressed by the excellence of the many essays submitted. All contestants displayed professional attainments of a high caliber and—whether winning or losing—have just cause to pride themselves on their efforts. If the standard set by the 1938 competitors is met by future groups there is no doubt but what these contests will go a long way towards the stimulation of thought and advancement of professional attainments of the Corps at large.

The U. S. Coast Artillery Association is grateful to the judges and to all contestants for making the competition so worthwhile. The fine work on the part of all concerned will serve us well in the future.

* * *

Annual Election Executive Council

The members of the Executive Council elected for the period January 1, 1939 to December 31, 1940 are:

Colonel Howard K. Loughry, C.A.C.
Colonel C. C. Dawes, C.A.N.G.
Major Milo Brinkley, CA-Res.

Colonel Loughry is at present on duty with the War Department General Staff and is serving as assistant to the deputy chief of staff in the budget and legislative planning branch.

Colonel Dawes is the commanding officer of the 202d Coast Artillery (AA), Illinois National Guard.

Major Brinkley is the commanding officer of the 622d Coast Artillery (HD). At the present time he is analyst and Examiner, Interstate Commerce Commission.

For the last two years we have been greatly pleased with the large number of members who have taken part in the election. The material increase in the number voting is an indication of healthy interest and progress. More members of the Association voted in this election than ever participated before, according to our records. We are extremely gratified by the interest shown and desire to congratulate the newly elected members of the Executive Council.

We also thank the retiring members for their splendid cooperation and help.

* * *

61st Demonstrates at Cincinnati

The 61st Coast Artillery (AA) of Fort Sheridan recently conducted a demonstration for the instruction of ROTC students and Reserve officers at the University of Cincinnati. During the night of October 31, 1938, the gun battery, machine-gun battery, and one searchlight operated on the university campus. Three searchlights also were located in suburban districts: Walnut Hills, Avondale, and Clifton. The demonstration included the regiment going into position; illumination of an airplane; simulated action by the searchlight battery, gun battery, and machine-gun battery; and concluded with the regiment taking up "march order."

The demonstration was witnessed by all ROTC students of Section I (including Coast Artillery and Ordnance Units), sixty-seven Reserve officers, prominent members of The American Legion and other patriotic organizations, and a large number of citizens. Weather conditions were excellent. During the demonstration the airplane pilot was instructed to try to maneuver out of the searchlight beams and to increase altitude from 7,000 to 11,000 feet, all of which added considerable interest. This was probably the first occasion in Cincinnati during which an airplane was illuminated by searchlights, and therefore the display attracted wide attention. Approximately 200 Reserve officers, who were not able to attend on the campus, witnessed the searchlight illumination from other parts of the city.

A daylight drill took place the following day with the equipment of the 61st Coast Artillery placed in position on the campus. All ROTC students of Section I and fifteen Reserve officers attended. The 1st and 2d Battalions, ROTC, were present for 45 minute periods each. An airplane flew courses over the northern and eastern portions of the city and the batteries of the 61st simulated action against it.

All ROTC students were rotated through each element of the regiment to inspect the equipment and get a general knowledge of the drills. This was in preparation for more detailed instruction and drills to follow on the equipment of a detachment that remained in Cincinnati for several days after the departure of the regiment for Fort Sheridan. This detachment consisted of one officer and nine enlisted men with the following equipment:

1 Gun, antiaircraft, M3
1 Stereoscopic height finder (K&E) T9E1
1 Director, Vickers, M1A1
1 Instrument trailer with power unit

1 Data transmission system, AC
1 Searchlight, antiaircraft MVI
1 Sound locator, M1A3
2 Machine guns, cal. .50, M1, with tripods
2 Prime movers, (GM)
1 Truck, 2½ ton.

All ROTC students of Section I (except the freshmen, who had received instruction during the two-day stay of the regiment) received instruction and drill on the equipment, a total of 159 Coast Artillery and Ordnance students taking part. An airplane mission was available each day for the purpose of tracking and simulated action. The Section II students also received instruction and drill on the equipment, a total of 158 taking part.

The Commanding Officer, Air Corps Detachment, Lunken Airport, provided nine airplane missions as follows:

Night and day drills of 61st CA (AA)	2
Drills of ROTC students Section I	3
Drills of ROTC students Section II	4

These demonstration day drills were particularly beneficial to the ROTC students and Reserve officers. Both groups were able to see a modern antiaircraft regiment go into position, simulate action against an illuminated airplane, and take up "march order." Except for some Coast Artillery Reserve officers who had attended summer camps at Fort Sheridan, none of these groups had even seen an antiaircraft regiment in action. They gained a good knowledge not only of the personnel and equipment required for a modern antiaircraft regiment, but also of the technical operations and tactical procedure. In addition, a large portion of the citizens of Cincinnati were able to witness an airplane illuminated by searchlights.

The detachment that remained after the regiment left was of particular value and importance. The ROTC students, particularly the juniors and seniors of both sections, were given detailed instruction in the operation of each piece of equipment, and are now able to follow more clearly the classroom instruction. It was especially fortunate that this detachment and its equipment were present at the beginning of the school year, inasmuch as future antiaircraft instruction can be based on and coördinated with the knowledge acquired early in the year. Moreover, the juniors and seniors now have a good knowledge of the equipment they will use during the ROTC Camp.

Instruction in the 250th C.A. (TD)

By Captain S. R. Dows, 250th Coast Artillery

Our colonel announced that batteries would be adjudged satisfactory in gunner qualification when *five* men were qualified each month. But since in the National Guard a battery commander contends with a large personnel turn-over—a 62-man gun battery frequently handling a total of a hundred men a year—that means a solution to the qualification problem is rather complex. How can we solve the problem when men come and go so fast? And how can we impart maximum training when half the battery is likely to be in the ranks for less than a year?

In order to meet the specification of five men per month per battery, we have turned our attention for the moment to instruction, with the emphasis on second class gunners. We follow a program of carefully supervised instruction, which includes written examinations of a modified true-false type, practical examinations, and some competitions to stimulate interest in gunnery.

Our written examinations for second class gunners, are principally of the true-false type. We include some multiple choice questions. First class and expert gunners are still examined with the type of questions that we developed many years ago, using sketches and diagrams similar to those published by the COAST ARTILLERY JOURNAL. We also have used some of the printed examinations and found them satisfactory.

The true-false type of examination has been criticized, but our experience bears out the opinion of various authorities—that for the purpose of gunner qualification there is nothing better. The theory that false statements leave false impressions has been positively disproved. By proper instruction and by returning graded papers for discussion, all such criticisms are amply met. There is some objection that a man can make 50% by blind guessing. To overcome this, we put in a sprinkling of "multiple choice" and "blank-space" questions. We also spice some of the true-false questions by adding a "why" and leaving space for the answer. This device limits guessing and also avoids ambiguity. We have had enough results from these examinations to satisfy us as to their worth.

Our oral examinations are all standardized so that a definite coverage is accomplished on all candidates. The outline is short, covering service of the piece, cordage, connecting and testing a telephone, and some practical nomenclature of motor transportation.

The primary difficulty with gunners' instruction is that it lacks human interest. With the hope of humanizing the subject, the writer has worked out a competition to accomplish for gunnery what the "drill down" does for infantry instruction. The competition is called a "quizzick" and requires no equipment and no other preparation than a good set of true-false questions. It can be adapted to limited space and brief periods of time. It can be used in conjunction with instruction groups or it can be employed for inter-battery or indvidual competition.

The operation is simple. Any convenient number of men are formed in single rank. A true-false question is given, followed by the command "Those who agree: one pace forward—*March.*" Those who are wrong, or slow to execute the command, are eliminated. To accommodate the quizzick to limited space, the command "About face" can be used in lieu of "Forward march." The quizzick is quick, full of fun, and is fair, because every man gets the *same* question. Its success, of course, depends on the care with which questions are selected.

As ours is a motorized regiment we value mechanical

operations and also have several competitions based on knot tying, sheer lashing, and rigging of tackle. None of these are entirely satisfactory and we invite correspondence through the JOURNAL with any who have found some competitions that work.

The final measure of success is *qualified gunners*. Our examinations are probably more strenuous than the limited instruction time warrants but we believe qualified gunners form the foundation for consistent artillery scores, so our standard is purposely high. The specification of five qualified men per battery per month has led us to a program of continuous concentrated second class instruction in which the battery details a small group of men for instruction each month. These men take their written examination the first drill of the following month. The oral examination follows quickly so that qualification is completed and the badge issued during that month. Of course, complete instruction of second class gunners is not accomplished in one month for the men have had some previous instruction. But in that month the finishing touches are applied.

We use publicity to get results by resorting to progress charts based on a trajectory. The origin of the trajectory is a gun with a target for the goal. Our trajectory is divided into sixty units (five men for each of twelve months) and a battery is represented by a pin which is moved along the trajectory as each battery progresses.

There are three objectives to our program. First we stress *practical instruction* methods, endeavoring to improve the quality of performance of the instructors. We believe that if instruction is good, examinations are only a formality. Secondly, we seek a foundation of general knowledge of gunnery so that in the target practice season the job of firing at moving targets will be approached by every man with a reasonable amount of understanding. Thirdly, the regiment is cognizant of its obligation to the four or five hundred men who leave us every year. It is the duty of every National Guard organization to give these men something definite to take with them by way of a real accomplishment along military lines. The second class gunner badge signifies that a task was undertaken and accomplished.

Cities as Targets

One is accustomed to cheery utterances at a luncheon club, and an address on such an occasion at Leeds by the Officer Commanding the 66th Anti-Aircraft Brigade was in keeping with the fashion. Rightly he lauded the predictor for reducing the element of chance in shooting raiders down, and it is good tidings that we have an apparatus on the coast which, in favourable conditions, can detect approaching enemies while 60 miles away.

But he still insisted that the hostile bomber can only carry out its mission by flying at a constant height and on a constant course, and thus provide the gunner with his opportunity. To bomb an isolated target, yes! But in order effectually to bomb London, for instance, the enemy can pursue a gnat's path in the air and yet succeed, for a city is all target and its area is huge.

—*United Services Review.*

Military Road Movement

The November, 1938, *Journal of the Royal United Service Institution* carries an instructive article entitled "Military Road Movement." It describes an exercise to ascertain the quickest and safest method of moving a division and attached troops (including medium artillery and infantry tanks) partly by day and partly by night over a distance of about fifty miles in an area protected by our friendly troops but exposed to air attack.

Following is a significant excerpt: "The exercises tended to show that large columns of motor transportation keeping steadily on the move at low densities, on roads that are not obstructed, have little to fear from air attack. The vehicles do not provide targets commensurate with the risks which either bombers or low-flying aircraft would have to run to obtain effect. To prevent hostile aircraft from obtaining a reasonable accurate idea of the area in which troops are concentrated, either before or after a move, may be difficult or even impossible. Bombing of such areas, therefore, will have to be reckoned with. In addition to measures of active A.A. defense the widest possible dispersion should be adopted. With the development of motor transportation and consequent increase of mobility, the need for concentrations in relatively narrow areas has now disappeared."

The author stresses the importance of not forgetting the man at the wheel, in overalls, and points out that many promising maneuvers have failed to achieve success because of excessive fatigue of the troops.

Movements by day and night are discussed and the factors governing these movements are given in detail. The following four main systems of movement by day are described and the disadvantages and advantages of each outlined with their special application to anticipated problems.

a. The "Independent" or "Go as you please" system.
b. The "Sector Timings" system.
c. The "Controlled Dispersion" system.
d. The "Small Group" system.

The factors governing the employment of movement by night are discussed as well as halts by day and night. It is of interest to note that the author maintains that in movement by day, if the move does not exceed three hours running, no halts are required. Details of control organization, distinctive marks, action in the event of road blocks and transport of matching personnel are presented. The results of enemy air reconnaissance are given including a comprehensive discussion governing the decision as to the density to be ordered in a particular move.

The Art of Command

Major General H. Rowan-Robinson deals with "The Art of Command" in the October, 1938 *Journal of the Royal Artillery*. This experienced soldier in discussing the requirements for command places emphasis on those primary essentials such as character, intelligence (reinforced by study) and a sound physique. He makes his most telling points by citing examples of tested and proven leadership.

Admitting that the best age for generals is debatable, especially at this moment, he concludes, on the whole, that there appears not much to choose between age and youth. He feels that youth has definite advantages: physical fitness, energy, activity, endurance and imagination and that it is untrammelled by prejudice. But he maintains that these qualities must be present in high degree to balance the lack of experience. He asserts that though no great artistry was displayed in 1866, 1870, and 1904, the victors in those campaigns won most convincingly in spite of the fact that the higher commanders were, almost without exception, sexagenarians. But, on the other hand, says he, the old have much to lose and but little perhaps to gain and they therefore fight shy of risks. "And the old are fast bound by prejudice and tradition, which makes it difficult for them to adopt innovations in the heat of conflict. Ossification has set in, not only physical but also moral and mental."

Rowan-Robinson pleads that we study past campaigns and seek much-needed guidance from them in the swift movement of military progress. But he argues that we must not treat the methods of the great leaders of the past as a ritual and make no attempt to adapt these to current needs for there are many pitfalls even when the student appears to be working on the soundest lines. He thinks that a commander will fail, both in his studies and in his battle plans, unless he is possessed of imagination or makes use of those who possess that quality. Further, that imagination must be duly restrained by common sense. He warns us that although "common sense," "sound judgment" and "ordinary prudence," are admirable qualities, they, often connote lack of vision and a tendency towards the avoidance of risks.

He cautions against that type of officer popularity known as a "regulation worshipet"—the man to whom it seems almost a crime to overstep by one inch "sealed pattern" and regulations. He also warns against overloading the high command with what he terms peacetime officers. However, he says "that a peace-general may be of the utmost service to his country, without being equal, mentally, morally or physically, to the strain of war." Furthermore, during peace, he may in fact render better service than a natural leader of resolute and stubborn character. But, on the other hand, the crucial test of the soldier is war; and Rowan-Robinson contends it would be clearly dangerous to allow a commander to reach a position from which the next step would normally be translation from the office to the field.

He differentiates between moral and physical courage and cites interesting examples to prove that physical courage is of secondary importance when a man possesses true moral courage. He points out that Frederick the Great lacked physical courage and fled from his first battlefield; and gives us the quaint story of Turenne which indicates that his moral courage was superior to his physical courage. Just before a fight, someone remarked to him that his knees were shaking. To which he replied: "That is because they know where I am going to take them."

Noting the value of unified command, he tells us that when the Directorate, a little jealous of Napoleon's success in Italy, suggested that he should share control there with Kellerman, Napoleon replied: "Kellerman would command the army as well as I should . . . But I believe that, to unite Kellerman with me in Italy would mean the loss of all . . . I believe one bad general is better than two good ones."

He concludes with the statement "Having examined the qualities necessary for the adequate discharge of the functions of high command, we may now consider by what process of education and in what nature of environment, such seeds of genius as may exist may be brought to fruition. This is a matter on which opinions will differ considerably and which lends itself to very wide discussion." And then General Rowan-Robinson gives us a brief opinion, based on his personal experience, of the measures calculated to bring the best men to the top, fit physically and highly developed mentally for the responsibilities that they may have to assume.

* * *

Camouflage in Nature and in War

The feature article of the December, 1938, *Royal Engineers Journal* is a report of a lecture given to the Society of Military Engineers by Dr. H. B. Cott, Lecturer in Zoology, Cambridge University. This article contains a description of the optical principles upon which concealment depends including a description of the methods by which this end has been achieved in nature and the bearing of these principles and devices upon the important problem of applied camouflage.

Dr. Cott discusses animal concealment and gives his reasons for citing their case as twofold. "In the first place, while the general scientific principles to be discussed apply to all objects under natural daylight illumination, the case of animal coloration is particularly well calculated to drive home the principles into the minds of those who, like so many of our officers, happen themselves to be keen and observant sportsmen. In the second place, there is a close analogy between the need for concealment in nature and in war. But in this sphere of visual concealment different wild animals have attained a degree of perfection far beyond the comparatively clumsy attempts at camouflage with which we are too easily satisfied. For this reason we may learn from the study of Nature many valuable lessons which otherwise might scarcely be apprehended."

The important part played by concealment in the lives of animals is followed in this report with a history of the development of camouflage as we understand it. Dr. Cott discusses in a very effective manner general color resemblance, obliterative shading, disruptive coloration, differential blending, maximum disruptive contrast, coincident disruptive patterns, contour obliteration, background picturing, shadow elimination and special deceptive resemblance.

He concludes that while it is not necessary to stress the importance of this whole question of concealment we should take cognizance of the fact that: "If two powers are at war, and if one tackles this problem in a serious and scientific manner, while the other neglects to do so, she is bound to gain an enormous advantage—an advantage which under conditions of modern warfare may well make all the difference between disaster and victory."

Long Range Bombardment of Paris

In the October, 1938, *Journal of the Royal Artillery*, Lieutenant Colonel H. G. de Watteville, Royal Artillery, gives a translation of Colonel Ferdinand von Loncarevic-Syposs' graphic description of the long range bombardment of Paris which was published originally in the *Militärwissenschaftliche Mitteilungen* of Vienna.

Colonel de Watteville, who was sent to Paris by the British Government in March, 1918, to collect data concerning the bombardment, is especially well informed on this subject. He says that one must bear in mind that the article is a description from the German point of view and there is manifest embroidery of detail and certain exaggeration of fact, especially as concerns the effects of the shellfire in Paris. But he believes that if allowances are made for all such natural and pardonable embellishments, the account will be found correct not only from the technical standpoint but also from the historic.

Colonel de Watteville states "The bombardment of the French capital between March and August, 1918, constitutes a military achievement which has probably never been surpassed in originality of conception, in skill and pertinacity of execution or in the care and accuracy of its preparation. It stands out as a master stroke of military science. It is but necessary to reflect that after five centuries the range of artillery had not exceeded 2½ to 3 miles. Then in the two decades preceding the Great War this range grew to something like 20 miles. Suddenly there was an increase to 80 miles; it seemed magic."

The article covers in detail the preparations for and the actual bombardment of the city. At the end, the author poses the question: "Did the Paris gun pay for its cost?" His answer—The Paris gun was well worth its cost, if only by reason of the enormous moral effect which it exercised over that great city. He asks a further question: "What of the future?" and answers that only the future alone can show. Nevertheless he calls our attention to the fact that the human mind is ever working out new and more wonderful machines to be taken into the national armory, and that in spite of rebuffs, science will always come to the fore.

This article contains sufficient factual material dealing with the preparation and operation of the various guns to make it worth reading. Characteristics of the gun, carriage and ammunition are lucidly stated.

Home Defense

Air Commander L. E. O. Charlton maintains in the November 3, 1938, *United Services Review*, that "speed is imperative" to put Britain's defense house in order. He pleads for public realization of the seriousness of the "narrow shave" of last October and that they once and for all determine to get things done. He says that Liddell Hart has told the real truth and laments the conditions which resulted in barely 100 antiaircraft guns being available for the defense of the capital, although Paris had seven times that number in readiness.

He further states that "when it is remembered that the most efficient method of counteracting the bomber by night—the interceptor-fighter that is—practically powerless without the aid which gun and searchlight *alone* can give it, then the gauge of the defencelessness of London can be truly taken."

Success of Blackouts

The whole of Switzerland was blacked out a little time ago as a test for A.R.P. and some instructive lessons were derived from the exercise. Military aircraft, either singly or in small groups, took the observations and flew at heights varying from 4,500 feet to 7,000 feet. They were directed by wireless, for otherwise the absence of familiar landmarks would have resulted in a loss of all direction. The general conclusion was that definite targets cannot be distinguished with precision if the black-out is properly carried out. Neither railway lines nor rivers serve any longer as directional guides to flights, and towns, for the most part, are wholly unrecognizable.

The Swiss railway system is electrified and, although the locomotive headlights could be dimmed occasionally, contacts with the overhead wires caused flashes which were readily visible. Motor-cars, all of which had received instructions to "blue" their lamps, could not be seen travelling along the road. There is little doubt that the black-out is a highly efficacious means of baffling an air invasion when large identifiable areas are not at hand as bomb objectives. *United Services Review.*

The Knox Trophy

By Captain H. N. Toftoy, CAC.

For the first time in history a submarine mine battery has won the Knox Trophy. The announcement that Battery D, 4th Coast Artillery is the 1938 winner dispels the notion that it is impossible for a mine organization to win the trophy.

Submarine mining is highly technical and must be done "at-ease." The planting and subsequent pick-up of mines is laborious; and the day's work frequently extends from dawn to dusk—and sometimes into the night. The work is beset by all the trials and tribulations of undersea work, and in bad weather becomes decidedly unpleasant and uncomfortable. One never knows when hard luck in the form of unfavorable weather, an accident, or the unexpected will bring trouble and delay. In short, many factors work against a smooth, well coördinated mine practice. Yet these very difficulties develop teamwork, and with teamwork comes high morale and satisfaction.

For the benefit of those who have not lately been associated with mines, let us run briefly over an outline of the much changed mine practice. To begin with, a controlled mine is a steel case containing explosives and a firing device fired electrically from a casemate on shore. The mine is large enough to float were it not held beneath the surface by a mooring rope attached to a heavy anchor. Record practice now consists of two phases which cover planting, firing, extended operation, and maintenance. In the firing phase the mines are first planted, and after certain tests, some are fired electrically from shore at a target towed across the line. The mines to be fired and the moment of firing are determined by a range section, similar to that of any seacoast battery.

In the test phase another group of mines, without explosives, is planted and operated for two weeks with mine tests every ten hours. In addition there are operating tests on the mine system itself, and toward the end of the phase, a test to determine whether mines bumped by a vessel will signal properly in the casemate. The total score possible is 150 points. Deductions are made for any mine planted outside the specified limits, and those which fail on the electrical or bumping tests. Operating failures and repairs are also penalized. Except for a few items, rotation of mine equipment is required; that is, different matériel must be used each year and matériel used in the firing phase may not be used in the test phase.

The record mine practice of Battery D, 4th Coast Artillery, held off Fort Amador, Canal Zone, began February 4, 1938, and continued until February 23d. For the first time in nine months the mine planter *General William M. Graham* whose home station is Fort Sherman, was made available for our use. Although this period came during the dry season, when strong daily winds and unpredictable currents are generally unfavorable for planting operations there was no choice of time because of coming maneuvers and seacoast practices. On February 4th the mine planter with the master, Warrant Officer C. B. Maxim on the bridge, left the wharf at 7:15 AM. When we arrived at the mine field the red flag was flying on the distribution box boat, indicating that the shore cable was aboard. We established communication with the casemate, and were ready to receive the first mine cable. A similar flag displayed on shore showed that the observing stations and range section were ready to plot the mine positions. The three mine yawls were bobbing in position and the chief planter reported "Mine number So-and-So ready to plant, sir." Without stopping, the mine planter sounded her whistle, and steamed past the distribution box boat which received one end of the mine cable. In a few moments came the command "Stand by—*let go!*" which sent the first mine plunging into the water. There were no delays and the firing phase was completed before noon. By 4:30 PM the mines had been picked up and all sections dismissed. Weather and water had been good.

On February 9th the test phase was scheduled to begin. Once again everything was coördinated and in readiness, and planting began " on the minute," but soon the dry season wind suddenly freshened to what seemed to me, the planting officer, nothing less than a gale. It was a gusty cross-wind and the old *Graham* was exceedingly difficult to handle accurately. Mr. Maxim fought the tricky conditions and deserves a lot of credit for the skill with which he forced the ship across the line at the proper intervals, thus saving us from lateral planting penalties. Luck was with us. Although speed had not been stressed, the planting was over in ninety-five minutes; 170 minutes being allowed without penalty. The group was planted near the shipping lanes and five improvised buoys carrying red flags and red lights served to warn navigation. In addition, our boat crews performed practically continuous guard duty at the mine field. Nothing untoward occurred during the test phase and it ended on schedule without the loss of a single point. A perfect score had been made.

The results attained can be attributed mainly to the training of the individual and to the preparation of matériel. In addition we had fine coördination, high morale and no bad luck.

In spite of limited time, our preparatory working program had not been overcrowded and sufficient time had been allotted to the shore details so as to properly prepare and assemble the hundreds of items that go into a mine group. Here is an outline of the working program for the training period:

Tues.	Jan. 18	Preparation of equipment for sub-mine practice.
Wed.	" 19	Lay out mine field. Drill: range, casemate, and small boat sections.
Thurs.	" 20	(Arrival of mine planter.) Lay shore cables. Drill all water details by the numbers.
Fri.	" 21	Load planter, plant, fire sub-mines, and pick up group.
Sat.	" 22	Unload planter. Prepare equipment for next sub-mine practice. Analyze practice. Range section drill.

Battery D, 4th C.A., 1938 Knox Trophy winner, passes in review headed by Captain Toftoy and Lieutenant Taber

Mon.	"	24	Same as Friday.
Tues.	"	25	Same as Saturday.
Wed.	"	26	Assemble mine group. Lay out mine field. Load planter.
Thurs.	"	27	Plant final preliminary group. Fire submarines. Make test phase tests.
Fri.	"	28	Continue test phase tests. Rehearse repairs to distribution box, cable, and replace a mine. Experiment with various methods of bumping and tilting mines. Begin pickup of group. Range section drill.
Sat.	"	29	Complete picking up group. Unload planter. Disassemble equipment. Analyze practice. Range section drill.
Mon.	"	31	Preparation inspection of matériel for record practice firing phase.
Wed.	Feb.	2	Assembly of record practice firing phase group. Range section drill. Lay out record mine field.
Thurs.	"	3	Load planter for record practice (less loaded mines). Assemble loaded mines with explosives.
Fri.	"	4	Place loaded mines aboard planter. Plant, test, and fire for record. Pick up group.
Sat.	"	5	Disassemble and check equipment. Analyze firing phase.
Mon.	"	7	Prepare, inspect, and assemble matériel for record test phase.
Tues.	"	8	Load planter for test phase.
Wed.	"	9	Plant record test phase group. Conduct tests.
Thurs. to Wed.	"	10 to 23	Daily tests. Bumping test on Feb. 17.
Thurs.	"	24	Pick up test phase group. Unload planter. Analyze.
Fri.	"	25	Pick up shore cables. Disassemble equipment.

Only three preliminary groups were planted, but by using a mine yawl as a target and stationing a signalman in a boat at an end buoy we were able to hold daily coordinated range and casemate drills and also to check predictions, whether mines were planted or not. The last group planted prior to record practice remained in the water for thirty-six hours. During this time test phase procedure was followed, and repairs in the mine field, including the replacement of a mine, were rehearsed. No repairs were necessary during either phase of the record practice, but every precaution to remedy faults promptly had been taken, and two mines complete with anchors lay assembled on the deck of the planter ready to plant in the event of trouble.

Noncommissioned officers in charge of the various sections were responsible for the training of their units. So far as practical they were permitted to select the men with whom they were to work; the increased harmony and teamwork was evident. All training was carefully supervised by Lieutenant A. P. Taber, First Sergeant K. L. Marcum, and myself. Speed and parade ground snap were discouraged, for all phases of mine work are in a class with skilled labor, varying from fine adjustments on delicate electrical control apparatus to the assembly of heavy mine gear. Some men must be trained to operate motor boats, others to assemble the mechanism of the mines and fill them with explosives, and still others to handle cable and make watertight joints. Faced by such varied duties, our policy was to teach each man how to best perform his duties, and require him to know all the reasons for taking each step in the prescribed manner. Records were kept so that responsibility for faulty work could be definitely established. After each planting the underwater equipment was disassembled and carefully examined, in addition to the usual analysis.

In spite of rather a trying period, morale was high. For one thing, the men appreciated getting hot meals on time. Elimination of all useless work had its good effect, as did compliments given to individuals and sections whenever

their work was outstanding. Notwithstanding much overtime and hard physical effort, the men seemed glad to get away from close-order drill, parades, and formal inspections.

Coördination had much to do with the dispatch with which this practice was executed. Frequent short conferences were held and penciled notes along with reminder lists were given the noncommissioned officers. There was then no excuse for the misunderstandings that normally bring last minute haste and avoidable delays.

Painstaking preparation, adjustment, and assembly of matériel were made under closest supervision. No step or part was overlooked. To be sure that mines would not leak at the compound plug, all scored or uneven surfaces were made perfectly flat. Watertight joints were made only by experienced men. Casemate apparatus was carefully examined and all units showing effects of any tropical deterioration were renovated under the supervision of Staff Sergeant H. N. Smith.

The battalion commander, Lieutenant Colonel Harold E. Small, took great interest in this practice, and as chief umpire strictly enforced all requirements, and made daily surprise inspections.

Lieutenant Alden P. Taber was the other officer assigned to Battery D. In addition to his duties as mine property officer, he was in full charge of the range section. Although on his first detail in a mine battery, he expertly assisted in all phases of the work. I acted as planting officer.

The coöperation from the personnel of the mine planter could not have been better. Immediately after the last mine had been planted I proceeded by yawl to inspect the work on the distribution box boat. During the "soaking" period which is required before initial tests and firing, I returned to shore to act as casemate officer and battery commander. Such changing from one duty to another is purely a peacetime proposition necessitated by the shortage of officers. With only two officers available additional duties were imposed on First Sergeant Marcum, who was an able general assistant and did much to develop the efficiency of the battery. I should like to name all who distinguished themselves, but I feel every man did so well that anything less than a battery roster would be an injustice.

The award of the Knox Trophy to Battery D, 4th Coast Artillery means more than honor to a highly deserving unit—it also shows that the controlled submarine mines of the Coast Artillery Corps have been developed to the point where they are accepted as an important component of our national defense.

THE KNOX MEDAL

The Society of the Sons of the Revolution in the Commonwealth of Massachusetts also makes an annual award of a medal to the best enlisted student at the Coast Artillery School. The medal is much coveted and the competition for it is marked by keen application to duty.

To be chosen to attend the course for enlisted specialists at the Coast Artillery School is itself evidence of high attainments. Therefore to be selected as the outstanding soldier among a group of the best men of the Corps is indeed a signal honor. The winner is determined after a detailed and careful study of the records of the leading men of the class. The points considered are scholastic standing, coöperation, diligence, conduct, attention to duty, military bearing, neatness and character.

For the 1937-1938 school year the award goes to Private Thaddeus M. Colchiski, who was enrolled in the Artillery (master gunner) Course. Upon graduation Private Colchiski was assigned to duty with the Coast Artillery School Detachment, Fort Monroe.

Private Colchiski hails from New Castle, Pennsylvania, where he was born on January 9, 1916. Graduating with high honors from the New Castle High School in June, 1934, he spent the next year preparing himself for admission to the U. S. Military Academy. Enlisting in the Army in 1935 with the idea of obtaining admission to the West Point Preparatory School he was disappointed in this ambition because of a dental defect. After serving eighteen months as a court reporter he then took the examination for admission to the Coast Artillery School for Enlisted Specialists in which he was successful.

During the school year he participated in wrestling and in the 145-pound class represented the Fort Monroe YMCA. Football is his keenest sport, although he plays tennis and is at the moment on the basketball squad of the Coast Artillery School Detachment.

Major General A. H. Sunderland, Chief of Coast Artillery has sent his congratulations to Private Colchiski for his outstanding demonstration of soldierly qualifications.

In winning the Knox Medal, Private Colchiski has shown that he possesses exceptional ability, a high sense of duty, and is a man of the highest character. The U. S. Coast Artillery Association congratulates him and commends him for his achievement. He has well earned the admiration of the Corps and has our sincere wishes for a successful Army career.

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery
MAJOR GENERAL A. H. SUNDERLAND

Executive
COLONEL JOSEPH A. GREEN

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

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

Plans and Projects Section
LIEUTENANT COLONEL A. G. STRONG

Personnel
LIEUTENANT COLONEL K. T. BLOOD

☆ ☆

Notes from the Chief's Office

TABLES OF ORGANIZATION

Revised tables of organization for all Coast Artillery units, railway, tractor drawn, harbor defense and antiaircraft, will be available in a short time as they now are being printed. These tables of organization have been revised owing to changes in Table of Basic Allowances (equipment), the necessity for providing enlisted cadres for each type of organization in the event of war, the equalization of grades and ratings, and the desirability of reducing the size of headquarters units. Tractor drawn and harbor defense tables of organization have been changed only slightly. All personnel, including the machine-gun battalion of the antiaircraft regiment, is now armed with the rifle and an appropriate number of automatic rifles to provide additional fire power for the protection of important elements and installations. The tables of organization for the antiaircraft regiment have been changed materially. The war organization of the second battalion now includes one battery of caliber-.50 machine guns and three batteries of 37-mm. guns. In peace there will be one caliber-.50 machine-gun battery and one 37-mm. gun battery. The new organization of the machine-gun battalion is flexible so that in the event 37-mm. matériel is not available the battalion can be armed with either caliber-.30 or caliber-.50 machine guns.

* * *

KNOX TROPHY AWARD

The Chief of Coast Artillery has recommended that Battery D, 4th Coast Artillery, Harbor Defenses of Balboa, Fort Amador, Canal Zone, be awarded the Knox Trophy which is awarded annually by the Society of the Sons of the Revolution in the Commonwealth of Massachusetts. This battery conducted an outstanding mine practice and it is interesting to note that this is the first time a mine battery has been awarded the Knox Trophy. Captain Holger N. Toftoy commanded this battery during its practice. Captain Toftoy is now on duty at the Submarine Mine Depot, Fort Monroe, Virginia. Battery K, 64th Coast Artillery (AA), Fort Shafter, Hawaii, commanded by Captain Pierre B. Denson, firing 3-inch antiaircraft guns, was awarded second place. Battery F, 52d Coast Artillery (Ry), Fort Monroe, Virginia, commanded by Captain Perry McC. Smith, firing 8-inch railway guns, was awarded third place. As previously announced, target practices conducted during the period October 1, 1937 and September 30, 1938, were considered in making the award.

* * *

KNOX MEDAL

In addition to the award of the Knox Trophy, the Society of the Sons of the Revolution in the Commonwealth of Massachusetts awards a medal to the enlisted man making the best record as a student at the Coast Artillery School. This year Private First Class Thaddeus M. Colchiski was selected to receive the medal. Private Colchiski has demonstrated that he possesses to an outstanding degree the following characteristics which are considered in making the award—

Scholastic standing
Coöperation
Diligence
Conduct and attention to military duty
Military bearing and neatness
Character.

Private Colchiski's home address is New Castle, Pennsylvania.

He is now a member of the Coast Artillery School Detachment, Fort Monroe, Virginia.

Fort Monroe

BRIGADIER GENERAL F. H. SMITH, *Commanding*

COLONEL EUGENE B. WALKER
Commanding Harbor Defenses of Chesapeake Bay and 2d Coast Artillery (HD)

COLONEL F. P. HARDAWAY
Commanding 51st Coast Artillery (TD)

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

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

November, December and 1938 have gone their way in the usual kaleidoscope of activities, arrivals, and departures. A flying trip to Kitty Hawk, the annual Peninsula Charity Fair at Langley Field, and numerous board tests, not to mention Thanksgiving and Christmas have left no time for even vague thoughts toward winter hibernation.

PERSONNEL

Colonel William E. Shedd received his stars on December 1st and he and Mrs. Shedd left for Fort McPherson. To compensate for our loss in the recent retirement of General Gulick and the departure of General Shedd, General Frederick H. Smith arrived November 21st and assumed command.

Other recent departures: Lieutenant Colonel Wallace, Captain Baron, Lieutenant MacNair, who becomes General Shedd's aide, and Lieutenant John D. Wood.

Other arrivals to the post have been Colonel E. E. Bennett, who has been assigned to duty as executive, Third Coast Artillery District; Colonel Francis P. Hardaway, who has assumed command of the 51st Coast Artillery; Lieutenant Colonel Brown S. McClintick who replaces Lieutenant Colonel Wallace; Captain Carl F. Tischbein, who has assumed command of Battery B, 2d Coast Artillery; Captain John E. Reierson, in command of Battery D, 2d Coast Artillery, and Captain Richard H. Grinder, in command of Battery A, 51st Coast Artillery.

PENINSULA CHARITY FAIR

The annual Peninsula Charity Fair was held again this year at Langley Field from the 2d to 4th of December. In coöperation with the civic organizations of the Peninsula and with Langley Field, Fort Monroe again participated. A complete hangar was used for the Fort Monroe exhibit. A 3-inch antiaircraft gun was emplaced, with all the trimmings from director and camouflage to live props reminiscent of Fort Bragg. A pair of 155-mm. GPF's complete with plotting trailer were also emplaced. Gun drills were held on all guns many times each day of the exhibit. Other displays included searchlights and sound locators, quartermaster, chemical warfare and ordnance exhibits. And by far not the least were many booths run by individual organizations which guaranteed practically painless extraction of any spare change you had.

KITTY HAWK EXPEDITIONARY FORCE

December 17th the Kitty Hawk Expeditionary Force consisting of Battery B, 2d Coast Artillery (antiaircraft searchlights), with Major L. W. Jefferson and Captain Tischbein, rolled out for Manteo, North Carolina, to participate in a celebration commemorating the 35th Anniversary of the Wright Brothers airplane flight. Despite a pea-soup fog the searchlight exhibition went off on schedule. A drafty trip down and back was reported.

ATHLETICS

At a regimental parade held December 19th, Colonel Walker presented the beautiful annual trophy to Headquarters Battery, 2d Coast Artillery, post athletic champions. The same battery also received the post baseball championship trophy. Battery F, 52d Coast Artillery (railway) received the touch football trophy. Battery C, 2d Coast Artillery received the trophy for second place in the baseball division and the Medical Department detachment for second place in touch football. What may possibly be the last cross-country race on the post was run December 21st. Battery F, 52d Coast Artillery ran off with the honors with Battery C, 2d Coast Artillery, a good second.

Basketball and bowling now occupy the stage in intra-battery athletics.

Washington Chapter

Social activities high-lighted the month of December for Washington Coast Artillerymen. During the first week a large group of officers attended the annual dinner at the Army and Navy Country Club at which Major General A. H. Sunderland, Chief of Coast Artillery was the honor guest. Colonel H. P. Newton acted as toastmaster while other arrangements were in charge of Lieutenant Colonel R. S. Atwood and Major T. J. Betts.

Later in December the Coast Artillery Reserve officers of Washington held a dinner dance at the Army and Navy Country Club. During the dinner, which was attended by over a hundred guests, professional entertainers held forth with song and jest. Following the dinner, motion pictures of the training of the 913th Coast Artillery (AA) at Fort Monroe during the past summer were exhibited. Dancing followed the movies.

Hawaiian Separate Coast Artillery Brigade

Brigadier General Fulton Q. C. Gardner, *Commanding*
Colonel Robert Arthur, *Chief of Staff*
Major F. A. Macon, *Adjutant General & S-1*

Captain W. H. Dunham, *S-2 & Gunnery* — Lieutenant Colonel A. E. Rowland, *S-3*
Lieutenant Colonel J. H. Lindt, *S-4 & War Plans*

Captain L. D. Flory
Com. and Engineer Officer

Captain W. H. Kendall
Sec. Ath. Officer

Captain S. E. Whitesides, Jr.
Chemical Warfare Officer

Lieutenant W. A. Call
Ordnance Officer

Colonel H. C. Merriam
Commanding Harbor Defenses of Pearl Harbor

Colonel Sanderford Jarman
Commanding 64th Coast Artillery (AA)

Colonel W. D. Frazer
Commanding Harbor Defenses of Honolulu

By Lieutenant Milan G. Weber

Training

On November 1st the brigade took the field for minor joint exercises which were divided into two phases. The first phase, ending on November 5th, consisted of joint operations with the Navy; the second, ending on November 15th, consisted of joint operations with the 18th Wing. Both phases were entirely successful and brought much valuable information. All target practices have been completed for the year, although the searchlight practices of the 64th Coast Artillery were delayed somewhat because of unfavorable weather.

The brigade is now in the midst of a rehabilitation month. During this period all schedules are called off, each organization turning to the many odd jobs which accumulate during the year. Barracks are being repaired, landscaping is being done; guns are being painted; and, in general, everything is being placed in readiness for early spring training.

General Peyton Departs

A brigade searchlight review was held the evening of December 13th on the parade ground at Fort DeRussy, in honor of the departing brigade commander, Brigadier General Phillip B. Peyton. Troops from the Harbor Defenses of Pearl Harbor, Harbor Defenses of Honolulu, and the 64th Coast Artillery moved into line in darkness. Upon a bugle signal the searchlights of the 64th Coast Artillery went into action, to illuminate the review field and form a cone of lights over the brigade. This impressive spectacle was a fitting salute to General Peyton and the final tribute from a command that sees him leave with real regret. General Peyton goes to Schofield Barracks to command the 21st Infantry Brigade.

General Gardner Arrives

Brigadier General Fulton Q. C. Gardner, accompanied by his aide, Lieutenant Milan G. Weber, arrived via the *Republic* on December 16th to take command of the brigade. He was met at the dock by many officers and ladies of the brigade who have served with him during his long service in the Corps. General Gardner is quite familiar with the Hawaiian Separate Coast Artillery Brigade for he served as its chief of staff during a previous tour of duty in Hawaii in 1933-35.

A dismounted review was held in General Gardner's honor at Fort DeRussy, on December 20th. On that evening the new commanding general met the officers and ladies at a reception at the newly-built Pavilion Club at DeRussy.

Athletics

Originally intended to be a ten-team loop, the Honolulu Sector-Navy Basketball League has been cut to nine teams with the withdrawal of Submarine Squadron Four. As a result, only four games will be played on each playing date, one team drawing a bye.

The cage season gets under way on January 2 with the defending champions, Luke Field, now known as the Fifth Bombardment Group, meeting the Minecraft Battle Force team at Luke Field. The Honolulu Sector Staff five will mix with the Fort Kamehameha team at Fort Kam. Two games will be played at the Army-Navy YMCA, Honolulu playing the Pearl Harbor Marines in the feature mix. In the curtain-raiser, Fort Shafter meets the Pearl Harbor Naval Hospital. Two rounds will be played, the first round ending on January 30. The second round will begin a week after the end of the initial round.

Inter-battery boxing is in full swing at the three main posts, Fort Shafter, Fort Kamehameha, and the Harbor Defenses of Honolulu. The first sector smoker will be a dual affair and will be held on February 24th. The second and third smokers, also dual affairs, will be held on March 3d and March 10th, respectively. Each of the three teams will meet each other, with the championship being awarded on the basis of the number of smokers won. In case of a tie, the number of bouts won will be considered.

The sector will not enter a team in the department championship boxing smoker. Instead, men who are deemed competent of fighting for the department title, will be allowed to challenge Hawaiian Division champions. The Honolulu Sector Boxing Council will pass on the individual boxer's ability.

Corregidor

BRIGADIER GENERAL WALTER K. WILSON, *Commanding*
COLONEL T. A. TERRY, *Executive*

COLONEL GEORGE RUHLEN
Commanding 59th Coast Artillery (HD)

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

COLONEL FREDERIC A. PRICE
Commanding 91st Coast Artillery (PS) (HD)

LIEUTENANT COLONEL ALBERT H. WARREN
Commanding 92d Coast Artillery (PS) (TD)

By Lieutenant Colonel R. E. Phillips

The improvement in weather that usually characterizes October and November came on time this year and permitted the harbor defense to carry out the fall firing program under favorable conditions. Recent changes in coast artillery qualification requirements increased the amount of rifle and pistol shooting for which this period is reserved. All annual antiaircraft machine-gun firings have been concluded, and, except for a few 75-mm. gun problems, all the various types of firing with beach defense weapons have been finished for 1938.

Although busily occupied with the firings the garrison managed to observe all ancient customs incident to welcoming new arrivals and speeding old friends when the *Grant* made port the last week in October. Colonel Thiele joined the harbor defense staff—taking up the duties of S-2 and executive for emergency defense formerly handled by Colonel Hood.

During October, annual play for the Caldwell Cup occupied the interests of our golfers. The four regiments and the artillery and special staff entered six-man teams and the 59th and the artillery staff emerged in a tie for first honors. The play-off was a hot contest which went to the staff players, 6-3.

Our entertainment graph shot upward again on November 19th when nearly the entire club membership assembled for the annual golf marathon. In general, the usual rules prevailed, regiments and staffs being limited to 12-man teams. Competing teams took the field in succession and played a single ball around the first nine holes. Organized heckling reached a new height of ingenuity and deadliness—mirrors flashing, paper bags popping, and the usual deluge of jeers and distracting advice. The ladies kept books on time and strokes and these showed the 92d an easy winner. Their tour of the course took a little under six and one-half minutes and only thirty-seven strokes. Despite the fact that the fairways were strewn with dozens of balls thrown down by hostile spectators, the Kindley Field aggregation refused to be diverted. They played best; Staff A played the funniest.

We will close our general news section with a brief account of the assembly for the Army-Navy game. This was bigger and better than ever, chiefly because of the energy of the club secretary, Lieutenant Whipple, who scouted out the equipment necessary to direct reception, obtained from a west coast station by courtesy of RCA. Over a hundred gathered to hear the broadcast and partake of the free, victory breakfast served by the club.

59TH COAST ARTILLERY NOTES

By Lieutenant L. R. Drake

October and November were devoted to small-arms training both on the range and at beach defense positions. Record firing on the rifle range has been completed and the towed target firings with the beach defense machine guns have been run off. In spite of the use of colored bullets, some of the many bullet holes in the towed target could not be identified, leaving open the question of which battery did the best shooting. In preparation for the coming target practice season with the primary armament, battery officers are attending a troop school, designed to bring out some of the finer points in gunnery, and are looking forward to a most successful season.

On November 26th, the curtain fell on the basketball season. The inter-battery league ended with Battery F (Captain Crim commanding) in first place with ten victories out of twelve games. At the beginning of the inter-regimental season, the 59th team defeated the strong quintet from the 60th in a three-game series for the post championship, the scores being 36-25, 27-38, and 28-27. Throughout the tournament, the team showed excellent spirit and was a credit to the regiment. Lieutenant L. R. Drake was the team coach and Staff Sergeant G. J. Armstrong was the team captain.

Several weeks prior to the inter-regimental boxing smoker with the 60th, a training camp was established at Fort Hughes under the direction of Sergeant I. Johnson of Battery G. This proved a good idea for our boxers were in excellent condition for the smoker and won six of the nine bouts.

At present, the batteries are organizing track and baseball teams. Captain S. J. Goodman has been designated as officer in charge of track and baseball. The battery baseball league will open about December 12th; three games per week being played until the regimental team is organized in March.

60TH COAST ARTILLERY

Although the last transport brought no one for the 60th, there have been a number of important changes in personnel. Colonel James H. Cunningham's assignment to Organized Reserves at Los Angeles was revoked and he has been assigned to command the harbor defenses of Puget Sound. Colonel W. C. Koenig was transferred from the 91st Coast Artillery (PS) taking command of the regiment on November 4th. Captain Samuel H. Morrow has taken command of Battery B. Lieutenant George

E. Keeler, Jr., spent November at the Cooks' and Bakers' School at Fort McKinley, where, in addition to burning up the food supply, he burned up the golf course preparatory to the department tournament. Captain DeWitt Ballard, 57th Infantry, spent the week of November 20-26 on DS with the 60th, observing part of the machine-gun firing of the regiment and other forms of training.

Boxing and basketball have held the interest of the sporting world of Corregidor during October and November. Battery D won the regimental boxing championship. The 60th lost the boxing championship to the 59th in a number of hard fought bouts. In basketball, Battery A once again won the regimental championship. In the interbattery American division championship series of Fort Mills, Battery A defeated Battery F, 59th. In the interregimental championship series the 60th lost the deciding game to the 59th by a one-point decision. However, in the American division of the department basketball tournament, the 60th defeated the 59th in both games. The conclusion of the Department Tournament finds the 60th and the 31st Infantry tied for first place. Play-off arrangements have not yet been completed.

For the past two months the regiment has been firing steadily. Small arms firing has been going on since the middle of October and should finish the first week of December. To date the results have been gratifying.

During October the 2d Battalion conducted balloon firing. In November preliminary and record practices were fired with caliber .30 and caliber .50 machine guns.

Battery A has been conducting intensive training for its annual searchlight practice. Air missions have been numerous and progress has been satisfactory in spite of unusually cloudy and rainy weather. Weather permitting, the service practice of this battery should take place within the next two weeks.

The gun batteries have been taking advantage of all air missions in preparation for their target practices in January. Present indications point to the completion of their practices early in February.

The October transport brought an unusually large number of recruits to the 60th—of these about one-third were previous service men who were turned to duty promptly. The remainder have just completed their training program and have been turned to duty with their batteries.

Troop schools have been recently completed on the tactics and technique of antiaircraft machine gun and searchlight batteries. A school on antiaircraft gun battery tactics and technique starts this week.

In addition to the above the regiment has been conducting normal training to enable it to fulfill its various missions.

91st Coast Artillery (PS)

By Major A. L. Lavery and Lieutenant T. McG. Metz

The regiment acquired Colonel Frederic A. Price, Captains James L. Hogan and Dean Luce and Lieutenants Robert F. Moore, Henry M. Spengler, Melvin R. Russell and Paul C. Davis from the October transport. Captains Ernest A. Merkle and Marion G. Pohl, and Lieutenants David B. Routh and Pennock H. Wollaston returned to the States on the same transport.

Captain Glenn Newman and Lieutenant Joseph B. Yost returned from Fort Frank at the end of October having been relieved by Captain Hogan and Lieutenant R. F. Moore.

Batteries A, B, D and G have completed their additional antiaircraft machine gun practices with good results, using only tracer control.

Mine Batteries A and G are busy getting mine matériel in shape for mine practice the first of the year.

Beach defense firing with machine guns and 37-mm. guns have been conducted.

The department basketball tournament stole the athletic show for October and November. The 91st basketeers won ten and lost four games in the tournament which placed them third in the final standing. All of the tournament games were interesting and well attended. The two games with the 92d in the department tournament also counted towards the post championship (Scout Division). Both of these games were won by the 91st. By winning these two games the 91st won the post championship (Scout Division) for the first time in three years.

For the first time in the history of the regiment, university boxing teams from Manila were invited to fight against the 91st boxers in the regimental smokers. The National University won their bouts 4½ to 3½. The Far Eastern University (UAA Boxing Champions 1938) won their fights from the 91st, 7 to 5. Much interest was created by those fights and the regiment hopes to invite more teams over to the Rock in the near future. The interregimental smoker will be held December 14 at the athletic arena.

92d Coast Artillery

By Major H. A. McMorrow

The past two months saw the completion of firings of both types of secondary armament. The antiaircraft machine-gun firing was completed in October and the beach defense machine gun, 37-mm. gun and 75-mm. field gun firing during November. The results are considered very satisfactory.

A mobilization test was held October 29th. The regiment was found to be in excellent condition and ready for immediate field service.

At the present time the regiment is conducting intensive artillery training in preparation for annual service practices. It is hoped that high speed targets will be available for at least one practice.

The annual field meet was held December 2d; Battery C winning with 59 points; Battery B came in second with 35 points. The highest individual point winner was Private Victorino Lucero, Battery B, with 15 points.

First Coast Artillery District

Brigadier General Edmund L. Daley, *Commanding*

Colonel Rodney H. Smith, *Executive*

Major Robert T. Chaplin, *Adjutant*

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

Colonel Monte J. Hickok
Commanding Harbor Defenses of Boston

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

Major Edward L. Supple
Commanding Harbor Defenses of Narragansett Bay

Captain Charles N. Branham
Commanding Harbor Defenses of New Bedford

With this issue of the Journal the First Coast Artillery District breaks into print.

General Daley, recently assigned to command of the district, came to Boston from New York, where he has been Division Engineer of the North Atlantic Division. After completing a thorough inspection of all the Harbor Defenses in the district in November, General Daley turned his attention to the affairs of the Coast Artillery National Guard and Reserve units in New England. His December activities included: speaking at a unit meeting of the Reserve officers in the Hartford area; speaker at the Coast Artillery Reserve meeting in Boston; attendance at an armory drill of the 242d Coast Artillery, Connecticut National Guard, in Bridgeport; meeting the officers of the 243d Coast Artillery Rhode Island National Guard in Providence; and again in Hartford as guest speaker at the meeting of the Reserve Officers' Association. During his inspection schedule of the Regular regiments the General found time to meet and discuss Coast Artillery matters with the officers of the National Guard and Reserves in the locality of the regular establishments. At Fall River, he was the guest of Lieutenant Colonel R. C. Allen, CA-Res. and there addressed a joint meeting of the officers of the 241st Coast Artillery, Massachusetts National Guard, and Reserve officers of the Southeastern Massachusetts area.

The outstanding event of the last few months in this district was, of course, the hurricane of September 21st. Its destructive effect was most severe in the Harbor Defenses of Long Island Sound, Narragansett Bay, and New Bedford. Naturally at those stations the date of the storm has become the refetence date for almost every other event since. Much of the news at this time, therefore, is news of destruction and disaster. But rehabilitation is well under way, and everyone knows that the future news from New England will be news of construction and progress toward a greater efficiency in the system of coast defense for the North Atlantic States.

Harbor Defenses of Portland and Portsmouth

By Major H. W. Lins

Brigadier General Edmund L. Daley, U.S.A., district commander, and Colonel Rodney H. Smith, district executive, visited the harbor defenses recently for two days. As this was General Daley's first visit to the defenses he was quite interested in the setup.

During his stay here he gave an interesting and instructive talk to a large group of Reserve officers of Portland and vicinity.

The winter schedule of maintenance work and such training as can be carried on in bad weather is now well under way.

Harbor Defenses of Long Island Sound

By Lieutenant Charles L. Andrews

September 22. "Water is restricted for *drinking purposes* and *cooking* only, until further notice. Fires will be withdrawn from all heating plants and discontinued until further notice."

September 24. "Standard time becomes effective at 2:00 PM, Sunday, September 25, 1938."

September 25. "At 2:00 AM, Sunday, September 26, 1938, all clocks will be set *up* one hour. Daylight saving time will *again* be effective at that time."

Such notices were typical of the matter appearing in the Harbor Defenses Daily Bulletin following the hurricane of last September. The entire garrison had to temporarily abandon all training projects, including antiaircraft target practices, and devoted all its time for the following two weeks to hauling away wreckage and making stop-gap repairs in an effort to waterproof damaged quarters and buildings. The absence of electric power and consequent water shortage existed for four days. An emergency supply of alternating current for the post hospital and movie was set up by Technical Sergeant LeDoux and Staff Sergeant Scheemaker. They converted an old AC-DC moto

Utility area at Fort Rodman, Massachusetts, after the hurricane.

Ruins of a garage at Fort H. G. Wright, New York, after the hurricane.

generator set into a DC-AC set operating on fortification power and producing the desired alternating current. Unfortunately the capacity of this set-up was limited so electric stoves and ice boxes did not function and barracks and quarters remained dark. Connections were made to use this source of power to operate the Fisher's Island pumping plant in the event that the supply of water in the reservoir became completely exhausted, or if a large quantity of water became necessary for fire-fighting.

At the height of the storm a wind velocity of 109 was recorded before the anemometer was carried away. It is reported that 120 mph was indicated on another instrument on Fisher's Island. The tremendous power of wind and wave was amply demonstrated by the fact that large battery iceboxes were carried hundreds of yards from the National Guard Camp. Here the permanent buildings were almost totally destroyed, and a 2,500-pound cast iron AA director T6 was knocked over and damaged, forcing the AA gun battery to switch from Case III to Case 1½ pointing in its target practice.

The SS *Iesup*, tied to the dock in New London after being driven back by the storm, was rammed by a ferry boat out of control, with a damage of $19,800, while the MS *Greene* was rammed aground by another steamer. A large detail went to New London to assist in floating the *Greene*. Another detail under Staff Sergeant Maykovich, wire chief, went to New London and cleared the shore end of the Fisher's Island telephone cable. All civil and military needs for communication with the mainland up to that time had been filled by improvised radio, the New London terminal being an L-boat set which was rigged on the *Iesup*.

The work of the technically trained noncommissioned staff during and after the disaster was a glowing example of the excellence of their training and their value to the service.

Following the completion of the bulk of the rehabilitation work, C Battery, with two weeks of training hampered by shortage of airplane missions, fired a commendable practice using 1918 mobile guns and an RA Corrector. Seven hits were obtained from 49 rounds fired on four courses. Batteries A and B, similarly handicapped, fired good machine-gun practices.

Small arms firing continues despite sub-freezing weather in an effort to fire all men before spring which will bring the primary target practices.

Our new district commander, General Edmund L. Daley, made his first inspection of the harbor defenses in November. On this occasion winds of such high velocity prevailed that the troops were unable to stand at the review, and high seas forestalled a landing by the inspecting party at Fort Michie.

L-43 aground at Fort Greble, Rhode Island.

After losing the post baseball championship to Battery B, 1-0, in a playoff, Battery C breezed through to the football championship by scoring 84 points to its opponents' 7 in three games.

Harbor Defenses of Narragansett Bay

By Captain Virgil M. Kimm

The 10th Coast Artillery may go down in history as the only organization to conduct a mine practice during a hurricane. When the hurricane struck, practice was in full swing. A 19-mine group was down undergoing test. Tests completed, the mine flotilla on the afternoon of September 21, proceeded to the mine field to pick up the group. About 3:00 PM it became evident that the weather would not abate and that the sea was too rough to continue operations. Accordingly the *L-43* and mine yawls took what they thought to be shelter at the Fort Greble docks and boathouse. But a slight change in wind direction brought the full force of the sea against the Greble docks. The boathouse, docks and boats were all swept away. The *L-43* was grounded at Greble. One mine yawl was recovered in the woods on Jamestown Island a few days later. Mines and keg-buoys from the storehouse were scattered along the beaches for miles, left high and dry by the receding waters which reached a height of slightly better than fifteen feet above mean low water.

The mine planter *Baird*, under the direction of Warrant Officer Trahey fared better. She rode out the storm in the waters of Narragansett Bay without mishap, which must be considered a tribute to the seamanship of her master. However, the next day there were very few docks left to tie up to. The *Baird* put lifeboats ashore to remove marooned personnel at Greble and Wetherill.

The mine system functioned perfectly through the storm. At 11:00 PM, some six hours after the height of the storm, the selectors were stopped. Emergency sources

of power were used during this period as commercial power failed early. In fact during this night of storm and terror, the casemates presented the only lights in a sea of darkness.

An observer in the mine group station with eyes sharp enough to pierce the murky haze would have seen the top story of the steel and concrete Whale Rock light blow off, carrying the keeper to his death; he would have seen 25-foot waves breaking over the causeway at Old Town Beach, carrying a school-bus load of children to their death; he would have seen, at Fort Kearney, the destruction of a colonial landmark—a stone building in which fatigue clothing was made for Revolutionary soldiers.

A new officers' club, a WPA project, is now under way at Fort Adams. The club overlooks Narragansett Bay, facing Jamestown Island. The club should be completed in January, 1939.

Our new District Commander, Brigadier General Edmund L. Daley, was welcomed to Fort Adams on November 21st for his first visit and inspection.

The Fort Adams radio station and telephone system worked with 100% efficiency through the hurricane. Telephone communication to the outposts did not fail at any time. The successful operation of the system is a tribute to the efficiency of the Coast Artillery fire control installations.

Harbor Defenses of New Bedford

By Captain Charles N. Branham

The following commendation extracted from the narrative report of the commanding officer following the hurricane at Fort Rodman gives only a bare outline how the storm was met by the garrison of this post.

"Acknowledgment has been made of the excellent work done here by those officers and men sent by higher authority to assist in the huge task of reclamation which faced the small regular garrison normally stationed here. But that same small garrison of nine soldiers to whom the initially staggering task of protection of life and government property became an immediate duty I now commend with all the admiration possible in written expression for duty well performed. To single out any one individual for praise would be inadequate and inappropriate. Every man performed his task to the limit of his abilities, and demonstrated a wholehearted loyalty to the interests of his government that was most gratifying. This is perhaps the only result of the storm that is pleasant, and is more significant than all the loss and damage sustained by matériel and equipment. . . ."

West Point

By Lieutenant E. E. Farnsworth, Jr.

After the Christmas interlude, the post has returned to the routine which precedes the opening of the winter sports season. Most of the officers who remained at the Academy during the holidays were occupied with the semi-annual examinations. Consequently, we scarcely realized that 1938 was on the way out prior to the New Year's Hop.

The past year has witnessed some important changes at West Point. The extensive construction program has completely remodelled the face of the Military Academy. The four most recently completed buildings—the new gym, the new academic building, the new cadet barracks, and the huge AAA field house—have taken their place in the panorama of West Point and are being used by the cadets. There has also been a large turnover and enlargement of the staff of the Academy. The advent of the three-year rule in athletics has added the final touch of prestige to the Academy's high standards and, incidentally, has improved the caliber of our teams. Once again, the strains of *Army Blue* have a realistic ring as the blue of our uniforms blends with the cadet gray in the evening. Even the academic courses have felt the ever-changing influence of progress. Indeed 1938 was a mighty milestone in the life of West Point.

In November Colonel Sanderford Jarman spoke to the Coast Artillery officers on the Fort Bragg exercises. Everyone turned out and enjoyed a most interesting and instructive talk. Colonel Jarman spoke on the most recent problems of antiaircraft defense and the modern trend of methods of fire and matériel. The conduct of the intelligence net proved to be a source of much professional information as well as a great deal of amusement.

The winter sports, three of which get under way January 7th, will signal the return of activity on the post. We should have a great basketball team this year, which, together with the fencing, swimming and gymnastic teams, should run our 1938-39 record with the Navy to seven wins and no losses.

Coast Artillery Board Notes

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

THE COAST ARTILLERY BOARD

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ANTIAIRCRAFT SPOTTING METHODS AND INSTRUMENTS (PROJECT NO. 1105). This project was initiated in the summer of 1937 as a result of a study made by the Coast Artillery Board of the characteristics and intended uses of the Instrument, Observation, AA, BC, M1 (BC telescope). Such study indicated the need for a thorough investigation of the entire spotting problem with a view to developing a reasonably satisfactory instrument for spotting under actual service conditions.

a. Present spotting methods and instruments.

(1) Before proceeding to a detailed description of the various tests conducted in connection with this investigation it first would appear desirable to outline the spotting situation as it exists at the present time. The following subparagraphs, therefore, are intended as a brief discussion of present standard spotting instruments and methods.

(2) The three range spotting methods now recognized as practicable for use in observation of antiaircraft gun fire are the stereoscopic (or modified bracketing) method, the fuze range pattern and the angular unit method. All three methods are described in detail in *Coast Artillery Field Manual*, Volume 11, Part 2.

(3) Present accepted doctrine, confirmed by certain spotting tests conducted by a detachment of the 62d Coast Artillery at Fort Bragg, North Carolina, in 1937, ranks these methods of adjustment in order of effectiveness as: angular unit method using magnitude spots obtained from a flank station on a measured base line; fuze range pattern method using observations from a flank station, no measured base line being required; and modified bracketing method using a stereoscopic height finder at the battery to obtain spots by sensing only. The last named method is generally regarded as being far less accurate than the other two and ordinarily would be used solely in those situations where one or the other of the more effective systems were not available.

(4) Spotting by the fuze range pattern method requires that two of the four guns of a battery be spread in fuze range to provide a spotting "yardstick" in the sky. This method therefore implies a considerable loss in fire effectiveness particularly in so far as the first few rounds are concerned. The spread may be removed after an adjustment has been secured, but by that time the destructive effect of a number of bursts has been sacrificed to provide the necessary yardstick for spotting purposes. The method is weak also in that it provides for spotting only in terms of range forks. It is manifestly incapable of the accuracy obtainable with the angular unit method. Furthermore, it involves almost as difficult a problem for the range officer as does the angular unit method in determining and applying the proper conversion factor for converting deviations in range forks to corrections in terms of yards altitude. No special type of spotting instrument is required when spotting is done by the fuze range pattern method, observations being made either with the naked eye or with the assistance of such binoculars as may be available.

(5) The angular unit method is admittedly the most accurate of the three standard spotting methods. It requires the use of at least one flank spotting station, a spotting base line of known length and a suitable instrument for the measurement of range deviations. Spots in mils are transmitted to the battery position where the range officer multiplies them by a predetermined factor to convert them to corrections in terms of yards altitude. The value of this factor varies with the length of the spotting base line, the altitude, the target angle, the angular height of the target from the flank (o_2) station, and the slant range from o_2. Depending on the particular type of spotting instrument available, deviations may be read at the flank station (1) in a horizontal plane or (2) in the slant plane containing the target and the spotting base line.

(6) The present standard flank spotting instrument for antiaircraft gun batteries is the Instrument, Observation, AA, BC, M1 (BC telescope). It can be used to

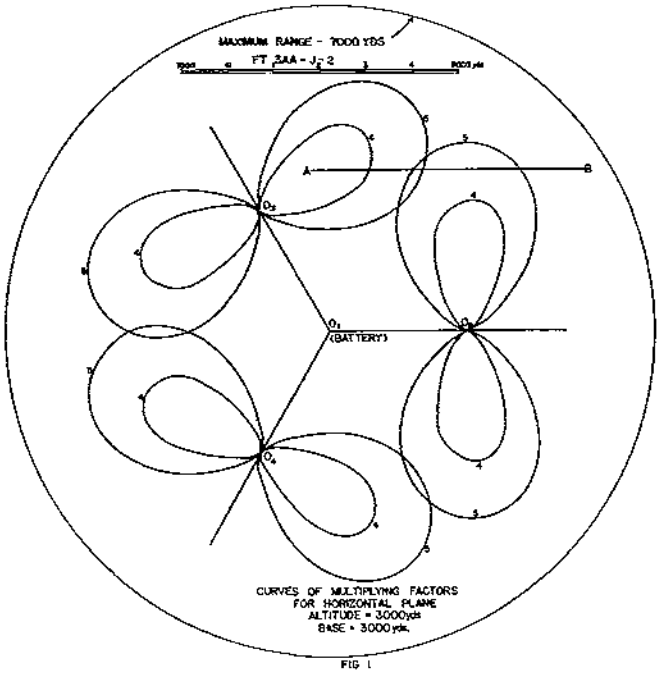

FIG. 1

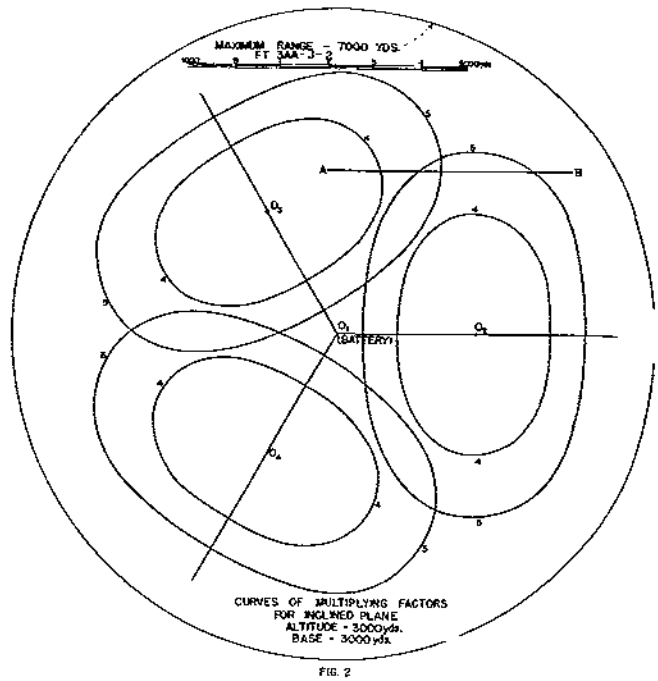

FIG. 2

measure deviations in the horizontal plane only. Therefore, except in cases where locally improvised matériel is employed, adjustment of fire by the angular unit method is necessarily limited to the use of deviations observed in the horizontal plane.

(7) The limited usefulness under service conditions of horizontal plane spotting is well illustrated by reference to Figures 1 and 2. In these charts a situation is assumed in which spotting base lines of 3,000 yards are employed, with a target at 3,000 yards altitude. A 360-degree field of fire is assumed, with three flank spotting stations located 120 degrees apart. Figure 1 contains curves of multiplying factors to be used with each of these spotting stations under the conditions assumed, throughout the field of fire, when deviations are observed in the horizontal plane. Figure 2 shows corresponding factor curves for spotting in the inclined plane. For the sake of clarity, in both figures, curves of factors greater than five are omitted. A study of these charts reveals the following facts:

(*a*) Employing slant plane spotting, under the conditions assumed, it is possible to cover the entire field of fire by observation from at least one of the flank stations using factors of a value of five or less.

(*b*) With horizontal plane spotting, it is impossible to spot from a station so located that the target is within 1,000 yards of the vertical plane containing the spotting base line, due to the prohibitively large values of the multiplying factors involved. Therefore under the conditions assumed, a number of "dead areas" will exist which cannot satisfactorily be covered by any of the three flank stations. A minimum of six such stations would be necessary to cover suitably the entire 360-degree field.

(*c*) Generally speaking, multiplying factors for the horizontal plane are greater and change faster as the target moves along its course than the corresponding factors for inclined plane spotting. Since the inherent accuracy of the spotting method employed may be said to vary inversely with the multiplying factor used, it is important that these factors be kept as small as possible for all points in the field of fire.

(8) The charts described in subparagraph (7), above, are of use for only one target altitude and one length of base line. Further comparisons, using various other lengths of base lines and target altitudes, serve to substantiate the facts already set forth with reference to multiplying factors for horizontal and inclined plane spotting.

(9) For ordinary target practice conditions, where a limited field of fire only is to be used, the spotting base line can be so selected that spotting in the horizontal plane is practicable. Thus, in Figures 1 and 2 with a target flying the course AB, there will be little to choose between horizontal and inclined plane spotting. Only when the entire field of fire is considered does the unsuitability of horizontal plane spotting become evident.

(10) For target practices, charts similar to the one shown in Figure 1 are commonly employed. Since the value of the multiplying factor varies with the altitude, a large number of such charts would be required for service conditions, even with a single base line. A separate set of these charts must be prepared for each different length of base line employed. Except for a semi-permanent rear area defense, where base lines can be measured and charts prepared in advance, this method would appear impracticable for use under war conditions. Therefore, regardless of whether deviations are read in the horizontal or the inclined plane, it may be stated that no satisfactory means are as yet available to the service for obtaining accurately and for applying the proper multiplying factor.

(11) Subparagraphs (2) to (10), above, may be summarized briefly as follows:

(*a*) Of the three spotting methods in general use, the angular unit method is potentially the most accurate.

(*b*) The present standard spotting instrument is the BC telescope. It is used with the angular method and is satisfactory only under target practice conditions. It is unsuitable for employment under war conditions because it provides for the spotting of deviations in the horizontal plane rather than in the slant plane containing the target and the spotting base line.

(*c*) A need exists for a flank spotting instrument which will enable deviations to be read in the inclined plane and for a means whereby the proper multiplying factor for converting such deviations to corrections in terms of yards altitude can be accurately and readily determined.

b. Tests.

(1) Initial tests held under this project were concluded in the late spring of 1938. In these tests the altitude grill, 64th Coast Artillery (AA), and the modified altimeter were used for spotting during an extended period of firings held in connection with other investigations. Both of these instruments are fully described in the COAST ARTILLERY JOURNAL, September-October, 1937. The altitude grill was found to be purely a target practice instrument. With a favorable target angle and at short ranges it was reasonably satisfactory, but at many points in the field of fire it was entirely unusable. Furthermore, the lack of a telescope made it difficult and sometimes impossible for the observer to follow the target at the longer ranges. The modified altimeter was found to be reasonably satisfactory, in so far as actual observation of the bursts was concerned. However, since no suitable field method for rapidly selecting and applying the proper multiplying factor had been developed, the spotting method involved was not considered entirely suitable for actual service use.

(2) In the fall of 1938, further tests of spotting in the inclined plane appeared to be warranted, as new methods of making use of deviations thus obtained had been devised subsequent to the tests just described. These further tests were planned to investigate the suitability of inclined plane spotting when used in connection with the spotting slide rule developed by Captain F. B. Kane, Coast Artillery Corps, and the flank spotting instrument constructed at the Coast Artillery Board. The tests were conducted at Fort Story, Virginia, using personnel from Battery C, 2d Coast Artillery.

(3) The Kane Flank Spotting Rule is a circular logarithmic slide rule, intended as a means for determining readily the proper multiplying factor for use in reducing spotted deviations in the slant plane to corrections in terms of yards altitude. The rule also indicates the actual value of the altitude correction thus determined. When properly set (see Figure 3) to the measured values of the spotting base line (b) the altitude (H) and the two angles (Θ) and (ε_m), the rule determines the value of the factor (C) by solving logarithmically the formula:

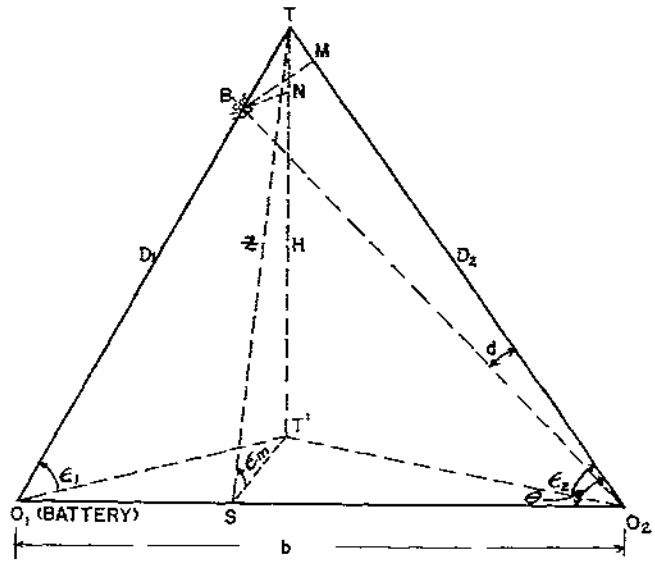

FIG. 3

$$C = \frac{H^2}{b \sin \varepsilon_m \sin^2 \Theta}$$

(4) The Coast Artillery Board Flank Spotting Instrument was designed as a simple observing device to furnish the data necessary for operation of the Kane Slide Rule. In principle the instrument is identical with the modified altimeter except that it is provided with the necessary scale and pointers for indicating values of the angles Θ and ε_m (Figure 3). For operation, an observer and a reader are required. The observer tracks the target and announces deviations of bursts as they occur. The reader calls off values of the two base angles at the instant fire is opened and at convenient intervals thereafter.

(5) Results of firing tests of these spotting devices may be summarized as follows:

(*a*) Accurate spotting results were obtained with the equipment tested when all bursts with large lateral or vertical deviations (as viewed from the battery) were disregarded.

(*b*) The method employed was particularly sensitive to lateral deviations (as viewed from the battery) when the short base line (1,100 yards) was used. In this case bursts with lateral deviations as small as five mils resulted in corrections being determined in the wrong sense.

(*c*) The Kane Flank Spotting Rule functioned satisfactorily. The initial setting was easily and quickly made; very little practice was required for its operation; and the resulting altitude corrections could be read almost instantly upon the receipt of the deviations from the flank station.

(*d*) The Coast Artillery Board Spotting Instrument also functioned satisfactorily. It could have been improved by the provision of an open sight to assist initially in picking up the target.

c. Discussion. As already pointed out, it was not expected that the subject devices would prove to be much

superior in target practice to present accepted spotting methods. The chief advantage claimed for such instruments is that they are suitable for use throughout the entire field of fire, irrespective of target altitude or range. Since the restrictions imposed by peacetime safety regulations and by the limited field of fire available prevented a conclusive firing test of these characteristics, the Board attempted to determine the value of the instruments for general field use by a theoretical analysis. To this end a group of representative target courses were selected at various ranges and altitudes, and curves of multiplying factors, using various base line lengths, were plotted for each course. From a study of these curves the following deductions were made:

(1) For all courses, values of multiplying factors are greatest and change fastest when a short base line is employed.

(2) For most courses these values are prohibitively large when using the 1,000-yard base line.

(3) Using three base lines, each 3,000 yards or more in length, accurate spotting results should be obtainable at all altitudes throughout the field of fire.

(4) Improvement in magnitude and rate of change of factor values when the base line is lengthened from 3,000 to 5,000 yards is so slight as scarcely to warrant the additional effort involved in installing and maintaining communications.

(5) In so far as can be determined, the employment of the method of angular unit spotting with the Coast Artillery Board Flank Spotting Instrument and the Kane Spotting Rule should be entirely feasible under service conditions. Generally speaking an accuracy of spotting only slightly less than that obtainable in target practice may be expected throughout the field of fire, provided only that proper allowance is made for wide lateral or vertical deviations.

(6) It is of particular interest to note that the settings of the values of ε_m and Θ on the spotting rule are by no means critical. Variations of several hundreds of mils in these angles result, in the general case, in only a small change in the value of the multiplying factor determined. Thus, the settings made on the rule at the beginning of a string of bursts need not ordinarily be changed until after a string of fifteen or twenty rounds has been fired or until a pause in the firing furnishes an opportunity for the transmission over the telephone of new values of these angles. Furthermore, if the flank station fails to pick up the target in time to permit of the transmission of these readings initially, the rule may be set with reasonable accuracy to values of ε_m and Θ as estimated from the battery.

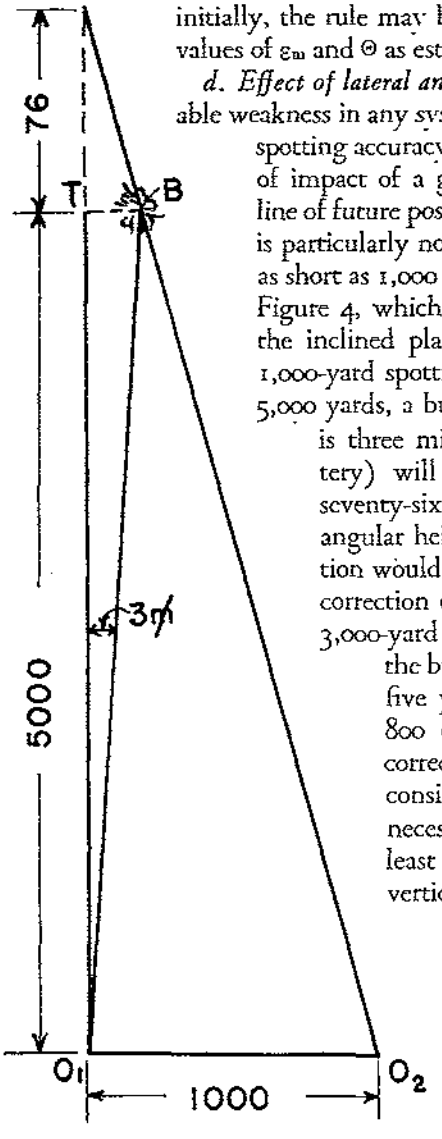

FIG. 4

d. Effect of lateral and vertical deviations. An unavoidable weakness in any system of flank spotting is the loss in spotting accuracy which will result when the center of impact of a group of bursts occurs far off the line of future position. The effect of such deviations is particularly noticeable when a spotting base line as short as 1,000 yards is employed. For example in Figure 4, which represents the firing situation in the inclined plane, it will be noted that with a 1,000-yard spotting base line and a slant range of 5,000 yards, a burst which is correct for range but is three mils right (observed from the battery) will appear from the flank as being seventy-six yards over in slant range. At an angular height of 800 mils, such an observation would thus call for an erroneous altitude correction of down fifty-four yards. Using a 3,000-yard base line under similar conditions, the burst would appear as being twenty-five yards over in slant range, at ε = 800 calling for an erroneous altitude correction of down eighteen yards. This consideration indicates once more the necessity for a spotting base line of at least 3,000 yards in length. Lateral and vertical deviations from the line of position will each result in spotting errors of varying amounts, depending on the target angle, the slant range, and the inclination of the slant plane. When ε_m is less than 800 mils, the effect of lateral deviations will be the more serious. When ε_m is greater than 800 mils, the reverse will be true. In any case, it should be accepted as a definite principle of antiaircraft gunnery that only when the center of impact of a group of bursts is within five mils of the target, both laterally and vertically (with a spotting base line of 3,000 yards or more), can full reliance be placed on flank observations.

e. Comparison with fuze range pattern. It may be noted that the errors due to lateral and vertical deviations discussed above have exactly the same effect on spotting accuracy when using the fuze range pattern as when using the angular unit method. Thus, in the example cited, if the burst as plotted is considered as the center of the fuze range pattern, a similarly erroneous altitude correction will be called for. It appears, therefore, that a base line at least 3,000 yards long is quite necessary with either of these two flank spotting methods. The present tendency to regard the fuze range pattern method as suitable for use with a base line of 1,000 yards or thereabouts is, therefore, decidedly in error. The second advantage claimed for this method: i.e., that it requires no measurement of base line

length, would seem to bear little weight since it can easily be shown that map measurement is sufficiently accurate for a base line used with the angular unit method. Hence the advantages claimed for the fuze range pattern method have been shown to be practically non-existent; whereas, its disadvantages have become by comparison more serious than before, in view of the increased accuracy to be expected from the angular unit method with the proposed devices for inclined plane spotting.

f. Comparison with stereoscopic spotting. The Coast Artillery Board believes that the possibilities of stereoscopic spotting have never been fully exploited by the service. With the latest improved height finders now being made available to troops in the field and with the emphasis now being placed on this type of spotting during annual target practices, improvement in results may be expected in the near future. However, in its present state of development, stereoscopic spotting should still be regarded as an emergency method for use when failure of communications, difficulties of target identification, or other unforeseen troubles, render flank spotting facilities unavailable. Moreover, it appears likely that the angular unit method of flank spotting will always be potentially more accurate and will provide a quicker adjustment than will ever be possible with an unilateral system. Accordingly, it is believed desirable to provide every firing battery with the necessary devices for accurate flank observation of bursts throughout a 360-degree field of fire.

g. Conclusions. The Coast Artillery Board concluded that:

(1) The angular unit method of flank spotting is potentially the most accurate of any of the spotting methods as yet proposed for use in adjustment of fire of antiaircraft guns.

(2) When employed with the present standard flank spotting instrument, the angular unit method is not suitable for use under field conditions.

(3) When employed with the spotting devices described herein the angular unit method is entirely suitable for service use. It provides a means for ready and accurate adjustment of fire at any altitude throughout a 360-degree field of fire.

(4) As compared with the angular unit method employing the subject spotting devices, the fuze range pattern method possesses no appreciable advantages for use under service conditions and is inherently less accurate and more wasteful of fire power.

(5) The Kane Flank Spotting Rule and the Coast Artillery Board Spotting Instrument should be suitable and adequate for the purpose for which they are intended.

(6) The method of stereoscopic spotting is of value chiefly as an emergency method, for use when flank spotting facilities are not readily available.

h. Recommendations. The Board recommended that the Kane Spotting Rule and the Coast Artillery Board Spotting Instrument, modified in a few minor particulars, be standardized for issue to the service on the basis of one spotting rule and three spotting instruments per antiaircraft gun battery.

SIGHT MOUNTS FOR 155-MM. GUNS. Following the test of the Panoramic Telescope T2 (see pages 499 and 500, COAST ARTILLERY JOURNAL, November-December, 1938, CA Board Project 1137), the Chief of Coast Artillery directed the Board to comment on whether it might be practicable to effect reductions in the cost of the sighting equipment for harbor defense 155-mm. guns emplaced on concrete bases, through simplification of the sight mounts by eliminating the mechanical features which provide for cross-leveling and fore and aft leveling. It was suggested that a simple sight bracket, without leveling features, mounted on the side of the carriage to support the T2 telescope and a range drum geared to the trunnion would provide adequate but inexpensive equipment.

The Board reported that the feasibility of simplifying the sight mount will depend on the extent to which the surface of the bottom carriage corresponds to a horizontal plane. The axis of the bore and trunnions are fixed, by construction, in reference to this surface and are constrained to elevate and rotate in planes perpendicular and parallel, respectively, to this surface. Whenever the surface of the bottom carriage is not horizontal, errors of direction and elevation, unless compensated for, will be introduced, varying with the direction at which the gun is pointed.

A study of the construction of a 155-mm. carriage indicates that the surface of the bottom carriage is fixed with relation to the plane containing the top of the axle and the ends of the trails. Also that if the ends of the trails are on a level plane and the pivot pin is at the proper height above this plane, the surface of the bottom carriage will be level and correct elevations and directions will be afforded by non-compensating sight mounts regardless of the direction or elevation given to the gun.

The construction drawings of the concrete 155-mm. emplacements show that the emplacements are designed in such a way that the ends of the trails will remain level with respect to each other and that the height of the pivot pin will be fixed in reference to the level of the trail ends regardless of what position the mount occupies on the emplacement. The wheel pedestal is designed to be at the same level as the top of the rails in the traversing arc. Whether this relationship is such as to give the pivot pin and the concentric surface, forming the top of the axle, the proper height above the trail ends is not definitely known. It is believed, however, that the proper relations will exist if the surface supporting the wheels, with new tires and grousers attached, is at the same level as the trail bearing surface.

Calculations demonstrate that an error or difference in height of one inch between the actual and proper height of the top surface of the axle would cause an inclination, from the horizontal, of the bearing surface of the bottom

carriage of about five mils. If this inclination is not corrected for, it will introduce errors varying from about two to five mils in quadrant elevation and up to about two mils in direction. The Board is of the opinion that these errors can be eliminated by adjusting the top surface of the pedestal to the proper height.

The Board reported that it believed that the use of a simplified non-compensating sight mount with 155-mm. guns emplaced on the ground with no prepared base would be unsatisfactory since positions sufficiently level would not be available, nor could they be made so without much labor. Furthermore the firing of a few rounds would disturb, to a large extent, whatever conditions of level did exist prior to firing and thereby introduce unacceptable errors in pointing.

The Board in its report concluded that, provided a considerable saving in cost could be effected thereby, the plan to use a simplified sight mount was practicable on carriages designated for employment on concrete emplacements. Such a simplified sight mount would eliminate entirely the cross-level features of existing mounts and probably would provide for some form of trunnion-mounted quadrant for the worm and sub-dial mechanism with match pointer linkage now used to lay the gun in elevation.

UNIVERSAL TOWING BAR. One universal towing bar developed by the Quartermaster Corps was received at Fort Monroe, Virginia, early in September, 1938, and issued to Battery C, 2d Coast Artillery, for possible emergency use during the exercises at Fort Bragg, North Carolina. As no opportunity presented itself for actual service test of the tow bar during the exercises a special test was conducted under the supervision of the Coast Artillery Board after the return of Battery C to Fort Monroe.

This tow-bar consists of a welded steel shaft with wood core, having a lunette at one end and a suitable mounting at the other end for attachment to either the bumper or front axle of the towed vehicle. Swivels are provided which permit free movement of the shaft either laterally or vertically at the point of attachment to the mounting. The shaft is slightly curved to insure proper clearances when attached to the front axle. The over-all length of the tow-bar is ninety-one inches. Its gross weight is 106 pounds.

Tests conducted by the Coast Artillery Board included installation of the tow-bar on various types of standard vehicles and a road march from Fort Monroe to Yorktown and return, during which the device was used to tow an antiaircraft gun prime mover with its 3-inch gun attached. The total weight of the entire towed load with which the bar was tested was thus in the neighborhood of 40,000 pounds. This approximates the heaviest towed load with which such a tow-bar, in the hands of Coast Artillery troops, would conceivably be employed.

The bar functioned satisfactorily throughout the tests. When towing all-wheel drive vehicles such as antiaircraft gun prime movers and Federal 2½-ton trucks, it was found advisable to install the bar on the front bumper rather than on the axle, to avoid the possibility of crushing the axle housing. On vehicles of other types, installation on the front axle was satisfactory. The width of the bumpers on the prime movers and Federal trucks necessitated the use of longer bolts than those furnished with the tow-bar mounting.

The road test indicated that the bar is sufficiently strong for all Coast Artillery purposes. The 40,000-pound load was towed up and down steep grades with no apparent difficulty. No tendency of the load to jack-knife was observed so long as the driver of the towed vehicle was careful to keep his truck directly in rear of the towing truck. This, however, was found to be a difficult matter at road speeds greater than approximately fifteen miles per hour, particularly when sharp curves were encountered. Under these conditions, if the brakes on the towed load are inoperative, a sudden application of brakes on the towing truck is almost certain to cause the towed load to jack-knife. When such a movement once starts it is very difficult and often impossible for the rear truck to straighten out in time to avoid a serious accident. This situation indicates the need for safety chains. Such chains should be removable easily as their use generally would be limited to the case where brakes on the towed load have been rendered unserviceable. One end of each chain should be equipped with a hook to facilitate attachment to any convenient part of the frame of the towed vehicle.

As a result of the test the Board concluded that the subject equipment with minor modifications should be a satisfactory towing device for emergency use with antiaircraft gun prime movers and other Quartermaster vehicles.

RADIO-CONTROLLED MARINE TARGETS. A 34-foot radio-controlled high-speed marine target, developed by the Air Corps Matériel Division at Wright Field and recently tested by the GHQ Air Force at Langley Field, will be made available to the Coast Artillery Board in January, 1939, for such tests as are necessary to determine its serviceability and seaworthiness under conditions to be met with in routine Coast Artillery seacoast target practices. The Air Corps target will be used for tracking missions only to determine limits of visibility from shore stations and from airplanes. The radio control features, when the target is running straight and variable courses, will be tested with the control transmitter operated from harbor boats and from an airplane.

The 28-foot Gar Wood radio-controlled high-speed marine target, developed by the Coast Artillery Board, has been reconditioned and new control mechanism has been installed. Present plans contemplate the use of this boat during February and March for tracking missions and as a target during the firing of 100 rounds of 155-mm. ammunition in connection with tests of the autogiro (see page 403, COAST ARTILLERY JOURNAL, September-October, 1938) for aerial position finding for seacoast artillery.

The Contributors

MAJOR E. M. BENITEZ, Coast Artillery Corps, winner of the 1938 prize essay contest, receives editorial mention on page 66.

CAPTAIN E. W. CHAMBERLAIN, Coast Artillery Corps, was born in Idaho and accepted appointment to the Military Academy from that state. Graduating with the Class of 1927, he was assigned to the Coast Artillery and has served with that arm for the past twelve years. He is a graduate of the Coast Artillery School Regular Course (1936) and Advanced Technical Course (1937). He is on duty as a member of the Coast Artillery Board, Fort Monroe.

ADMIRAL WILLIAM D. LEAHY, Chief of Naval Operations, has a long and distinguished career that began with his appointment as ensign upon graduation from the Naval Academy in 1897. In his first year of service he served aboard the *Oregon* on her famous trip from the Pacific to the Atlantic en route to the battle of Santiago de Cuba. Later he saw service in the Philippine Insurrection, the Boxer uprising, and was stationed at Panama during the construction of the canal. During the World War he was executive of the Battleship *Nevada*, commanded the *Princess Matoika*, and served as director of gunnery and engineering in the Navy Department. Admiral Leahy holds the Navy Cross, the Sampson Medal and numerous decorations and badges awarded by the United States and foreign governments. During the year preceding appointment as Chief of Naval Operations he commanded the Battle Force.

MAJOR THOMAS R. PHILLIPS, Coast Artillery Corps, is an instructor at the Command and General Staff School, whose previous articles in the JOURNAL have been widely discussed in *La Revue d'Infanterie*, *Militär Wochenblatt*, and other foreign magazines.

FLETCHER PRATT, writer of military and naval history, lives in New York. At the moment he is completing a work of several volumes on Napoleon the first of which is scheduled for spring publication by Doubleday, Doran & Co. "Bonaparte in Italy," which begins on page 35, is the story of the first Italian Campaign on which The JOURNAL has obtained serial rights.

CAPTAIN H. N. TOFTOY, Coast Artillery Corps, who was born in Illinois, graduated from the Military Academy with the Class of 1926. Originally appointed in the Air Service, he transferred to the Coast Artillery Corps in 1927. He is a graduate of the Coast Artillery School Regular Course (1936) and at the moment is on duty at the Submarine Mine Depot, Fort Monroe.

LIEUTENANT MILAN G. WEBER, Coast Artillery Corps, a native of Wisconsin, graduated from the U. S. Military Academy in 1931 and from the Coast Artillery School Regular Course in 1937. He is stationed at Fort Shafter where he is aide to General F. Q. C. Gardner who commands the Hawaiian Separate Coast Artillery Brigade.

HOWARD WILLIAMSON, the artist who did the pen-and-inks for "Bonaparte in Italy," was born in Little Rock, Arkansas. He avers that he acquired his first pair of shoes at the age of sixteen. He received his art training at the Chicago Art Institute after attending Castle Heights Military Academy and the University of Texas. He has also managed to get in six years of professional baseball: three years with Syracuse (International League); one year with the St. Louis Cardinals as a member of the championship 1928 team; and a year with Chattanooga (Southern League). He has been in commercial art for the past ten years.

MAJOR WILLIAM YALE, Military Intelligence Reserve, is Professor of History at the University of New Hampshire. During our participation in the World War he served as a special agent for the Department of State at Cairo and as a military observer with Allenby in Palestine. At the Paris Peace Conference he was a member of the section of the American staff that dealt with Arab affairs. Later in 1919 he went to Turkey to serve in the American Section of the International Mandates Commission.

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Book Reviews

AMERICA AND THE STRIFE OF EUROPE. By J. Fred Rippy. Chicago: University of Chicago Press, 1938. 264 Pages. $2.00.

THE CRISIS OF DEMOCRACY. By William E. Rappard. Chicago: University of Chicago Press, 1938. 288 Pages. $2.50.

These timely two books are bound together by a common, all-prevailing question: What is to be done about democracy?

Dr. Rippy, Professor of American History at the University of Chicago, traces the course, through one hundred and sixty years of national existence, of the conflicting ideals of pacifism and isolation on the one hand, and "Manifest Destiny" and crusading for democracy on the other. However mutually contradictory the two points of view may be, they are both of ancient lineage. The national faith in democratic processes as the superior form of government for this world found expression in Washington's First Inaugural, while the Farewell Address, crystallizing the isolation sentiment, set no precedent, but "merely confirmed an established policy."

During the Nineteenth Century, the discords of Europe redounded to America's advantage; they made possible, not only the Monroe Doctrine, but also America's expansion to the Pacific. In 1898 came the emergence of the United States as a world power and, for thirty-five years thereafter, the pressure politics in the Caribbean familiarly labeled "Dollar Diplomacy." Dr. Rippy believes that "the advances were made with Europe in mind at almost every step." And, he adds, referring to the contraction of empire that began with Hoover, "It is possible that the recessions were made also in part for a similar reason."

The last portion of the book deals with the part played by the United States in maintaining and restoring the peace of Europe, from the time when Theodore Roosevelt resurrected the Hague Court by submitting a controversy to that tribunal, through Bryan's arbitration enthusiasms and the oft-told tales of the war and post-war periods, down through the debates on the Neutrality Act and Franklin Roosevelt's quarantine proposals.

Dr. Rappard, Director of the Graduate Institute of International Studies at Geneva, traces the ups and downs of democracy in Europe from Versailles, which terminated the war to end war, up to the summer before Munich, which has just inaugurated the peace to end peace. He points out that in none of the victorious World War nations that had a tradition of democracy before 1914 has dictatorship been successful, and feels that the truly remarkable feature of the Wilsonian program was "not that it failed of fulfillment, but rather that it secured such an unusual measure of success."

Dr. Rappard notes that "democracy thrives on peace, and dictatorship on war," from which he concludes that "the crisis of democracy today is therefore to a large extent the crisis of world peace." At the same time, he feels that, catastrophic though war would be, the result would again be the downfall of autocracy.

He is fortunately free from the too-easy optimism characteristic of most encomia on democracy, and suggests that the defense of popular government requires a return to greater economic freedom, and a relief of the state from "many of the burdens under which it is staggering today and under which it cannot remain either responsive to the will of the people or respectful of their primary liberties." In other words, Dr. Rappard suggests that the effectiveness of government, to use the current phrase, proceeds in inverse ratio to the liberties of the individual.

Apart from the foregoing, the net result of the two volumes is considerable historical perspective without, however, any great deal of current enlightenment. (Dr. Rippy, it may be noted, remarks disconsolately in his preface, "I confess I know not what to advise.")

It may be suggested, however, that with the recent spectacle of erstwhile Mountains seeking out Mohammed fresh in our minds, the best practical solution is to keep one's powder dry. That means, in modern dress, plenty of planes, and plenty of AA guns. For with bombers able to cross the Atlantic, isolation is simply not a fact.

F. B. W.

* * *

THE RIFLE IN AMERICA. By Philip B. Sharpe. New York: William Morrow & Company, 1938. 639 Pages; over 400 Plates and Illustrations; Appendix; Index. $7.50.

This, in Hollywood parlance, is super-colossal: the shooter's dream book. No rifleman ever born, or rather no born rifleman but would cherish this book to his bosom, pore over its pages for hours at a time. In it can be found the history of any rifle ever used in America; together with its caliber, weight, diameter of bore, and general characteristics—not to mention a few interesting comments and anecdotes about its inventor and maker.

Actually, this book covers everything and everybody who ever had anything to do with the production of guns. For instance, it enumerates those firms who made rifles for the Government during the Civil War: how many and for how much. It includes the ballistics and specifications for cartridges— from the .219 Zipper to the 50/110 Winchester. Also are given the addresses of reliable firms selling present-day rifles, ammunitions, sights, targets,

accessories, cleaning supplies, binoculars, and what have you. From early developments of the trigger squeeze to the managing of a modern target range, nothing has been overlooked.

Should an historian need to know what rifle and ammunition was used during the World War by Turkey, Roumania, or even Peru, he has only to turn to Chapter 27 to discover not only the weapon's name but its weight, magazine capacity, and muzzle velocity as well. On the other hand, if one is curious about the Ethan Allen, Berdan, Bullard, Empire Breech-Loading, or Evans Butt-Loading rifles, Chapter 5 gives complete descriptions—with pictures to boot. In fact, this publication is the rifle in America and elsewhere—from muzzle loader to machine gun.

If you are at all fond of gunpowder, this book is an investment. And even if you are not, *The Rifle In America* is still a classic. E. D. C.

* * *

THE REAL CONFLICT BETWEEN CHINA AND JAPAN. By Dr. Harley F. MacNair. Chicago: University of Chicago Press, 1938. 209 Pages. $2.00.

An extensive literature, based upon the present Asiatic war, is already in the making. A factor vital to the ultimate outcome of that conflict, and one which is receiving much consideration, is the effect of the spiritual and mental outlook of the contenders upon the peace to be achieved. Dr. MacNair's book is therefore important for both its subject and its approach. Disagreeing with commonly held beliefs, his dissent is a valuable contribution to the contemporary history of the Far Eastern war.

It has been argued that common racial and cultural heritages of the Japanese and Chinese, together with the undoubted advantages resulting from a united economic front, will inevitably draw the two nations into cooperation when the war is over and forgotten. Dr. MacNair disputes this theory on its own premises, holding that those very elements constitute barriers rather than magnets. Quite apart from the hatreds kindled by the ruthlessness of the present struggle, the two peoples are and always have been antagonistic.

For centuries the Chinese have considered all foreigners as "barbarians"; none more so than the aggressive Nipponese, who have borrowed frequently and heavily from Chinese culture. That culture is, to the Chinese mind, the only civilization worthy of the name. As befits a nation whose enlightened power is above strife, diplomacy is superior to war, the recourse of backward people.

Japan, this author believes, is possessed of intense pride of race and an inferiority complex, and is wedded to a driving ambition to rule the Asiatic world. Aggressive where the Chinese compromise, the Japanese look upon force as the simplest and most effective way to impose their will. China could hardly be expected to accept such a philosophy, which means admission that Japanese civilization is superior to her own. Neither can China be

impressed by the principle of force. In short it is th author's conclusion that the nations neither understa nor respect each other, and are therefore incapable of co operation.

Dr. MacNair, professor of Far Eastern history at th University of Chicago, is the author of numerous work on the Orient. While his book cannot escape the charg of bias, it is interesting and illuminating. Its pungent an often humorous style recommends it, as does its length and wealth of historical reference. J. W. R.

* * *

TWO SOLDIERS: The Campaign Diaries of Thomas Key, CSA and Robert J. Campbell, USA. Edited wit an introduction, Notes, and Maps, by Wirt Armistea Cate. Chapel Hill: The University of North Caroli Press, 1938. 277 Pages; $2.50.

Captain Thomas J. Key was a capable, Christian leade of Confederate infantry. An experienced newspaper ma before the war, he could write clearly and interestingly i his diary of his own wartime experiences. He must hav been not only an intelligent observer and writer but an in telligent listener, for generals talked freely with him o their ideas and sometimes of their plans. He was also practical soldier in every sense of the word, offering mo than once in his diary a genteel criticism of some absurdi in the military system of which he was a part.

Captain Robert J. Campbell of Iowa was an officer in th Union Army. On January 1, 1864, after three years service, he began a diary. He was then a member McPherson's command near Vicksburg. He was not th observer and writer that Key was, noting mainly the dai weather and happenings in brief form. Campbell wa captured on July 22, 1864, in the Battle of Atlanta, an his diary with him.

Captain Key had been keeping a diary since Decembe 1863. Campbell's diary fell into his hands and he use the blank pages for his own notes over a period of seven months. Mr. Cate now gives us both diaries, and humo documents indeed they are. Key's diary especially give us close sidelights on the last year of the war.

This is the kind of war book that brings you close war's reality. Mr. Cate has done an able and thorou piece of editing and the University of North Caroli Press has published, as usual, an attractive and fine printed book. G. V.

* * *

AND SO TO WAR. By Rupert Herring. New Have Yale University Press, 1938. 172 pages; index; $2.0

In the partiality currently exhibited toward certain n tions at war and in the notes, near ultimatums, new paper editorials, condemnation of aggressors, fleet m neuvers and rearmament, Mr. Herring sees events th closely parallel those which drew us into the "futile wa in Europe.

He tries to show that we have "played Britain's ha . . . in every crisis, for over a hundred years." In 1918,

declares, we "gave the kind of teamwork which can't be bought, but we were bought—and sold."

"Furthermore," he adds, "we are in imminent danger of being noble again . . . when the bugles blow . . . we will not seek a single selfish end—and we won't achieve any either."

"The Sir Galahad philosophy of collective security," he says, "ignores too many factors of importance"—actual motives of *pure* nations, tragic humors of Versailles peace, dynamic quality of nations, ebb and flow of peoples.

Having pointed out the errors of the past, Mr. Herring suggests how to avoid repetition—namely, by preserving a consistent neutrality; by *cultivating honesty, deciding what we want,* and *deciding exactly how to get what we want.*

To cultivate honesty "America must get rid of the shibboleths of the crusaders" and "seek to capture that long perspective on our blundering race (through which) we will view (deeds done in Nanking and Addis Ababa) in the light of their antecedent provocations and measure them against the cyclorama of world history. . . .

"Our self righteousness must yield to sharp realism. America has also enjoyed vagrant days . . . broken treaties without a qualm . . . (therefore) our belaboring of the treaty breakers . . . is not conducive to honest thinking."

Deciding what we want brings us to three schools of American thought:

One that sees the present world as the object of our care.

One that seeks protection of our "national interests" abroad.

One that decries America's contemplated policing of the world and contends for the preservation of an American zone of sanity.

In *deciding how to get what we want,* two choices are open says the author. We can go into war, or, by consistent neutrality, we can stay out.

"The neutral government, no matter how the sympathies and convictions of its citizens may turn, must officially maintain that single-minded impartiality which makes no room for mortal judgments and imprecations. . . ."

The author would have the powers of the President checked at those points where decisions make for war: limiting his powers in the making of international agreements, dividing his powers among a larger body of advisers.

"Congress alone," he affirms, "can recall us to the sane path of neutrality, putting a stop to all talk of joint blockades of Japan, recalling our nationals from all war zones, stipulating that all travel and trade in war zones are at the risk of the traveler and trader, and stopping all trade with belligerents in the implements of war."

Mr. Herring's book sketches only roughly how to avoid entanglements. Yet the warning is there, and it provides a much needed alkali to neutralize fermenting crusaderism and imperialism. W. G. J.

Prize Essay Competition 1939

First Prize $200.00

Honorable Mention Prizes . 100.00

a. PERMISSIBLE COMPETITORS:

Any member of the Coast Artillery Association at date of submission of essay.

b. SUBJECT:

To be selected by the author. Appropriateness of subject for Coast Artillery readers is a point to be considered in awarding prize.

c. PRIZES:

(1) *Number:*

(*a*) One First Prize—$200.00. Not to be awarded if no essay submitted is outstanding.

(*b*) Not to exceed two Honorable Mention Prizes—$100.00 each.

(2) Awarded by Chief of Coast Artillery upon recommendation of Board of Officers appointed by him. Membership of Committee to be published only after awards for the year have been made.

(3) *Time limit.*

No essay received after September 30th will be awarded a prize.

(4) *Payments.*

Payments of prizes will be made immediately after awards are made. All essays submitted become the property of the COAST ARTILLERY JOURNAL. Any person receiving a prize for an essay will receive no other compensation. If any essay is published the author of which received no prize, such author will be paid at the usual rates.

d. HOW SUBMITTED:

Essays will be submitted to the Editor of the COAST ARTILLERY JOURNAL in a sealed envelope bearing the notation "Prize Essay Contest." The copy submitted will contain nothing to indicate its authorship, will be signed by a "nom de plume," and will be accompanied by a separate sealed envelope containing the nom de plume and also the name of the writer. This latter envelope will be delivered to the Chief of Coast Artillery when received and will be opened in the presence of the Editor of the COAST ARTILLERY JOURNAL after the relative merits of the essays have been determined.

e. FORM:

(1) Essays should be limited to approximately 8,000 words, but shorter articles will receive consideration.

(2) Three typewritten copies of each essay will be submitted on letter size paper (one original, two carbons) with double-spaced lines. At least one of any illustration will be a drawing, tracing, or photograph, not a blue print or brown print.

JUNGLE PATROL: The Story of The Philippine Constabulary. By Vic Hurley. New York: E. P. Dutton & Company, Inc., 1938. 399 Pages; 15 Plates; Bibliography and Index. $3.50.

Here is a book that will nauseate the pacifists. It brazenly eulogizes Americans at war. Of course, the story is not of the present but starts in the roaring 90's, when citizens of the United States still thought they could lick anybody in the world—for money, marbles, or chalk.

Those who do read this book will find themselves wading through a welter of steaming jungles and lusty killings, because this is the authentic story of careless youngsters in slouched campaign hats and blue shirts who went forth with song and levity on their lips to have a tilt with death; a sudden, messy sort of death beneath the swirling bolos of Juramentados, Moros, and the like.

These blustering young nephews of Uncle Sam fell in the massacre at Balangiga, the attack on Surigao, in ambush, and exciting single-hand combats. A dramatic decade of blood letting during which our Philippine Constabulary was established. This organization was forced into being by insurrection, kept alive by hard shooting, and fostered throughout by Army officers—some of whom are still in active service and about whom are recounted many droll and personal skits. These same skits are both the strength and weakness of Hurley's style of writing. His narrative jumps from island to island and from barrio to barrio so fast the reader hardly knows where he is or whether he is coming or going. But one thing is sure, the reader knows he has been in a fight—not once but many times.

Naturally, these leg-choppings, head-rollings, and general hellings-around are a little too robust for a Mr. Milquetoast; but if you like your Americans to fight against any kind of odds, for any kind of pay, for the mere fun of fighting or for love of the Stars and Stripes, then don't be afraid of the *Jungle Patrol*. E. D. C.

ALARMS AND EXCURSIONS, by Lieutenant General Sir Tom Bridges, KCB, KCMG, DSO, LL.D. London: Longmans, Green & Company, 1938. 361 Pages; Index. $4.20.

A four-star book by a three-star general. A reading of it is urged upon all ranks, even if they have to buy it themselves. The author is that rare British bird who can use a bit of American slang occasionally, naturally, and convincingly. Known to the title page as Lieutenant General Sir Tom Bridges, Knight Commander of the Bath, Knight Commander of the Order of St. Michael and St. George, Distinguished Service Order, and Doctor of Civil and Canon Law, the Australian digger called him "Tom"—and he liked it.

"A tale told at a cavalry trot," says Winston Churchill. "A gay story of grim events." One might add that it is a regular story by a regular soldier and a regular fellow, who joined the army and saw the world.

After reading the list of the author's battles, wounds,

honors, and citations, and his comments on statecraft and strategy, the question inevitably poses itself how he came to miss high command. For one thing, his accomplishments and personal qualities—mastery of languages, cosmopolitanism, wide acquaintance—marked him for diplomatic tasks. Then too, he had imagination and marked literary ability (his uncle was the Poet Laureate), qualities which would make any war office regard a soldier with suspicion.

J. M. S.

* * *

DER DEUTSCHE FLUGSPORT (German Aviation Sport). A picture book by Peter Supf. Foreword by Lieutenant General Christiansen. Berlin: Junker and Dünnhaupt, 1938. 96 pages; 130 photographs; $2.25.

* * *

DIE LUFTMÄCHTE DER WELT (The World's Air Power). A picture book by Captain Eichelbaum and Feuchter. Berlin: Junker and Dünnhaupt, 1939. 96 pages; 130 photographs; $2.25.

The rise of the German air force is admittedly one of the major military phenomena of the age. From a standing start the Reich air force has grown to such proportions that many commentators credit it with being the real power that dictated the terms of the Franco-British capitulation at Munich. If this is so, an examination of the system that built Europe's most potent air weapon should pay dividends. Today that system should be of especial interest to the United States since we now toy with the idea of giving preliminary air training to thousands of young men.

These two little books give a bird's-eye view of the German system. Although they are picture books and the captions are written in German, the pictures are significant enough in themselves to tell a story to those who do not command the German language.

Der deutsche Flugsport deals with the citizen-sportsman's interest in aviation. It shows us how German children in primary grades are given elementary instruction in model construction and the theory of flight. The pictures then carry through to glider construction and flight for those with a little more age on their shoulders. From gliders the transition to engine-powered aircraft is logical, and we see pictures of the activities of the many flying clubs now operating in the Reich. There are also photographs of balloons and allied sports.

Die Luftmächte der Welt is a camera study devoted to the late model aerial warcraft possessed by the world's major nations. Some pictures also deal with antiaircraft. The selection is comprehensive enough to give in an hour's time a fair picture of various types of planes favored by different nations. Americans will be interested to see late pictures of our 3-inch AA gun, the "flying fortress," the Barcuda, and a couple of squadrons of Marine Corps Curtiss Hawks.

In both books, the photography and reproduction is more than technically excellent.

Coast Artillery Orders

(November 1 to December 31, 1938)

Colonel A. G. Campbell, from 61st, Ft. Sheridan, to General Staff Corps, 8th Corps Area, Ft. Sam Houston.

Colonel F. P. Hardaway, from 2d, Ft. Monroe, to 51st.

Colonel R. M. Mitchell, from Org. Res., Richmond, to New York Port of Embarkation, Brooklyn.

Colonel E. B. Walker, from 51st, Ft. Monroe, to 2d.

Lieutenant Colonel W. M. Cravens, from Hawaii, to Org. Res., Schenectady.

Lieutenant Colonel J. C. Hutson, from Panama, to 7th, Ft. DuPont.

Major Delbert Ausmus, from Org. Res., Schenectady, to the Philippines, sailing New York, April 1.

Major H. R. Behrens, from Org. Res., Portland, Oregon, to Hawaii, sailing San Francisco, March 1.

Major K. C. Bonney, from 13th, Ft. Barrancas, to the Philippines, sailing New York, April 1.

Major M. E. Coumble, from the Philippines, to Org. Res., Portland, Oregon.

Major V. P. Foster, from 52d, Ft. Hancock, to the Philippines, sailing New York, April 1.

Major W. Q. Jeffords, Jr., from Hawaii, to 6th, Ft. Winfield Scott.

Major A. M. Lawrence, from 63d, Ft. MacArthur, to Hawaii, sailing San Francisco, March 1.

Major W. S. Phillips, promoted Lieutenant Colonel, November 1.

Major W. R. Stewart, promoted Lieutenant Colonel, November 1.

Major L. H. Thompson, from CCC duty, Van Nuys, Calif., to the Philippines, sailing San Francisco, February 28.

Major E. H. Underwood, promoted Lieutenant Colonel, December 1.

Captain G. B. Anderson, from Panama, to Quartermaster Corps. Previous orders revoked.

Captain P. B. Denson, from Hawaii, to 13th, Ft. Barrancas.

Captain J. W. Dwyer, from 62d, Ft. Totten, to the Philippines, sailing New York, April 1.

Captain J. M. England, from the Philippines, to 52d, Ft. Hancock.

Captain L. D. Flory, from Hawaii, to 62d, Ft. Totten.

Captain D. B. Gill, from the Philippines, to 61st, Ft. Sheridan.

Captain E. R. Guild, retired, November 30.

Captain A. R. Hartman, from the Philippines, to 62d, Ft. Totten.

Captain N. E. Hartman, promoted Major, November 1.

Captain D. B. Latimer, transferred to Finance Department, December 20.

Captain Leif Neprud, from 3d, Ft. MacArthur, to Quartermaster Corps, December 5.

Captain G. F. Nichols, from 7th, Ft. DuPont, to Panama, sailing New York, March 1.

Captain J. F. Simmons, from Hawaii, to 6th, Ft. Winfield Scott.

Captain L. K. Tarrant, from the Philippines, to 6th, Ft. Winfield Scott.

Captain H. T. Turnbull, from 61st, Ft. Sheridan, to Hawaii, sailing New York, February 7.

Captain N. D. Young, from 3d, Ft. Rosecrans, to Hawaii, sailing San Francisco, March 1.

First Lieutenant G. N. Adams, from 51st, Ft. Monroe, to Panama, sailing New York, March 1. Previous orders revoked.

First Lieutenant R. E. Frith, Jr., from the Philippines, to 2d, Ft. Monroe.

First Lieutenant H. R. Greenlee, Jr., from Panama, to 51st, Ft. Monroe.

First Lieutenant T. K. MacNair, from 3d, Ft. Monroe, to 4th C.A. Dist., Ft. McPherson. Previous orders revoked.

First Lieutenant Robert Morris, from Hawaii, to 51st, Ft. Monroe.

First Lieutenant W. R. Murrin, from Hawaii, to 2d, Ft. Monroe.

First Lieutenant W. H. Parr, from Panama, to 3d, Ft. Rosecrans.

First Lieutenant F. H. Shepardson, from Hawaii, to 2d, Ft. Monroe.

First Lieutenant W. F. Spurgin, from 2d, Ft. Monroe, to Panama, sailing New York, March 1.

First Lieutenant E. H. Walter, from Hawaii, to 2d, Ft. Monroe.

First Lieutenant K. J. Woodbury, from the Philippines, to 52d, Ft. Hancock.

Second Lieutenant G. R. Ames, from 52d, Ft. Monroe, to the Philippines, sailing New York, April 1.

Second Lieutenant Joseph Conigliaro, from Air Corps Primary Flying School, Randolph Field, to the Philippines, sailing San Francisco, February 28.

Second Lieutenant F. J. Gerlich, from 61st, Ft. Sheridan, to the Philippines, sailing New York, February 7.

Second Lieutenant J. M. Gulick, from 52d, Ft. Monroe, to the Philippines, sailing New York, April 1.

Second Lieutenant J. R. Holmes, from 69th, Ft. Crockett, to the Philippines, sailing San Francisco, February 28.

Second Lieutenant R. G. Ivey, from 14th, Ft. Worden, to the Philippines, sailing San Francisco, February 28.

Second Lieutenant Arthur Kramer, from Hawaii, to 2d, Ft. Monroe.

Second Lieutenant C. A. Langford, from 63d, Ft. MacArthur, to Hawaii, sailing San Francisco, March 1.

Second Lieutenant I. A. Peterson, from 6th, Ft. Winfield Scott, to Hawaii, sailing San Francisco, March 1.

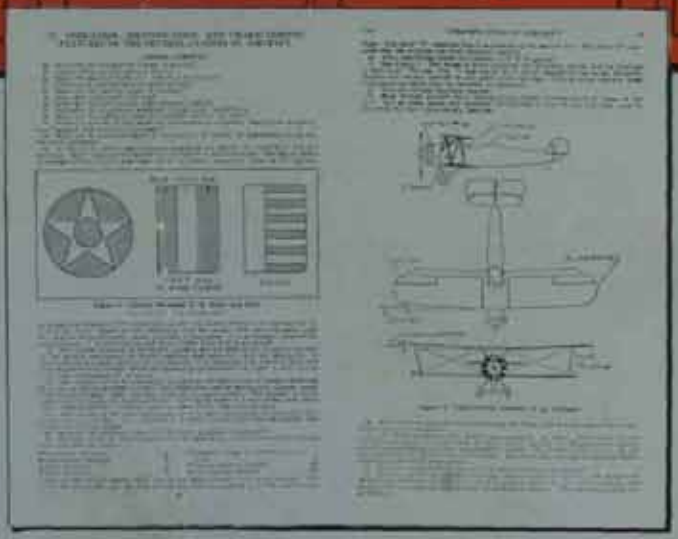
Second Lieutenant E. S. Rosenstock, from 6th, Ft. Winfield Scott, to the Philippines, sailing San Francisco, February 28.

Second Lieutenant Alan Seff, from 52d, Ft. Hancock, to Panama, sailing New York, March 1.

Second Lieutenant W. H. Vail, Jr., from 62d, Ft. Totten, to Hawaii, sailing New York, February 7.

Second Lieutenant K. G. Wickham, from 62d, Ft. Totten, to Hawaii, sailing New York, February 7.

GUNNERS' INSTRUCTION



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