

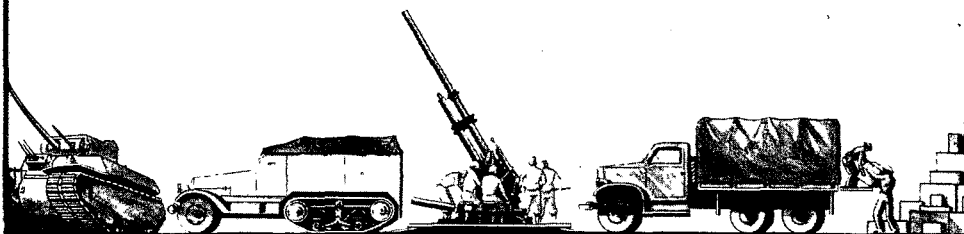
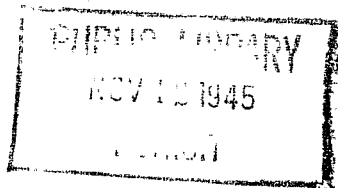
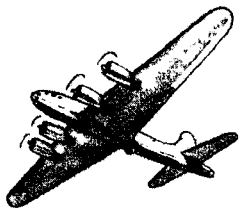
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MILITARY REVIEW

DECEMBER 1945 • VOLUME XXV • NUMBER 9



COMMAND AND GENERAL STAFF SCHOOL

FORT LEAVENWORTH, KANSAS

A MONTHLY REVIEW OF MILITARY LITERATURE

Major General R. W. Grow, commanding the 6th Armored Division in the European Theater of Operations, in a letter to the Editor of the MILITARY REVIEW made the following interesting statements which it is believed are well worth quoting:

It is hard to pick out from a mass of ideas that one acquires during a campaign the few outstanding items without simply repeating the lessons that have been taught in our schools for many years. If there is one thing that war has taught me, it is that our schools were good. I have never run across the situation that involved any violation of principles that we have been taught.

Our Division encountered almost every type of combat from the attack of a fortified position to pursuit as well as defensive operations. We even had withdrawal although never to such an extent that we employed delaying action. However, we did see delaying action employed by the Germans, who operated as if they had graduated from Leavenworth.

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Command Class Command and General Staff School

MAJOR GENERAL KARL TRUESDELL
Commandant, Command and General Staff School

IN compliance with Circular 239, War Department, Washington, D.C., 7 August 1945, the First Command Class came into being 1 October 1945. The object of this course is to afford common training for selected air, ground, and service officers for higher command, and for duty on the staffs of the higher echelons.

The curriculum of this course covers general staff duties in integrated task forces and in the larger air, ground, and service commands of the Army.

The Command Class is a separate entity and has no immediate connection with the General Staff Class courses. It emphasizes the major aspects of Command and of General Staff planning, and includes instruction in those factors which influence the conduct of war and with which higher commanders and staffs of our present and future military forces must deal.

While eventually the course should be one year, at present it extends over a period of twenty and one-half weeks and is organized and divided as follows:

General Review	5½ weeks
The War Department	1 week
Analytical Studies	1½ weeks
Regional Surveys	3 weeks
Studies of Recent Operations ...	3 weeks
Theater Planning	6 weeks
Report on Course	½ week

Let us now take up each of the above periods and consider its purpose and scope.

GENERAL REVIEW

The *General Review* period of five and one-half weeks is itself divided into five sub-periods: *Initial*, *Collateral*, *Higher Echelon*, *Practical*, and *Visits*. It will be noted that the sub-periods below add up to six weeks while the *General Review* period is scheduled for five and one-half weeks. The three or four days discrepancy is adjusted among the six sub-periods.

The *Initial* sub-period of one week enables each student to review all the current course material pertaining to the *General Staff* course from which he previously graduated, or should have graduated. The present class examined the material of the 25th *General Staff* Class, each student examining the material of the course from which he graduated. For example, if the student took the *Air Course* when he attended the *General Staff* Class, then he examined the *Air Course* Material of the 25th *General Staff* Class. In this way, each student, by analyzing the broad aspects, establishes conformity thereof to the *Theater* trends; and this enables him, later, to be in a position to conduct tutorial instruction therein. This is discussed later. In addition, he submits a brief report on the adequacy, correctness, and correlation of the course he has just examined with respect to field requirements and realities.

The *Collateral* sub-period of two weeks is organized into minimum balanced committee groups, following the tutorial method, in which each student is familiarized with the other two current *General Staff* Class courses which he did not pursue when a member of a prior *General Staff* Class. Subjects common to all courses are not repeated and, because of limitations of time, only the important portions of the related courses are considered. The committee chairman, a student, organizes the group and designates appropriate discussion leaders. If the class as a whole is not in balanced composition, specific assignments will be made or additional members will be assigned from the Faculty. This period is concluded with forums.

In the *Higher Echelons* sub-period of one week the balanced committee groups still continue, each extending the previous studies to include, objectively, the organization and general operation of highest air, ground, and

service headquarters in major theaters of operations.

During the *Practical* sub-period of one week, the students as individuals conduct two tutorials and participate as senior commanders in one Map Maneuver with the current General Staff Class. Of course, the time at which this portion of the course takes place depends on the General Staff Class Schedule.

THE WAR DEPARTMENT

The *War Department* period of one week consists of an explanatory presentation of the organization and duties of the War Department General Staff and of the Army Air Forces, Army Ground Forces, and Army Service Forces. This course is conducted by the Faculty and by representative speakers from the War Department. Practical instruction in War Department current problems, procedures, inter-office relations and forms is given during this period.

ANALYTICAL STUDIES

The *Analytical Studies* period of one and one-half weeks finds the class organized into small committees, each one being required to submit a succinct report with supporting references together with a concluding summary or constructive recommendation on an assigned subject. The subjects vary from time to time, the following being some currently covered:

- Policies of the United States
- National Policies of Nations
- Public Opinion and the Conduct of War
- Field Manual 100-10
- Field Manual 101-5
- Military Program of the United States

REGIONAL SURVEYS

The *Regional Survey* period lasts three weeks in which the committees, varying in size, study and analyze assigned countries or areas according to the major factors: geographic, population and social conditions, political, economic, and military. The breakdown of these factors is the same as in current MIS formulae. The presentation embraces one week.

STUDIES OF RECENT OPERATIONS

In the *Studies of Recent Operations*, which is of three weeks' duration, larger committees, but still well balanced, are used, each being assigned the study of a major operation. These are problems of research embracing a broad coverage in both Europe and the Western Pacific. Combined and joint operations only will be studied, none, however, prior to the invasion of Normandy. Fortunately adequate Theater material is available in the Command and General Staff School Archives.

THEATER PLANNING

The *Theater Planning* period extends for six weeks, and under general directives several parallel committees are organized to formulate major comprehensive war plans. The committees may be sub-divided or may work progressively. In this period the initiating Faculty directives are on the Joint or Combined Chiefs of Staff level. In its work the committee develops down to major task force, army, or equivalent planning level, the Naval aspects being furnished, in outline, by the Faculty. This phase also includes the war gaming of one selected series of plans.

REPORT ON COURSE

This period, *Report on Course*, comprises one week and utilizes the last days for specific constructive recommendations by the class, which will be utilized to improve the subsequent curriculum of the Command Course.

At present the qualifications for assignment as students to the Command Class are:

Age.—No student may be more than forty years of age.

Professional.—Officers must have superior qualifications and will be selected from those who have demonstrated by their performance their potential suitability for command and higher staff duty.

Minimum Grade.—Lieutenant colonel.

During the formative build-up of the course, the Commandant, Major General Karl Truesdell, a former Director of the pre-war Army War College as well as a graduate of the Naval War College, functioned as Acting Director of the Command Class. Major General William F. Dean, commander of the 44th Division, also a graduate of the former Army War College, was designated as Class Director. He is assisted by a Deputy for Air, Colonel Willard

B. Atwell, AC; Deputy for Ground, Colonel Leo B. Connor, Cav; and Deputy for Service, Lieutenant Colonel T. H. Magness, Jr., CWS.

It is hoped that the Command Class course will be a proving ground to test adequately the high caliber of its students and that most of them will be among our future generals as the present ones gradually fade out of the picture; but it is believed that in the meantime, as a result of this course, they will be better able to perform the top intermediary positions so important and, at the same time so hard to fill suitably.

Naval Postgraduate School

Digested at the Command and General Staff School from an article in *Army and Navy Register*.

THE Navy has long recognized the value of advanced technical education, with specialized training to meet specific naval needs. The Postgraduate School was established at the Naval Academy for this purpose in 1909. The school has continued since that time except for a brief period during World War I. It has grown from a small staff and a few students until the number of officers under graduate instruction now exceeds 600.

Officers for postgraduate training are selected from applicants of both the Regular Navy and the Naval Reserve who have shown particular aptitude in the various specialties. High standards of admission have been set for guidance in selection. A bachelor of science degree from a recognized educational institution is a prime requisite.

All technical curriculums are designed as three-year educational programs to fulfil specific service requirements. In many of

these curriculums the third year is spent in civilian educational institutions. The following engineering curriculums are established at the Postgraduate School: Aero-logical, aeronautical, electronics, ordnance, and naval (marine) engineering. Aeronautical engineering is subdivided so that officers with special qualifications and talents may specialize in power plants, structures, or armaments. Ordnance engineering is further divided into general ordnance, explosives, torpedoes, metallurgy, and fire control. Naval engineering is a broad course embracing both mechanical and electrical engineering. Recently curriculums have been established under naval engineering in chemical engineering and petroleum engineering.

In the interests of furthering the Navy's educational program, the Navy Department has granted authority to the Postgraduate School to participate in an exchange professorship program with selected colleges and universities.

"Up Tail and Away"

COLONEL S. P. MARLAND, JR., *General Staff Corps*
Assistant Chief of Staff, G-3, 43d Infantry Division

TO the casual student of tactics, the word *movement* has acquired a glib meaning. It has fallen through ill-considered usage into the vocabulary of catch-phrases that have lost their meaning in the text and classroom. No commander, be he squad leader or corps commander, can remotely conceive the full impact of the word until he actually moves his forces on the battlefield.

My observations will concern chiefly the processes which govern the commander's *decision to move*. Indeed there is little reason for hesitancy in arriving at the decision to move or maneuver, for the commander has paid lip service to this term throughout his military career. He has read books and listened to the wisdom of his elders, and he has played at war games; and there is no question in his mind as to whether or not he should move—or is there?

The battalion commander has advanced rapidly in his zone of action, driving in the enemy outposts in successive rolling hills. His leading company has managed the task well, and his orderly attack has been a credit to himself and his men. But now his leading elements strike the enemy defenses. These are Jap defenses, for those are the only ones I know. Machine guns, cunningly disposed; 150-mm mortars—crushing, frightening, seemingly invulnerable; artillery that the cub planes cannot find and that the flash seekers cannot plot—these realities are thrust upon the new commander as his telephone and 300 radios furnish multiplying testimony that his battalion is being bled.

At night the raiding parties find his command post and his ration dump. He does not sleep, for the infiltrators are working his local defenses; and a rainy dawn brings little hope of rations for his men today. His artillery liaison officer makes futile calls for this and that mission; the lines have

been cut and the radio is wet. "Perhaps a little later," the artilleryman says.

His weapons company commander in a power slit trench is shouting over a sound power phone, and he is barked into silence for giving his location away to the Japs that may be lurking in the nearby brush after their night raid. But his mortars need ammunition. The dozer roads are temporarily impassable to vehicles and there has been a mixup in native carriers, so there probably will be no ammunition until afternoon.

Patrols to be sent out to flush the enemy from the immediate vicinity; contact patrols to the regiment on the right; evacuation party of ten riflemen and thirty bearers for last night's wounded—where to draw the patrols? Yes—A Company from over on that hill—Japs with a light machine gun in the bamboo draw this side of A Company.

The 284 radio operators take a message in CW [continuous wave]. "What air support do you want tomorrow? Reply at once giving detailed target data." "How in hell do I know—never mind. Tell them, No air support required. Information insufficient at this time."

The company commander of B Company is severely wounded by sniper fire at a forward observation post. Can the surgeon get up there right off? The runner is red-eyed; his trip from the company had been an ordeal of terrain and mortar fire. His face shows that he almost hopes the medic cannot go, so that he will not have to guide him back.

And does the battalion commander lean back in his hole and say, "Now I shall maneuver"? Not unless he is a very unusual battalion commander—or squad leader or regimental commander or division commander. These circumstances were everyday reality in the war against Japan. The commanders in the war against Japan all learned before the battle that they had to maneuver to realize success in combat. But the *decision to maneuver*, when the chips are down,

is the greatest single act of leadership that the commander is obliged to perform in the course of an action. Faced with a hundred immediate problems, large and small, the battalion commander who can disengage his mind and his troops from the matters immediately at hand and plan and execute a tactical move is an extraordinary leader.

There are many factors which cause the commander to hesitate in committing himself to bold movement. Perhaps the greatest of these is the instinctive action that the inexperienced leader takes involuntarily. He gathers his strength about him when faced with danger; the herd instinct is strong on the battlefield, and it applies to battalions and regiments as well as to individuals. This instinct must be overcome before the commander can decide to maneuver.

Having taken this step, our battalion commander must face certain practical matters. His own reconnaissance shows that he may swing his companies wide to the right through a heavily wooded hill mass and after an estimated three-day march (5,000 yards) be in a position to engage the left of the enemy strongpoint which is his objective. But he knows that his communications will be uncertain in the rugged terrain he must cross. His supporting artillery will be of doubtful value with the limited observation obtainable, and may even have to be suspended entirely through lack of accurate information on the location of his troops.

Supplies for supporting the envelopment are a considerable problem. Will carriers be available? If so, how far can they support the movement efficiently before the food and water they require exceed the volume they can carry? What road-building equipment is available, and can a road be constructed over the route of advance? Will air-drops be available for food and ammunition, and if air-drop is to be the supply means, what provision will be made for evacuation? Certainly the litter bearers must eventually come from the rifle elements, and if casualties are heavy, what striking force will be left to execute the enveloping attack?

After surveying these obstacles, the commander must analyze the enemy's capabilities of intervention, and these may often be most discouraging. His command post had been raided the previous night and his wires cut. The enemy certainly was familiar with the details of his disposition. Continuous harassment of his supply columns and lines of communication must be expected. By displacing his force, he accepts the responsibility for a line of communications he cannot protect without dissipating his strength. And he knows that there is no greater source of bitterness among his troops than the knowledge that casualties are being ambushed along the trail to the rear.

Further, it is evident from the accuracy of the enemy artillery and mortar fire that the Jap's observation is good. The movement may be detected, and the enemy may turn to meet the flanking threat, thus dividing the battalion strength. Further, the enemy knows the trails and terrain conditions far better than his own troops. Trails and defiles are registered for interdiction by enemy artillery and mortars. To avoid trails would cause excessive delay.

Finally, the commander looks at his own troops. They are trained and ready. But the strength of his rifle companies averages eighty-five effectives for combat. Thus, the battalion can bring 255 men to bear against the enemy, supported by normal heavy weapons.

Now the term that fell so easily into the instructor's vocabulary rises as a mocking echo. Movement in the face of these obstacles is a terrible challenge. For all his training and indoctrination in the wisdom of movement, the commander deliberates, hesitating to make his *decision to move*. At this very crucial period in the course of an offensive action, experienced commanders distinguish themselves from their inexperienced contemporaries.

The decision must be made. Movement must be initiated and vigorously executed. Even in the face of superior enemy strength

and fire power, the surest and least costly course of action against the Jap is rapid, unhesitating maneuver of maximum available strength. The route must be one which, through its disadvantages, has been deemed by the enemy unworthy of defense in strength. The maneuvering troops will suffer from fatigue. Endless hills and swamps

the maneuvering force was his center regiment, the 169th Infantry.

The 43d Infantry Division landed as the Sixth Army's left division in the Lingayen Gulf beachhead. By S plus 3 the division had advanced inland an average of 15,000 yards against moderate resistance while the remainder of the Sixth Army sped south

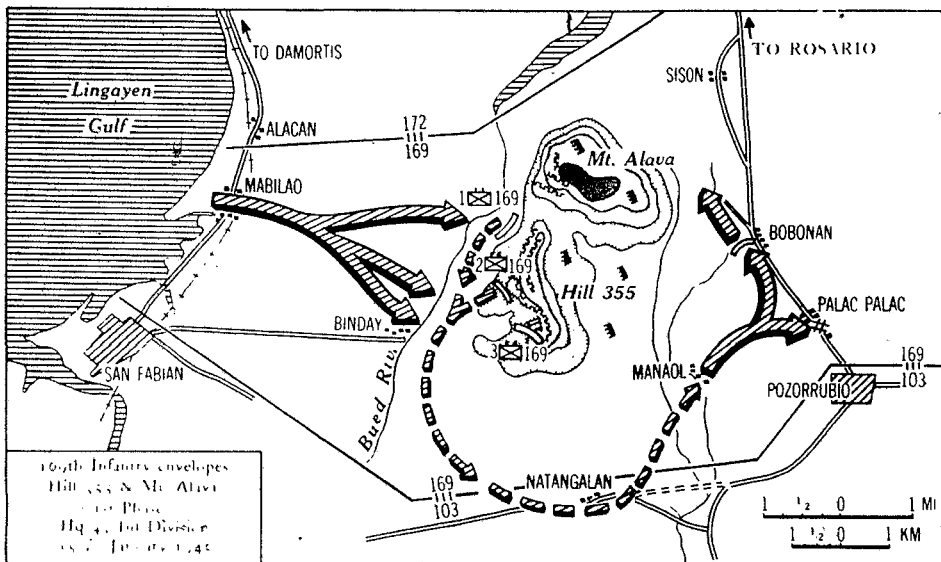


Figure 1.

and forest will combine their obstacles until it seems the objective will never be reached.

But it will be reached. And the infantry soldier soon learns the wisdom of enduring the crushing fatigue of the race over rugged terrain. He arrives exhausted at his objective, but he generally arrives. The calculated risk of bold maneuver, made by an intelligent commander, has rarely failed to disorganize the Jap, providing the movement is rapid—and long-range.

A graphic example of the calculated risk occurred in the early phases of the Luzon campaign. In this case the movement was conceived by the division commander, and

toward Manila virtually unopposed.

The Jap, respecting our armor, had elected to hold in the hills, abandoning the broad valleys and their excellent highways. The zone of action of the 43d Division included the rugged hill masses flanking the Lingayen Plain on the north. Ten miles from the beach, the arc of objectives before the division extended over a front of twenty-two miles.

By S plus 5 the 172d Infantry, the left regiment of the division, and the 158th Regimental Combat Team, attached, had driven ten miles into the hills surrounding Damortis and Rosario. The 103d Infantry,

the right regiment, had driven fifteen miles into the foothills flanking Pozorrubic. But the center regiment had crashed headlong into 20,000 square yards of hill-fortress only four miles from the beach, thus permitting the enemy a vicious salient deep in our beachhead (Figure 1). This enemy fortress

was a soft spot in their 5,000-yard front. Air, naval, and artillery support in great concentration failed to dislodge the enemy from his carefully concealed subterranean defenses. A night attack in battalion strength following intense artillery preparation gained a 100-yard advance. But the ground taken

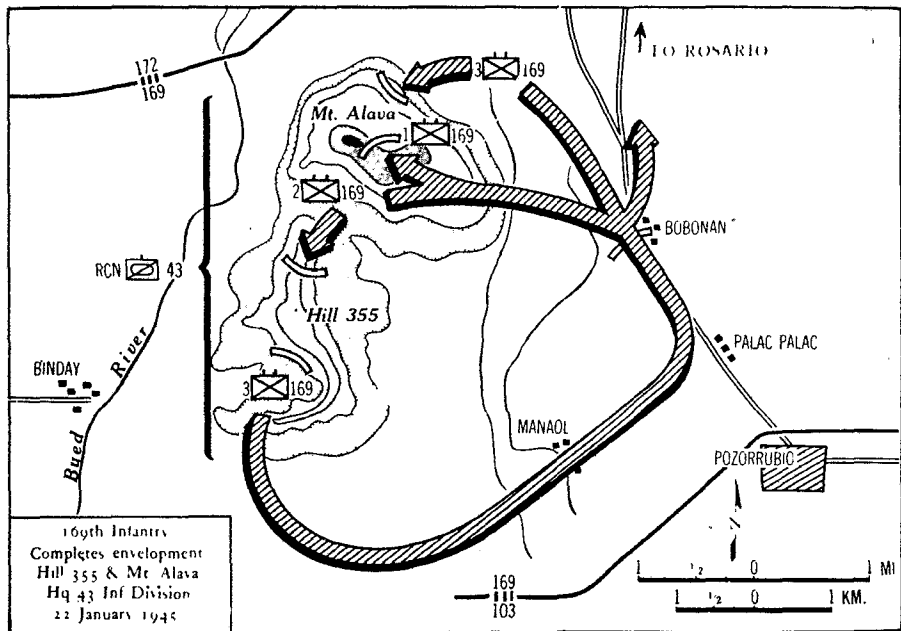


Figure 2.

was a complicated maze of caves, tunnels, and underground chambers disposed cunningly over major hill masses known as Mount Alava and Hill 355. It was manned by the 64th Japanese Infantry in full strength, supported by three battalions of artillery, including 150-mm rifles, 105-mm howitzers, and antitank weapons in strength.

The 169th Infantry engaged this fortress frontally in its drive to secure the initial beachhead. It was stopped completely with substantial losses. For three days and nights the regiment probed the hill masses seeking

was so untenable that it was relinquished with heavy casualties.

General Leonard F. Wing, commanding the 43d Division, examined the ground and consulted with the regimental commander and his battalion commanders. He studied routes for maneuver and directed local reconnaissance. That night the division commander evaluated his situation. His mission was to seize and hold the left of the army beachhead while the invasion forces completed their landing and drove south to Manila. Each night, increased infiltration raids

had cut his communication lines and threatened his rear installations as well as the entire beachhead. Enemy artillery from commanding heights outgunned him two to one. A gap of seven miles had developed between his left elements driving north and his center regiment on Hill 355. Only occasional patrols could be afforded to cover this gap. His right regiment had encountered tanks and armored infantry at Pozorrubio; if the tanks should break through the right regiment they would have a wide-open highway leading straight to the beaches with nothing but service elements to engage them. The cavalry reconnaissance troop was the division reserve.

Utter dependence was placed on civilian carriers to supply front-line battalions. Some days, a thousand carriers were available; other days, a hesitant hundred. Airdrops were not available.

And an enemy regiment sat in its fortress 5,000 yards from the shore!

That night the division commander called the regimental commander on the telephone. "OK, Bill, up tail and away, and the devil take the hindmost." That was the field order. That was the *decision to move*.

The division cavalry reconnaissance troop relieved the regiment in its position against Hill 355 and Mount Alava, with the mission of making a demonstration of strength, supported by maximum artillery, until further orders.

During the night the regiment disengaged itself, and marched south in column of battalions. It crossed the boundary into the sector of the right regiment, and turned east again. It marched until daylight, skirting the south slopes of Hill 355 while our artillery pounded incessantly to cover the movement. By dawn the leading elements had moved seven miles, and had severed the Pozorrubio—Rosario Highway in rear of Hill

355, which the enemy used as his main supply road (Figure 2).

A company of tanks was committed to assist the leading battalion as it continued its circuit of the enemy stronghold. The encirclement continued, while the reconnaissance troop, now assisted by a rifle platoon from the right regiment, contained Hill 355 and Mount Alava on the west.

For two days and two nights enemy artillery, disorganized by this unexpected development, made sporadic efforts to turn and engage the regiment concentrating at its rear. Enemy infantry elements by platoons and companies threw themselves desperately against our battalions as they lay across the Jap line of communication and withdrawal. Horse-drawn 105-mm howitzers caught on the highway at daybreak were no match for infantry supported medium tanks.

Four days after the maneuver was initiated, the regiment had completely isolated the hills. Mopping up required three more days. Counted Japs killed in action on Hill 355 and Mount Alava totaled 2,600. Jap artillery and antitank guns destroyed or overrun totaled eighty-four pieces. Our losses in the regiment for the period of the maneuver and mopping-up operations were small by comparison. Prior to initiation of the movement, we suffered almost as many casualties in the regiment without gaining a square yard.

The maneuver worked. Maneuver will continue to work if it is carefully planned and swiftly executed. The decision to maneuver is the hardest part. In the face of countless hazards, the commander must take a calculated risk. If that risk involves the use of a reconnaissance troop to contain a regiment—that is the chance he takes. But the battle will be much longer and much more costly if commanders permit themselves to calculate too long before they take the risk.

Battleship Tactics

CAPTAIN M. R. BROWNING, *United States Navy*

Instructor, Command and General Staff School

THE battleship is the heavyweight in any national stable of sea fighters. In the battleship are combined a heavier concentration of fire power and a greater capacity to absorb punishment than in any other type of combatant vessel. These two characteristics are fundamental factors which control, in large measure, battleship tactics.

The class name "battleship" is merely a contraction of the older term "line-of-battleship." The latter designation was originally applied to the heavily-gunned two- and three-decked sailing ships of the British Admiral Lord Nelson's era. They were massive and unwieldy vessels whose fitness to "lie in the line (of battle)" was measured by the number of heavy guns they carried and the thickness of their sides and bulwarks. A ship-of-the-line was, then as now, a ship which could give and take the maximum punishment. Those old sailing mastodons carried anywhere from seventy-four to upwards of a hundred guns and their tough oak and teak sides ran as high as four feet in thickness.

From these colorful ancestors have descended our modern battleships—the so-called superdreadnoughts. Throughout all the centuries of their evolution, their design has invariably been controlled and their tactics conditioned by the fact that their ultimate destiny is to lie in the line of battle and slug it out with enemy battleships.

Any combatant vessel may be looked upon as an organized strongpoint capable of movement anywhere on the surface of the sea. It is a concept which is readily grasped by the layman and which, if he will but keep it always before him, will serve to clarify immediately any difficulty he may experience in understanding the fundamental principles of naval tactics. In the case of the battleship, this organized strongpoint takes on all the power and resources of a major fortress, and the ship's ability to move swiftly and in any direction eman-

ates that fortress from the generic weakness of its kind; i.e., its limitation to static defense. In the form of the battleship, it can carry its striking power where it will and thus take the offensive at any instant it wishes. With this conception of the battleship in mind, it is readily perceived that, not only can a single such mobile fortress carry the action to the enemy, but also a number of them can concentrate and coordinate their attack at any desired point. Such a concentration is a "battleline" in the terminology of sea warfare, and such coordinated action by the floating fortresses which comprise the line, makes up what we call "battleline tactics."

In any surface fleet engagement, the battleline action—the slugfest of the heavyweights—constitutes the decisive phase of the battle. Sea warfare is essentially combat between ships as the opposing elements and not between men as individuals. Final victory is marked by the sinking of the enemy ships; the death of the men making up their crews is a secondary byproduct of such victory. As a corollary, the weapons employed in naval combat are primarily those most suitable for the destruction of ships, themselves, rather than of the human lives within them. For that purpose, the big gun, the torpedo, and the heavy-case bomb are the most efficient; small arms find no major field of usefulness such as they do in land warfare. Of these three principal weapons, the big gun is by far the most important—and the battleship is the epitome of concentrated heavy gun power.

The offensive armament of the modern battleship consists of her main battery. In addition, for her defense against air, submarine, and light force attack, she carries a strong secondary battery of dual-purpose guns of intermediate caliber, and automatic weapons. The main battery comprises, typically, nine to twelve fourteen-, fifteen-, or sixteen-inch rifles, mounted in three to

four turrets. Their maximum range is approximately twenty statute miles. Individual projectiles weigh from 1,400 to 2,400 pounds, depending upon the gun bore. The guns of the main battery of any one ship are of uniform size and are mounted in the armored turrets in twin, triple, or quadruple mounts. Each turret mount can be operated entirely independently of any other, but the guns within a turret cannot be trained (traversed) separately. The entire battery installation is designed primarily for salvo fire under centralized control, and this is normal in action at sea. Obviously, the battery fire can be divided to cover separate targets up to a maximum number equal to the number of turrets in the particular ship, but efficiency of control as well as total fire effect are at their peak when the entire battery is concentrated upon one target. This is due mainly to the fact that ships are highly maneuverable pinpoint targets upon which, at expectable battle ranges, single gun fire cannot register hits with sufficient rapidity. The cumulative fire effect of a battleship or a battleline is measured in "hits-per-gun-per-minute" (abbreviated "hpgpm"), and the major effort in their battle tactics is to establish that rate at the highest possible value at the earliest possible moment in the action. Salvo fire is employed to this end, and pattern size is a closely controlled factor in the fire to cover normal dispersion plus enemy evasive maneuver.

Since the maximum hpgpm is the objective of the battleship fire effort, it is obvious that, other things being equal, any disparity in the number of ships in opposing battlelines will tend to multiply itself as a factor of inequality between the two lines. In general terms, the potential fire effect of a battleship is dependent not only upon the capacity of her battery and its control, but also—and heavily—upon whether or not she is, herself, under effective fire and in what volume. When one or more ships of a line must divide their main battery fire to insure that effective fire is placed upon every opposing vessel, the total of hpgpm

falls off for the smaller force due to the reduced efficiency of divided fire. Also, because those enemy ships which are under the divided fire are less affected by it, the hpgpm factor for the enemy line is correspondingly increased. Long analysis and actual experience have led to the practically universal acceptance among naval tacticians of a thumb-rule in this regard, called the "N-squared law." This is merely a ratio of effectiveness which states that, other factors being equal, the relative strengths of opposing battlelines are as the squares of the number of ships which lie in them. Thus, five battleships opposing four similar vessels enjoy an advantage in ratio of twenty-five to sixteen; two ships against one possess a superiority of four to one.

The N-squared law lies at the root of battleline—and, hence, battleship—tactics. What these tactics are may be summarized briefly as:

First—bring the maximum possible number of ships into action at the *earliest* possible moment.

Second—bring all ships into action at the *same* moment.

Third—deploy the battleline—and keep it so deployed—so that the range is the same from every ship in our line to the nearest point (ship) in the enemy line.

Fourth—insure that every enemy ship within range is brought and kept under effective fire.

By adhering to these principles, the value of hpgpm is established and kept at a maximum from the outset. In addition, the danger of exposing a part of our line to a superior concentration from the enemy is minimized; at the same time, any weakness in his deployment is fully exploited.

Battleship tactics are thus fundamentally a matter of precision as to timing and maneuver. Meticulous accuracy as to close-order station keeping in the line, in simultaneous course changes, in opening fire, and in taking the correct target as assigned in

the fire distribution plan, are the essence of success. In their turn, these considerations have been mainly responsible for the effort by each naval power to maintain maximum homogeneity in its successive battleship designs. Of course, gun power and speed cannot be long stabilized without falling behind in the race; nevertheless, every nation persistently attempts to keep down the number of changes in these characteristics. The battleship is designed and built for close-order precise maneuver in the concentrated company of her sisters; the more closely similar she is to the rest of the line, the better she is fitted for that job.

The modern battleship represents a measurable portion of the fleet strength of any naval power. She costs much in both time and money; if lost, she is extremely difficult to replace. For this reason, she is not lightly risked. While nothing which moves on the sea can stand up to her, it is also true that a lucky torpedo, bomb, or mine hit, or damage from collision or grounding, may pull her out of the line for a long period. Accordingly, she is well guarded. Battleships never operate without anti-submarine screens. If within range of hostile aircraft, they are always given air cover. They are invariably at, or near, the center of any fleet disposition. It is true that in task forces built around aircraft carriers, and in certain cases when the fleet is escorting valuable convoys, the battleships are normally placed on the first, or inner, screening circle just outside the center. In these dispositions, the battleships are augmenting the anti-aircraft screen of the carriers—or train—in the center; which latter are the "softest" and the prime enemy targets. It is to be noted, lest the reader be confused by this, that, in these cases, the battleships (and cruisers) are themselves enjoying the extremely heavy air cover provided such forces and are inside the antisubmarine screen of the outlying destroyers and pickets. Further, their presence in these instances is dictated primarily by the imperative necessity for readi-

ness to meet enemy battleships, should they materialize, and to conduct shore bombardment; not by their contribution to the anti-aircraft fire power of the force.

It is well to repeat here that the battleship is predominantly intended to lie in the line and slug out the decision with heavy guns. In such a bout, she and her sisters must abide by certain principles or invite disaster. Within the framework of those principles, there are niceties of tactics which serve to further emphasize the importance of precision in their battle handling. The reader is familiar with the vital importance of the hpgpm factor in the battleline duel. Expressed another way, we may say that the maximum hpgpm means the maximum weight of metal and explosive into the enemy ships in the minimum time. But do we get these projectiles into the enemy ships; into their vitals, that is? We do if we penetrate; otherwise our hits can produce only superficial damage. All battleships are heavily armored against penetration of vital parts—ship- and fire-control stations, interior communication systems, magazines, and machinery spaces. These are enclosed in casements of face-hardened steel which will defeat all but certain shell hits. The weight of the shell, its striking velocity, angle of impact, and design of nose and case, are critical factors in the types of hits which can—or cannot—get through. Side and turret armor are generally so heavy that only relatively short-range hits by major-caliber shells will penetrate. Horizontal armor, on the other hand, is mainly menaced by the plunging type of hit—either very long-range gunfire or bombs. In the never-ending competition between armor and projectile, the type, location, and thicknesses of these protective casements have been varied in the successive battleship designs of each great power. Nation A's latest ships, for example, may have emphasized horizontal armor at the expense of some thickness in side armor. Obviously, such ships will better withstand gun hits at very long range, but will be penetrated more often at shorter ranges, than others

in which the heavier side armor has been retained. In other words, a conventional battleship, in a gun duel with one of A's latest ships, would do well to close the range through the outer brackets as rapidly as possible. Somewhere in the scope of effective fire for any two opposing ships, there will be range bands or brackets which are relatively advantageous for the one and unfavorable for the other. Likewise, for battlelines having any real degree of homogeneity among their respective ships, there will be similar favorable and unfavorable bands. Furthermore, these will vary as between different opposing battlelines. One of the most important tasks of any battleline commander, and of each battleship captain, is to know just where these good and bad range bands lie vis-a-vis each battleship in a hostile fleet. When action is joined, the battleline's tactics will include, as a major feature, closing or opening, as the case may be, the range as quickly as possible through disadvantageous bands and maintaining it within the limits of advantageous ones.

Another vitally important factor in battleship tactics concerns itself with the effect on gunfire of the strength and direction of the wind and sea. When it is realized that the ship is nothing more than a gun platform, it becomes apparent that the amount of motion of that platform has a direct bearing on the volume and accuracy of fire. The course and speed of a ship

with relation to the sea which is running, determines whether her roll and pitch are swift and jerky or relatively easy. The amplitude of roll and pitch can likewise be largely controlled by wise course selection. Spray—and even green water—when heading into the sea, may handicap gunfire. Smoke—both powder and stack—may do likewise, particularly if drifting down between us and the enemy. Closely associated with these considerations is the factor of light conditions at the scene of the battle. A line silhouetted against an early morning or evening sky is at a distinct disadvantage.

These are some of the more salient factors which must be weighed constantly in the handling of battleships. They condition the direction of approach and the time and course of deployment for an action, and they exercise a vital and continuous influence upon the entire engagement.

The enormous fire power and stamina of the battleship are not thrown haphazard into battle. The ships must be manipulated in precise and adroit pattern to take maximum advantage of complex and interlocking considerations which are different for each encounter and which vary from moment to moment during battle. It is not enough that our heavyweight should pack a knockout in each hand and be possessed of an iron jaw; he must, in addition, be a dexterous and shrewd ring general to win his bout.

An overall summary of figures covering transactions of the U.S. Government abroad from 1 July 1940 through 31 March 1945 reveals that \$828,000,000 had been spent for airbases, out of a total installation construction figure of \$1,776,000,000.

Foreign Economic Administration reported that through 31 March the Government had built 473 airports and airbases outside the country using a total of 940,000 acres of land.

(From "Aviation News")

An Armored Division Issues Orders

MAJOR GENERAL R. W. GROW

Commanding General, 6th Armored Division

EXACT time allowances and sequence for the preparation and issue of combat orders cannot be prescribed; however, certain definite principles govern. This has doubtless been the experience in all divisions. We did not analyze the problem much during active operations, but now in retrospect, we can draw some conclusions. The several factors considered involve these questions: How much time need an echelon allow for dissemination of orders all the way down? What forms do orders take? What methods of dissemination are practicable?

As a background, we are faced with a condition in combat that cannot be duplicated in school, namely, everyone knows the situation to a considerable although varying degree. He has "lived" the situation from the beginning. The most junior commander, if he be at all experienced, has consciously or subconsciously made plans for every contingency that he can foresee. He is either going to stay where he is and continue his present status or he is going to move in one direction or another. In the first case, he has already issued his orders and needs only to make current modifications. In the second case, he turns over in his mind the possibilities within his local horizon and goes over them with his subordinates as possible plans. To the battletwise commander, then, orders that involve action in the same area seldom come as a surprise. Little time is necessary for dissemination. They can and often do take the form of commands. This is true as high as division level.

The chief problem results when a change of locality and mission is involved. From a division point of view, this very frequently includes the added complication of a shift to another corps. If the division has not worked with the corps before, that means getting acquainted. In the supply field, it often means a new army and even a greater get-acquainted problem. The 6th Armored Division worked with two army groups, four armies, and five corps during the European

campaign. The shifts numbered many more, as we frequently returned to a former corps. We were under VIII Corps three times, XII Corps three times, etc. Fortunately, we were under Third Army the greater part of the time, so administrative matters were reasonably stabilized. There was a general uniformity at corps level in the method of issuing orders, a natural result of our splendid Fort Leavenworth teachings.

Corps orders reached division in every conceivable manner from the very formally worked out plan and conference with complete written orders in advance to the Corps Commander meeting the Division Commander in a front-line observation post and pointing out the new direction and mission on the map, necessitating radio orders on the spot. The former method was used in stabilized situations, the latter during an exploitation.

The same variation occurred within the division. Therefore, it is impracticable to lay down inflexible rules as to minimum time that must be allowed, as to form, or as to method of dissemination. We did, however, follow well-known principles, most of which have been taught in our service schools for years. Below are given some of the principles which we found most important, with reasons.

For the first time we became very security conscious. This resulted in the adoption of three policies that I believe are important when dealing with a powerful intelligent enemy. First, we never issued orders earlier than necessary for thorough dissemination. For example, division might know of an operation a week in advance. The higher commanders would be given their orders within twenty-four hours. The battalion commanders might get theirs two days in advance, depending on the preparations required. The company officers and men would get their orders just early enough to accomplish their mission effectively. Second: No unit commander was told more

than he needed to know. Just before an operation jumped off, this information was often amplified and passed on down to give everyone the picture. In only one case, prior to an exploitation, did I assemble the entire division and from a big chart give them the "big picture," including some things that would normally be considered secret. This was a case in which the enemy could take no advantage of the information and greatly increased the interest and morale of the troops. Third: The division rarely issued a complete written order before an operation jumped off. The order constituted a confirmation and a record. It could not fall into the hands of the enemy in time to benefit him. I know of no case in which this resulted in misunderstanding. The more experience the unit has, the more satisfactory this becomes. Frequently, last minute changes cropped up that would require a change in a written order. This did not preclude the issue of overlays and occasionally written fragments, usually labeled plans and containing a minimum of information of value to the enemy, never dates or hours.

The most satisfactory method of promulgation we found to be a conference where questions and coordination could be settled on the spot. Commanders called their subordinates back when there was plenty of time. Frequently, and always when an engagement is on, the commander went forward from one subordinate to another, or, if practicable, met two or three at a central observation post or command post. I consider it very important never to call commanders to the rear during a fight. In mounted combat, radio orders are frequent, and, of course, if available, the telephone is used probably more than any other means.

It is a good plan to have all oral orders repeated back, particularly in lower units.

When time is available, we found the following sequence to be most satisfactory. As time becomes critical, obvious short cuts must be resorted to, finally reduced to the simple command.

Start with a conference of senior commanders and staff of the issuing office. Give situation, orders of higher authority, decision, and tentative plan. Secure recommendations of senior commanders on the plan. Announce final plan. If the plan indicates further reconnaissance, direct a subsequent conference at which changes or further recommendations of senior commanders are considered. Issue order orally (dictated to staff and senior commanders). Each senior commander then follows the same process in his own unit, limiting his discussion to the essentials for his own unit (for security reasons). In the meantime, the senior staff drafts a complete formal order to be given distribution at the latest hour practicable and still serve its purpose as confirmation.

Even during active operations, I often found it practicable to gather the senior staff officers and commanders, fifteen to twenty officers, together in the evening for cocktails and dinner and a general "hashing over" of the situation. It may not appear important other than for good fellowship or morale. But it is positively amazing how valuable it was for clear understanding and cooperation, and, consequently, how important it was in the issue of orders. If officers understand each other, operations succeed. That is the only "must" principle in the issue of orders.

To expect defeat increases the possibility of being defeated; an army convinced of its superiority doubles its courage and its probabilities of achieving victory.

—Le Bon in *Guardia Nacional*, Nicaragua

Report on Engineer Operations in the Recapture of Fort Drum

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THE PROBLEM.—Fort Drum is essentially a strong, battleship-shaped reinforced concrete box, located on a reef about twenty-six miles southwest of Manila. Sides and top are thirty and eighteen feet thick respectively. Top edges are beveled, pre-

- a. Ventilators and stairwells.
- b. Casemates.
- c. Turrets.
- d. Sally ports.
- e. Top.
- f. Side walls.



Fort Drum at the mouth of Manila Bay.

cluding the use of scaling ladders. The concrete is pierced by two gun turrets, stairwells and ventilators on top, and by a two-gun casemate and a sally port on each side. The armament was rendered inoperative by U.S. forces prior to evacuation. It had been occupied by Japanese forces. The problem was how best to recapture the fort.

RECONNAISSANCE.—Reconnaissance included interviews with former members of U.S. garrisons and study of available "secret" plans and photographs. This reconnaissance generally determined that the weakest points were, in order of weakness:

THE DECISION.—The decision was made to attack, with naval gunfire, a six-inch casemate with a view to providing a possible means of access into the fort, and to make the principal attack with oil and flame and high explosive through the ventilators and stairwells.

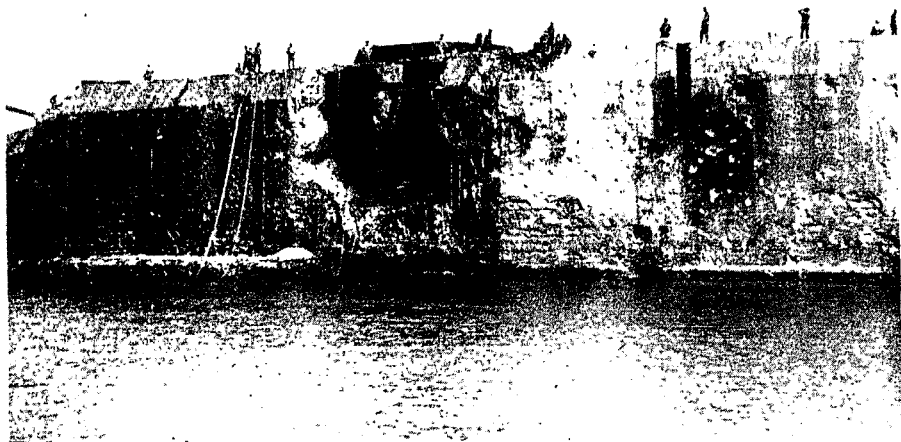
PREPARATIONS.—Preparations consisted of equipping one LSM with a drawbridge on the bridge of the vessel to facilitate rapid placement of the assault team on the top of the fort, and providing an LCM specially fitted out with two (NL) Navy cubes containing 2,200 gallons of gasoline and diesel

oil in a ratio of one to three, a POL 125 pounds per square inch pump, three hundred feet of firehose, and a special pipe nozzle. Ample satchel charges and sandbags were provided.

ORGANIZATION. The force provided by the 38th Infantry Division consisted of an infantry covering force, an engineer oil and

a. The LSM was placed alongside of the fort and the drawbridge was lowered to the top of the fort. The covering force landed without difficulty and was followed by the two engineer parties. Only ineffectual small-arms fire was received.

b. After a rapid reconnaissance of openings on the top of the fort, 600 pounds of TNT



Engineers of the 113th Engineer Battalion atop Fort Drum during the operation.

flame party of thirteen men, and an engineer demolition party of thirteen men. The last two parties were from the 113th Engineer Combat Battalion. The 592d Engineer Boat and Shore Regiment provided and manned the LCM. The Navy provided the LSM.

PRELIMINARY OPERATION.—On 12 April 1945 the Navy took the port casemate under six-inch gunfire. Fire was concentrated on the lower gun port, which is on a level with the upper interior deck of the fort. The gun was knocked out of battery and the casemate was penetrated in several places.

OPERATIONS.—The main assault was made on 13 April 1945. The operation proceeded as follows:

in thirty twenty-pound satchel charges were placed by the demolition party in the after starboard stairwell and tamped with sandbags. The charge was fuzed with primacord.

c. The oil and flame party selected the afterport stairwell as best adapted to their purpose. The LCM was signaled to come alongside and eight knotted manila-rope escape lines were lowered over the side of the fort. Then the hose was hauled up, the nozzle placed and sandbagged in position, and the ignition charge was placed near the nozzle. The ignition charge consisted of four WP [white phosphorus] grenades bound together and wrapped with primacord. The primacord from the ignition and demolition charges

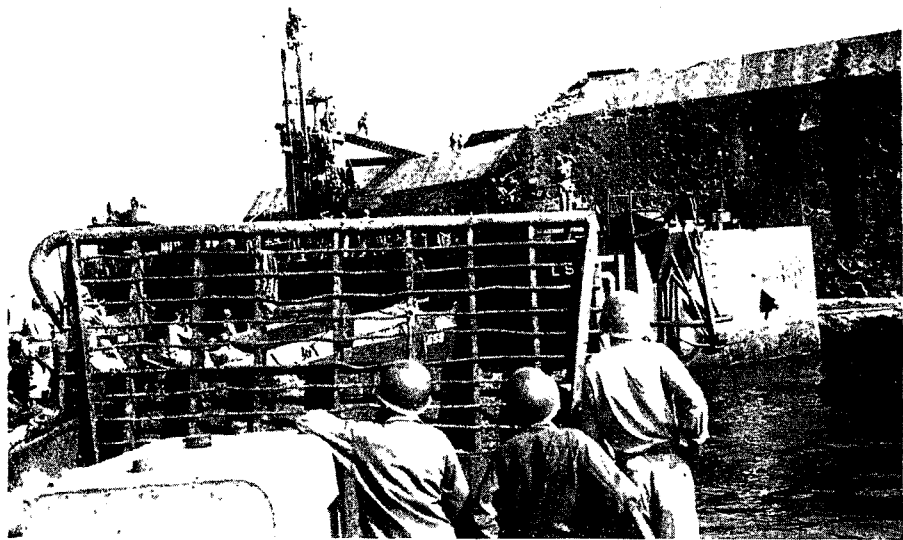
were united and a thirty-minute length of safety fuze was attached thereto.

d. The LCM started to pump oil into the fort, and on signal the time fuze was lighted. The covering force and engineers returned to the LSM.

c. After about 400 gallons of oil had been

grenades ignited the oil and gasoline mixture. The demolition charge threw concrete fragments and steel into the air. Three minor explosions about fifteen minutes apart began about thirty minutes later, as magazines within the fort exploded.

h. Reconnaissance was attempted after



Using a specially-built ramp from the bridge of an LCM to the top of the wall, infantrymen land at Fort Drum to cover engineers during operations.

pumped into the fort, the fire hose burst. This necessitated a return to the fort. The time fuze was cut and the damaged section of hose removed. As oil leakage around the port casemate was noticed, the nozzle was transferred to a ventilator opening more remote from the casemate. The pumping of oil was resumed, the time fuze relighted, and the fort again evacuated. The draw-bridge was raised and the LSM stood off a safe distance.

f. The LCM completed pumping the 2,200 gallons, of the gasoline and oil mixture into the fort, the hose was disconnected, and the LCM withdrew.

g. At the proper time the WP grenades and the demolition charge detonated. The

seventy-two hours, but the fort was too hot to be examined. Later reconnaissance found sixty dead within the fort. In general, death had been caused by concussion and by burning. Three had apparently committed harikari.

i. The assault force had only two men wounded by small-arms fire.

Consideration of this problem after the fact indicates that the oil and flame treatment alone might have been successful and that the naval bombardment and the demolition charge were unnecessary. Such a conclusion is not necessarily sound. Had the oil and flame treatment not been so successful it might have been necessary to force entrance and fight it out from deck to deck.

in darkness and with advantage to the defenders. The effects of the 600-pound demolition charge on the defenders can only be a matter of conjecture. In such an operation, every available opportunity must be taken to push the assault. The overall sturdiness of the fortification, as a whole, was remarkable. The turrets and casemates remained in position after internal explosions. The reinforced concrete sides and deck remained intact. One thin slab of concrete over the starboard casemate was displaced. The method employed was developed in the reduction of the mortar pit area, in the assault on Caballo Island. It became known as the "hot oil treatment."

CONCLUSIONS.—This successful operation illustrates:

a. The value of thorough reconnaissance and analysis of the problem leading to a decision to attack the most vulnerable points.

b. That initiative, original thinking, and a willingness to depart from accepted patterns of assault are required as the problems become more difficult.

c. The value of careful preparation.

d. The need and the value of an organization adapted to the task.

e. The effectiveness of the "hot oil treatment" method.

Navy Research Explodes Myth

From Army and Navy Register.

ONE of the great horror myths of tropical warfare—which grew because of the lack of information about the disease of filariasis—has now been exploded by Navy research.

Early in the war in the Pacific, filariasis was confused generally with the more fearful, disfiguring disease of elephantiasis. Harrowing predictions spread about its possible effects. It might produce epidemics. It might permanently disfigure and disable a man.

The fears have been proved for the most part a myth.

Filariasis will impair a man's health for as much as a week at a time; it produces an uncomfortable feeling and low spirits; and it may recur. But research has also established that it is not fatal. It cannot be caught from another person. It will not permanently impair health. It does not produce sterility. It offers no danger of epidemics to families in this country.

Compared with the large number of men in the service, the number who became infected with filariasis was small. Estimates include from 1,000 to 2,000 in the Navy and as many as 10,000 in the Marine Corps. Nearly all of the infections occurred in the Samoan Islands, with a small number in the Philippines and the Solomons.

The disease is transmitted by a mosquito and has not proved fatal to a Navy man in a single instance. No specific treatment for the disease has been found despite lengthy research, but the study has shown that patients regain health without special treatment or the use of any drugs.

A Staff Officer Looks at the Infantry

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THE general staff officer must thoroughly comprehend the concept that he is a staff officer of a force of combined arms if he is to perform his task properly. He must realize that his interests are no longer unilateral—infantry, artillery, armor—but that his mission is to assist in the coordination of the activities of all arms and services in such a manner as to exploit the power of combined arms. To do this, he must have an intimate knowledge of the tools with which he works. Consider for a moment a man, calling himself a carpenter, who has specialized in driving nails—a hammer expert. He is hired for a job, and on reporting, finds that this time he is not only to use a hammer but must cut and trim framing and siding. He knows nothing of the new tools; does not know a rip saw from a crosscut. He immediately finds himself in a difficult position. An officer, purporting to be a staff officer, ignorant of the arms and services, their capabilities and limitations, will sooner or later find himself in a similar position.

In this article I want to present the basic knowledge a staff officer must possess concerning one of the arms—the infantry—if he is to understand and properly employ it as a member of the team of combined arms. It must be emphasized, however, that this is a presentation of only the fundamentals relating to the infantry and that no staff officer worthy of the name will limit his background to the information imparted herein.

During the "Blitz," when the German Army rolled through the Lowlands and into France, many military experts believed that armor supported by air had become the basic combat element, and that infantry would be relegated to a secondary role. But as the war continued into the mountains of Italy, and into the jungles of the South Pacific, it was found that the capabilities of tanks were limited, that they could not always go

where desired. Further, that a well-trained and well-equipped infantry, under favorable conditions, was capable of protecting itself against armor. These developments reaffirmed the fact that in spite of modern motorization and mechanization, the infantry is still the basic element of the combat forces.

Perhaps the most important reason that the infantry is still the "queen of battle" is its high degree of mobility. The terrain may be difficult because of steep, rocky mountains, dense jungles, swamps, or ice and snow; or it may have been made difficult because of mine fields, gun emplacements, and pillboxes installed by the enemy. These tend to present themselves as insurmountable obstacles for mechanization. The infantry has the ability and the organization to adopt small inconspicuous formations, take full advantage of covered routes of approach by utilizing all minor accidents of the terrain, maneuver into a position where it can bring the maximum effect of its weapons to bear, and at the same time protect itself. One can readily understand, then, that if the infantry has this ability to maneuver over any kind of terrain and fight the enemy under any circumstance or condition, it would be given the mission of close combat, to close with the enemy and destroy him. The mobility of the infantry, in and of itself, is limited in an operation which requires rapid movements over considerable distance. However, as was demonstrated in the Sicilian campaign and after the breakthrough in France, the use of motor transportation for personnel and supplies has greatly increased the doughboy's mobility. Thus, we find that the infantry has met the terms of modern warfare by making the necessary revisions in its tactics and equipment.

Generally speaking, organization depends upon our weapons and the tactics we develop to utilize these weapons to their best advantage. Underlying this is the consideration of control. Paradoxical though it may

seem, we decentralize to gain control. This is on the premise that one man may not effectively control more than a small number of subordinates. In our organization we have violated this principle only in the case of the rifle squad where we have twelve men.

The reader will have little difficulty in understanding the organization of personnel and the distribution of weapons in the infantry if he remembers that there is a recurrence of three similar elements in each echelon. This recurrence is not accidental. It gives the commander one element for use in fixing the enemy, a second for use as a maneuvering element, and a third to be used initially as a reserve.

The addition of the fourth element, the supporting element, gives the commander the organic means of closely supporting the maneuver of his other three similar elements.

The organization is built upon the individual soldier, or the grouping of several individuals into a team. The rifle squad is a group of twelve soldiers, including a staff sergeant who is the squad leader, and a sergeant who is the assistant squad leader. This is a highly mobile unit in that it is not armed with anything heavier than the Browning automatic rifle (BAR). Its armament consists of eleven M1 rifles and one BAR. The squad is built on mobility and morale. As a unit, the squad has two functions: to defend itself as a group, and to go forward in the attack as a team.

The rifle platoon is just three rifle squads with a control headquarters. Because the platoon has no weapons other than those in the squads, its mobility is the same as the squad—a compact, maneuverable unit equipped to carry out the mission of close combat.

The rifle company is composed of three rifle platoons and, in addition, has a weapons platoon. Here we find for the first time crew-served weapons, which, while so necessary, do reduce the mobility of a unit. The weapons platoon has two sections: the light machine gun and the light 60-mm mortar. There are two of the light machine guns and three 60-mm mortars. This is the or-

ganic fire support of the company, giving the company commander the means by which he can closely support the action of his rifle platoons. The momentum of the attack must be maintained if we are to be successful, and this fire support is the means employed by the infantry to maintain the momentum. The firing positions of the machine guns and the mortars will usually be widely separated, due to their different characteristics. Therefore, they have been divided into sections for control. With the weapons platoon the company commander can closely support his rifle platoons. The weapons platoon is the one means the rifle company commander has to influence the action once his reserve is committed.

In the battalion there are three rifle companies and with these a heavy weapons company and also a headquarters company. The heavy weapons company has three platoons: two machine-gun platoons of four guns each, and one mortar platoon of six 81-mm mortars. This is the organic fire support of the rifle battalion. We term this the "heavy" weapons company although in fact the weapons are not too heavy for hand carry and displacement for considerable distance and at a reasonable speed. They are heavier and less mobile than the weapons of the rifle company, however. Here again, the three similar elements—the three rifle companies—the supporting element, and for the first time, additional support found in the headquarters company—the antitank platoon, the ammunition and pioneer (A & P) platoon, the communication platoon, and medical detachment. The antitank platoon has three 57-mm antitank guns and is identical with the platoons of the antitank company of the regiment. The A & P platoon, in addition to handling ammunition, can perform for the battalion some simple engineer jobs. There is also, from the regimental medical detachment, a battalion section which furnishes the aid station and aid men for the companies. Here, in the support units, is again the means that the battalion commander has to influence the action once his reserve is committed.

The infantry regiment is composed of three rifle battalions. Again the three similar elements and again the supporting elements, the antitank company and the cannon company.

The antitank company has three platoons of three 57-mm antitank guns each, and in addition a mine platoon. The cannon company has three platoons of two 105-mm howitzers M-3 each. These two units, while designed primarily for the general support of the regiment, due to their organization, lend themselves readily to attachment to the various battalions. It is feasible, quite often advisable, to attach one or more platoons of the antitank company to the battalion. The same applies to the cannon company. In Africa, and again in Sicily, battalions were often so widely separated that they were not mutually supporting and the attachment of these and other units became almost habitual, creating, in fact, battalion task forces or battalion combat teams. Even when these units are not attached, their organization permits direct support missions, under centralized control. When the battalions are close enough together to be mutually supporting, these units are the one means that the regimental commander has to influence the action, once his reserve has been committed. There is also the regimental headquarters company, which furnishes the communication platoon and the intelligence and reconnaissance (I & R) platoon. The I & R platoon is the reconnaissance agency of the regiment. It operates under the regimental S-2, manning the regimental observation post and performing other intelligence missions directed by the S-2. The service company, as the name implies, furnishes transportation for the various supplies of the regiment and the overhead personnel to do the paper work.

This completes the organization of the infantry. The infantry division, which is the next higher echelon, is an organization of combined arms. It consists mainly of three infantry regiments supported by four battalions of field artillery.

This brings us to the question, "How are

the tools of the infantry used to accomplish the mission?" It was mentioned earlier in this discussion that the successive groupments of personnel and weapons distribution was made to facilitate their employment by the application of fire, maneuver, and shock action.

Fire and movement are used together so that we can close with the enemy. In explaining what is meant by the phrase "fire and movement," we may use a short sentence accredited to one of our generals. It is: "Grab 'em by the nose and kick 'em in the pants."

To aid in remembering, picture the "fire" as the grabbing by the nose. Fire is used to "fix" or neutralize the enemy. It weakens him by inflicting casualties and neutralizes his elements by forcing them to take cover. By neutralizing or fixing the enemy we protect our own movements. Fire is used to protect all movements not masked by cover, fog, smoke, or other condition of reduced visibility. The "fire" inflicted on the enemy may be only rifle fire in the case of a squad, or in the case of a regiment it may include the mortars, machine guns, and the 105-mm howitzers as well as rifle fire. It depends on which element we are dealing with.

Now picture the movement as the "kicking 'em in the pants." Using only so much of his force as is necessary to "fix" the enemy, the combat leader, be he sergeant or lieutenant general, maneuvers the balance of his force to get it in an advantageous position. Through movement, fire effect is increased by decreasing the range and by placing elements in positions on the hostile flanks from which they can develop convergent fires. Movement also permits the attacking echelon to maneuver around the main fire of the enemy, and to close with him from the rear.

By a judicious combination of fire and movement, the infantry is able to advance to a point from which it can engage in its decisive use of shock action. During this phase, all the supporting fires which have aided in keeping the hostile resistance down

are lifted. As the members of the assaulting echelon approach the hostile positions, they are on their own. They must depend entirely on their use of the rifle, bayonet, and grenades to accomplish the final objective, that of destroying the enemy.

Because of the role of the infantry—close combat—its battle life presents major problems for general staff consideration.

There is a limit to how much a human body can stand. The physical and mental strain on a soldier in close combat is tiring, and continuous action will render a good soldier useless from the standpoint of combat efficiency. Good combat outfits have been converted into units of "gun-shy," nonaggressive, battle-weary individuals because of excessive employment in combat. This condition will seriously affect the success of a battle, since in order to be successful the battle must be characterized by an aggressive, offensive spirit and enthusiasm throughout. Care should be taken during planning to see that every opportunity is provided to give the infantryman a rest.

Because of his position on the battlefield, it is difficult to provide the infantryman with the services of supply which can be given to other arms relatively easily. Therefore, as staff officers we must insure that nothing is overlooked or left undone which would tend to give to the infantry better services of supply.

Experience has proved that the infantry usually has to pay a somewhat unproportionately higher cost in casualties than some of the other arms. Permit me to quote a few statistics on this item of losses. The infantry in World War I sustained eighty-eight percent of the losses in battle casualties. These figures are not obsolete. In the Tunisian campaign the losses of the infantry were eighty-five percent of the total battle casualties. In the other campaigns of this war, the infantry losses have far exceeded those of other ground forces. With the infantry sustaining this high percentage of losses, the turnover in personnel is tremendous. This will affect the combat efficiency of the units, because a new replacement can-

not function as efficiently as a soldier who has *trained* and *fought* with a unit and knows the individuals in the unit as teammates. It is a problem that deserves the careful consideration of staff officers as well as commanders. We have a special task in seeing that the infantry gets its fair share of the talent. Certainly if there is any place where leadership is important it is on the battlefield with those units actually in contact with the enemy. Yet how often we assign the smartest men and probably the best group of potential leaders to some clerical job in a headquarters, or as assistant to the chaplain.

All the factors I have mentioned will affect the morale of the infantryman. Therefore, when he is out of the line, nothing should be considered too good for him. He should be given the best there is to offer: food, clothing, shelter, rest, and entertainment. However, we must not confine our effort to merely providing physical comforts during the periods of rest. We must provide a good training program in order to give the many new replacements a chance to be accepted by their fellow teammates as efficient members of the fighting team.

As staff officers we must always keep in mind that the big problem of supply, evacuation, replacement, and morale will be with the infantry units.

To summarize, as staff officers we must remember the following basic facts concerning the infantry if we are to perform our job efficiently:

First, the role of the infantry is one of close combat and its mission is to close with the enemy and destroy him. Its battle life is characterized by four factors, evacuation, morale, supply, and losses, which present major problems for general staff consideration.

Second, the infantry is organized with a basic groupment of "three which pyramids itself throughout in order to give the commander a fixing force, a maneuvering force, and a third force to be used initially as a reserve." Additional groupings are made or-

ganic to provide immediate supporting fire power and to facilitate control.

Third, the infantry is highly mobile and contains tremendous fire power and shock action, and is well suited and equipped for its role of close combat.

Fourth, the infantry, or any other one arm of the service, cannot accomplish the mission of destroying the enemy alone. It takes the combination of all arms and serv-

ices performing their various roles to the maximum of their possibilities to win battles.

Lastly, in the infantry as in no other branch of the service, leadership is paramount. No matter how well organized and equipped a unit is, unless it is well led it will fail to accomplish its task of closing with and destroying the enemy. An infantry unit well organized, well equipped, well trained, and well led is unbeatable.

Prisoner Interrogation

G-2, 3d Infantry Division

THE basic pattern for employment of interrogator personnel never changed from the beginning of the Sicilian operation to the conclusion of hostilities in Germany; namely, one officer and two enlisted men at division cage and at each regimental cage. When possible, an extra officer and enlisted man were kept at division cage to assist in the greater amount of work there, and to serve as pool in case of transfer or casualty.

Given reasonably intelligent, well trained, and cooperative personnel, prisoner interrogation should present no difficulties. Nine times out of ten, the EEI are obvious, and consist of answers to the elementary questions: Enemy dispositions and strength, reserves, weapons, supply, intentions.

The following lessons may be noted:

a. Interrogators must visit their CP once or twice daily to confer with the G-2 (or S-2) and become completely familiar with the situation.

b. Interrogators must be completely equipped with maps and air photos, and must be able to use them.

c. Telephone communication from the CP to the cage is absolutely essential.

d. Interrogation by non-trained personnel at battalion level should be actively discouraged.

e. All troops must be periodically indoctrinated concerning handling of PW's.

Development of Airborne Forces

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IT was a fair, bright morning when the first Ju 52 of the Luftwaffe thrust its stubby nose southward from the Grecian mainland towards the little isle of Crete lying in the blue Mediterranean like a guardian of the waters and shores of the Aegean peninsula. A guardian she was, too, because to hold Greece and make use of her coastal waterways and to prevent enemy air operations over her lines of communication, the Reich required the possession of Crete. How to get it? The British fleet, always determined and tenacious even under the handicaps imposed upon it for maintaining British sea power in the Middle East, was controlling the waters in and around Crete and thus denying to the German the obvious means of entering and engaging the Empire ground forces on the island. Try as she might, the German Navy did not possess sufficient strength in the adjacent waters to permit her to transship the necessary troops across the relatively narrow lanes of sea which barred her from the beaches of Crete. In the air, however, the picture was quite different. Here, the closeness of air bases on the mainland presented a dominating position not only over her own areas and troop concentrations but also across to Crete and beyond. She could move with relative impunity therein and did, save for the few magnificent efforts on the part of the RAF to interfere from Alexandria, but both sides knew that these efforts were only a gesture and could never become a deciding factor in a fight for the possession of the island.

Thus the stage was set for the first large-scale airborne operation; the clumsy Ju 52's carried their heavy loads of men and weapons into the air in Greece, passed over the barrier imposed by the British fleet units on the surface below, and overwhelmed by *vertical attack* the courageous but badly outnumbered ground units below. It was the first major airborne assault in history and beyond a doubt came as a definite shock to

many of those who had scoffed at this new weapon. It was startling . . . It was thought-compelling . . . It was new . . . And most important of all, it was successful! Almost immediately the wheels began to turn in various circles, including our own U.S. Army, and although nebulous at that time and opposed by many authorities on war in positions both high and low, its place in modern warfare was assured. The German was to reap a sorry harvest from the seeds he had so powerfully sown on Crete.

Crete was our proving ground. From there, even though our enemies did the proving, came forth many of the doctrinal and tactical principles in use today. There was the first practical demonstration of the usability of the arm involved, and a pressing proof that here was no toy nor unit for demonstration to impress visiting dignitaries, but rather a full-fledged unit of war. Young? Yes. Growing? Certainly. But nonetheless a potential means of applying shock action to the enemy's weakest positions, and of exploiting the advantages of surprise against his defenses which has not been surpassed since some age-old warrior first perceived the greater desirability of being astride a horse when he engaged his foe, as compared to launching the same engagement on foot. It opened a new field of thought in the realm of transporting and delivering combat troops quickly and efficiently to the desired point, and the results of these thoughts have been apparent in every major campaign since the invasion of Sicily, culminating within the Reich itself during the crumbling last days of the once imperious Wehrmacht. The reasons? They have not always been clear and have required much testing and forming, but gradually their form has become more and more recognizable, until now, developed and proven in the most trustworthy crucible of all, combat, they are solid matter, tangible and discernible to all. Let us examine them—not in an historical light, for as history they have

already been covered by current publications, but in an effort to see *why* their development came as it did, and where it may be considered to be going. For this purpose, phases are apparent which distinguish each step in our advancement from the previous one, and these phases are inextricably bound in with campaigns. Each taught its lesson or justified the plan in operation; so by campaigns we should study them.

SICILY

When war actually came to the United States, and Pearl Harbor was a reality, we had in existence exactly three separate battalions of Parachute Infantry. Under the stimulus of great necessity, and spurred by the clear thinking of such officers as William C. Lee and W. M. Miley, later both Major Generals, a program was directed by the War Department to increase this strength manyfold. Production of parachutists at the Parachute School was intensified, and a series of activations of airborne units, including all arms and services and on a division level as well as lower, was commenced. Thus, by the early summer of 1942, we were able to dispatch to the United Kingdom a token force of Parachute Infantry which was earmarked to participate in the North African landings. At the same time, the Air Forces had been able to concentrate in England sufficient Troop Carrier aircraft to enable a lift of this unit to be made. These units trained intensively for several months in preparation for our first attempt at airborne warfare, and with no experience or teachings of the past to fall back upon, gradually began the evolution of a plan of operation and form of doctrine for their initial effort which was to provide a foundation for an expansion beyond their conception at that time. They saw that with the small force at their disposal they must depend first of all upon surprise, and consolidated their entire planning around this sound premise. Whether or not they met with unqualified success in this venture is unimportant; they gave us a pattern. We have made great use of it since that time.

As the North African campaign progressed, it was decided that the next step towards defeat of the Reich was to wrest from them their Mediterranean footholds, and that the first phase of this objective was the occupation of Sicily and the Italian peninsula. Airborne divisions were by this time available in the United States, and one, the 82d of later fame, commanded by Major General (now Lieutenant General) Mathew Ridgway, was landed in the theater and placed at the disposition of the Allied Commander. It was incorporated into the scheme of maneuver for the landings in Sicily, and in the word "incorporated" lies a story which greatly influenced the development of Airborne Forces from that time on. Remembering always that conditions were peculiar to the particular theater, and that insufficient airlift existed for a simultaneous commitment of the unit, plans were formulated to best utilize the possible capabilities of the force involved. With little precedent except the operations of the 2d Battalion of the 503d Parachute Infantry around Oran in November 1942, and the lessons of the Germans themselves, which were vague and unexplained at that time, the division was included in the initial operations. The landings of the initial drops were to be at night, and the task was to block reserves and seize critical terrain to assist the seaborne landings and the advance inland. The operation was culminated, but many lessons became immediately apparent, and others in the weeks and months of study which followed. All commanders agreed that the assistance given them by the airborne phase was invaluable, and that their efforts were of great help in all the landings and following actions. But certain lessons were obvious which might have increased the efficiency of the contribution, and which were to be followed later:

1. Coordination between the various branches engaged in any operation is vital. There can be no let-down in the effecting of all details between air, airborne, ground, and sea for any operation in which Airborne troops.

are to be included. Careful planning with scrupulous checking of plans of all concerned is indispensable. This has never since been forgotten.

2. The plan of navigation must be simple and carefully worked out. It is easy to be lost at night when flying low and over strange terrain, and only a fraction of a second in timing or a few degrees in direction will mean that every plan is obviated because the troops making the attack are not at their intended position for launching of the attack. This fact was carefully noted by the Troop Carrier Command, and has been the target of its most diligent efforts in every operation since, with gratifying results.

3. The plan of operation itself after reaching the drop zones and landing zones (D Z and L Z) must be simple, flexible, and familiar to every member of the command. This fact is self-explanatory.

4. The airborne portion of the plan cannot be subordinated to the remainder. Instead, equilateral consideration must be given to the effect each will have on the other, and whether or not a *postponement* of either will be feasible if necessary.

The results of Sicily were good. True, they were not exactly as anticipated, but the effort was definitely of great assistance, and the lessons learned were invaluable. The 82d Airborne Division came through with colors flying and with knowledge and experience under its belt that could have been learned in only one way—the way they learned it.

ITALY

Quickly behind Sicily came the Italian campaign. There was considerable participation by Airborne Forces, but owing to the circumstances of the action and terrain, it was chiefly in a ground role, and with little of airborne landings. One new tack was followed, however, which cast a new light upon possible uses of these troops, and that was the reinforcement *behind our own lines* of a beach landing effort which was undergoing an ordeal of fire from the enemy. The speed and facility with which an impressive quan-

tity of manpower and fire power could be committed to the relief of hard-pressed and weary fighting forces was quickly noted by planners throughout the Army, and a new paragraph was added in the unwritten manual of doctrine for *Airborne Operations*. Even this term was as yet uncoined, but following Sicily and Italy it was to become a familiar phrase.

The other engagement by an airborne force was the drop of approximately a battalion of parachutists well out from the beachhead, again at night, to wreck consternation in German minds and on their plans. It was almost a weapon of opportunity in this instance, and with little warning was able to perform its task of disrupting German operations for the required period, but the inevitable lesson was learned only by personal experience of the troops involved. They were dropped almost directly upon concentrated Wehrmacht forces, including tanks and self-propelled guns, and during their period of organization and initial combat, were to pay considerably in casualties for the knowledge gained. The lesson: Drop sufficiently clear of enemy forces capable of interfering with the assembly and initial action to permit the unit involved to gain its identity and fight as such. Rapid interception by an alert enemy of an airborne landing, be it parachute or glider, will almost certainly demoralize the attack to such an extent that it must turn into a fight for survival rather than a planned effort to complete its mission or missions. This, of course, is to be avoided.

NORMANDY

The demonstration of power applied by airborne means in the Mediterranean was impressive. And the weight of this impressiveness, plus the obviously desirable features of having such troops spearhead the deliberate assault upon a heavily defended and hostile shore, was a great factor in the concentration and employment of a considerable strength of airborne troops in the Normandy invasion. Operation "OVERLORD" had one great concern. That was to get sufficient

force ashore in France in order to prevent the German doing anything about it, before he (the German) fully appreciated that this was the long-awaited invasion. Needless to say, it was successful because of many factors, the least of which was certainly not the contribution made by somewhat more than three airborne divisions landed almost simultaneously behind enemy positions some several hours before H-hour.

DOCTRINE FORMULATED

Here the deliberate character of the attack lent to the situation an atmosphere of calm reasoning that imparted confidence to everyone engaged in mounting the landing, and especially to the airborne personnel was it obvious that every known precaution was being undertaken to insure not only success, but success at the least possible cost. The amount of airlift available was incredible to one who two years before had seen the poverty of the Troop Carrier Command in equipment and trained personnel. The same was true of our airborne strength, and even more valuable was the knowledge and experience that was being brought to the operation by trained, capable commanders who *knew* rather than conjectured what was to be done. This time there was a precedent, and full use was made of its lessons. Sicily and Italy had brought out the facts enumerated before, and in the meantime action had been taken by the War Department to formulate and crystalize the badly-needed doctrine for the guidance of all theaters in the employment of their Airborne-Troop Carrier forces. In the autumn of 1943 there had been convened a committee with directions to recommend a pertinent publication for such guidance, and after some time was spent by the foremost and most experienced Airborne officers in the United States (headed by Major General Leo Donovan, present G-3 of Army Ground Forces) there emerged War Department Training Circular Number 113. Published prior to Normandy, and before other major engagements which were to take place, this doctrine has been so carefully considered and so clearly thought to a finish

that to this day it is the almost complete guide for airborne operations everywhere and has been concurred in by every Airborne commander in all theaters. It is impossible to accord to the officers concerned too great a credit for their efforts, and especially for their remarkable results.

OPERATION OVERLORD

With this doctrine as a guide, bolstered by the personal knowledge of commanders from Sicily and Italy, the plan for operation "OVERLORD" came into being. Its theme was *mass*. One of the nine guiding principles of war as old as war itself, it was for the first time being applied to an airborne operation. Heretofore, *surprise* had been the catchword, and here also there was to be no lessening of this all-important element of an attack; now there was sufficient means available to deliver a *mass* of airborne forces simultaneously in sufficient force to overwhelm the known enemy troop dispositions, and the important fact was not lost upon the planners. Again, noting the lessons of the past, coordination of all branches was given the utmost of attention, and the plan as a whole was basically airborne. It bore not the faintest taint of being a superimposition upon the general scheme of "OVERLORD," but rather was an entity in itself, woven cleanly into the fabric that was the overall plan. It was given the personal attention of Supreme Headquarters, and a plan of postponement for the entire operation was evolved in the event that the airborne phase could not be launched. Actually, the weather was such on the originally planned D-day that the Troop Carrier could not have possibly flown its missions, and at the direction of Supreme Headquarters a twenty-four hour delay of the landings was effected in order that the benefits of airborne participation could be included. Consequently it proved well worth it. The story of Normandy is familiar through other mediums, but it is worthy of note that certain results not commonly known were obtained. The urgent need for permanently organized and constituted Pathfinder units was most apparent. These Pathfinder units,

consisting of airborne ground personnel and Troop Carrier personnel and aircraft, were designed and equipped to drop ahead of and guide the formations over designated drop and landing zones. A great need for some provision for reaching the planned D/Z's and L/Z's was thoroughly proven, and such an organization was quickly provided in the IX Troop Carrier Command. The other most urgent need, and one quickly perceived, was that of a standardized method of aerial resupply that would work. It was in Normandy that the real thinking concerning resupply began, and it was based upon this operation that a solution was finally produced.

USE OF AIRBORNE TROOPS

Airborne Forces possess a highly desirable type of combat soldier. He is normally a volunteer; a young, keenly trained, and physically hardened soldier who is capable of considerable endeavor in combat. This stamina and aggressiveness is recognized immediately by senior ground commanders as soon as they became the recipients of airborne units assigned or attached to their headquarters, and as a result airborne units are often held in a ground role long after the airborne phase has passed. This is of course necessary in many cases because of the exigencies of the situation, but it is also a great impediment in the reconditioning and preparing of airborne units for their proper role—airborne operations. It is accepted that the mere presence of an airborne division in a given theater will cause an enemy aware of its presence to look carefully to its anti-airborne defenses. Since the range of our transporting aircraft is such that landings may be made anywhere within a radius of action of almost a thousand miles, it becomes obvious that the manning of such defenses, and the resultant immobilization of the requisite personnel to so man them, causes the immobility and unavailability of a number of troops to the enemy which may be considerably larger than the *number of our airborne troops* themselves. This, then, may cause them to make a contribution to an overall campaign which is greater, by their poised readiness on de-

parture airfields, than if they were actually engaged in ground combat in the front lines where it is realized by an alert enemy that they cannot immediately be air-committed, thus permitting him to relax his defenses and use that defensive personnel for other missions. For this, and because airborne operations are heart and soul of an airborne unit, it is considered most desirable to relieve these specialized troops as quickly as the immediate ground situation will permit, and to re-equip, re-man, and generally rehabilitate them for future use in their inherent and most qualified role.

Thus went Normandy—thirty-odd days of consecutive combat that was unavoidable because of the circumstances in the beachhead, and then back to the United Kingdom to prepare for the actions that were to follow the breakout at St. Lo and the gallop across France to the stabilized positions on the edge of Germany and Belgium. The lessons were reviewed: Mass employment. Simplicity of plan. Reinforcement by ground units of heavier artillery, tanks, and tank destroyers (if the action is to be prolonged). And particularly the impression that airborne troops, parachute units especially, are highly immobile after reaching the ground in the forward area unless some provision is made for them to have transportation brought up from outside sources, or unless they themselves capture such transportation. There had been a total of two heavily reinforced U.S. airborne divisions in Normandy, and one British. There were to be more later.

FURTHER DEVELOPMENT

From Sicily came a great deal of the basic tactical knowledge which was to provide a guide for future employment of the smaller airborne units, and which was to give them a precedent of combat experience as a basis for their planning and orders. From Normandy, however, came not only a reiteration of these same tactical principles for smaller units, but also the background and realization that airborne operations on the scale which is currently possible require somewhat

more of planning, supervision, and coordination. Heretofore, cooperation had been the basis upon which arrangements between the services involved had been completed, but with several reinforced airborne divisions and a like number of Troop Carrier wings concerned in every drop, not to mention the supporting arms and weapons, air support and protection, etc., which were also required, it became apparent that further provision for the commitment of these units must be made. Due to the peculiar type of contribution which Airborne-Troop Carrier is able to make to a campaign, it had gradually come to be recognized that they must be used on a large scale only when the scope of that contribution is *vital* to the strategic campaign of the *theater as a whole*. In short, the best results could not be obtained by using them in place of other types of ground units of greater capabilities for a specific assignment, or to commit them haphazardly in indiscriminate actions around the various combat areas according to the local desires of temporary nature. Conversely to that, they are actually more valuable if held under the control of the highest headquarters operating in the theater, and employed by direction of the authority who likewise is charged with the responsibility for commitment of air, ground, and other forces separate and distinct from the airborne units. Generally speaking, because of the diversity of the types of units and arms involved, only the theater commander has such authority, and is thus the only one capable of intelligently directing that coordination among these arms be effected. Coordination it must be; for an operation of the scope of Normandy and of others to follow, cooperation alone was not sufficient to care for all the minutiae of detail which must of necessity be completed.

FIRST (ALLIED) AIRBORNE ARMY

From the realization of this necessity and because of the ever-increasing size of the Airborne-Troop Carrier contingent in the theater, it became self-evident that some organization must be activated to bring all the elements of such a force into one cohesive

whole rather than permit them to remain echelons of various diversified major units of unrelated characteristics: Hence, upon direction of the Supreme Commander and with War Department concurrence from the U.S. and British approval for her units, there was formed the First (Allied) Airborne Army. This headquarters, under command of Lieutenant General Lewis H. Brereton of the U.S. Army, was composed of three major elements. The American Airborne Forces were grouped together to form the XVIII Corps (Airborne), the British Airborne Forces under a similar command, the Troop Carrier units of three wings under IX Troop Carrier Command, and all assigned organically to the Airborne Army. The Army itself was assigned directly to Supreme Headquarters Allied Expeditionary Forces (SHAEF) and was thus under the control of the Theater Commander for all operations. The origination of such a unit fulfilled the requirements for the operational commitment of this type of arm, and yet left available to commanders of armies and army groups a channel through which they could obtain airborne assistance upon application to the overall directing control of the campaign being planned or already under way. It was a major step in the right direction, and needless to say, placed airborne operations on the level at which they were suited to function best. It set the stage for our largest airborne drop in history—Holland-Belgium in September of 1944.

HOLLAND

Although historical narrative in character, a brief survey of the situation and tactical considerations which led to the abortive attempt to turn the German right flank on the North German plain in the autumn of 1944 may help to clarify the effect it had upon our airborne forces and their development. There were definite indications that if the turning movement could be accomplished it might influence the entire course of the campaign in the European Theater and the decision was taken to employ the maximum available force of ground units and airborne power. The mission: to seize the crossings

of the many rivers and canals north of the line of departure of the British Second Army, and to protect the corridor for the advance of armor to and across the Neder Rijn at Arnhem. The entire operation involved extremely careful planning and coordination by the newly formed headquarters of the Airborne Army, and was under its supervision for the primary preparations and landings, reverting to British Second Army upon contact after landing.

The greatest departure from standardized and accepted prior procedures was that of making the major portion of the flight in daylight, and the landings and initial attacks the same. Heretofore, every airborne attack had been under cover of darkness and the protection it offered. This conferred many benefits in concealment, surprise, and other capacities, but it also had its disadvantages in that assembly and organization in the initial melee after landing is very difficult and fraught with chance. The situations that arise and the circumstances which may confront a local commander after reaching the ground during darkness are inconceivable to the average officer of other branches, and may in themselves offer an impediment which can become the determining factor in an otherwise marginal engagement between airborne forces and the enemy. At any rate, careful consideration revealed an excellent opportunity for the daylight operation, including the benefits of escorting fighter aircraft and immediate preliminary ground bombing and strafing by tactical air units as the drop time approached, so the decision was effected. It was one of the most noteworthy decisions in Airborne history as it revealed the tremendous advantages of operating by day under certain conditions. First, such an action could not even be considered unless an air superiority sufficient to prevent aerial interference by the enemy is at all times in existence. The dangers of aerial interception during the flight in to the drop zones cannot be too greatly stressed, and if it ever occurs it might result in disaster to all concerned. The standard type

transport aircraft which are employed to effect troop movements by air are unarmored and unarmed. Their gasoline tanks are completely unprotected, and their speed and the size of the formations involved render them most vulnerable to attack by fighter or interceptor type aircraft. Their only salvation is an overwhelming air superiority, and no airborne operation should even be considered when this superiority does not exist, unless emergency demands. When such daylight flights can be undertaken, however, they provide an advantage in navigational observations and the maintenance of formations which is considerable, and most authorities of both airborne and Troop Carrier forces now believe that the light of day offers the best opportunity for the most favorable conditions under which to launch such operations, always providing that the two limitations of weather and air superiority can be successfully met.

Without further consideration of the tactical success of this operation, certain observations can be stated which were the result of the efforts expended here.

First, it emphasized the already-learned maxim that the maximum force available should be employed in *mass* with care exercised that dissipation of these forces over too great a front will not destroy their unity or capabilities to fight as a unit. Piecemeal attack is not the most efficient employment of the arm, and this point was emphasized in Holland. In measuring the operation after its finish, the Division Commander of the 82d Airborne Division, Major General James M. Gavin, in his report summed the position as follows:

"The practice of assigning an airborne division frontage far in excess of that normally given a ground division must be weighed very carefully and full consideration given to the probable enemy ground reaction . . . The problem of mopping up the area within the perimeter of defense alone was sufficient to engage the great bulk of the division . . . Operation MARKET was a marginal performance as a *ground operation* from start to

finish and should not be taken as a yardstick for the capabilities of an airborne division in an average situation." There is little doubt that this sums up accurately one of our major lessons of the campaign.

Secondly, weather is such an influencing factor in the development of the action and the permissible build-up of the troops, supplies, and equipment which are to follow the initial drops, that it must be given meticulous scrutiny before launching the air movement, and likewise, arrangements must be such that postponement or interruption of the planned delivery of reinforcements, either men or matériel, can be met without detrimental effect on the operations as a whole. Because this factor of weather cannot be controlled, and yet the importance of establishing strength of personnel and supplies in the forward areas cannot be over-emphasized, certain prearranged methods of supply were developed which have improved the likelihood of success of an airborne attack. Heavy bombardment aircraft can transport considerably greater loads than the standard Troop Carrier type transports, and can deliver it simultaneously by the use of its bomb bays and toggle switch. Thus, accomplishing two desirable elements of the resupply plan at one time, it will always be found to be advantageous to have heavies, B-24's or 17's, fly in immediately behind the last personnel aircraft of the troop delivery serials and drop as large a quantity of basic types of resupply items as possible. This enables the airborne forces to establish immediately a dump of the vital classes of supplies, and relieves to some extent their previous dependence upon the favorability of the coming period of weather. For the same reason, it is likewise desirable to commit as great a percentage of the troops involved at the initial dropping hour as the airlift available within the theater will permit. Obviously, it would be desirable to have sufficient Troop Carrier planes to lift the entire echelon of ground personnel, while heavy types deliver enough supplies and equipment to sustain the unit until its relief by advancing ground troops. Since this cannot always be, planning should

be accomplished to place as little reliance as possible on reinforcements and future deliveries to the forward areas. In short, when the circumstances permit, planning should attempt to place the absolute maximum in men and matériel on the D/Z's and L/Z's at the time of the first drop and landing, governed only by the availability of aircraft which may be assigned to this mission. It will pay dividends in the end.

THE RHINE CROSSINGS—WESEL

In the use of Airborne Forces during the crossing of the Rhine late in the spring of 1945, we seemingly violated one of the principles which we had previously stated for the employment of this arm—namely, that it be used only in a vital role and on missions which could not be so well accomplished by other forces. It can be said that this was only seemingly, because the peculiar situation which existed, i.e., the imminent breakup of the German Army and for that matter the entire Reich, created a set of conditions which proved to be the exception to the general rule, and which indicated that airborne units, employed soundly and with a keen tactical sense of timing, could make a valuable contribution to the efforts of the army groups involved in the many crossings and in the ultimate destruction of the Wehrmacht. To do this, it was decided that for the greatest return in results from such an airborne operation, a daylight landing *following*, not preceding, the river crossings would most disrupt the German mind and defenses, and assist the unmolested advance of the main efforts after they had crossed the Rhine under their own impetus. In short, it was conceded that the ground forces already in positions along the west bank could force the crossings about as easily without airborne assistance as with it, but that after the crossing was accomplished and the inevitable slack occurred to permit reorganization for the push east and north, a major attack from the air designed to seize key terrain farther on to the east of the bridgehead and thus permit unimpeded advance of the attacking divisions of the armies coming across the river would speed the

campaign by days, and would prevent considerable casualties during that critical period.

Thus, the arm was employed in corps strength, not as the initial and spearheading unit of Normandy and Holland, but as a protecting element for the greater masses of troops to follow, and as a security echelon in the seizure of dominant terrain that might otherwise have been occupied and defended by the enemy for a considerable period of time. Success was beyond even the most optimistic expectations, and the XVIII Corps (Airborne) advanced far past its original objectives, and provided following armor a safe exit from the Rhine Valley into the very heartland of Germany proper. It was the last great attack of the European war, and it added to our knowledge of the conduct of airborne operations in certain new ways, but it served chiefly to emphasize those lessons of the months previous, and which have already been stated. Its new contribution was twofold at least:

First, it became apparent that certain arrangements should be made to have airborne units in about regimental combat team strength alerted and ready for short notice commitment anywhere along the route of the advancing ground units. Many corps commanders and army commanders have made the statement that had such airborne units, preferably parachute, been so available they would have been able to use them as a *weapon of opportunity* in various instances. Thus, although we still must continue to insist that the airborne unit is most properly controlled at the theater level, or at combined level of operational command of all branches, naval, air, and ground, we can provide a standard arrangement whereby ground units of corps and army level can secure airborne services at short notice much as they now obtain air support when and where it is needed to assist in the overcoming of obstacles to the general advance. The establishment of airborne forces as a weapon of opportunity should always be considered in future operations under which it is expected to use this arm.

Secondly, it pointed out that airborne forces can be used after the main attack is launched to supply a telling punch at a critical time and place, and can thereby be as effective as in their traditional spearhead role. The application of several thousand heavily armed and keenly trained shock troops to a situation which is in doubt will almost always be sufficient in its influence on the action underway to decide it favorably. Their contribution in this situation, always providing that sound planning and preparation precede their use, should never be a waste, but rather a decisive factor in the results obtained. It in no way denies the doctrine of the vital mission.

THE PACIFIC OPERATIONS

The numbers of airborne units involved in the Pacific fighting have not been so great as those in Europe, and the conditions which they have faced have been entirely different. But their experiences, the lessons which they have learned in the hard-fought engagements in that theater, will provide us with our basic foundation upon which to pattern the future. It will be well to note them with care.

In briefly surveying the major airborne operations which have taken place to date in the Pacific campaigns, it becomes evident that they have followed a standard pattern. They have lacked in size the operations launched in Europe, mainly because of the paucity of airfields and equipment available to them, but also because of the tremendous distances which have been involved. Remember, the Pacific is a much larger place than the other theaters in which we have noted airborne attacks, and in all this tremendous expanse of space the land mass is so small in comparison as to have a considerable effect upon any decision to use airborne troops. It becomes very difficult to commit this arm when your objective may well be at the extreme range of your aircraft, and especially so when the airfields and aircraft themselves cannot be found to provide the necessary lift for the flight. The net result, then, has been that most of the actual airborne landings

have been somewhat smaller than division level, and have until recently been almost characteristically parachutist.

Lae, in New Guinea, and Noemfoor Island, two of the first engagements in which parachutists were used, can both be observed in the same light, although considerable time separated the actions. In both, the landings were unopposed, and the facilities for the launching of the air lift was one strip only. In both, some time was required actually to effect the drops, but in both the element of surprise was present and gave a considerable success to the efforts. They were somewhat in the warm-up category so far as the airborne phase itself went, although obviously there was hard fighting at both times after the troops were aground, or the landings themselves would not have been ordered. Their chief difference from European actions was that they landed more or less unopposed and moved out to their fighting at later times. They followed the doctrine evolved previously, and, with modifications to fit their needs, they were little different in character. They were successful both tactically and from the viewpoint to savings in casualties.

It was actually after the landings commenced in the Philippines that the airborne units began to face situations to be solved by themselves alone, and involving objectives which they alone could reach with sufficient strength and surprise to provide success. There was the critical ground in the areas west of Manila which were overrun by airborne forces. There was the complete reduction of Corregidor by the attack of parachute infantry, and there was the memorable release of thousands of Allied prisoners of war by the operations of an airborne unit dropped near their enclosure. There were the landings in the north of Luzon to cut the Jap off from the Appari coast, and to complete his encirclement and fix him for the kill. There have been others, all vital, all deeply contributive to the objectives striven for, and none of which could have been done in any other way. They did not deviate from the accepted principles generally governing the use of

Airborne Forces, although at times they changed these principles slightly and adapted them to their own peculiar needs of the moment, and by so doing added to the store of knowledge which we possess on the subject. Their experience has been to point out that unless we are engaged in operations on a large land mass and against massive enemy forces, the type and pattern of airborne operations in an oceanic and insular theater may follow those already ended; that is the use of basically smaller units aimed at objectives which are difficult of access and which require immediate attention to prevent circumstances on those objectives changing beyond our desires or capabilities to intervene. They may possibly be based from only one or two airstrips, and needing large quantities of aircraft to provide the airlift, they may require curtailment because of their lack of that lift. They may follow this pattern. They may not. Whether or not it will be considered expeditious to converge and launch a great airborne force is beyond answering now, but of one thing we may be certain—the future of airborne operations and for Airborne Forces is just opening.

CONCLUSION

Great strides are being made in the development and production of larger and more capable aircraft, both powered and glider. Our knowledge of techniques and operational methods, envisioned in the past and proven in every conceivable type of action and climate, has broadened our viewpoint until facts are apparent that not so long ago were obscured by our shallowness of experience. We know now that we can launch and *sustain by aerial resupply alone*, major operations which can bring decisive pressure to bear against our enemies. We know that the future technological advances which may be expected will increase our capabilities and broaden our range of action to cover unthought-of distances, and we know that now, even as a thousand years ago, the commander who first dominates the situation by bringing to bear the greatest force will be the victor. If this force be brought to bear sufficiently early and

with a keen grasp of the situation, it is possible that we can prevent the opening of future conflicts which might well become uncontrollable if reliance were placed on the old and cumbersome methods of transportation.

The future is open. The means are at our hands. We can move corps and armies with their heavy weapons by air, and by air we can support them. All that remains is to determine to do so—and to do it!

Dutch Underground Activities

From Netherlands News.

WHEN the Allied airborne landings near Arnhem on 17 September 1944 ended in failure, innumerable British soldiers managed to hide in the woods north of the city after the bulk of the forces had been withdrawn across the Lower Rhine. The Dutch underground movement organized raiding parties on food distribution centers to supply the British soldiers. An intricate communications system was put into effect, and on moonless nights groups of as many as 150 men were assembled in one single camp, from where they were taken safely through the enemy lines.

One of the most amazing feats of the Netherlands underground movement was the establishment of a country-wide secret telephone network, linking up even small villages with the central posts. The work was carried out right under the noses of the Germans. The system was automatic and every one of the larger towns had its own central exchange. When the Germans blew up the bridges across the IJssel, thus cutting the secret telephone lines, underground workers strung a new line, rowing across in a small boat by night.

The men who maintained this secret telephone network also tapped German teleprinter lines, thus gaining valuable information which was passed on to the Allied forces by means of the underground telephone lines.

How to Inspect Automotive Shops

MAJOR THEODORE H. ERBE

OUR American armies move on wheels no more efficiently than automotive maintenance shops operate to keep those wheels rolling. A practical field guide for the inspection of automotive shops has long been needed to give the general and field officer, with command responsibility, a vivid impression of the general overall efficiency of his highly important automotive shops.

Field shops are not merely mobile civilian garages staffed with disciplined army personnel; their methods of operation, supply, and control are entirely different. Army shops require more elaborate supply planning, closer control, and considerable administrative overhead unmatched in civilian life. To take automotive shops as a matter-of-fact service is to overlook a tremendous aid to the efficiency of an entire command. To become acquainted with the maintenance men, to inspect them frequently, and to hear of their difficulties is to touch upon a subject which will lead the commander to a new understanding of his entire command.

Automotive shops, regardless of where and how they operate, are always composed of repair, supply, and administrative groups. Assuming the inspection of administrative portions of a shop is routine, we will consider only the technical portions of an organization. If weaknesses exist within an organization, they will generally be found in the service portions, and experience has shown that frequently these are best inspected first.

Inspectors should visit the shop office first and meet the shop officer. The inspector should explain his own mission, stating whether he is making a formal or informal inspection, what he is especially interested

in seeing, and what the shop officer may expect as a result of the inspection. Regardless of type, the inspection should be made "to determine the condition and economical use of personnel, equipment, and supplies and to insure that subordinate commanders are complying with established procedures and regulations." In brief, it should be a shrewd



Supply tent of a maintenance company in the South Pacific.
(U.S. Army Signal Corps photo.)

observation of the overall efficiency of the shop as an operating, producing unit.

Formalities of introductions and orientation completed, the inspector would profit by inspecting the supply elements of the automotive shop. The supply trucks, tents, or area should be wisely arranged and centrally located to the repair groups of the shop. The area should be free of accumulations of "junk" in the form of salvage items, crates, wrappings, and littered supplies.

The clerks on duty should be able to answer the following questions rapidly:

1. What are your stock levels for various parts and supplies?

2. How and when do you follow up parts the depot is unable to furnish?
3. Is any priority system established for the supply of critically needed items?
4. Based on local experience, how often do

in oil, bearings especially well preserved, and all parts reasonably clean and protected against weather.

While full compliance with such a procedure may be thought to be more ideal than practical in the field combat zone, a superior shop should equal the requirements given. Common sense, applied against local conditions and tactical operations, will permit the inspector to revise his opinion of the supply group to a point where the rating is an honest reflection of the efficiency shown.

The bulk of the service group should be inspected next. As in the case of the supply facilities, the area should be clean; but it should be remembered that in a theater of operations the service elements of any shop will be the most cluttered and apparently disorganized sections in the shop because of the nature of their business of patching and repairing.

In the service elements, the following are inspector items:

you revise stockage of spare parts to keep your stock in line with your own needs?

5. Is parts interchangeability posted on all items of your stock, especially on such items as bearings and oil seals?

6. Can you give any examples of how you improvised a solution to a supply problem in the last week or so?

The inspector by now will have a complete picture of how the shop receives the spare parts and supplies necessary for its operation. He should verify the information given him by the officers and men by checking the stock record for accuracy, minimum and maximum stock figures, and reordering methods. He should study the amount of paper work within the supply group and determine whether or not it is excessive. Finally, he should inspect the physical condition of the spare parts and supplies on hand. An excellent shop, regardless of local conditions, will have gaskets stored flat, oil seals soaked

1. Are service personnel making full use of improvisation?

2. Is too much "miscellaneous" work being done? (The manufacture of signs, gadgets, footlockers, or any other items which do not aid materially the mission of the organization.)

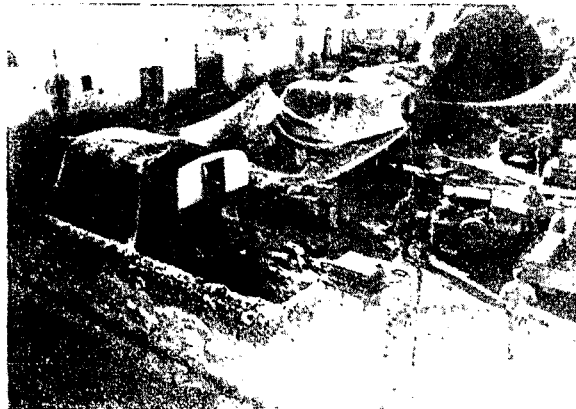
3. Are the tools and equipment clean, safe to operate, and complete with all attachments and fittings?

4. Does the volume of work (considering any stock shortages and local weather conditions) seem reasonable?

5. Is the flow of operating supplies (flux, solder, welding rod, and metal stock) sufficient to maintain all service work?

6. Are service-group personnel adequate, well trained and supervised?

When he has completed the supply and



Divisional maintenance shop during the Italian campaign.
(U.S. Army Signal Corps photo.)

service groups, the inspector will know of ways by which he can help his maintenance organization. He may have discovered critical shortages of operating supplies such as parts common or acid for the battery men. He will undoubtedly find that the production of the entire shop is being slowed by failure to receive certain critical spare parts such as radiator hose, universal joints, and electrical subassemblies. The wise inspector will

type done by the shop. A 2½-ton 6x6 truck is generally the best vehicle, and it should be met at the point where initial inspection is performed.

The initial inspection should be complete and thorough and performed by the most skilled mechanics in the shop. It should be conducted without rush; it cannot be considered satisfactory if slipshod, short-cutting methods are used. *All work necessary* must



Backing of business for heavy shop companies on the Alaska Highway.

use the weight of his rank to obtain these critical materials, for the more trucks his shop can repair, the more efficient his command becomes.

The inspector should now inspect the shop office in detail; thus, during the remainder of the tour, he can check actual operation against theory. There are many questions he may ask. What paper work in the shop office, entirely unnecessary in the field, is still being maintained? What work remains on the deadline? What drives have been made to increase shop capacity and production? What is the shop SOP on processing work from the moment it enters the shop until it leaves?

The inspector should next attach himself to an incoming item of work typical of the

be noted on technical-inspection sheets with such clarity that nothing is left to the mechanics' imagination. The failure of weak shops generally is found in their initial inspection systems. No inspector should continue until he has thoroughly investigated initial inspection.

When the work reaches the repair bay, the inspector should note that he has reached the core of the shop production problem. All supply and service groups, all inspection and processing of work up to this point, have simply been preliminaries to the main bout. It is the repair bay and all that happens within it that separates shops into categories labeled superior, excellent, good, and poor. In the combat zone, mechanics must work under tent flies and tarps or out in the open where

conditions exist under which automotive equipment was never meant to be repaired. But for the necessities of war, work never would be performed there. Under most combat conditions, sheer ingenuity of the mechanics alone will make shop production successful.

The background, appearance, and morale of the mechanics will indicate much about the shop. If they are reasonably neat, know how to address an inspecting officer, and demonstrate skill in their jobs, the shop is on the road to success. Inquire into the civilian background of the men. How long does it take them to do a representative job such as replacing an engine or transfer case? How do they get parts for a job? How long does it take? Do they get along with the section foremen? Do they like their work? How does their unit compare with other similar ones?

For the same reasons, tools are a good indication of the shop efficiency. Are the mechanics' individual tool sets complete, or are many of the socket-wrench extensions missing from the sets? Are the tools reasonably clean under the current field conditions? How quickly are lost tools replaced? Are the men well acquainted with the use of their tools? Do they make use of all special tools available for certain equipment? Are practical examples of locally made tools and devices on hand which indicate an interest on the part of the shop personnel in doing their job more quickly? On the other hand, have so many local inventions been built that it appears the shop is more interested in building novelties than in repairing vehicles?

While the more technically skilled officers will put on overalls and crawl under the vehicle, the inexperienced officer can quickly learn to check such items as oil seals, clutch-pedal travel, steering play, and fan-belt tension. If the inspector is qualified, he should spot-check the work done by the mechanics, as this is the sure gauge of performance.

Some questions which the inspector might ask the repairman follow:

1. What methods does your shop use to

train the using troops or persons in proper preventive maintenance?

2. Have you any difficulty in procuring technical publications pertaining to your specialty?

3. Of all parts used in repair, how many would you estimate are new parts and how many are old?

4. What percentage of your incoming work is evacuated to higher-echelon shops?

5. How do you keep track of all modification work orders required on your equipment?

More time should be spent in the repair areas than in any other portion of the shop. The wise inspector will soon develop the ability to question men intelligently concerning their work and will at once be able to test with acid the theoretical method of shop operation explained to him during his preliminary visits to the supply and service elements of the shop.

The inspection is not over when the vehicle is repaired, for the method of releasing the vehicle (especially its final inspection) must be thoroughly investigated. By final inspection, the shop assures itself that no faulty work is released to the using troops. In final inspection, the work of the mechanics is closely checked, equipment is tested, and the vehicle is given a road test whenever the work done makes this desirable. Items needing repair, whether or not listed on the work order, should be corrected before the vehicle is closed out. The following final inspection questions should be answered:

1. How is the inspection performed—by whom, when, and where?

2. When does a vehicle get a road test?

3. How many jobs are rejected by the inspectors and returned to the mechanics for additional work?

4. How is the vehicle returned to the using unit quickly and efficiently?

Before passing final inspection, the inspector should accompany the truck on the road test. He can observe the road route, noting whether it covers terrain that will really test

vehicles. The test driver should use all drives, gears, and ranges in the test and should investigate all unusual noises in drive units—engine, transmission, transfer case, and differentials. He should either pass or reject the vehicle upon his return.

Much of the value of the inspection is lost without a comprehensive critique. The shop officer, company commander, and shop foreman will usually be available to hear the inspector's reactions to what he has seen. The critique, for psychological reasons, is best begun with good points, followed with bad ones. Suggestions and corrective criticism should be clear and definite. The wise

inspector should mention what he intends to do to help the shop get needed supplies and equipment. If the inspector expects to return later, he can use the date of expected return as a deadline by which all corrections he has directed must be in effect; but, in any case, he should give a definite time by which corrections must be accomplished.

In the long run, automotive shops operate no better than the quality of their inspection and supervision. A commander who inspects his shop or shops frequently (regardless of field conditions) will find his motor equipment in an improved condition when he orders it to roll forward.

Amphibious Reconnaissance

Digested at the Command and General Staff School from an article by
Lieutenant Leo B. Shinn in *Marine Corps Gazette*.

ANTICIPATING the need in future operations for certain types of information which could be obtained from no other source, the Commanding General, Amphibious Corps, Pacific Fleet, in January 1943, activated the first amphibious reconnaissance company. This company trained in the United States approximately nine months.

After taking part in several operations which occurred in rather rapid succession, it was apparent that one company of this type encountered difficulty in preparing itself for the next operation. After careful study, therefore, the Marine Corps decided to organize an amphibious reconnaissance battalion. The tables of organization provided for a headquarters company and two reconnaissance companies. The organization of each reconnaissance company was augmented by a weapon platoon of one officer and nineteen men trained in the use of mortars, light machine guns, and other special weapons.

The general function of amphibious reconnaissance needs little discussion. Much intelligence information can be gained from aerial photos and other intelligence sources. There are certain types of information, however, which cannot be determined by any method other than by an actual physical reconnaissance. Depths of water just off beaches where landings are contemplated, nature of surf, reefs, and other hydrographic conditions, negotiability of vegetation, covered terrain for vehicles, presence of mines and other concealed obstacles—these are some examples.

In addition to positive information of the nature described above, important negative information is often secured which promotes economy of force and of matériel. In one instance, an amphibious reconnaissance patrol discovered that a certain atoll was undefended (all previous indications were that the atoll was defended), and the destruction of valuable buildings and matériel ashore by naval gunfire was avoided.

Operational Highlights of the 3d Infantry Division

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RECENT efforts of Observer Boards to compile worthwhile battle experience and battle lesson material have produced a world of invaluable data for use in future study and training. The 3d Infantry Division has contributed liberally in the way of lessons, experiences, methods, and observations, and will continue to do so as the preparation of final after-action reports progresses.

Whereas the usual report covering battle experiences, lessons, methods, and observations covers separate items in detail, it is thought that a brief examination of some of the outstanding features of the 3d Division's action, dealt with in more or less broad terms, will be of value in punctuating the most important ones.

THE WAR ROOM

In the early days of the Sicilian campaign it became evident that the division headquarters was unable to function properly during a fast-moving situation when employing the normal method of command and staff operation within individual sections. To put it briefly, more time was spent by a staff section, particularly the G-3 Section, in orienting the other sections as to its own activities, than in conducting the battle itself. It was decided, therefore, to streamline the headquarters by splitting the forward echelon into a tactical or forward group centered about a war or operations room, and into a rear establishment which could join the forward installation when the situation permitted but which would otherwise operate apart from the forward group. In the war room would be kept a G-3 situation map, a G-2 situation map, a G-4 situation map, an engineer road and bridge map, artillery firing capability charts, and the battle casualty and other pertinent administrative records of G-1. The division journal would be maintained in this room also. All operational calls entering the division headquarters were to be routed to the war room and monitored

therein. Likewise, all outgoing calls of the Commanding General, Chief of Staff, and section chiefs would be routed through the war room monitoring system for the purpose of record. In short, the war room, when operated under the system outlined above, would serve as a nerve center for the Division Commander. In it, he could find the latest information without the necessity of visiting the several staff sections, or requiring his Chief of Staff to consolidate the contributions of the several staff sections on a separate map.

Operating personnel for the war room under the supervision of the General Staff Secretary were obtained by drawing on the general and special staff sections for stenographers, clerks, and draftsmen, and by augmenting these men with several additional men placed on special duty from other units of the division. Two duty officers were to be present in the war room on a twenty-four hour basis. The liaison officers, the Chemical Officer, and several additional officers drafted from other divisional units provide the pool of duty officers. Liaison officers from Division Artillery and Division Engineers were to be available on call at the war room for immediate action on matters concerning their respective units.

So successful was the operation of the war room that in addition to providing a smoother, faster means of staff operation, it welded the staff together, and displayed in one small area all of the operational material with which the division was dealing. By breaking the forward echelon of the headquarters into an even smaller group, displacement problems were vastly simplified, and time consumed in displacement was reduced markedly.

After several months of increasingly successful operations in southern Italy, regiments adopted the war room procedure within their headquarters; and discovered that staff procedure and the maintenance of the unit journal were vastly simplified, as

was the problem of displacement. Infantry battalions, seeking to streamline their headquarters, adopted the use of the so-called "OP Group," which consisted, in brief, of the battalion commander, his S-2, S-3, heavy weapons company commander, one runner per company, artillery liaison, 81-mm mortar liaison, intelligence section, operations sergeant, one or two aid men, radio team, and wire party. This group, varying in size from thirty to fifty individuals, was able to move about freely and rapidly, and to maintain communication both by radio and wire while so doing.

OBJECTIVE TRAINING

Of certain importance in the division's accomplishments was its insistence upon receiving its next operational mission sufficiently in advance to enable available training time to be devoted to objective training. Needless to say, the division's four amphibious operations included ample objective training, but it is well to point out that among other important actions made successful by even brief periods of intensive objective training were the crossing of the Meurthe River in the Vosges, the crossing of the Fecht and Ill Rivers in the Colmar pocket, the breaching of the Siegfried Line, and the crossing of the Rhine River. The employment of this type of training served not only to familiarize troops with the nature of their assignments, but provided an inspiration for added effort in the direction of a specific task. It was found that the psychological build-up of offensive spirit was vastly improved when leaders could refer to specific types of actions that were to come, and for which the unit was then training.

LEADERS AND STAFFS

A long-standing characteristic of 3d Division leaders was their operation well forward. This became a tradition, and was possibly the greatest single factor for individual and combined success. Commanders were required during combat to lead their men from posts in at least the next lower echelon, and by example to provide the inspiration necessary to maintain the power of the advance. Com-

mencing with the battalion, it became a policy to include on the staff only combat experienced and trained personnel. The battalion S-3, for example, was ordinarily a veteran company commander who would probably graduate from his position as S-3 into that of battalion executive—ultimately battalion commander. Regimental staff officers were almost without exception veteran company commanders or battalion staff officers. This system definitely improved the caliber of staff performance in all echelons, and served to instill confidence in the staff of the units beneath them.

NIGHT OPERATIONS

Night operations coupled with bypassing tactics gained more ground for the division during periods of strenuous combat than daylight actions. During periods of prolonged and severe combat, the division applied a system of fighting two battalions within one regiment by day, while resting the third battalion which passed through the leading elements of the first two at dusk, and pressed the advance during the night. Rather than endeavor to take the enemy head-on, the night attack force purposely advanced on secondary routes, or infiltrated well to the enemy rear—invariably causing such consternation and confusion in his ranks by their presence that his resistance forward of the newly-won positions crumbled rapidly. Whereas night operations of this type were at one time considered unsound, highly impracticable, and extremely risky, this division and all of its subordinate elements favored them to daylight operations by virtue of the fact that enemy fire is less effective, interference by enemy reserves is virtually impossible, and the ascertaining of our direction and purpose by the enemy is likewise impossible. The best examples of this type of action are to be found during the Vosges campaign with the capture of the anchor position of Saales by the 7th Infantry, of Saulxures by the 30th Infantry, and of Mutzig and Molsheim by the 15th Infantry. After crossing the Rhine River, the advance through Munich was characterized by deep night-time thrusts

which isolated thousands of enemy troops, resulting in their capture together with their equipment and armament. In the final stages of the European war, the division employed motorized forces reinforced with armor and mechanized reconnaissance to proceed with all possible speed along both main and secondary routes by day and night. With the aid of a favorable moon, this type of advance at night was conducted with success equal to daytime advances.

It is the opinion of most of the leaders of the division that the successful conduct of night operations is due not to new and revolutionary techniques but to their frequent use with the resultant development of confidence in the men in their ability to operate at night. As it may be summed up now, the division conducted night operations in precisely the same fashion as any daylight operation, except that distances and intervals were sharply reduced, and column formation rather than the more open daylight formations were recommended. The bypassing technique is a combination of prior study of routes which will avoid the enemy, or of decision on the ground during the advance itself.

ARTIFICIAL MOONLIGHT

Worth mentioning at this point is the value of "artificial moonlight" produced by attached or supporting searchlights. This division first used searchlights during the Colmar operation, and thereafter habitually employed one platoon of six lights. Two lights were normally placed in direct support of one regimental combat team, but wire tie-in enabled the massing of more or all lights when desirable. The advantages of the lights can be summed up with the statement that all variety of night activity was simplified and facilitated by the improved visibility.

SEIZE THE BRIDGES

Having conducted seven major river crossings in four months, the division came to realize the importance of the seizure of intact bridges, overpasses, etc. To the enemy's destruction of bridges can be attributed more loss of time than the action of his weapons

and troops. All orders during the final three months of the action emphasized the necessity for the seizing and securing of bridges, even to the point of conducting special detached operations in the rear of the enemy's lines, or to the flank, to obtain the necessary results. Perhaps the best example of such an operation was the spectacular train movement of a special volunteer force of three officers and forty men behind the enemy's lines via the railroad between Bamberg, Germany, and Erlangen, Germany, with a view to seizing an intact bridge in the division's zone of advance over the Regnitz River, thereby setting the stage for the assault on Munich. This operation was unsuccessful due to demolition of the railroad, but serves to punctuate the importance placed on seizure of bridges and the ends to which the Division Commander would go to seize and secure a vital bridge. Indeed, the last few weeks of the European action may be described as a race for bridges, rather than a well-defined battle against the enemy. On a somewhat smaller scale, regiments, battalions, and division reconnaissance elements placed every effort on the seizure of the minor bridges essential to movement within their respective zones.

MOVEMENT CONTROL

Perhaps the least appreciated and certainly the least talked about procedure that contributed so greatly to this division's success was its movements control. A Division Movements Control Officer with an enlisted assistant was established under the G-3. This officer worked in close harmony with the Provost Marshal. Within each regiment, a traffic control organization was established, composed of one officer and twenty special military police (since raised to fifty, of which the additional thirty are used primarily by Military Government for maintenance of order within towns). Ten or more vehicles were considered a convoy, and their movement had to be cleared through the division's movements officer. In order to provide a workable basis for the clearing of movements, the movements officer prescribed a series of traf-

fic control posts (TCP's) on the main division forward and lateral axes. The Division Signal Officer promptly tied in these TCP's by wire, either direct or through adjacent switchboards. Each regiment maintained a traffic block post in the vicinity of its regimental command post. This post was manned by the regimental special military police, and was tied in by wire to the regiment. No traffic of any variety, except command, staff, reconnaissance, wire, ammunition, and evacuation was permitted forward of these block posts without the authority of the regiment. Clearances arranged through the division movements officer were called to the regimental TCP in order that all unauthorized convoys arriving at that point could be turned off the road on to side roads or conveniently situated dispersal areas. Regimental combat team movements forward of the regimental block posts were handled by the regiments. Corps or other non-divisional traffic was not permitted to enter the division area without prior clearance through division movements. A system of division block posts on the principal road entrants in the division area, manned by courteous but notably firm military police, stopped all motorized convoys.

During river crossings, the traffic system was extended forward to the division bridge or bridges. At the bridge, a traffic control post was established and tied in by wire. The as-

sault regiment or regiments established vehicle assembly areas, and tied each of these assembly areas in by wire to the regiment. The crossing priorities were carefully planned and established not only within individual vehicle assembly areas, but among the several areas, i.e., tank, tank destroyer, jeep, dukw, antitank, cannon, etc. In order to insure the prompt movement of engineer bridge material and antiaircraft to the bridge site, regimental military police blocked off all other traffic until these vehicles reached their forward assembly areas on the river. The Division Movements Officer took post at the TCP at the bridge sufficiently in advance of its completion to check his communications, and remained there throughout the twelve to fifteen hours required to cross the division with its attached tanks, tank destroyers, antiaircraft, chemical mortars, smoke generators, and searchlights, plus the supporting corps artillery and engineers. He controlled personally, by granting clearances on the ground, all movements across the bridge. No vehicle moved from its assembly area without a clearance from the bridge. If communication went out, the unit desiring to cross sent a messenger or liaison officer to the bridge. Indeed, the last and most successful crossings found the wire communication at the bridge supplemented by liaison officers from all commanders concerned.

Coordinated Ship to Shore Movement

Digest of a portion of a letter from a battalion commander, Okinawa.

ON the Okinawa operation a certain officer was brought up to Division Staff temporarily to prepare and coordinate the Ship to Shore Movement Plan and to supervise its execution. He was called the Army Control Officer for the Division and with the division commander's support was able to work directly with the Navy Control Officer. The officer was given radio communication both with the division commander and the three

regiments (Division Command Net) and full authority to dispatch movements to shore as fast as the tactical situation permitted. By having direct Army-Navy control (the Navy Control Officer had the same authority delegated to him by the naval commander) it was possible not only to set a record of getting troops and tactical equipment ashore but also to prevent the crowding of the beaches and traffic snarls off the beaches.

Aviation Engineer Operations

COLONEL LYNN W. PINE, *Corps of Engineers*
Instructor, Command and General Staff School

THE mission of Aviation Engineers is to meet the needs of the Army Air Forces for engineer work in overseas theaters. They are intended for overseas use only, the only construction work they perform in the United States being for training purposes. As would be expected, all normal operations of Aviation Engineers are centered around airfields.

The major engineering requirements of overseas air forces, which are hence the functions of Aviation Engineers, include the following:

1. Construction of new airfields and rehabilitation of captured fields.
2. Maintenance of airfields and service and repair installations.
3. Extension or enlargement of existing airfields or other facilities.
4. Construction of facilities for refueling and rearming aircraft; for storing gasoline, Ordnance, and Air Force supplies; and for housing personnel at air installations.
5. Construction of supply installations for all types of supplies.
6. Construction and maintenance of roads, ports, fuel pipeline systems, and other line of communications facilities only *when not provided by others*.

Since the primary job of the Aviation Engineers is the construction of airfields, let us see how they are developed. A number of factors influence the selection of airfield sites—the strategic plan, the type of planes for which the field is intended, the number of planes to be based thereat, topography, soil conditions, climate, availability of construction materials, shipping available, and probable future developments. A-3 will be concerned with the locations of the fields and when they can be made ready. The Engineer will normally recommend to the Commanding General the fields to be built after conferring with the A-3. The Commanding General will then tell A-4 to arrange for the construction

of the desired facilities, it being A-4's responsibility to provide airfields for the force. The Engineer would work through or with the A-4 of the staff.

Airfield construction is a big job, a far bigger job than most people realize. Airfield construction requires lots of work and large amounts of such materials as rock, asphalt, cement, and landing mat. It is a question of thousands of tons of shipping if local materials are not available. A large three-runway airfield may involve more work than the building of seventy-five miles of road, and the figures for VHB (very heavy bomber) airfields are fantastic. Witness the following overall figures on the Saipan work: earth-moving, 4,433,315 cubic yards; coral-surfaced areas, 3,866,680 square yards; paved areas, 11,000,000 square feet; building construction (floor space), 1,053,774 square feet; bulk avgas (storage capacity), several million gallons; pipeline, avgas, 62,083 feet; asphaltic cement produced, 127,332 tons; Portland cement placed, 4,142 cubic yards; oil or cut-back asphalt laid (as dust palliative), 379,648 gallons; aggregate produced, 31,273 cubic yards; coral quarried (other than from runways), 2,326,970 cubic yards; explosives used, 861,000 pounds; mogas fuel consumed, 1,721,439 gallons; diesel fuel consumed, 1,349,828 gallons.

Obviously, the selection and layout of airfields should be carefully planned to insure that the number of fields and the work at each is kept to a minimum. Time, labor, and materials must not be wasted on fields that will be of little value to the Air Force. To insure this, there must be full coordination between the A-3, A-4, and the Engineer at all times. All construction should be kept to the barest necessities and should be pre-planned as far in advance as possible. Economy of time is almost always the primary consideration. Such items as cost, convenience, and appearance must be subordinated to utility and speed of construction.

The engineers must always make the best use of local labor and materials, and must be quick to improvise when the desired materials are not available.

After selecting an airfield site, the laying out of the desired facilities is the next prob-

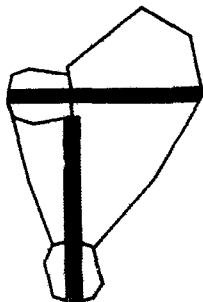


Figure 1.

lem. Naturally, the runways are the primary consideration. Runways should be oriented in accordance with the prevailing winds insofar as practicable. It is desirable that the maximum deviation from the prevailing

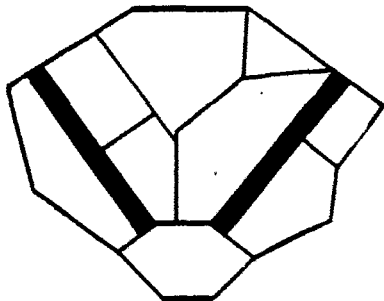


Figure 2.

wind be less than $22\frac{1}{2}$ degrees. If the site is subject to severe variable winds, two or more runways will be required. For dispersion they should be in an open "T" or an open "V." They should not cross in an "X." Figure 1 shows the open "T" layout, Figure

2 the open "V," and Figure 3 a logical layout when you have three or four runways. Their relative positions should be such as to cause a minimum of interference and hazard to air

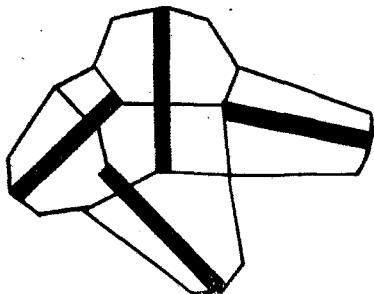


Figure 3.

operations in the adjacent approach zones. If there is a great amount of air traffic, a parallel runway system such as is shown in Figure 4 may be used. Parallel runways should be at least 750 feet apart. The present

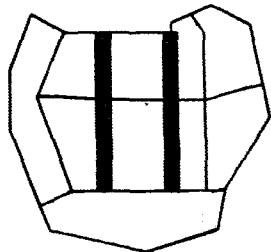


Figure 4.

policy is not to construct diagonal runways unless crosswinds are so severe as to present an undue hazard to air operations.

When locating and laying out fields, camouflage should not be overlooked. The principal camouflage measures are site selection, layout, dispersion, and the use of natural cover. A great deal can be done toward the camouflage of a field by proper selection of the site and careful laying out of the facilities. Dispersion is another important and

frequently neglected camouflage measure. If a site is poorly selected, dispersion may be its only protection. Even though we may have air superiority in all areas, the enemy is still capable of sporadic bombing and strafing attacks on our forward airfields. It is interesting to note that during the early stages of the war, when we were very much on the defensive, the placing of more than one squadron on a field was avoided. Later, when we were on the offensive and enjoyed a high degree of air superiority, the tendency was toward group airfields. This created quite a dispersion problem.

Airfields may be classified in terms of their stage of development as emergency landing strips, refueling and rearming strips, advanced landing fields, field airdromes, and base airdromes. They may also be classified as fighter or bomber fields, according to the heaviest type of planes they can accommodate. Classifications such as "dry weather" or "wet weather" may be used to classify airfields according to the restrictions weather may place on their use. The classification of an airfield can be changed by improvements or additional construction. For example, a dry-weather fighter field might be changed to an all-weather bomber field by lengthening the runway and improving the surfaces. Or by constructing taxiways and hard-standings, and improving the facilities for supply and service, an advanced landing field is converted to a field airdrome.

If at all possible, runways should be surfaced to insure continuous all-weather use. Minimum standards for runways vary in the different theaters. They are usually 4,000 feet long for fighters, 5,000 feet for medium bombers, 6,000 feet for heavy bombers, and from 7,000 to 8,500 feet for VHB's. Desired minimum widths are 100 to 150 feet for fighters, 150 feet for medium and heavy bombers, and 200 feet for VHB's.

After the runways, probably the next most important items on an airfield are the necessary dispersal facilities, taxiways and hard-standings. These will frequently represent more work than the runways themselves.

Runways and taxiways will usually be of the same type construction, and may be of turf, graded and compacted earth, soil-cement, black top, concrete, or one of the various forms of landing mat. Other facilities that must be provided are gasoline storage, housing, hangars, warehouses, utilities, and defensive and protective works.

A great deal has been heard of steel landing mat and other portable runway surfaces such as prefabricated bituminous surfacing. Steel mat and the other types of mat surfacing must not be looked upon as a sort of magic carpet that we can just lay down anywhere and have a landing strip. Landing mat will give satisfactory service only when supported by an adequate subgrade. It will fail if not supported by a well-drained subgrade of adequate bearing capacity. The grading that must be done prior to the laying of the mat invariably requires far more time than the actual laying process. Further, the movement of the mat requires a great deal of transportation. It takes nearly 2,000 tons of steel pierced plank mat to surface a landing strip 150 feet by 5,000 feet. To move this quantity of mat would require 150 or so landing craft or eight hundred C-47's. So it is obvious that mat should be used only when absolutely necessary, and that when it is used the area of the surface to be paved should be held to minimum dimensions. However, landing mat is portable, it can be picked up and reused, its use makes for speed, and it has been used very extensively in all theaters.

Steel pierced plank is the best mat for all-around use, including even B-29 runways. It weighs 5.25 pounds per square foot. And this same mat is now being made of aluminum, cutting its weight in half. Due to its lighter weight, the laying rate for aluminum mat is nearly twice that for steel mat. The reader may have encountered heavy bar and rod or Irving Grid mat in the various overseas theaters. Heavy bar and rod weighs 3.90 pounds per square foot, Irving Grid mat, 5.56 pounds per square foot. Although good mats, they are not as popular as pierced plank.

Other types of steel mat which were not too successful and have been discontinued are the Sommerfeld and light bar and rod. Two newcomers into the field are wood mat and PBS (prefabricated bituminous surfacing). Although no wood mat has been laid in overseas theaters, tests indicate that it is "first rate." In areas where there is plenty of timber, and facilities for cutting it up are available, the merits of this type of surface should not be overlooked. It has more load-carrying ability and better trafficability than any of the other types of mat. The PBS, or "hessian cloth," is a burlap fabric, impregnated with asphalt. It is laid in strips approximately forty inches wide with a fifty percent overlap. The surface produced is nothing except a raincoat for the field. It is obvious that PBS has waterproofing qualities but no structural strength, while steel-pierced plank has some structural strength but no waterproofing ability. It appears that a combination of the two would be an excellent answer to the problem. If they are placed one directly on the other, holes are soon punched through the PBS, destroying its waterproofness. Tests to determine the best manner of combining the two are now under way.

Incidentally, the United States had produced 662,000,000 square feet of landing mat up to a few months ago—enough to lay a four-lane highway from New York to San Francisco. During 1944, 589,000,000 square feet were shipped overseas—enough to surface 785 runways 150 by 5,000 feet in size. Requirements from overseas theaters for aluminum mat for the last several months of the war averaged about 1,000,000 square feet or 3,000,000 pounds per month. This was equal to fourteen per cent of the aluminum production of the United States for 1939.

Obviously, not all construction at an airfield can start at once. It must be done in accordance with priorities established by competent authority. The following is believed to be a logical order for the construction work:

1. One runway.
2. Dispersal areas, taxiways, and hard-standings.

3. Additional runways (if required).
4. Service installations.
5. Housing.
6. Protective construction.
7. Defensive installations.
8. Camouflage.

Of highest priority, naturally, is something to take off from and land on. Priorities will vary in different theaters and under different circumstances, depending on the tactical situation, the terrain, and the climate. Frequently, work on several of these different features will be carried on simultaneously, with the emphasis going to the item of highest priority. While camouflage is shown last, it is definitely not the last item to be considered or to be done. Camouflage must be considered right from the start in everything done, especially in site selection and layout. It is shown last on the list solely because additional camouflage works as decoy airfields and dummy aircraft are usually provided last.

Since the Communications Zone Engineers provide many facilities used by the Air Forces, one of the big jobs of the Air Force Engineer is the accomplishment of the necessary coordination and joint planning with the Communications Zone Engineer. Communications Zone Engineers build and maintain airfield access roads, pipelines, air installations in rear areas, ports, railroads, and numerous other facilities used by Air Forces.

They operate most engineer supply and equipment maintenance facilities. Air Force requirements for land areas for airfields, bombing ranges, and the countless other air installations must be coordinated with those of the communications zone. By coordinating and cooperating with the Engineer of the communications zone, the Air Force Engineer makes certain that his command gets the maximum benefit from the engineering services and facilities provided by the communications zone.

Let us follow through briefly the engineer staff planning for a hypothetical task force operation. As soon as informed of the mission, the Engineer would check with A-3 and A-4

to see how many airfields are to be needed, where there are desired, the probable period of use and future development of these airfields, the number and type of planes, and the facilities to be provided at each. The Engineer would then contact A-2 for information of the area in which the operation is to take place, and he would also like to get an idea from A-2 as to the enemy's capabilities to interfere with his work, such as sabotage or airborne attack. Then the Engineer must study the problem, select the airfield sites, and reconnoiter them; formulate a plan for the construction work; determine the troops, equipment, and materials to be required; and make up a construction schedule. He would then check this with the A-3 to make sure it satisfied the tactical needs, and then he and A-3 would present it to the Commanding General or the Chief of Staff. When the plan had been approved, he would request that the necessary troops be assigned to the operation. Following this the Engineer would work out with the A-4 the procurement of any special equipment or supplies needed, and the details of necessary movements of personnel, supplies, and equipment. During the course of his planning, the Engineer would have coordinated with the Ground Force and Communications Zone Engineers to make sure they were not planning other uses for the areas selected for air installations. Likewise, he would want the Communications Zone Engineer to consider the air installations in planning routes of communication and supply and maintenance facilities. He would also take necessary action to insure that the Aviation Engineer units were properly trained and equipped. Then, with the general aspects of the engineer plan for the air task force worked out and approved, the Engineer would proceed with his detailed planning. During the operation he would cooperate with the A-2, A-3, and A-4, and the Engineers of the other major commands involved, and would follow up closely to insure that the work was carried out efficiently and in accordance with the plan approved by the Commanding General.

The first Aviation Engineer unit was formed just a little over five years ago. On the occasion of the Aviation Engineers' fifth anniversary, General Arnold made the following statement:

"Five years ago today, the Aviation Engineers were organized as an integral part of the Army Air Forces. Their mission, reduced to its bare essentials, was to provide the Army Air Forces with adequate base facilities not only in the United States but in combat areas in all theaters of operation. The complexities and hardships of this immense task can hardly be overstated. Enormous bases had to be constructed to accommodate thousands of our heavy bombers. Forward fighter strips had to be constructed with the lightest of engineering equipment, frequently under fire. Often as not, our men slept in slit trenches, lived off field rations, and worked in shifts that shattered all preconceived notions of human endurance. Bases sprang into being overnight.

"In France, despite the astonishing speed of our ground advances, airstrips were always within a hundred miles of our front lines, often within five miles of a fluid front, and, on occasion, ahead of the infantry. The engineer battalion which went ashore on the morning of D-day was at the Maginot Line on D plus 120, having built seven airfields en route. Jungle clearings in New Guinea, inaccessible by land, were put into operating condition in a matter of days through use of airborne equipment.

"All this was achieved without fanfare, without the immediate recognition that accompanies more spectacular operations. Yet the record of the Aviation Engineers compares with that of any combat outfit in our armed forces. It is a record that cannot be enhanced by any commendation, however glowing. It is a proud record; new and brilliant achievements are being added to it daily in the Pacific; it is a record that speaks eloquently for itself."

Since Aviation Engineers provide the operating bases without which air power can-

not be employed, and since there are seldom, if ever, enough Aviation Engineers to go around, it is imperative that operations in-

volving their employment always be carefully planned and coordinated to insure their being used in the most efficient manner.

Weather for War

From a British Source

THE story of Eta—the code name for the “hush-hush” weather forecasting station that was the nerve center of the entire British meteorological system—need no longer be kept a secret.

From the air or the main road Eta looked like a small hill in the rolling Bedfordshire Downs, and no worse. All that could be seen of its entrance was the dark opening of an apparent cave. Its location was never discovered by the Germans.

Eta was indispensable to victory in Europe. It was on the strength of its forty-eight hour weather forecast that Eisenhower postponed D-day from 5 June to 6 June.

In three shacks standing in an open field were housed some of the most important secret inventions of British meteorologists. One of the three thunderstorm locators in existence was there, the others being at two other meteorological stations in Britain. From the three instruments it was possible to determine the position of any thunderstorm within 1,500 miles of the British Isles. Every flash of lightning occurring within this radius was recorded simultaneously by the instruments. By plotting the bearings from the three stations the exact position of the thunderstorm

could be found within a few seconds. The course of the storm could easily be followed and the time at which it would affect the British Isles predicted.

Information was obtained about conditions in the upper air by means of a “radio-sonde” apparatus. Several times a day hydrogen-filled balloons, each fitted with a tiny radio transmitter, were released from eight meteorological stations in Britain, Iceland, North Africa, and the Azores.

These balloons ascend rapidly, the transmitter working all the time until they reach the height of about ten miles, when the low atmospheric pressure bursts the balloon. The midjet radio transmitter then floats down to the earth on a parachute.

Information about upper air conditions was also supplied by a fleet of 100 reconnaissance airplanes which ascended in spirals to heights up to three and a half miles, taking observations all the way.

Reports on weather conditions in the northern hemisphere poured in by radio, telephone, and teleprinter all day and all night. From this information, Eta was able to send out by teletype 8,000 forecasts a day.

Of all the duties of a soldier, obedience is the first and most important.

—Quoted from *Guardia Nacional*, Nicaragua

Logistical Planning for a Reserve Amphibious Division

LIEUTENANT COLONEL J. D. HITTLE, *United States Marine Corps*
G-4, 3d Marine Division

IWO JIMA was the first operation in which a Marine Amphibious Corps of three divisions has been committed with two divisions in the assault, thus requiring the designation of one complete division as the corps reserve.

Some features of the overall planning are significantly simplified when applied to the requirements of a division designated as a reserve for an amphibious operation. Such is definitely not the case with the logistical problems.

The planning for the reserve division for Iwo Jima operation pointedly established the fact that, contrary to expectations, the process of logistical planning for a division designated as a reserve presents numerous staff problems which are peculiar only to a reserve division. Soon after the 3d Division G-4 Section entered the planning phase for Iwo Jima, it was realized that practically all the important considerations involved in the logistics of an assault had to be approached in a somewhat different manner in formulating the plans for the reserve division.

Actually, the basis for the difference between the logistical planning for an assault and a reserve division goes directly back to the fact that an assault division has well established preferred and alternate plans, that indicate the course of action which can reasonably be expected. Conversely, even though a division designated as the reserve has preferred and alternate plans of action, the very concept of the reserve indicates that, particularly in amphibious operations, practically everything in and out of the book can happen.

For instance: It was expected that the 3d Marine Division would sail for Iwo Jima as a complete unit. Two days prior to the division sailing date, one-third of the division received advance sailing orders. It was anticipated, on the basis of previous conferences with higher echelons, that if the 3d Division,

in reserve, was actually landed at the target, beaches would be operating under consolidated control, and shore party services would be provided the reserve division. Actually the reserve division was finally ordered to land over newly assigned beaches and establish its own shore party. On the basis of planning phase estimates it was not anticipated that the reserve division, if landed, would remain on the island more than a relatively short time. Elements of the reserve division were still being re-embarked on D-day plus 50.

While the principles of Combat Unit Loading are generally recognized as sound for all units participating in amphibious operations, these general rules must be even more rigidly adhered to by a reserve division. While an assault division can logically expect to be sailed and committed as a unit in accordance with plans, the piecemeal sailing of a reserve division may, under many circumstances, be ordered by higher authority. This obviously requires the ships to be carefully loaded in conformity with the principles of Combat Unit Loading, for only through this type of loading can each embarked unit be logistically self-sufficient. If, as was the case of the 3d Marine Division prior to Iwo Jima, one-third of the division should be sailed separately with a strong possibility of being committed well ahead of the remainder of the division, the units that sail separately, as well as those that remain for a later sailing, must have all equipment and supplies loaded for a tactical debarkation.

Not only is rigid adherence to Combat Unit Loading indicated by the possibility of a separate sailing of some of the units, but it is also imperative in view of the strong likelihood that the division may finally be landed both piecemeal and incompletely. A piecemeal debarkation of designated units cannot be successfully accomplished unless the proper equipment and supplies are landed

with the personnel. Only through proper Combat Unit Loading can the desired matériel for all units be available when needed.

Depending on the way in which the situation develops ashore, higher command may decide to commit only as much of a reserve division as is tactically necessary. If a portion of the division is not committed to landing, as was the case of the 3d Division at Iwo Jima, the units that do land must have logistical self-sufficiency and cannot be dependent on any matériel which may be loaded aboard ships not committed to the debarkation. Piecemeal and partial debarkation of a reserve division can be accomplished only if the division is properly Combat Unit Loaded.

It will quite probably be the exception rather than the rule for a reserve division to have adequate landing craft to carry out a normal landing of equipment and supplies. For that reason, the Combat Unit Loading should be planned in such a way as to permit, if necessary, the selective unloading of high priority supplies such as water, ammunition, and rations.

The temptations to deviate from proper loading technique must be steadfastly guarded against. Every determined decision to adhere to the accepted principles of Combat Unit Loading will pay dividends in logistical efficiency when the unexpected starts to happen during debarkation.

The shore party problem is never a simple one in amphibious operations. In some ways it is even more complicated for a reserve division. An assault division can, from maps and aerial photographs, make fairly accurate decisions as to where the shore party installations and supply dumps will be located during the landing. However, a reserve division does not definitely know over which beaches it will eventually land, nor does it know what supply installations of the assault units will be in place, or where the supply installations will be operating, when the reserve division finally arrives on the beach. If a reserve division goes ashore over the beaches completely organized and operated by an assault division, it is readily apparent

that the reserve division has no need for the usual shore party. If a reserve division could be sure that the beaches over which it was to land would be consolidated, smoothly functioning, and ready to provide the shore party services for the reserve units, all the reserve division would need to provide would be a few guards and guides for organizational property. During the planning phase, as the plans begin to take form on paper, such desirable conditions appear quite possible, and it appears almost logical to relegate the reserve division's shore party problem to a secondary consideration.

If amphibious experience in this war has established anything, it is that nothing can be taken for granted in shore party planning; that to expect the worst is to be realistic.

Since a reserve division cannot normally indulge in the detailed shore party planning which is usually feasible for the assault division, the shore party plans for the reserve division must be based upon "standard" shore party procedure that can readily be adapted to the terrain and beach conditions as they develop. In view of the fact that elements of the reserve division may sail separately, and be landed piecemeal or in part, it is essential that shore party plans provide for the embarkation of shore party personnel and equipment on the same shipping with the troops whose beaches the shore party elements are to service. It is unjustified optimism to base shore party plans on the assumption that the assault divisions and corps will be operating the beaches and be capable of completely handling the personnel and equipment of the reserve division when it lands. The only safe and sound procedure for shore party planning in a reserve division is to provide for a complete shore party as it would be used for a "normal" assault landing.

If it should happen that the shore parties of the assault divisions are functioning smoothly under consolidated control and are capable of servicing the reserve division when it lands, the reserve division shore party can be used to supplement the existing facilities, or for any other purpose as directed

by the division commander. At least, no harm results from having it available. Yet, when the reserve division is landed, if it is found that it must furnish its own shore party, such an organization is complete and ready to function.

In conclusion, the following general rules might be laid down for logistical planning of a reserve division: Combat Unit Loading must be rigidly adhered to. Complete shore parties must be embarked in the same manner required for a standard landing, prepared to adjust installations according to the

existing conditions when landed ashore. Because it is impossible to foresee everything that might happen to a reserve division, it is impossible for the logistical planning to be applied in detail to a number of given situations, as is possible in the case of assault divisions. Consequently, the logistical planning of a reserve division in amphibious operations should be based upon sound doctrine rather than peculiar techniques applicable to special situations. Plans should be general in nature, adjustable to any reasonable situation.

Observation

G-2, 3d Infantry Division

GROUND and air observation contributed heavily to our knowledge of enemy activity. The main problem was not one of obtaining satisfactory observation, but of obtaining rapid means of communication in order to utilize the information. The following comments are pertinent:

a. In static or slow-moving situations, personnel of the division reconnaissance troop normally established a division OP, with a telephone line direct to the division switchboard. This provided a check on other ground observation facilities, quick notification of any important activity in the forward division area, and a point to which the commanding general or other division personnel could go to observe the battlefield.

b. The artillery S-2 was charged with the responsibility of reporting immediately any important information gained from artillery OP's, whether ground or air. In addition,

artillery cubs were frequently employed on division reconnaissance missions. Air photos (obliques) taken from a cub with a Sped Graphic or K-20 camera were frequently employed. On some occasions an SCR 300 radio was employed at the division CP to maintain communication with a cub equipped with an SCR-610, intercommunication being possible on one channel. Division staff officers made frequent cub flights on tactical reconnaissance; the division engineer used this means of reconnoitering terrain.

c. The division signal company should be provided a receiver and operators to monitor the tactical reconnaissance net. One system which worked very well was to have a Tac/R plane in a corps zone work directly on missions obtained from air control parties with corps or division CP's; the main difficulty with this system was that the planes were not always available when needed.

Air Force Field Orders

LIEUTENANT COLONEL LESTER C. HESS, *Air Corps*
Instructor, Command and General Staff School

THE gigantic air attacks against Tokyo or other enemy installations did not just happen. Before the airplanes left the ground bound for enemy targets, many hours of painstaking effort planning these operations took place. Finally, when plans were completed, orders were issued. Then an entire command was galvanized into a coordinated action against the enemy. It is quite evident, then, that combat orders are a vital link in the process of getting over to subordinate elements of a command the part they will play in the operation.

There are many methods of issuing orders and writing them. They may be issued orally, verbally, or in writing in the form of fragmentary orders, letters of instruction, warning orders, and field orders. Letters of instruction we often find being issued by very high echelons of command, particularly air forces and theater air forces. The terminology designating this type of order may vary; for instance, they may be called operations instructions. However, regardless of the terminology, this type of combat order usually directs operations to be carried out over a period of time, and gives directions concerning the broad aspects of a campaign rather than a single mission or operation.

Warning orders are used at all echelons of command. The purpose is simply to give the operating elements of a command timely warning of a contemplated operation. Care should be used in issuing warning orders, because if they are issued too far in advance they lose their effectiveness. For example, after a warning order has been issued, subsequent major changes in the plan may be forthcoming requiring detailed changes in the preparations that the lower units have already made, based on the first warning order. Fragmentary orders are simply fragments of field orders, and, of course, may be issued by any of the methods mentioned above. Fragmentary orders have been used alone to direct units carrying out an entire

campaign. When we think of this type of order we envisage directions going only to one subordinate unit giving this subordinate unit its directions for operations and not the complete details as we find in a field order. Their use is advantageous in fast-moving situations where time and effort cannot be devoted to writing and distributing complete field orders. Consequently, fast-moving situations, such as Tactical Air Command operations following up an army in the advance, lend themselves to the use of fragmentary orders. They are issued sometimes orally, in written message form, or by teletype. Of course the method used depends primarily upon the communications facilities available and the importance placed on the element of time.

In connection with the above discussion, it can be established that if the technique of writing a five-paragraph field order is understood, variations of this type order should be easy to comprehend. All of the orders previously mentioned are variations of the five-paragraph field order.

Which brings us to the question, just what is a field order? Definition of a field order in a few words is difficult. It may be stated that a field order is the formal statement of a commander giving his decision and the necessary information and instructions to effect the coordinated execution of air operations in the field.

Field orders are the final results of staff action. They reflect the efforts of all staff sections, both general and special. They are issued through necessity by any headquarters that must coordinate and direct the action of subordinate units. In the Air Forces, a group (comparable to a regiment in the Ground Forces) is normally the lowest unit that issues a field order. Higher headquarters than group, such as wing (two or more groups), command (two or more wings), task force, or air force, are the prime users of field orders. Of course, the people who actually con-

struct the field orders are those individuals on the staff of the headquarters in question.

The material generally found in a field order consists of information both friendly and enemy, the mission of the unit, tactical instructions to lower units, administrative instructions, and signal instructions. Matters that require coverage other than those mentioned above are included as annexes; i.e., engineer annex.

For actual formulation of the order, A-3 is responsible. However, the individual parts of the order are prepared by the various staff officers. For instance, the A-1 covers personnel matters; the A-2, intelligence information; and A-4, the supply plan. The A-4 has the additional responsibility of consolidating all logistical data and then passing it on to the A-3 before the order is finally formulated. The exact paragraphs in which this information is placed will subsequently be covered in the discussion.

There are numerous reasons for use of field orders as such. The salient reason is standardization. It is not infrequent that air units are transferred from one theater to another, or from one air force to another. If each air force has its own little method of writing its orders and the procedure for writing orders is not the same, chaos and confusion result. Further, it means time-consuming indoctrination for the transferred units. Now in addition, standardization of the field order will aid the prospective field order writer in making his orders more complete.

Necessity for complete orders cannot be overestimated. Pilots know of the importance of the check list that accompanies every airplane. Each time before flying he uses this check list. He checks off the items that appear on it, and thereby assures himself that no omissions have been made and that his flight will be a safe one. The procedure of using a check list is applicable to writing field orders, only in the instance of field orders the stakes are much higher and the responsibilities much greater. An omission here may mean the lives of many crews and

many aircraft, as well as jeopardizing our position in the war.

Completeness in a field order is not enough; other factors that must be considered are clearness and conciseness. Perhaps the best example of expressing what is meant by clearness and conciseness is that of the person writing a telegram, every word of which costs money. The first draft of the telegram is normally not the last. Prepositions and unnecessary words are cut out. The draft is read and reread until the point is reached where the message is concise but still clear enough to be understood. Now, in our military organization we have developed, over a period of years, military terms which convey ideas which would take many words to express; i.e., "reconnaissance" or "reconnoiter." Use of military terms will lead to concise orders without impairing clarity. Their use, however, must be tempered with a knowledge of the state of training and experience of the recipient. The same limiting factor applies to abbreviations. The use of authorized abbreviations is encouraged, and where clarity is not sacrificed we use them.

Many of the points mentioned previously can be more clearly illustrated by actually going through the process of analyzing an order already written. We can accomplish this best by referring to the general form or check list for an order and an actual order that accompany this article (see pp. 57-58).

The first part of the order to consider is the heading, which includes everything down to and including the map references. In the upper right-hand corner we find the designation of the issuing unit and the place. The place of issue may be indicated by the actual geographical name of the location, the coordinates to identify positively the location and the country in which the place is located to facilitate finding the place. If secrecy is desired, the approved code name for the location may be used. The important thing to remember is that the recipient should have positive indication of the location of the issuing headquarters. Following the location

[Continued on page 60.]

CHECK LIST FORM FOR A FIVE-PARAGRAPH FIELD ORDER

Issuing Unit
 Place of Issue
 Hour and Date of Issue

FO -----

Maps: [Basic map(s), scale, identification of sheet(s) used in operation, revision date(s).]

1. *a. Enemy.*—Information, both ground and air, that has a bearing on the execution of the mission. If information on ground and air units is necessary, a separate subparagraph may be devoted to each.

b. Friendly Forces.—Information, both ground and air, on those friendly units whose operations have a bearing on the execution of the mission. If information on ground and air units is necessary, a separate subparagraph may be devoted to each.

2. The mission—including target, secondary target, last resort target—result to be achieved, place of the action, time of the action, and so much of the scheme of maneuver as applies to the entire unit. Scheme of maneuver may include: assembly, route out, rendezvous, initial point, axis of attack, method of bombing, rally, and route back. The larger purpose of the operation should be stated where practicable.

3. Detailed instructions to *each* of the next lower subordinate units of the command, using a *separate lettered subparagraph for each*.

a. Instructions applicable to *two or more* units, which are necessary for coordination.

4. Administrative and supply instructions necessary for the operation which are not covered in Standing Operating Procedure or in an Administrative Order.

5. Signal Communications.

a. Signal instructions. Reference to signal annex and signal operation instructions, if issued.

b. Command posts air and command posts ground if necessary.

Commander

Authentication

Annexes: (listed)

Distribution

NOTE: Complete oral or dictated field orders follow generally this same form; fragmentary orders conform to appropriate portions.

**FIELD ORDER FOR A BOMBARDMENT WING
IN A STRATEGIC OPERATION**

332d Bomb Wg
CHELMSFORD, ENGLAND
2400Z, 7 Feb 44

FO 8

Maps: Air Planning Chart, 1:1,000,000 (LONDON-BERLIN).

1. a. (1) Annex 1, Int.
(2) Obj Folder GR 8027, Blu Bar, Area F.
- b. (1) 321st Bomb Wg Atks GR 7062, 1000Z, 8 Feb.
(2) 322d Bomb Wg Atks GR 7031, 1000Z, 8 Feb.
(3) Ftr Escort, 80 Spit IX, RAF 11 Gp, en route out.
(4) RAF makes extensive Ftr sweeps over GERMANY commencing 0900A, 8 Feb.
2. This Wg destroys Obj GR 8027, 1000Z, 8 Feb 44; secondary Obj AACHEN; LRT any industrial city on withdrawal.
Assembly: MALDEN, 0740Z, 16,000 ft.
Route Colm in order 541st, 542d, 543d and 544th Gps.
Rdv: FOLKSTONE, 0800Z, 20,000 ft, Ftr escort.
Route out: FOLKSTONE, MONS, LIEGE, IP, Obj.
IP: SIEGBERG (50°49'N—7°12'E).
Axis of Atk: 340°M.
Method of bombing: Individual Gps from route Colm 26,000 ft. salvo by Gps.
RP: DUREN: 25,000 ft, Gp stagger.
Route back: Reverse of route out.
3. a. 25th Pathfinder Sq lead to target.
b. 541st Gp, 27 Acft, Atk Area A.
c. 542d Gp, 27 Acft, Atk Area C.
d. 543d Gp, 31 Acft, Atk Area D.
e. 544th Gp, 33 Acft, Atk Area F.
x. (1) 6 x 1000 lb; Gp; 1/10 sec nose, 1/40 tail fuse.
(2) EEI (a) Enemy activity and Instls in coastal area.
(b) Location, intensity and accuracy of flak.
(c) New types and tactics of enemy Acft seen.

4 Adm 0 5.

5. a. (1) Index 3, SOI, effective 2300Z, 7 Feb.
(2) Bomb Gp Ln Freq 3100 KC.
- b. Col DAVIS, 541st Gp Comds; Deputy, Maj BONES, 542d Gp.

MORGAN
Brig Gen

OFFICIAL

/s/ Smith

A-3

Annex: 1 Int

Distr: A

RAF 11 Gp

FOR THE PURPOSE OF CLARIFYING the abbreviations and terminology appearing in FO 8 the items of information are written out in sequence by paragraphs as they appear in the order.

1. a. (1) Annex 1, Intelligence.
- (2) Objective Folder of Germany numbered 8027. (This objective folder contains information on enemy defenses, maps, approach charts, etc., of a specific target in Germany identified by the number 8027.) Balloon barrage in Area F (a subarea of objective 8027). This information is included because it is not found anywhere else.
- b. (1) 321st Bombardment Wing attacks GR 7062 at 1000Z zone time on the 8th of February.
- (2)
- (3) Fighter escort for our mission is furnished by 80 Spitfires IX of the Royal Air Force 11 group on the route out.
- (4) As indicated (information of these fighter sweeps is vital to us because it will have an effect on the enemy air warning system and draw off enemy fighter opposition).
2. This wing destroys objective GR 8027 as mentioned above, at 1000Z zone time on the 8th of February 1944. If this objective cannot be reached, we have as a secondary objective Aachen. If we cannot attack Aachen, we will strike any industrial target on our return.
- Assembly: The various groups of our wing will assemble over Malden, 0740Z, 16,000 feet. The formation will be route column with the order of the groups in the formation as indicated.
- Rendezvous: At Folkstone, 0800Z, 20,000 feet. Our wing will meet with our fighter escort.
- Route out: As indicated.
- IP: The "initial point" or place where we turn on to the target and make preparations for our bombing run. This happens to be Sieberg, a clearly identifiable place from the air.
- Axis of attack: The bearing or direction from the initial point to the target is 40° magnetic heading.
- Method of bombing: How will we drop our bombs? As it appears, our groups will bomb individually from the route column formation at 26,000 feet and will salvo their bombs by groups.
- RP: Rally point—after the target has been hit, a place is picked outside the flak-defended areas where the aircraft can rally and get together in the proper formation for the trip home.
- Route back: As indicated.
3. a. The Pathfinder Squadron leads the wing to the target as indicated.
- b.
- c. The groups mentioned in this paragraph will use the numbers of aircraft shown to
- d. attack the various areas which are part of objective GR 8027.
- e.
- f. (1) Each aircraft carries six 1,000-pound general-purpose bombs with a 1/10-second delay nose fuse and a 1/40-second delay tail fuse.
- (2) As indicated. Essential Elements of Information.
4. Administrative Order 5 covers logistic details for this operation.
5. a. (1) As indicated.
- (2) The bomb group liaison frequency is 3100 kilocycles.
- b. Colonel Davis of the 541st Group is the commander of the Wing.
Major Bones of the 542d Group is the deputy.

of the unit, we find the time and date the order is signed. Time is always expressed in the 2400 system, followed generally by the time-zone suffix. Specifying the time zone is extremely important to make certain all participating parties in a coordinate action are using the same time. Failure to have a basic understanding on time may lead to an unsuccessful mission. When time has been established, of course we must have the date, month, and year in that sequence. From here we move to the left of the order and find the field order number. When numbering orders, remember they are numbered successively from the time the unit issues its first order. For instance, an air unit being redeployed to the Pacific from Europe, and its last FO in Europe being 350, will, when participating in its first action in the Pacific, number this order 351. Following the field order number we find map references. Interpretation of any combat order will require perusal of maps. These maps must be positively identified. This will necessitate naming the basic map(s), giving the scale, and then identifying sheet or sheets used--giving the revision dates, if any. Undoubtedly, many errors have taken place because recipients of orders have used improper maps or improper revisions of the map named.

From the heading discussed above we move into the body of the order. Here we have five paragraphs broken down as indicated in the preceding forms.

Paragraph 1 contains only information. Simple as this phrase may seem, "only information," much confusion exists in distinguishing between information and directions. We have little trouble about enemy information in that it is impossible to give orders to enemy units. However, when we consider friendly information we begin our difficulties.

First, in considering enemy information, what do we include? Undoubtedly we will have a wealth of information on the enemy.

Do we include it all? The question is answered obviously in the negative. Only that information is included that has a bearing on

the accomplishment of our mission stated in paragraph 2. For instance, if new flak areas exist between our present position and the target area, planning on the part of our command may inadvertently pass routes over these areas unless the information is disseminated in the order. Current information on enemy air defenses in the target area and new enemy fighter tactics we are apt to be confronted with are types of information commonly placed in paragraph 1 concerning the enemy. For the average large-scale operation, details about the enemy may tend to be bulky, and placing all of this material in the order may tend to detract from its effectiveness. If it so happens that this is true, the intelligence officer (A-2) will construct an annex which will accompany the order and be referred to in subparagraph 1a, as indicated in the order used in this article. In this connection, material concerning the enemy is placed in sequence before friendly information which follows in subparagraph 1b.

Friendly information contained in the order may be on friendly ground elements or air elements, and again our mission determines what will appear. The order appearing in this article, being for a strategic attack, has only information on friendly air activity. As it happens, the information contained here is very pertinent because it concerns attacks taking place at the time of our strike in close proximity to our target. It further gives information on our escort, which is vital to the successful accomplishment of our mission. If this order has been issued by a Tactical Air Command, information on friendly ground elements that we were cooperating with invariably would be included. Because we will give orders to our lower units, information on their activities would be covered elsewhere in the order but not in paragraph 1. Where to place directions to our subordinate units will subsequently be covered in the discussion.

The basis for the field order is the assignment of a mission or task to be performed. We find the statement of this task in paragraph 2 of the order. In the example order FO 8, we find a very clear, concise statement

of what the 322d Wing is going to do, the time and date it is going to do it, and where it is going to do it. These items are generally covered in an order specifying a single strike or mission. Remember, though, there are exceptions. Higher level commands may very well establish broader, more general missions covering a greater period of time. Now in addition to the statement of the task to be performed for coordinated attacks, a scheme of maneuver may exist for the command as a whole. To amplify this statement we can merely refer to paragraph 2 of FO 8. Notice there are many common items in the tactical plan that affect all of the subordinate units. These items as they appear are: assembly; rendezvous; route out; the initial point or place where combat formations are picked up just prior to passing over the target; axis of attack or final direction of approach to the target; method of bombing or how we will drop our bombs, in train, salvo by squadrons, groups, etc., and the formation to be flown; rally point or where we pick up our formation for return to our bases; and route back to our bases. These items are definitely a part of our tactical plan. In connection with this discussion the question might arise about bomb loads and fusings, gas loads, and similar instructions. Here it should be remembered that these items have a bearing on the tactical plan but actually are not a part of it. We find, then, these items covered in paragraph 3 of the order.

Paragraph 3 is devoted entirely to directions to the subordinate units, directions which are not a part of the scheme of maneuver for the command as a whole. If these directions apply to two or more units, they appear in subparagraph 3x. It is not uncommon for confusion to exist in trying to determine when directions rightfully belong in paragraph 2 and when in paragraph 3. For Field Order 8, the problem is simple. All of the groups attacking are assembling together and then carrying out the remainder of the mission together. This material rightfully becomes part of the scheme of maneuver of the entire command. Details still remain that

concern all of the units and individual units. These details are placed in paragraph 3 without further difficulty. Consider momentarily that in FO 8, the 541st and 542d Groups were attacking one target and the 543d and 544th another target in carrying out the basic mission of the command.

Let us suppose, in addition, that these targets are great distances from each other, necessitating separate routes; and consequently all directions that would normally appear as the "scheme of maneuver" in paragraph 2 we would then find in 3x as one subparagraph devoted to the 541st and 542d Groups and another subparagraph to the 543d and 544th Groups.

Now, in addition, in subparagraph 3x we place instructions that apply to the units of the command that are not properly a part of the scheme of maneuver for the entire command. In FO 8 appears bomb load and fusings. Similar types of instructions would be photographic details, gas loads, and EEI (Essential Elements of Information). Actually, all of the instructions that appear in subparagraph 3x might be in one of the other subparagraphs of 3; however, this material would then be common only to one subordinate unit. Notice that in subparagraphs a, b, c, d, and e of paragraph 3 in FO 8 the instructions listed apply only to the individual unit. Whether to place directions in paragraph 2 or 3 of the field order should offer little difficulty if check list or form similar to the one in this article is followed.

For a field order to be complete, instructions relative to administration must be included. We find these details in paragraph 4 of the field order. Quite often it is confusing to determine what appears in paragraph 4, particularly when an administrative order has been issued and is in effect. Under such circumstances, reference to the effective administrative order is all that is necessary. Many times, as well, an erroneous impression exists that every time a field order is published an administrative order is published and accompanies the field order. In air units, bases and base installations are static or

semi-static in nature; supply points and similar items remain fixed. We find the administrative orders issued less frequently than field orders. Perhaps there may be additional administrative instructions that are necessary to supplement those that already exist in the administrative order. If that situation is apparent, it is perfectly proper to include them in paragraph 4.

Paragraph 5 of the field order is devoted entirely to instructions to signal troops and signal agencies. In simpler terms, we must have communications to control the tactical operation, and correct instructions must be published for the establishment and maintenance of communications. Many times these instructions require a great amount of space. If so, we refer in subparagraph 5a of the order to the signal annex. If an annex does not accompany the order in this subparagraph, we refer to the signal operation instructions currently in effect. This subparagraph is also used for additional signal instructions that cannot be covered elsewhere. FO 8 provides a good example of how these instructions would appear. Subparagraph 5b indicates the position of the command posts air and

the command posts ground if necessary. The method of indicating is clearly shown in FO 8.

The ending of the order contains the signature, a list of annexes, if any, to accompany the order, and a distribution list for the order. The method in which FO 8 is signed indicates that the commanding general signed the original copy of the order. In that the remaining copies of the order were not signed by him, they were authenticated in the method shown. Rank of the person authenticating need not be shown. As a matter of interest, when authentication is necessary, this becomes a responsibility of the A-3.

In summation, wherever possible stick to the rules for writing a field order. It will save you time and difficulties. However, remember that conditions vary from place to place, and such items as state of training of the command, disposition of the various organizations of the command, dependence upon standing operating procedures, the operating conditions imposed by geography and weather, and the mission of the command will have a profound influence on the method of writing orders.

German What's-It

From *Marine Corps Gazette*.

MILITARY engineers are still trying to figure out what the Nazis had in mind when they built the huge What's-It found at a proving ground at Hillersleben, Germany. What's-It has four wheels, each nine feet in diameter, with wooden pads. It would weigh about 100 tons and is heavily armored. The machine has seats for two drivers in an armored compartment 12 feet above the ground. The top of the vehicle is flat, and fitted with bolts to which some firing device, doubtless, could be attached.

Rescue by the Rangers

CAPTAIN RAY M. STROUPE, *Infantry*

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NEWSPAPER and magazine articles have featured several notable rescues of Allied prisoners of war held by the Japanese. A number of these dramatic incidents occurred in the Philippines. While the rescue, by the Rangers, of the prisoners of Pangatian was no more sensational than others, it had tactical elements which deserve special attention.

Celebrated by the moving picture *Back to Bataan*, which was made with official cooperation, the rescue of these prisoners is the subject of the first scene in the thrilling story, the details of the final assault being accurately depicted, as described later in this account of the action at Pangatian.

Pangatian (Pahn-gaht-yáhn) is a mere village on the island of Luzon. At the time of the American return to the islands, there were some six hundred American and Allied prisoners of war in the stockade at that place, guarded by a small Japanese garrison. The rescue of these prisoners was effected on 30 January 1945 by a force of United States Rangers and Scouts, ably assisted by Filipino guerrillas and civilians.

This rescue involved movement for a considerable distance through country dotted with Japanese garrisons. However, most of these enemy forces were on the move along main roads, and the country at large was really held by the guerrillas. The great difficulty of the operation was to extract the prisoners deftly from the grip of Japan without causing harm to the men rescued. Thereafter, there would be the scarcely less difficult feat of getting the wasted, worn, and sick evacuees back to safety over the secondary roads and the trails of the back-country.

No new and startling procedures were employed to accomplish this notable feat of arms. The operation was based on careful, detailed planning, and on methodical, precise execution. So humdrum were the methods used that, even should the story have come to the attention of the Japanese, it could not

have told them anything that they did not already know. In fact, they customarily employed the same methods. The principal interest of this operation, from the professional point of view, lies in the careful integration and coordination of the methods by the staff that supervised the planning and the execution.

On the morning of 27 January, the friendly and all-prevailing guerrillas made an important routine report to the Military Intelligence Section of the staff on a high command echelon of the American Army. This report stated that some 300 to 500 Allied prisoners were held in the stockade at Pangatian. This village (see southeast corner of sketch) lies between Cabanatuan and Cabu on the road leading northeast to Rizal.

At this time, the American forces in this area were situated generally along the road (west edge of sketch) Aliaga—Quezon—Casanova—Manacsac—Guimba. The last named town was the initial point of the movement involved in the rescue. It was also the final assembly area on the route of withdrawal.

The routes of advance and withdrawal used in the operation were largely by trail (see sketch) via Lobang (on the approach)—Baloc—General Luna—Mataas na Kahoy—Balincarin (a bivouac area)—Plateros—Pangatian, and (withdrawal route) Plateros—Balincarin—Mataas na Kahoy—Sibul—Mambara—Casanova—Manacsac—Guimba.

On 27 January the higher American staff knew that the Japanese were withdrawing from the area east of the road Aliaga—Guimba (previously mentioned), via Cabanatuan by way of Highway No. 5 (south-north through Talavera and Baloc) and by way of the road Cabanatuan—Pangatian—Cabu to Rizal. Fearing that the Japanese would evacuate their Allied prisoners very soon, the American Army command decided to rescue them at once.

Only a small Japanese garrison was re-

ported at Pangatian, but other detachments were known to be in the area (see sketch), and considerable forces were estimated to be at Cabanatuan, Talavera, Baloc, and northwest thereof, with continuous traffic (more or less) by night along that road, which cut across all possible rescue routes from the Guimba area to Pangatian. Considerable enemy forces were also reported at Cabanatuan, at Pangatian or en route through that point, and along the Rizal road to the northeast. At any one point of rest or bivouac, any such Japanese force would probably number hundreds or at most a few thousands, but on the other hand, only a very small force of Americans could possibly make its way to Pangatian in time to accomplish the mission.

Some troops of one of our infantry divisions were in the Guimba area, which was a natural point of departure for the rescue party.

This party was made up of a few selected Scouts and of a small force of Rangers, not much more than one hundred men in all, but all volunteers and sworn to fulfil their mission to the end. To ensure unity of action with the guerrillas, overall planning was committed to the Military Intelligence Staff Section already mentioned. This task called for staff ingenuity, versatility, and precision.

Naturally, the most careful and complete planning and the most methodical execution would be essential to full success. With drawal of the weakened prisoners, after rescue, would be, in itself, a notable achievement, and would require every advance preparation and full assistance from the Filipinos.

Of course this full assistance was freely offered, and in the most effective manner. Its coordination, however, called for experience and skill on the part of the overall planning staff.

Moving out promptly via Guimba, the Scouts picked up native guides on 27 January, and advanced to Balincarin, thence commencing reconnaissance of Pangatian under cover of a screen of guerrillas and civilians.

Following to Guimba by truck early on the next day (28 January), the Rangers contacted units of the neighboring U.S. Infantry division, and arranged therewith the necessary recognition signals for the return of the Ranger force, also providing for a radio relay station at this point. Proceeding thence via Lobang, the Rangers picked up at that village an approximately equal force of guerrillas, the combined force arriving at the Scout bivouac at Balincarin early on 29 January.

Because of our air activity, the Japanese had been moving only during the hours of darkness. For purposes of secrecy, our small forces employed the same procedure, except as to essential daylight reconnaissance.

At Balincarin, arrangements were made with a guerrilla leader at Cabu (an "area commander") to establish and maintain all-around security, in depth, for the area north of the road Cabanatuan—Pangatian. Civilian entry into and departure from this area were to be absolutely interdicted. All chickens were to be penned, and all dogs were to be tied up and muzzled. An ox-cart train (the famous carabao being the ox) was to be organized for transportation of an estimated two hundred evacuees (litter cases) and casualties. Food for 650 persons was to be provided by the guerrillas and civilians, and to be distributed by them along the return route. All these missions the guerrilla chieftain performed, in the outcome, with absolute efficiency. Here (at the Balincarin bivouac) the reinforced Ranger force (now some 200 men, and already half guerrilla) was augmented again by guerrillas to a total strength of about 300. It also was reinforced by some 160 unarmed Filipino litter-bearers, who proved invaluable in the withdrawal.

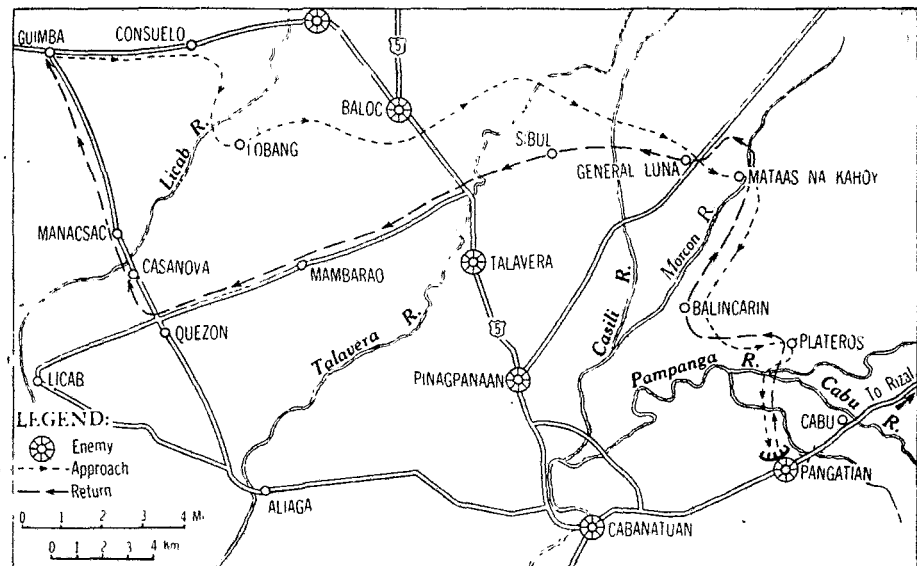
Meanwhile, as reconnaissance of the target area proceeded, radio arrangements were made with higher authority to provide air cover for the withdrawal, from and after 1900 on 29 January, in order to prevent pursuit by enemy tanks and trucks, known to be present. However, it having been found that the enemy at Pangatian had been rein-

forced by a large transient detachment en route to the northeast, the Ranger Chief moved to Plateros and initiated a final and extremely detailed reconnaissance, postponing the attack for one day.

It was desirable to make the attack in the evening, so that the considerable Japanese force reported at Cabanatuan would not yet

be quartered in the center section, south of the main gate, with officers quarters (north) and barracks (south). Tank (and truck) sheds were near the main gate.

The plan of attack was to assault both gates simultaneously, each assault force to telescope a group forward to protect the prisoners. The main-gate force would dispose



have arrived at Pangatian and, for similar reasons, at an hour late enough to ensure that the "transient" enemy force at Pangatian would have moved on to other parts.

The detailed reconnaissance was made by one Scout officer and one Scout on 30 January. The general layout of the stockade was charted, with its exterior and interior barbed-wire fences and its other key features.

The stockade was, in essentials, an enclosure (fenced) some 600 yards wide (east-west) and 800 yards long.

The main gate was in the north side, the rear gate on the south side near the southeast corner. The prisoners were penned off in the northeast corner, the transient Japanese being in the southeast section. The gar-

ds of the tanks and then "funnel" the prisoners out to safety, while the rear-gate force would clean up the transient Japanese. These Japanese were estimated at some 225.

A road block with antitank protection was to be installed at the bridge in the direction of Cabu (where some 800 enemy were reported) and another a half mile southwest toward Cabanatuan (7,000 Japanese being reported there).

A flare would signal that the evacuation was complete and that the Rangers were to withdraw. A second flare would signal completion of withdrawal across the Pampanga River.

Every man was thoroughly briefed on the overall plan and on his part in it.

The plan was executed like clockwork. The approach was made after dark to a final assembly position northwest of the stockade (see sketch), whence the rear-gate force circled east and south, by routes near the river, to its assault position. The attack was launched at 1945.

Some 200 Japanese were killed in the transient area. The prisoners of war were methodically evacuated with only one casualty—a man who dropped dead at the gate, by reason of excitement and overexertion.

At the second flare, the guerrillas facing Cabanatuan withdrew from the road block, forming an ambush covering the flank and rear of the column. Some 800 chanting Japanese, trotting down the road, lost about 300 men (to nine guerrilla casualties), and were thrown into wild confusion, their tanks (on coming up) making no effort to pursue. An hour later the guerrillas withdrew easily from contact. Thereafter they preceded the column, flanked it, and secured its rear at all times, calling on the surrounding civilians to bring in food, water, medical supplies, additional ox-carts, and even medical attendants.

At Plateros the non-transportable wounded were left under guard in an improvised hospital, with supplies and attendants and a detail to clear a Cub-plane landing strip for supply purposes. But the Scout-Ranger casualties were negligible in number, though

regrettable in that all were caused by enemy "overs" from mortar, tank, and automatic fire directed at the guerrilla ambush.

Moving deliberately but without any loss of time, the force withdrew via Balincarin, covering its rear with antitank road blocks and calling up (by radio) trucks to pick up the evacuees. The overall planning staff, alert to meet all requirements, sent this transportation forward as far as Sibul, covering the south flank of the movement by the seizure of Talavera. There was no hostile reaction from Baloc (north).

At Guimba, the rescued men were transferred to an evacuation hospital. A few weeks later their relatives, at home in the United States, were witnessing the movies (moving enough, in all conscience) of these survivors of Bataan. Marveling thankfully at the valor of the Rangers and Scouts, grateful beyond words to the Filipinos whose help made the job so complete and so effective, the folks at home were quite unconscious of the high-grade staff work—the planning, follow-up, and ceaseless overwatching—that made the rescue possible at all. All values assessed on the basis of their own merits, the accomplishment is a striking example of what can be done by good staff planning, to ease the effort and to ensure the end in view. Without this feature, there would in all likelihood have been another ending, and no such happy ending, for the prisoners of Pangatian.

In the Army there is no maintenance service ultimately more important than Preventive Maintenance. It's the old story of prevention being worth more than the cure, but it takes on a new importance when you realize that the time it takes to work a "cure" on a few items of deadlined equipment may be just the time it takes to lose a battle because you didn't have the equipment on hand and couldn't get replacements. This isn't far-fetched either, for men who have seen action will testify to the fact that there are times when combat operations are actually hindered by breakdowns due to lack of Preventive Maintenance. There is nothing more important in fighting a battle than winning it. Therefore, anything which contributes to the winning must be considered of foremost importance. Preventive Maintenance comes in this category!

—Maintenance Division, ASF

The Army's Civilian Responsibilities in the European Campaign

BRIGADIER GENERAL C. P. STEARNS

Recently G-5, European Theater of Operations, U.S. Army and Communications Zone;
European Theater of Operations, U.S. Army.

IN the first World War we had no civilian responsibilities until combat had ceased, for we neither liberated France nor fought our way into Germany, but in this war the utter destruction of the areas through which we pass, resulting from our modern methods of warfare, has forced upon our commanders a responsibility that they cannot ignore without jeopardizing their own rear with its many installations and its complex communications systems. The civilian problem of a liberating or occupying army is a problem that confronts that army as soon as the first town is captured. The extent of the problem is in proportion to the density of population and the industrial development of the areas to be entered.

The combat mission of the Allied armies in northwest Europe required that certain friendly countries be entered. The mission carried with it an auxiliary mission requiring that peace and order be maintained in both liberated and occupied areas. Since the successful conduct of the campaign was the primary objective, it was specifically directed that the rehabilitation of liberated countries and civilian assistance was to be restricted to that required by military necessity.

Probably the most outstanding lesson learned in Europe with reference to this civilian problem was that it is not a matter to be solved by a separate organization or by a separate branch or by a special staff section alone. It is a function of command and as such should be handled by all of the most suitable agencies available to the commander. The aspects of the problem in Europe were so varied and large that most of the agencies that served military commanders were given some part of the civil function to perform. This was a new concept of the problem to many older officers and in some instances

there was a lack of understanding due to pressure of combat requirements, but very soon the immensity of the problem became apparent to all and in a few weeks all staff sections and services were taking their new functions in their stride. There were general staff functions, special staff and services functions, and field functions to be performed.

There was established a G-5 General Staff Section in all echelons from the Supreme Headquarters down to include divisions, in ETOUSA [European Theater of Operations, United States Army] and communications zone headquarters and in each section headquarters of the communications zone. The functions of the Assistant Chief of Staff, G-5, were, in general, to make recommendations to his commander on civilian matters and to supervise and coordinate those matters in his commander's area of responsibility. G-4 was charged with his usual functions in their civilian as well as military aspect—for example, supervision of transportation, communications, etc., and the calling forward and the movement to destination of such supplies as G-5 determined were necessary for civilian use. G-1 was charged with the personnel policy problems of this activity as for other military activities.

The Theater Medical, Signal, Engineer, and Transportation Services and the Theater Quartermaster, etc., were charged with those civilian matters that were similar to their other military functions. For example, the Medical Service was charged with supervision of public health and the requisition, storage, and issue of medical supplies for civilians; the Signal and Engineer services with assisting civilians in the rehabilitation of civilian essential utilities; the Transportation service with control of civilian use of transportation; the Quartermaster for requi-

sitioning, receiving, storing, and issuing imported supplies for civilian needs. Other special staff sections, such as the General Purchasing Agent, Public Relations, Claims, Provost Marshal, etc., performed their functions with civilian communities as the situation demanded.

The field forces for the local control of civilian communities were detachments ranging in size, according to the size of the community and its problems, from three to twenty-five officers and half again as many enlisted men, distributed throughout liberated and occupied areas.

The specific units for this field work were obtained from the European Civil Affairs Division. The personnel of this Division was selected and trained in the United States for this purpose, sent to the United Kingdom, and there organized. It numbered approximately 2,500 officers and 5,000 enlisted men, organized into three regiments of eight to ten companies, each company consisting of many detachments of varying sizes. The companies of this Division were attached to armies, which dropped off detachments in towns and cities as they advanced, thus laying a carpet of Civil Affairs Detachments across the liberated countries. These detachments were administered by the company headquarters and the companies administered by the regimental headquarters of the European Civil Affairs Division. These headquarters were placed at suitable locations for this purpose. The detachments and companies operated under the command of the area commander in which they found themselves; that is, they served under different area commanders as the advance of the combat forces rolled eastwards and the rear boundaries of combat units moved forward. Initially, the carpet of detachments was a thick one, but the armies picked up most of their detachments as they moved their rear boundaries forward and dropped the detachments again and again, leaving only in the rear areas what the Communications Zone required.

These detachments during the early days of the liberation were a great boon to the liberated people. They brought order out of confusion in the numbed and stricken towns. They restored local authority, put people to work clearing the wreckage, conserving food supplies, and repairing utilities, and they administered relief and assistance. It must be realized in this connection that the armies passed so rapidly through France that their civil affairs functions were of necessity restricted to the emergency measures suitable for the limited time they remained in an area. The Communications Zone inherited these areas and some of the detachments, and completed the civil affairs mission therein.

So that there would be no unrest in the Zone of Communications, the main objectives of the Commanding General, Communications Zone in France, were to establish a French national government firmly in Paris, see that the people of France had sufficient food, and see that the means of government, such as transportation and utilities, were turned over to the French national authority as soon as the military situation would permit, in order that it might be a government in fact as well as in name.

When our armies broke through in Normandy and quickly advanced to the eastern French frontier, we found crops in the ground ready for harvesting and plenty of indigenous food in the country. The problem of supply of our armies over the open beaches in Normandy and the broken port of Cherbourg, with only one railroad from Normandy and that not yet open to Paris, posed such a supply problem that it was a question of halting the advance of our armies if we were to import food for France. With adequate food in the fields in France, only one decision was possible and that was made—to postpone imports and take immediate steps to exploit to the utmost these indigenous food supplies. Agricultural experts were sent into Normandy and Brittany to assist the French local authorities in their food collection and

distribution to Paris and other large cities, with the result that in the month following the liberation of Paris, 130,000 tons of food came into Paris, and in the following month, 190,000 tons. This was sufficient to meet initial minimum needs.

Transportation was the limiting factor on the amount of indigenous food that could be distributed. There was throughout the campaign sufficient food in France to meet civilian minimum needs, except for meats and fats and other items which were in world shortage. There was a shortage of food supplies in Paris from time to time because of limited transportation facilities. During the winter there were two setbacks; one, the German counteroffensive in December which disrupted rail transportation, and a month later, a severe cold spell which again disrupted transportation. In southern France there was little or no indigenous food, so imports to Marseilles were authorized.

When the French national government was brought to Paris after the liberation it was as completely cut off from the rest of France as if it had been on one of the Channel Islands. All rail communication outside the capital had been cut by the bombing activities of operations. Canals were blocked, power lines destroyed, telephone and telegraph lines completely disrupted, and post office services nonexistent. There was practically no coal for utilities and no gasoline, and there was no contact of any kind between Paris and the rest of France. In short, all the means needed by the French national government to govern were absent from the picture. It was as helpless as the rest of the civilians in the city. Within the three or four months following the liberation the situation was sufficiently restored through the strenuous efforts of all the great Communications Zone services concerned—viz., Transportation Corps, Signal Corps, Engineer Corps, etc.—in all echelons of command of the Communications Zone so that there was released to the French government sufficient of those means of communication and transportation to enable the French national authority to carry on. This

was being done at the same time that the great offensive against the Germans by our armies was being supported. The details of this astonishing accomplishment resound to the credit of the thousands of representatives of the Services concerned.

The civil problem in France was typical of the civil problems in southern Belgium, Luxembourg, and the Netherlands. The Communications Zone, in addition, had to meet the demands of the American armies for imported civilian supplies needed by them, to meet their refugee and displaced persons relief needs during their advance. Fortunately for our civilian responsibilities during the four months when our transportation and port difficulties were at their highest, the armies had uncovered large stocks of enemy supplies, but by the end of 1944 these supplies were becoming exhausted. Large quantities of relief imports had to be scheduled to meet the needs of the liberated nations and the millions of displaced persons that it was expected would be uncovered. By the end of February there was on the Continent approximately 100,000 tons of imported relief supplies to meet the emergency civilian needs of our armed forces. The supplies scheduled for monthly import thereafter were sufficient to meet our estimated requirements.

In addition to the problems outlined above, the armed forces in the liberated nations have been responsible for matters pertaining to public utilities, public safety, public health, public welfare, transportation, communications, supervision of civil courts, administration and supervision of local labor laws, and civil fire defense. In France, prior to the establishment of the national government in Paris, most of these problems were supervised locally and only to the extent that the friendly relations with France made them necessary. As the French government became more powerful, the problems diminished in importance, for the French were quite able to handle most of these matters themselves. In Belgium the same general situation existed.

The responsibility for the civilian life of northwest Europe has been one of constantly changing emphasis to meet the constantly changing conditions confronting our armies. As rapidly as the power of the French government could be restored in France and the Belgian government restored in Belgium, Supreme Headquarters, Allied Expeditionary Force (SHAEF), turned over to these governments complete territorial responsibility and set up a SHAEF Mission for France and a similar Mission for Belgium, to act as its representative on policy-making matters with the national governments of these countries. The Communications Zone organization became the operating agency to implement policies of SHAEF as well as to perform its other responsibility of maintaining order and quiet in the Communications Zone.

In May 1945 the French assumed complete responsibility for all French relief imports. When this transfer was completed, the principal civilian functions of the Communications Zone became the supply of civilian relief supplies to the armies to meet the tremendous displaced persons supply problem during the armies' advance, as well as assistance to the French to meet their great displaced persons program of returning nationals.

We saw the civilian problem in France come to its peak during the liberation of Paris and gradually recede as the Commanding General of the Communications Zone felt that the French government was able to keep peace and quiet throughout France so that the support of the American armies could continue unmolested.

In Belgium we saw much the same development as we saw in France.

Within Germany the civilian problems of the armies became military government problems as distinguished from what has been known as "Civil Affairs" in the liberated countries. The field organization set up for the conduct of local civil affairs in the towns and cities of the liberated countries was in the main moved into Germany and charged

in Germany with military government. Civil Affairs detachments became known as Military Government detachments.

The approach to the problems in Germany was 100 percent different from what it had been in France. The attitude of the personnel became one of firm, stern justice. The detachments were responsible under military government for much the same things that they were initially responsible for under Civil Affairs, that is, supply, transportation, communications, public utilities, public safety, public health, law and order, etc., but instead of approaching these problems from the point of view of rendering assistance as was their attitude in the liberated countries, they approached them by demanding results from the officials whom they installed to replace the Nazi officials. Ordinances were issued and firmly enforced by the necessary provost courts and military commissions.

As our troops advanced through Germany, hundreds of thousands of displaced persons were uncovered. The stories of the horrors of the concentration camps have been told in the press and will not be repeated here, but in addition to the inmates of these camps, a great proportion of displaced individuals who had been working in Germany were drifting. As rapidly as possible the whole flotsam and jetsam of humanity was taken under control by our armed forces. After combat had ceased, whole divisions were used in gathering these people into large camps where they could be properly fed and gradually returned to their homes. At this stage the millions of homeless people posed a problem for combat troops and staffs to handle. The Germans were required to feed these people and captured stocks were used to augment indigenous food supplies pending the time that the imported supplies brought in by the Communications Zone and sent forward for this purpose needed to be used. While all this was going on, the military government detachments in the various cities and towns of Germany were gradually bringing order out of chaos.

The success of the civilian mission of the armed forces in northwest Europe can only be measured in results. France, Belgium, the Netherlands, and Luxembourg had been occupied for four years by the enemy. The population of these countries had been forced to accept the complete authority of the invaders. Most of their efforts had been directed to doing as little as possible to help the Germans. Suddenly the liberation of their countries arrived—they were without organization, and initiative had been partially deadened. The Allied armies were thus confronted with the problem of not only carrying on the war against the enemy but with the difficult problem of helping a helpless people, who were weakened by inertia, to help themselves. This required patience, tact, and understanding.

The liberated nations were given great assistance. Moreover, this assistance was given with the minimum use of military transportation and other military facilities so badly needed in support of our armies at the front. In four or five months after these countries had been liberated, we were able to see them gradually take their place in the family of nations, sorely crippled to be sure and weak, but growing stronger every day.

In Germany the people were stunned by the terrific bombing and the rapid advance of our armies and the realization of the destruction of their country. Most of the population of the cities had fled to the countryside—thus millions of Germans as well as millions of displaced persons were uprooted. In spite of this chaotic condition in Germany, order was gradually restored. By the end of June over half of the displaced persons had been returned to their homes in liberated countries. The German people who were refugees from their own cities either gradually returned to their homes, or such parts of their homes as were standing, or they remained in the countryside.

From the military point of view therefore,

the civil part of the combat mission was accomplished in that at no time was the success of the military effort jeopardized by uprisings or disturbances in rear of our armies. The occupational phase of military government continues.

From a command and staff point of view the principal lessons to be derived from the Army's civilian experiences in northwest Europe are the following:

1. That civil affairs and military government are a command responsibility of all commanders who have zone of action or other area responsibility.

2. That since civilian problems should be the concern of nearly all special staff sections and services and large combat units, a general staff section is required to recommend policies and coordinate and supervise civilian matters within its commander's area of responsibility.

3. That the principal problem in populated areas is a supply problem involving food, medical, and other relief supplies.

4. That civilian supplies must be requisitioned, stored, and issued by the supply services.

5. That all staff sections and services should be assigned such part of the civilian responsibilities as are analogous to their other military functions.

6. That the field forces to perform local civilian functions, consisting of detachments of varying sizes, must be properly equipped and organized. They must be administered and controlled by some suitable parent organization such as a company headquarters and higher echelons if the number of detachments so justify. Without this hierarchy of administrative control, the hundreds of isolated detachments in Europe would have been helpless as the armed forces moved forward and left them behind. With such administrative control they could be rapidly moved where wanted and the individuals properly fed, clothed, paid, promoted, trans-

ferred, reclassified, and otherwise supervised. The value of the European Civil Affairs Division headquarters, with its regi-

mental and company headquarters, can hardly be overemphasized in its contribution to this problem in Europe.

Air Countermeasures Against V-2

Digested at the Command and General Staff School from an article in *The Fighting Forces* (Great Britain).

SOME indication may now be given of the countermeasures which were taken by the Royal Air Force against the V-2 attack on London and southern England.

For many months before the first V-2 fell on Britain on 8 September 1944, objectives associated with enemy preparations for rocket assaults were being attacked by RAF Bomber Command and the United States Eighth Air Force—and delay in development of the missile was undoubtedly caused by the Bomber Command raid on the V-weapon experimental station at Peenemunde in August 1943.

Meanwhile, the Germans took every precaution to prevent air attacks from interfering with the manufacture of the weapon. Components were produced in factories widely dispersed throughout the Reich, and plants manufacturing parts were located underground or in areas heavily defended by anti-aircraft guns. In several towns making components, including Berlin, Leipzig, Düsseldorf, Mannheim, and Friederichshafen, Bomber Command caused much devastation in a series of attacks onwards from 1943, when production of the weapon was to have begun.

The U.S. Eighth Air Force also delivered a number of attacks on component plants and chemical works, one of the most outstanding having been that of 24 August 1944, when Flying Fortresses almost entirely demolished a components plant near Weimar.

Originally, the enemy had made extensive plans to fire V-2's at London and southern England from occupied northern France.

When this territory was liberated by the Allied armies, he concentrated his rocket organization in Holland, mainly in the region of the Hague.

In order to reduce the severity of the attack, various countermeasures were undertaken. Storage depots, launching sites, headquarters buildings, and billets of the officers and men of the rocket organization, and lines of communications were, therefore, subjected to repeat air attack. Fighter-bomber squadrons of RAF Fighter Command made precision bombing and cannon and machine-gun attacks which were concentrated chiefly on storage and maintenance targets as well as on railways and roads leading to the launching zone from Germany.

The actual launching sites were most difficult to detect from the air. Unlike the flying-bomb ramps, they were not static; they were small and could be quickly set up on any convenient flat, hard surface. Moreover, they and the storage plants were in built-up or wooded areas and great care was taken by the enemy to give them effective camouflage. Heavy bombing attacks on launching sites so thoroughly concealed would have been impracticable, would not have prevented the enemy from establishing new sites in different locations, and, being in and near built-up areas, would have involved casualties among the Dutch people and destruction of property.

To assess accurately the full results of the air countermeasures is impracticable. It is certain that these measures achieved valuable results in reducing the scale of the enemy attack on Britain.

The Problems of a Division G-2

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Belgium, and Germany.

THE G-2 Report is the show window of the division G-2 section. Although the 1st Division started out according to the book, we developed over a period of time a report which was materially different in structure and content from that prescribed in the Field Manual. Working on the thesis that the report is only valuable in proportion to the amount it is read, it was found advisable to use trained writers to avoid the formal paragraphing of the prescribed form and to dress up the document with annexes which were not only instructive but also interesting and even entertaining. As the principal sales agency for intelligence, our daily report was made available to all unit commanders as soon as possible and was designed to give them the intelligence and information that they actually wanted.

We were fortunate in being able to lay hands on two professional writers, one from a metropolitan newspaper and the other from the *New Yorker* magazine. The presentation finally developed was first an accurate description of the operations for the preceding twenty-four hours in story form. This tended to cover both the "2" and the "3" side of the picture, but a close relationship with the "3" section avoided any rivalry difficulties. This material was of course interesting to all who had participated in the previous day's action, as naturally oneself is a main subject of interest to most people. It was found, however, that unit credits for actions had to be avoided, as the office was at one time regularly flooded each morning with protests that some unit or other was not credited and that another had not been mentioned by name for several days. By the discussion of the action in relation to place rather than unit this was avoided.

Following the description of the action of the previous twenty-four hours, a second section went into statistics on prisoners taken, tanks destroyed, and similar items including the weather forecast.

This was followed by enemy capabilities. It was found that a reverse presentation from that prescribed by the book was preferred by our readers. The reader wanted to know first of all what the G-2 believed to be the most likely enemy capability for the following day. Then other capabilities could be discussed, but it was apparent that the unit commanders were not interested in the one, two, three listing, that the enemy could attack, defend, or withdraw. Reader interest was found to be very much higher in the discussion form of presentation, than in the listing method.

Annexes to the G-2 Report were extensive and included a daily situation map. By exchanging periodics with some thirty divisions, corps, and armies, a wealth of anecdote and intelligence became available for extract; this was found to be of real interest when presented in small doses. Translations of pertinent captured documents and extracts from high-level estimates of the "big picture" were also popular items. The most interesting portion of the report, however, was the daily interrogation reports. By using a technique of having the interrogators report to a rewrite man and having him in turn write the report, it was possible to achieve instructive and entertaining material in the same document. It was unfortunate that we were unable to find an interrogator with a real mastery of the English language or a writer who could interrogate.

Surveys made of the reading of the report indicated that it was read from the back. First the interrogation report to find out what strange things had happened at the cage; then the bits and pieces from other documents and the translations of captured documents; then the capabilities; and finally the report proper.

The G-2 Report in most cases served to replace any need for formal estimates of the enemy situation, which were only prepared three or four times in ten months of con-

tinuous combat. These were prepared for major special operations such as the assault on the Normandy beach, the breakthrough from the peninsula, or the crossing of the Roer River. Normally, the special material was distributed as part of the periodic report or directly to the unit concerned.

Essential elements of information were usually handled directly with the collecting agencies. When included in estimates they were limited strictly to specific items of information that could be obtained by several units under command. The types of EEI [Essential Elements of Information] that were never used were those that read, "Will the enemy attack?—Will the enemy defend?—Will the enemy withdraw?" Similarly, intelligence prescribed for collection in the division SOP was not asked for again as EEI.

The G-2 Report was also found to play an important part in keeping higher and adjacent headquarters informed as to our activities. The corps commanders often personally read it in the mornings, and as a result its account of the previous day's action materially influenced plans for the division. This resulted in the division commander taking a personal and editorial interest in its contents, for it was desirable that higher commanders have the correct slant on the division action.

After the G-2 Report had achieved its wide reading and circulation throughout the division, it had to rebuff attempts to use it for too many extraneous purposes. Contributions came from many sources and in some cases had to be tactfully declined. It was found possible, however, to slip in surreptitiously some training material under the guise of telling what enemy units were doing in training for certain actions as compared to what we were doing.

The report had a circulation of approximately one hundred in and out of the division, including commanders of battalions, separate companies, and special units. Battalion commanders arranged to have company commanders read it in battalion command posts, and the coverage was as a result

very complete. Within the division itself one of the most popular features was the daily map. This was published as a map on overlay paper and not as a simple overlay. It could be read without reference to other maps or could be used as an overlay for more detailed checking. In this item the G-2 section limited itself strictly to enemy information to avoid any possible conflict with the G-3 overlay.

With as elaborate a report as that outlined above a special procedure was necessary. A small publication subsection was set up with one officer, a typist-stenographer, and a mimeograph operator. This subsection was responsible for the publication of all reports, the preparation of the annexes to the daily report, and the entire preparation of the monthly reports "after-action." An attempt was made to relieve this officer of any other duties, and it was found that his time was fully utilized in preparing the various publications. The report of the day's events was written by the night duty officer who also prepared the map, and the enemy capabilities were written by the G-2. Everything else was prepared by "Publications." By working up the annexes and similar material throughout the day it was possible to mimeograph the entire report by 0200 and make distribution by the first early-morning message-center run. Under favorable conditions, everyone from the army commander down had a copy for breakfast.

G-2 PERSONNEL

A major problem in G-2 operations within the division was the section organization and personnel. Four draftsmen, three stenographers, one typist, and one mimeograph operator, in addition to the chief clerk, were found to be a satisfactory enlisted staff for the section. That of course did not include the enlisted personnel of all the attached teams such as photo-interpreters, CIC [Counterintelligence Corps], language teams, and order-of-battle personnel. The operation of the section was based on three shifts within the twenty-four hour period, each shift made up of a duty officer, a stenographer, and a

draftsman. The extra draftsman did the special drafting jobs and handled the storage and distribution of maps and the endless odd assignments, as well as filling in for the duty draftsmen in emergencies. The typist was employed full time working for the publication subsection.

As normally neither the G-2 nor the assistant G-2 took the duty desk, it was necessary to utilize the officers from the various special teams to help with these shifts. The G-2 captain regularly took one of the shifts, the attached order-of-battle officer another, and the third shift, midnight to 0800, was rotated between the photo-interpretation officer, the CIC officer, and a liaison officer. In this manner the duty desk tour did not seriously hinder the specialist officers from doing their regular duties, and a replacement officer was always available in case of casualties.

As shifts changed, a generous overlap was arranged to provide time for meals and to permit the oncoming shift to get fully acquainted with the situation before taking over.

JOURNAL TECHNIQUE

Probably the most important single technique for the operation of the G-2 section was the journal system. All reports as received were typed into a continuous journal with distribution indicated therein. Telephone reports, which were by far the largest portion of the incoming reports, were copied into the journal verbatim, the duty stenographer taking them down in shorthand by means of a head set plugged into the duty officer's phone. The journal was typed in quintuplicate, and as each set of sheets was finished the first copy went into the journal book, the second to the General and Chief of Staff, the third to the G-3, the fourth to the liaison section, and the fifth to the duty draftsman, who plotted the material onto the map and then was supposed to pass his copy on to the G-4. In this way all key staff members were notified of developments immediately and automatically. The liaison officers had available all the information and could make further distribution if they saw fit.

In a similar manner the other staff sections made stenographic records of all conversations (this included the General and the Chief of Staff) and these were circulated within the staff. It was found that this system was almost airtight in keeping key personnel in touch with the tactical situation.

At the close of the twenty-four hour period the G-2 journal sheets were bound together with messages and the G-2 Reports from higher and adjacent units and became the record of the section. Portions of the outside reports were sometimes extracted into the journal sheets when it was felt that any of the staff might be interested.

The assistant G-2 who, in this type of organization, was not tied down to the duty desk, handled the administration of the section, being responsible for the activity of all the special teams. The total assigned and attached strength sometimes reached one hundred. He helped out the duty officer when he was overrun with work, handled the intelligence finances, supervised posting, worried about map distribution and air photos and preparation of reports, and pinch-hit for the G-2 in his absence.

The G-2 was thus left free for his primary duty of studying and understanding the tactical situation, advising the General, the Chief of Staff, and the G-3, and taking care of visitors from higher headquarters and adjacent units. He was also free to get out of the office when necessary for trips to the units of higher headquarters.

Of all the G-2 functions, probably the most interesting was the work with the G-3. Continuous personal contact, as stressed at Leavenworth, is the only possible solution for maintenance of an accurate and complete picture of the tactical situation. In the division we were fortunate in having G-3's who would cooperate fully, but if the situation had been different, it would have been up to the G-2 to go four-fifths of the way or farther. In the final analysis it was his job to make sure that the G-3, as the "operational compartment of the General's brain," knew all the essential elements of the enemy

situation. No matter how well everything else might run, if the G-2 failed in this respect he failed in his most important function, his only real reason for being there.

G-2 CONTACTS

The first problem, and the continuous problem of the division G-2 is the General, his boss. If he is fortunate enough, as we were in the 1st Division, to be on the staff of a commander who is already vitally interested in intelligence work, his battle is already half won. If not, he must at once set to work to gain the confidence and interest of his General.

It may be true that the G-2 is a compartment of the mind of the General, but generals place more confidence and have more interest in some parts of their minds than in others, and the G-2 has the job of making sure that "the boss" finds the "2" segment of his brain as interesting and active as any other.

Achieving this is not only part of his job—"keeping the division commander informed on the enemy situation"—but it also makes all the other functions of the G-2 far easier. If the General talks intelligence to the rest of his staff, to higher staffs and commanders, and to the regimental and battalion commanders, his apparent interest will greatly increase the cooperation that the G-2 always needs from everybody concerned. It is true that the G-2 must sell intelligence, but if the General is peddling the produce in spare moments, sales go up in an astonishing way.

Another problem in relationships concerns the unit G-2's and the unit commanders. In our division we found it advisable, and on the whole a successful policy, to sell ourselves as a service to unit commanders and S-2's. It was found that if we were able to give as much or more than we received from the lower units and to give special services on the side, we could count on getting what we wanted when we wanted it. Of course this policy has difficult moments, such as when a battalion commander calls for Scotch tape and grease pencils which he has been

unable to get through any channel. If, however, we could get him his tape, even when it meant sending a vehicle to an army dump and doing a little bargaining on the side, it paid in the long run. That battalion commander could then be counted on to perform the impossible when the occasion arose, and it usually did.

We did not find it necessary for the division G-2 to be continually visiting the units. A visit once a week to each regiment appeared to be about right. The regimental staff is busy in combat and does not want to see the G-2 unless he has something to say. This does not apply necessarily when out of contact, but on the Continent the number of days on which the division was out of contact were so few that no estimate on this is available from personal experience. This suggestion does not preclude the occasional evening "bull-session" with an S-2, but occasions for this in combat are also rather rare.

It was also found most advisable to maintain a close personal relationship with the three regimental commanders. This again is a matter of being willing to go more than half way. The G-2 profits from being able to do odd jobs for the regimental commander that he cannot get done elsewhere. Often the requests will be out of the G-2 field, but if "Joe" wants some local product of the country that the G-2 can get through his CIC or some other channel, it behooves him to get it. Then when things are hot and the S-2 is dog-tired and doesn't know, the G-2 can call up the regimental commander and find out just what is happening on the front of the 3d Battalion.

We found, however, that it was wise to stick to channels within the division in securing intelligence. The regimental S-2 does collect the intelligence from all parts of his combat team, and his evaluation is important. Likewise he should not be by-passed in disseminating intelligence to his units. He has, like the division G-2, the problem of selling himself to lower echelons, and what is given him is his bargaining material. The G-2 must build up the S-2 with everybody

including the regimental commander, for the S-2 is the G-2's main source of intelligence. Regimental commanders do not mind being told, even more than once, that their S-2's are good.

Another problem that a G-2 faces is the occasional attempt to divert S-2's into other work with the result that they do not have time to do their real job. That is when it is advisable to have the General available to point out that the intelligence function is important, and that although he doesn't care how it is done or who does it, he wants it done.

One detail that helps to prevent ruffled tempers is to make sure that the unit S-2's have informed their commanding officers of any intelligence which is being given immediately to the General. If the General phones the regimental commander, and it then develops that he has information about the regimental front that the regimental commander has not yet received, it may make the division commander pleased with his agency but it definitely does not build up good will with the regiment for the G-2.

HIGHER HEADQUARTERS

There is one way of certainly winning the cooperation of higher headquarters: give them a continuous flood of intelligence. This sounds harder than it was, for there always was something every hour or so that warranted a call to corps. As soon as the division can establish itself as a superior source of intelligence, then the battle with corps is won. The corps G-2 may think that personally the division G-2 is most obnoxious, but if the division is supplying him with floods of usable intelligence he will usually cooperate as best he can. It also helps if he knows that the division commander is keenly interested in the subject and is likely to discuss it with the corps commander. The obvious caution arrives here: the corps G-2 should never be told an item that the division commander does not already know about.

Nothing can do more to break down the happy relationship with corps than to have corps think that division is dealing direct

with army. It was our fate to go battling around from corps to corps but always to be in the same army. There was the obvious temptation to deal with army on things one wanted, but experience proved that, even in matters that would normally not be corps business, it was advisable to go through corps or at least clear with them before dealing direct with army. Corps normally wants to know everything that the division G-2 is up to and all his problems, and within reason he can be told without prejudice.

One of the greatest difficulties encountered by division G-2's on the Continent was getting documentary intelligence from higher headquarters promptly. As the 1st Division had a very close relationship with one of the British divisions, it was possible to check parallel distribution, and it was found that almost always documents from very high headquarters got to the British divisions days before they got to us. This of course did not apply to separate items of intelligence but only to high-level summaries and similar material. Whereas in our army a distribution of a SHAEF Summary went through successive headquarters, the British distributed direct, thus saving days and getting the information to the divisions while it was still "news." The same applies in a lesser degree to air photos. Adjoining British divisions were found on occasion to have recent cover that had not even reached the corps headquarters under which we were operating. It was found advisable in our case to establish very close contact with allied forces to get the most up-to-date high-level intelligence, and when possible, with the permission of corps, to establish liaison with the actual producing agency, no matter how many echelons were in between. This is a most difficult problem for the division G-2, but he must be willing to use whatever expedients are necessary to get for his commanding general the most recent intelligence.

A final aspect of the relationship with corps staff officers is the effect that it may have on the division commander. If division staff officers fight with the corps staff the reverberations may definitely hurt the divi-

sion commander. It behooves the division staff to maintain a sound relationship with corps, for corps staff officers influence their general who may attempt to take out any ill feeling on the division commander. We always found that corps staff officers would

cooperate if we met them half way and exercised a little patience. Despite the universal opinion of higher staffs held by all subordinate staffs, we found that corps wanted to win the war as much as we did. They were definitely on our side.

Soviet River Flotilla

Digested at the Command and General Staff School from an article by Lieutenant N. Lanin in *Information Bulletin*, Washington Embassy of USSR.

WHEN the Red Army began its famous Stalingrad offensive, the Dnieper Flotilla sailors started west. From the Volga the armored boats were conveyed by rail as far as Chernigov, the ancient Russian town located on the Desna. And in the autumn of 1943 the Flotilla began a campaign on fifteen rivers and numerous canals stretching for 2,000 kilometers, a drive which did not slacken until the fleet reached the heart of Germany.

From the Desna the ships were moved to the Dnieper. In the summer of 1944 the Flotilla distinguished itself in the battles for Bobruisk on the River Berezina, and for Luninets and Pinsk on the Pina. The detachments landed in the enemy rear disorganized the German defense line, while the ships' guns gave valuable support to the advancing Red Army units.

Winter found the sailors on the Vistula. In January the gunboats cooperated with the Red Army in reducing the enemy defenses before Warsaw. But then the front moved farther west and the Flotilla was left in an icebound river in the rear of Soviet troops. At this point it would seem that the war had ended for the Dnieper seamen, since the small rivers and canals joining the Vistula with the Oder were blocked by dozens of blown-up bridges and locks. It should have taken months to clear a route, but the

Dnieper sailors had their own views. They were confident they would get through to the Oder as successfully as they had to the Western Bug, where the crews had to push their ships through shallow waters for a distance of a hundred kilometers.

In early spring, the boats sailed with the ice down the Vistula to Bromberg, where the Bromberg Canal, blocked in thirty-six places by wrecked bridges, confronted them. Acting as sappers, they made passages for their ships by blowing up the wreckage. In some places they had to flood half of the compartments to allow the ships to pass under the demolished bridges. Overcoming all obstacles, the ships forged ahead and reached the Warta first and then the Oder, where they overtook the forward detachments of the Red Army and were just in time to take part in the general offensive against Berlin. And when the thousands of guns began to pound the German fortifications before the Nazi capital, the ships of the Flotilla did their share.

The Flotilla played a notable part in the Battle for Berlin. A detachment of marines captured Fuerstenberg, a strong pocket of resistance on the approaches to Berlin, and hoisted the Navy flag on one of the tallest buildings. The ships broke through under enemy fire to the canal of the Oder-Spree and carried a full infantry division across the river.

MILITARY NOTES

AROUND THE WORLD

GREAT BRITAIN

A Wall of Fire for Coast Defense:

After the fall of France in 1940, when Hitler was actually planning the invasion of Britain, a wall of fire was prepared around the island to cover the sea, the beaches, the cliffs, the roads, and the fields.



A great sea-flame barrier, fed by pipes into the Channel, was established, backed up by the Inshore Oil defenses, and by flame-throwing apparatus and tanks on land. Had the Germans set sail for England, their invasion craft would have gone up in fire and smoke before a single invader could have set foot on the shores.

The first picture above shows round patches of oil on the surface of the sea, the oil being projected into the sea from shore pipelines. The round patches will grow larger, until they form a continuous strip, when

they will be ignited. In the second picture the strip of sea parallel with the coast is ablaze, and the whole area is swept with



flame. Vital beaches from Kent down to Dorset were guarded in this manner.

(The Sphere, Great Britain)

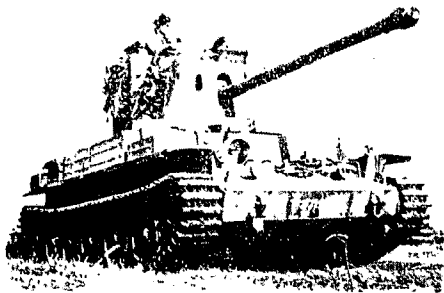
Automatic Landings:

Signal officials at the Air Technical Service Command in Europe have disclosed the development of an electric "brain" which synthesizes automatic pilots and instrument landing systems and will make it possible for air force pilots to bring their aircraft to within a foot of the runway without touching the controls. The "brain" guides the plane both vertically and laterally, changing its "mind" as often as necessary to make adjustments for wind currents and air pockets.

(Times Weekly Edition, London)

The Challenger Tank:

The British Challenger tank made its appearance in Holland in the autumn of 1944. It is an improvement on the Cromwell and is armed with a 17-pound gun and a



Browning. It has a speed of twenty-five miles per hour across country and carries a crew of five men.

(British Official Photo)

Skin Banks:

It is reported in the British medical journal *The Lancet* that Squadron Leader Mathews, a plastic surgeon in the RAF, has proved that skin can be stored and then used later to repair wounds.

The new treatment reduces the number of operations under anaesthetic at present undergone by badly burned airmen to one short one—when the skin is cut. Later, blood plasma is applied to the wound and thrombin—a “gluc” that takes the place of stitches—to the undersurface of the graft, which can be applied at the bedside without the use of an anaesthetic. In five experimental cases the skin grafts “took” after four days’ storage.

Skin storage would provide a “skin bank” in case the graft partially failed to take. It would also be available for experimental use in heterogeneous grafting on volunteers.

Skin that had been stored for twenty-one days was satisfactorily used in some cases.

(From a British source)

INDIA

Indian Military Academy:

The establishment of a military academy, on the lines of the United States Military Academy at West Point, for the education and basic training of future officers of the Royal Indian Navy, the Indian Army, and the Royal Indian Air Force, has been decided upon by the Government of India.

Education up to the university standard will be imparted at the academy and will embrace a comprehensive course in general subjects such as history, modern languages, science, and engineering, as well as in purely military subjects. Stress will be laid on the development of character, self-reliance, leadership, and self-discipline, which are regarded as essential qualities not only for officers in the armed forces but also for leaders in other spheres of national activity.

(*Indian Army Review*)

CHINA

Effect of Japanese Bombing:

China Air Force, the organ of the Commission on Aeronautical Affairs in Chungking, China, states that the Japanese bombing offensive failed against China. During the last three years, loss of life due to enemy action decreased considerably. In 1937, one hundred bombs dropped by the Japanese killed on an average thirty-five persons, wounded another fifteen, and damaged more than fifty-two buildings. In 1938, bombing was intensified. The number killed rose to more than thirty-nine per hundred bombs, over fifty-two were wounded, and at least 150 buildings were destroyed. The following year, deaths averaged forty-seven, wounded fifty-eight, and houses destroyed 229. From then onwards these figures decreased considerably. In 1944, on the average three people were killed, four were wounded, and six houses were destroyed for every

hundred bombs dropped. These figures refer only to bombing of towns and industrial areas and do not include battlefront casualties.

(*The Aeroplane, Great Britain*)

JAPAN

Jap Fleet:

According to information given to Admiral Nimitz by Japanese surrender envoys in Manila, the Japanese figures more than confirmed American estimates of damage done to Japan's fleet of 382 warships. They revealed that American reports had been too conservative.

For battleships, the crewless *Nagato*, heavily damaged by carrier planes, was still afloat at the Yokosuka naval base, but she was the only battleship remaining of twelve.

The *Hayataka*, at the Sasebo naval base on Kyushu, and the *Katsuragi*, at Kure on the Inland Sea, were both crewless and heavily damaged. They represented the remains of nine heavy carriers. There remained two light carriers, both mere hulls and crewless, of eight, and there were no light cruisers out of an original total of twenty-four.

In addition, of the 165 destroyers, there remained but twenty-six, four of these being heavily damaged.

The Jap Navy could boast of but twenty-two submarines, including six U-boats, out of an original 140.

The Japanese merchant fleet, once totaling more than 7,000,000 tons, had been reduced to 1,000,000 to 1,500,000 tons, counting all very small ships and a very few suitable for long voyages.

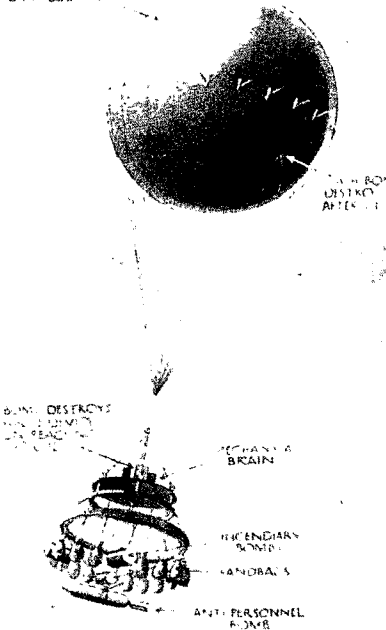
(*Army and Navy Journal*)

Bomb-Carrying Balloons:

Bomb-carrying balloons were launched from the Japanese home islands against the

West Coast of America—at least 4,000 miles away. The pilotless balloons were made of five layers of oiled paper and were thirty-four feet in diameter. When filled with hydrogen they rose to heights of between 25,000 and 35,000 feet, where they reached air currents which constantly travel from west to east. Each time they descended to

PILOON BAG
34 FT DIAMETER



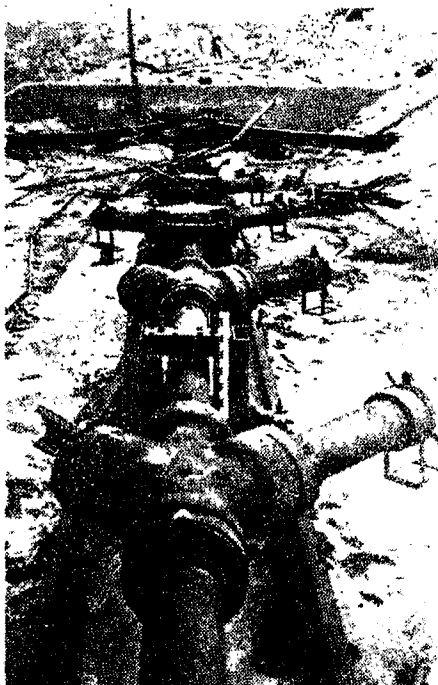
25,000 feet from loss of gas, a barometric pressure switch automatically dropped a sandbag, causing the balloon to rise again. A second automatic switch released a bomb. The balloon then went up again, then down, and another bomb was released, and so on as it traveled across the country. It was estimated that the balloons would take from eighty to 120 hours to reach America.

(*The Sphere, Great Britain*)

GERMANY

A Long-Range Weapon:

The pipes shown in the picture below were dug deep into the Channel cliffs by the Germans and were aligned on London. The tube is 400 feet long and has "booster"



chambers at intervals. It fires a fin-stabilized projectile ninety-two inches long and was credited with a range of eighty-two miles. This weapon was abandoned before being put into use.

(*The Times*, London)

U-Boat Offensive that Never Happened:

Evidence that a tremendous U-boat offensive might have been launched by Germany in the latter half of 1945 was noted by observers examining the construction yards in Bremen and Hamburg. Dozens of partly assembled U-boats still stood on the

slips. The U-boats were all of the prefabricated type but of particularly strong construction.

In Hamburg there was a half-mile stretch of docks where prefabricated sections stood four and sometimes seven deep. The hull forms came in at one end and were fitted up as they moved along. The completed sections had every pipe and valve in place, while the midship sections were completely wired. The strength of the structures was impressive. They were stiffened by outside beams at least six inches deep while the hull plating was at least half an inch thick. The pressure hulls were extremely strong to withstand depth-charge attacks. Though prefabricated, these new U-boats would have been much tougher adversaries than their predecessors.

(From a British source)

German War Secrets:

Besides an atomic bomb, on which, as has been made known, the Germans had made considerable progress, German scientists and engineers had developed a defense against radar and experimented on piloted rocket missiles that, it was thought, would be capable of crossing the Atlantic in seventeen minutes. These and many other German war secrets were disclosed by the Office of War Information.

The defense against radar was a system of radar camouflage consisting of antiradar coverings and coatings. It would be employed, presumably, on submarines and other weapons.

The Germans contemplated a piloted missile with a possible range of 3,000 miles, and they were working on a formula for new war gases that they hoped would prove more deadly than any yet developed.

They had found new uses for many staples. From coal the Germans were making a synthetic butter as well as alcohol of both beverage and industrial types, aviation lubricants, soap, and gasoline.

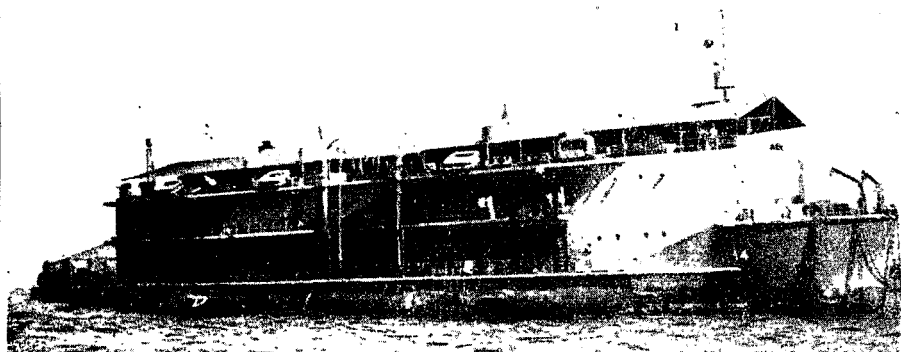
(From a news release)

UNITED STATES

Seabee Floating Hotel:

Proudly named the "Ritz Carlton," this floating hotel houses more than 600 Seabees stationed at one of the bases operated by

propelled, the USS *Ritz Carlton* is one of several hotels-on-hulls maintained by the Navy in the Pacific, containing nearly all the conveniences of a modern hostelry—in-



Squadron 10 of the Pacific Fleet Service Force, transferring and loading ammunition and supplies to and from ships. Not self-

cluding one they do not have, a movie auditorium, but excluding a cocktail lounge. (Official U.S. Navy Photo)

New Weapons:

The Army has disclosed a number of its ultranew weapons, some of them so new that they have not yet gone into production.

1. The Army's largest mobile antiaircraft gun using fixed ammunition, the 105-mm weapon. It weighs 46,000 pounds, has a muzzle velocity of 3,000 feet a second, and can send its shells to 46,000 feet. The gun can be controlled manually or by the T38 antiaircraft director.

2. A 10-inch mortar with a range of more than five miles and a firing rate of a round every two minutes.

3. The 8-inch, 41-ton howitzer with a range of 18,500 yards mounted on an M4 tank chassis.

4. The 155-mm "Long Tom" gun tube mounted on an M4 tank chassis. This weapon fires a 95-pound shell to a range of 25,400 yards and is operated by a crew of eight men.

5. The new 43-ton M26 General Pershing tank with a long-barreled 90-mm gun firing a shell with a muzzle velocity of 3,750 feet a second which can penetrate fourteen inches of armor at 300 yards.

6. A 90-mm antitank gun that can defeat armor eight inches thick and destroy a Panther-type tank at six and a quarter miles.

7. Radar antiaircraft-detection sets that can spot an airplane 120 miles away.

8. A radio detonator that will fire mines by remote control as far as twenty miles away, on land or sea, by dialing a combination as in making a telephone call.

9. A floating bridge of hollow aluminum beams so light they can be placed by hand and so strong they will support fifty tons.

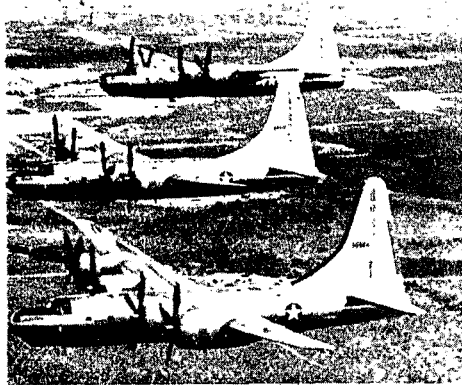
10. An electronically operated locator for keeping antiaircraft searchlights automatically trained on enemy planes.

(Army Ordnance)

The B-32 Bomber:

The Army Air Forces' new B-32—originally called the "Dominator"—is a heavy, high-wing, long-range bomber with four double-row, 18-cylinder, Wright Cyclone R-3350 engines, each producing in excess of 2,200 horsepower.

The two inboard powerplants are equipped with reversible Curtiss electric propellers,



largest on any production plane, which make it possible to land in less than 1,500 feet with 110,000 pounds gross, on the same runways used by Fortresses and Liberators.

Use of artificially aged and stretched aluminum alloy saved over 4,000 pounds per plane.

The B-32 fuselage is cylindrical or cigar-shaped and carries a normal crew of eight.

The airplane is designed for a normal gross weight of approximately 110,000 pounds with alternate gross weights of over 120,000 pounds.

Wing spread (span), 135 feet; length, 83 feet, 1 inch; height, 32 feet, 2 inches, in taxi position.

(Aviation News. U.S. Army Air Forces photo.)

A Bridge Built Backwards:

Nazi mortar and artillery fire was upsetting the plans of two Army Engineer units of the Ninth U.S. Army on the west bank of the Rhine. The assignment was to rush a floating Treadway bridge across the river in support of Ninth Army assault troops who had just breached the German defenses.

The western shore was smothered under enemy fire, and it was decided to reverse the bridge-building process. The engineers assembled sections of the bridge downstream, floated them across the river, and built the bridge backwards—that is, from the east bank to the west.

Methodical German artillery, zeroed in on what was to be the western approach to the bridge site, kept the shells soaring harmlessly over the heads of the engineers pushing their bridge out from the opposite side.

By the time the engineers approached the Rhine's west bank with their 1,095-foot bridge, all enemy artillery fire had been removed by the Allied advance inland.

(The Military Engineer)

UNITED NATIONS

Allied Forces In Italy:

Details of Allied divisions in action on the Italian front from the fall of Rome, 4 June 1944, to VE-day have been issued.

In June 1944 there were fourteen United Kingdom and Empire divisions of which seven were United Kingdom, three Indian, two Canadian, one New Zealand, and one South African. The other Allied divisions totaled fifteen: eight American, four French, two Polish, and one Italian gruppo (less than one division).

By VE-day there were eight United Kingdom and Empire divisions still in Italy—four British, two Indian, one New Zealand, and one South African. There were seven American divisions, two Polish divisions, one Brazilian division, and five Italian gruppi (equivalent approximately to three divisions).

(From a British source)

FOREIGN MILITARY DIGESTS

Medical Aspects of Air-Landing Operations in the East

Digested at the Command and General Staff School from an article by
Major H. Pozner in the *Journal of the Royal Army
Medical Corps* (Great Britain) May 1945.

THE spectacular progress of logistics in global warfare has materially affected the organization of the medical services in the field. This is very apparent in the eastern theaters of war where a campaign in all its complexities may be likened to the ripples of disturbance created by a stone thrown into a pool, the concentric circles representing alternating formations of friend and enemy.

Wherever there are combatants it is axiomatic that there must be the spearheads of the medical services, capable of functioning adequately as self-contained units. In consequence, the problems of medical equipment, maintenance, and evacuation have assumed a much wider scope and significance. In the interim between the two World Wars, the concept of the basic field medical unit, the Field Ambulance, was that of a cumbersome organization, inadequately mechanized and heavily laden with ordnance and medical equipment, suitable only for static trench warfare and incapable of fulfilling its role in a hard war of rapid movement. Parallel with the development of sea- and air-landing forces and the formation of long-range deep penetration patrols, there was a necessary progressive modification of medical establishments, until finally in the organization of the parachute medical units was realized the optimum compromise between compactness and utility.

The importance of such advances cannot be overstressed, since ultimately all these efforts at an efficient reorganization tend towards the removal of any undue time lag between the moment the soldier is wounded and his reception into an adequate treatment unit, with a resultant diminution in manpower wastage. In Southeast Asia where there is no formal battle front and a campaign may consist of a series of isolated actions, a successful conclusion is influenced by two main factors. The lines of communication are long, uncertain, and vulnerable to weather and enemy infiltration, and the constant vectors of disease may devitalize and eventually immobilize an army. Consequently, an air-transported medical organization, independent of land routes and capable of being rapidly switched to sectors where disease or battle casualties necessitate medical reinforcements, assumes an increasingly greater importance.

The use of air-transported forces in an operational role implies fundamentally a priority in transport of essential equipment and personnel.

The nature of the equipment is governed by the scope of the operation and the types and numbers of aircraft available, and the economy in personnel is compensated for by a much higher standard of training in which every man can be used as a specialist in various capacities. This principle,

together with those of distribution, tactical loading, and duplication, form the basic problems for all arms. Only operational experience can determine what a unit commander will prefer to take in the initial assault landings, but it is certain that medical detachments must be included in the first wave.

Aircraft loads, standard for men and equipment, are highly desirable since this ensures an even distribution of the essential stores and, in the eventuality of an aircraft being lost, the functioning efficiency of the medical unit as a whole will not be seriously impaired. Tactical loading implies that the personnel of each aircraft are capable of functioning immediately on landing as a medical or medical-auxiliary subunit. With this object in view, men skilled in first aid, nursing, and resuscitation, together with such basic equipment as stretchers, blankets, lanterns, and picks and shovels, are allotted as far as possible to each aircraft. The policy of attaching Medical Corps personnel to combatant units so that they become an integral part of the air-landing battalion group is one to be recommended and encouraged.

The air portability of motor transport suitable for medical purposes has provided many problems in modification. With the resources available, it is considered that the most useful vehicles are the jeep car and the jeep trailer. A great deal of ingenuity has been shown in the conversion of these into ambulances and stretcher carriers. A jeep car can carry three stretcher cases, can be loaded into the C-47 and Hadrian glider, and is invaluable over jungle terrain. The limitations in aircraft, freight, and space preclude the transport of motor vehicles in the maximum requisite numbers, and therefore the use of animal transport has also to be considered in detail. In no case of air-landing operations in jungle warfare can the availability or effective employment of motor transport be absolutely guaranteed. This, then, must result in modifications in the existing methods of carrying equipment. It is necessary that all the essential equip-

ment should be capable of being transported in man-packs, each weighing about twenty pounds, and all developmental work on equipment must be governed by the three criteria of lightness, portability, and durability.

The original conception of air-landing troops was that they would be used as an assault force to take and consolidate the region of the landing zone until contact had been established with relieving forces, and lines of communication, both by air and land, secured. In practice this has not always been realized, and the medical units of an air-transported force must be prepared to collect, treat, and accommodate casualties for an indefinite period. The casualties incurred in the initial landing operations must be demarcated from those due to the subsequent action, and here there appears a division of medical responsibility. Those medical units which are parts of the advancing combatant formations can only afford, within their limited resources, to take care of casualties from the offensive spearhead. After the first wave, certain formations with medical detachments have the sole function of occupying and maintaining the landing area, and thence is the responsibility of collecting the casualties from the actual landings, and later on of receiving and evacuating the casualties from the advanced medical units.

The problem of suitable hospital accommodation in this theater, unlike that of Europe, is acute. The answer to this appears to be the air-portable, prefabricated medical hut of which several satisfactory designs have already originated from the U.S.A.

The commitments of a medical unit in action daily become greater as the battle passes from the initial assault through the peak period to the phase of static warfare where there is a constant small intake of casualties. Parachute supply is often the only way of maintaining isolated formations. The obvious decision in the question of the maintenance of medical units is that there must be a standard second-line supply drop, which will consist of surgical, medical,

hygiene, and comfort packs, together with replenishments for heating and lighting sets. These supplies can be dropped in panniers, special containers, and bundles automatically each day and can be used to build up a reserve for the stage when the demands on the medical unit are suddenly increased. This method of maintenance is considered to be desirable except in the case of blood and blood-plasma.

The final problem of medical administration is the evacuation of casualties. The ideal is to have air evacuation bases as far forward as possible, and for this many varieties of aircraft have been pressed into service. The standard casualty evacuation aircraft in the Fourteenth Army is the C-47 (Dakota) and this proved to be invaluable as a medical maid-of-all-work. The C-46 (Commando) has a larger capacity, but its numbers are limited. Light American aircraft of the types L1 and L5 are used well up where there are short, rapidly constructed emergency landing strips, but from experience it is found that the great drawback to this undoubtedly valuable means of evacuation is the extremely limited accommodation for stretcher cases. Gliders have also been used, and now that the procedure of "snatching" glider ambulances from jungle air strips, inaccessible to powered aircraft, is being rapidly developed, the potentialities of glider evacuation have become considerably increased. Helicopters, although extremely vulnerable to enemy attack and possessing a small passenger capacity, can and have been used by the Allied deep-penetration columns with advantage in special circumstances. And lastly, the flying boat has its own special niche in the coordinated scheme of air evacuation, a role which was admirably demonstrated during the recent campaigns in the interior of Burma.

The training of ambulance personnel in the loading of casualties into aircraft has become a necessary and specialized function. Rapid, efficient loading is essential not only because of the necessity of clearing the aircraft from a strip in the forward zone where

enemy attack is possible, but also because the effect of the tropical sun's rays on the fuselage of a stationary aircraft renders the interior uncomfortably warm and humid, a state which when unduly prolonged can have only a deleterious effect on wounded personnel.

The medical problems peculiar to forces operating in the Far East are intensified in the case of air-transported troops, who must be prepared to live in a most insalubrious environment and fight in isolated detachments with the minimum of medical aid and without the advantages of a fixed line of evacuation with its chain of treatment centers. It is essential, therefore, that every individual of an airborne formation should have a reasonable practicable knowledge of first aid and medical prophylaxis. Malaria, dysentery, heat exhaustion, fatigue, unbalanced or restricted diet, and water deficiency are the main factors which affect the health and so directly the effectiveness of a combatant unit.

Troops used in air-landing operations should be temperamentally and organically sound, and it has been ably demonstrated by the late General Wingate that second-line troops of a low medical category can be raised to an exceedingly high standard of physical fitness and morale by a carefully graduated scheme of training, making demands not only on a soldier's endurance but also on his intelligence and powers of appreciation. The more specific problem is the prevention of air-sickness, and a number of investigations concerning this have been carried out on air crews and airborne personnel. The final conclusion appears to be that air-sickness may be activated by a variety of factors, organic, environmental, and psychological, most of which are but vaguely understood.

The demands of war have given the greatest impetus to the progress of air transportation, and its potentialities for the future are vast. In any scheme of postwar reconstruction there must surely be a place for an air-transported medical organization, bringing the remotest corners of the globe in

contact with the latest advances in skilled medical and surgical aid. War has provided the blueprint and the experience, and an

international air medical service may well prove to be a most potent weapon in the unending battle against disease and disaster.

Infantry Division in Attack

Translated and digested at the Command and General Staff School from Russian articles by Brigadier General G. Panchenko in *Krasnaya Zvezda* (Red Star) 13 and 14 June 1945.

THIS article is based on my personal combat experience as a commander of an infantry division, and deals with a number of problems concerning the organization of offensive operations.

As a general rule, the breakthrough is carried out at a high tempo. Within a day or two, the attacking force succeeds in overcoming strongly fortified enemy defenses to a depth of from eight to ten or more kilometers. This speed is a result of thoroughness in the organization of such operations and of the ability of the commander to create an overwhelming superiority of forces and matériel in the direction of main effort. Superiority in forces and thorough organization of cooperation of all arms make it possible to deliver a powerful initial blow and to keep on strengthening it steadily through the entire operation.

As soon as the commander's preliminary decision is made, the main points of cooperation are then decided upon. In the assigned zone, the division commander selects the direction of main effort. This is usually a narrow sector on one of the flanks or in the center of the battle formation. *An overwhelming number of reinforcing weapons is concentrated in this direction, and this is the most important principle of the disposition of forces from high to low echelons. It is the basis of the organization of cooperation.*

Disposition of forces is closely connected with the establishment of coordinated action of all arms, which is the essence of cooperation. Every unit and arm must know exactly what to do, where to do it, and when.

All problems of coordination are solved during the command reconnaissance. If poorly

conceived and organized, or carried out without any preliminary reconnaissance, it will fail to bring about the desired cooperation and coordination in the work of the various arms.

The plan of reconnaissance, the selection of combat groups and of observation points, the place and time of the meeting of the division commander with his regimental commanders—all this is thought over and considered beforehand. The great quantity of matériel used in the infantry attack can be advantageously employed only when the preliminary work done by the officers of the various arms is thoroughly organized.

In one of our operations our division with an attached tank regiment had 524 guns and 114 mortars. The main-attack zone was an extremely narrow sector, about 500 meters wide. The mission called for seizing three enemy trenches following the clearing of the mine fields and wire entanglements in front of the position. A strongly fortified hill was also to be taken by the regiment making the main attack. The height was to be shelled by 220 guns and mortars. The division zone was about two kilometers. Consequently, there were 300 or more pieces per kilometer of the front. During the command reconnaissance preceding the attack, it was decided to support the infantry with a double moving barrage to a depth of one and a half kilometers. Six phase lines were designated. The location of these lines was determined in the field and the fire means for laying down the barrages were also decided upon there. The artillery preparation was worked out literally to the nearest meter of space and second of time. Each company was assigned a path through the obstacles, and it was indicated

who was to destroy the obstacles, where, and when. Each infantry battalion knew who was to take care of this destruction and where. All the targets were assigned and studied beforehand. The artillery was to fire mainly on the targets located within the main line of resistance and areas immediately beyond it. The 82-mm mortars were to shell the first two trenches; the heavier pieces, all of them. Almost eighty guns for direct firing, each hitting its own target, were to fire in the decisive direction. The participation of the organic and supporting artillery in the general artillery preparation, the increase of the fire in the last few minutes preceding the assault, the creation of the moving barrage, the regrouping of forces preceding the assault, and the commitment of the second echelon, all these measures were decided upon during the command reconnaissance.

Experience shows how important it is, in the organization of cooperative action, to foresee the employment of reinforcing weapons for repelling enemy counterattacks. The commander must study all directions of possible counterattacks and instruct his troops accordingly. All possible variations in the development of the battle must also be considered. The first trench, for example, may be captured during the reconnaissance in force and become the starting line from which the infantry will launch its assault; or a secondary attack may turn into the main effort and call for a regrouping of the forces. Thus, one should try to foresee and consider all probable activities of all the units in the division zone of action throughout the entire depth of the mission.

Upon completion of the planning the commander and his staff supervise the execution of the plan. Have the troops occupied their positions as planned? Are the guns situated in designated areas? Are the tanks pulled up forward? In short, the execution of the plan is scrutinized to the smallest detail.

In practice, it is sometimes advantageous to make the main attack through a sector where the terrain does not permit of the

employment of large forces and where the enemy least expects it. The following example will confirm this statement and illustrate some of the organizational problems discussed above.

Our forces had forced a large water barrier and had established two bridgeheads, one of them spacious and more suitable for continuing the attack than the other. The employment of tanks in a breakthrough from the smaller bridgehead was impossible. The enemy, therefore, had disposed his reserve in the vicinity of the larger one. Our command, however, decided to make the main attack from the small bridgehead for the very reason that the enemy did not expect it from that point. The Nth Infantry Corps was to make the main attack.

The Germans occupied defensive positions on the west side of the river (see sketch). The first position consisted of two trenches with a system of antipersonnel obstacles, and included a village. A line of separate houses to the south had been transformed into machine-gun nests. Still farther to the south was a grove. The village was located on a hill with very steep eastern slopes and somewhat less steep southern slopes. The second position was also composed of two trenches protecting Hills 186 and 202.

The bulk of the German artillery was in position in the vicinity of the hills or about five kilometers from the main line of resistance. The third position was about seven kilometers farther to the west. The average depth of the defense zone was twelve kilometers.

The left flank of the corps was to make the main attack. Its commander was anxious to avoid fighting for the village, which was the strongest center of resistance the enemy possessed. Also, since the slopes of the hill were not so steep farther to the south, an opportunity was afforded there for displacing the artillery forward at that point more rapidly when the battle developed in the depth of the position.

The corps attacked in two echelons, the first of which was composed of two divi-

sions. The left-flank division was given a zone of action of only 1,500 meters in breadth. The second-echelon division was also to be used for the main attack. The supporting weapons were distributed accordingly. The direct-support tanks, as stated above, did not take part in the breakthrough, but there was an enormous concentration of artillery and aviation. The corps had at its disposal twenty-two regiments of artillery, twelve of which were intended to support the left-flank division making the main attack.

The battle formation of this division consisted of two regiments in the first and one regiment in the second echelon. The division was assigned as its first mission the capture of the first two positions, and as its final mission the capture of the rear position, all within its own zone of action, of course.

The enemy opposed the division with about a regiment of infantry and was able to concentrate powerful artillery fire in the zone of action of the division, using the artillery from other sectors.

The division making the main attack, with the exception of the supporting artillery units, made use, during the period of artillery preparation, of all the guns and mortars of the corps' second echelon. In its turn, the second-echelon regiment also moved its artillery and mortars forward to support the first echelon.

Altogether, on one kilometer of front there were concentrated an average of 300 guns. In the zone of action of the left-flank division, there were some 150 guns using direct laying only.

The artillery preparation lasted an hour and forty-five minutes. The infantry sprang up two minutes before the end of the artillery preparation, captured the first trench, and then, advancing back of a curtain of fire, seized the second trench. Within forty minutes, the first position was in our hands.

The success of the action in the rear of the defensive position depends, to a large extent, on how efficiently the decentralization of the artillery means proceeds when

the attacking infantry breaks into the main line of resistance. It is very important that the infantry have at their disposal not only 45- and 76-mm guns, but also large-caliber gun for destroying by direct firing powerful weapon emplacements in the subsequent positions and for repelling counterattacks.

The process of decentralization is a complicated one and depends, of course, on the preparation and on how accurately the various officers are aware of who accompanies whom, when to displace forward, etc. Antitank artillery regiments assigned to first echelons, and regimental artillery must displace forward immediately upon taking the first objective. This was the case in the given example.

The first echelon of the division met with serious resistance when it emerged from the western and southern edges of the grove. It is characteristic that the enemy artillery in the zone of the division was already so hard hit that only one or two of its batteries were able to fire.

Our artillery at this time was shelling the second position. But the first echelon was counterattacked by the German infantry from the zone of action of our neighbor on the left. They opened heavy artillery and mortar fire. In the breakthrough plan the possibility of such a counterattack had been foreseen, and in anticipation of it the division commander had adopted measures to prevent the regimental and antitank artillery from falling behind the infantry. In addition to this, the regiment was also protected by self-propelled guns—this also having been planned in advance.

The enemy undertook his counterattack just at the moment when our infantry was beginning to dig in on the edge of the grove. The division commander then committed all the artillery remaining in his hands. Along with this, the self-propelled units and heavy machine guns were also used to repel the counterattack.

The battle on the edge of the grove lasted an hour and a half. Following this, definite success was obtained on the right flank,

in the zone of action of the division making the holding attack. It broke into the second position. This expedited the destruction of the counterattacking group and the seizure of the second position in the zone of action of the left-flank division. Its infantry, having taken the trenches, began approaching Hill 186.

The division commander committed the second-echelon regiment. The regiment was to execute a turning movement on the south, around the German infantry group entrenched on the hill. All our artillery, including division artillery which had completed its displacement, laid down its fire on the German trenches. The infantry then attacked and mopped up the hill, and soon reached the area occupied by the main German artillery groups. They found only the wreckage of the enemy guns, these having been destroyed during the period of artillery and aerial preparation.

By this time the situation was as follows: The left-flank division had taken Hill 186 and was beginning to move forward toward the rear enemy position. It was not meeting with any resistance on the part of the enemy infantry, but was under fire from the zone of action of the neighboring unit on the left and under the long-range artillery fire coming from the area beyond the rear trenches.

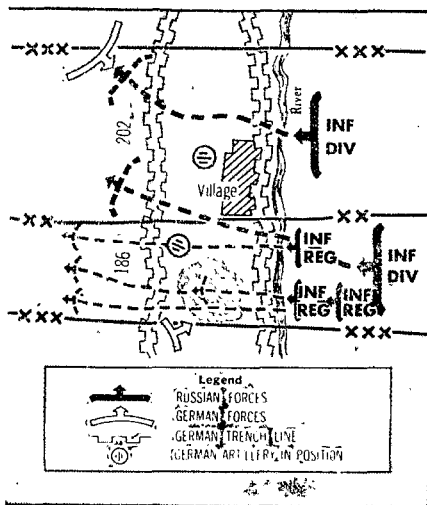
The right-flank division had taken the second position and was moving toward Hill 202. The corps as a whole had advanced farther west than its neighbor. Taking advantage of this, the Germans attempted to counterattack from the northwest.

The corps commander was obliged to make considerable corrections in his original plan of the employment of the second-echelon division. The right-flank division repelled a powerful counterattack and was now facing to the northwest. A gap had developed between it and the left-flank division. This interval was filled in by the second-echelon division.

As darkness began to come on, the second counterattacking group, too, was annihilated with the help of artillery and aviation. The division making the main

attack began displacing all its artillery forward to support the attack which was scheduled for daybreak of the following day.

The attack on the rear line began at 0800,



and at 1400 an armored corps was committed in the zone of action of the left-flank division. The division artillery was now in support of the tanks. Then began the next stage of the operation, vigorous pursuit.

The tempo of the breakthrough operation in the given case, as well as in many others, played a decisive role. Already on the second day of the battle, the German position was breached. Had it not been for this tempo, the Germans would have succeeded in bringing their operational reserve to the area of our smaller bridgehead. This tempo was attained because we had made our main attack in a sector where it was not expected by the enemy. It was also due to the excellent cooperation between the infantry and artillery, and, later, between artillery and armored forces. The basis of the success of this cooperation was the effectiveness of the preparation and the thorough planning and execution of the various phases of the battle.

Future of the British Army

Digested at the Command and General Staff School from an article by Cyril Falls in *The Illustrated London News* 14 July 1945.

FOR some time after the Armistice of 1918 we maintained a respectable army on the Rhine, which was, so to speak, our shop window in Europe. All our goods, however, were in that window, and there was little on the shelves. The Army gradually dwindled till it dropped far below the strength of that of 1914. Its establishment was reduced, but what was more disquieting, all efforts failed to keep it up to establishment, and this weakness actually became greater as the danger in Europe grew. It is worth noting, too, that this state of affairs brought in its train a disadvantage, apart from purely material lack of strength. Other nations fell into the belief that our weakness was moral also, that we were not prepared to make sacrifices in the cause of peace and security. Otherwise, they argued, we should surely have adopted some form of universal national service, however mild. From that point of view, Mr. Hore-Belisha's introduction of conscription was beneficial, even though it came so late, and though the experts of the German General Staff must have realized that, since we lacked equipment and even the power to produce it at the time, it would not increase our strength in the immediate future. It did, at least, forecast increased power and the will to use it. At the same time was witnessed the paradox that those who advocated the most adventurous policy in the various crises were also those who most strenuously opposed rearmament.

Today, once again, we are saying that affairs must never be allowed to drift until we find ourselves in the situation of the days of the remilitarization of the Rhineland, of Abyssinia, of Munich. And once again we are not quite sure how to set about the process of preventing a recurrence of this evil. It is true that our strength is assured for the time being. We must, however, direct our gaze to a more distant future, to the security of the

United Kingdom, the Dominions and Colonies, and the bases on the sea and air routes which link them.

I myself have come to the conclusion, not without a certain reluctance, that there can be no adequate substitute for compulsory national service during the next generation. I am not less certain that it alone will not suffice for our needs and that a professional Army will also be required. A nation with such important and distant commitments as we have to undertake cannot carry out its imperial defense and imperial policing with young conscripts serving for eighteen months at the maximum. It needs also troops who are more seasoned and who are available for longer spells of duty. We also have, however, and shall have for a long time to come, an important commitment nearer home, the military occupation of the zone allotted to our forces on the Continent, and for that the young soldiers of a national service army would not be unsuitable. They would also be presented with far better opportunities for training than would be afforded by these small, thickly populated, and highly cultivated islands. The Army Education Scheme for the release period, one of the most broadminded and promising projects for adult education on a large scale which has ever been put forward, would apply to them. The physical, mental, and moral advantages which accompany modern military training of the type instituted in this country by men such as Field Marshals Brooke and Alexander, and Generals Paget and Thorne, are universally admitted. We should have at our disposal the strength we needed, and the world would recognize that we were prepared to make sacrifices in order to secure peace and safety.

If we had the foundation of this national service army, mainly in our own country and in Germany, the professional foreign service army would not require to be large.

It could be garrisoned in two main blocks, the Middle East, which is of vital importance to our communications and the most suitable station for a strategic reserve, and the Far East. The latter would mean India and Malaya, assuming that the new India which will emerge under a new constitution recognized the need for British aid and participation in her defense.

The pay of the professional foreign service army, the prospects, the amenities, would have to be such as to attract volunteers, and volunteers of good type. Officers should continue to be drawn from the ranks, so that any intelligent, keen, and well-educated soldier might hope to attain a commission. Officers themselves should be afforded a more spacious life than was their lot before the war. It was not either through accident or snobbery that so many officers who attained distinction during the war were men who possessed considerable private means, which had broadened their minds and afforded them knowledge of the world through travel and social intercourse. The really brilliant man, it may be said, will make his way without a penny, and some did. It was none the less the case that many good men became cramped in their outlook and "flat-footed" through living circumscribed lives because they had not the resources to do otherwise. A great deal of local labor would have to be hired in order to avoid making the Army do its own housekeeping to an excessive extent, which is demoralizing to the troops and harmful to their efficiency. The postwar Army cannot be run on the cheap. At the same time, it would be folly to start it on a scale which there was no prospect of maintaining. It is certain that considerations of economy, which have been silenced during the war years, will make their voice heard again and that all expenditure will be closely scrutinized.

It is probable that the great Dominions will be prepared in the future to play a greater part than before the war in garrisoning stations which concern them, and today such stations may be far distant from

their own territory. They have recently not only undergone danger—that of Australia having been particularly acute—but have also been forced to realize how small an area this globe has become when measured by the range of the weapons already used or easily developed. They have observed, too, that even the range of these weapons is not more remarkable than their destructive power, so that the whole world's artificial installations and agglomerations of buildings are imperiled by them. Even agricultural populations might be menaced by slightly different weapons which would blast their crops and destroy the fodder of their livestock. Leaving Europe out of the question, New Zealand, Canada, even South Africa, and, of course, most of all Australia, have a deep interest in assuring the world from any recrudescence of aggression on the part of Japan. This state of affairs, no less than the improvement of communications, should bring the armed forces of the British Commonwealth of Nations into closer touch both physically and morally.

One risk must be avoided at all costs. Even sound military planners are only too much inclined to envisage an armed force as static in its composition, organization, training, and equipment, as a goal to be attained by careful preparation, after which it becomes as nearly perfect as possible and can thereafter be maintained at that level. This is a false conception, especially for the British Empire, which must in any circumstances take time to concentrate its strength and possesses better chances than most Powers of putting the final touches to its military preparations after the nature of the danger which it has to face has become apparent. An army, and other armed forces, too, must continually develop, and not even the strongest nations, or those which devote the greatest proportion of their resources to the means of fighting, can hope to possess in time of peace the strength or even the type of armed forces which they require in war. It is far better to be a little weaker materially, with good prospects of

expansion, then a little stronger at the moment, with bad prospects of development. Hence the necessity for research organizations, for scientific machinery, which should be kept up to date even more than the actual equipment of the fighting services. I have spoken here only of the Army

of the future, but the supreme lesson of all is the need for the coordination and integration of all the services. We need coordination in breadth—that is, all over the Empire; and also in depth—that is, right through the armed forces at home and abroad.

The Aerial Battle of Berlin

Translated and digested at the Command and General Staff School from a Russian article by Colonel N. Denisov and Major S. Rybakov in *Krasnaia Zvezda* (Red Star) 20 May 1945.

FROM the very first day of the offensive from the Oder River bridgeheads up to the last battles in the city streets, the Soviet aircraft had pounded the Germans by massed and concentrated blows in the air and on the ground. The aerial battle of Berlin was one of the last operations of the Soviet Air Force. Having established its unchallenged domination in the air, it broke the enemy's resistance and routed the remnants of the German aircraft.

Our fliers faced the German Sixth Air Force, such elite units as the corps of anti-aircraft defense of Berlin and Central Germany, and special German ace squadrons such as "Udet," "Göring," "Hindenburg," etc. Furthermore, to fight the attacking Red Army, the enemy committed units equipped with the latest innovations of aviation technique.

The basic type of the jet-propelled plane used by the Germans was the Me 262, a high-speed twin engine fighter-interceptor. The aerial combat with Me 262 was based on the principle of maximum exploitation of the armament of our planes. Every jet-propelled plane was taken under the fire of several of our fighters immediately after its detection, and this called unquestionably for a definite battle formation for our aerial patrols.

Another innovation widely used by the Germans was the "plane-bomb." It was composed of a bomber and a fighter coupled together. In some cases the bomb in the

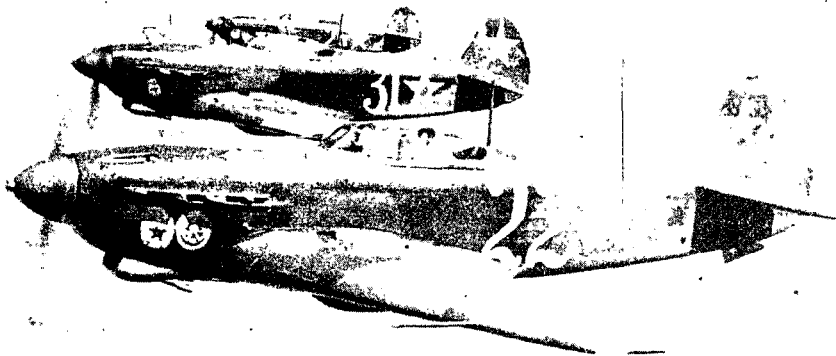
"couple" was the bomber plane; in other cases, a radio-operated fighter plane. The "couple" was piloted by one flier. One of the two planes was laden to capacity with various explosives. This plane was placed either on the upper part of the fuselage of the carrying plane, or carried the plane with the pilot on its back. Such a "couple" consisted usually of a Junkers with an FW 190 fastened on its back. During the flight the motors of both planes were in operation. At a certain moment the pilot unfastened the plane with the explosive charge. It dived steeply toward the target. The operations of the coupled Junkers 188's and FW 190's were based on the utilization by the crew of a special radio-transmitter. At the moment of uncoupling the planes, the pilot aimed the "couple" in the general direction of the target, then plugged in the radio-transmitter and adjusted the movement of the "plane-bomb" equipped with a small radio receiver.

One of the peculiarities of the aerial battle of Berlin was the German tendency to organize the operations of their bombers and attack planes on two levels—at extremely low altitudes (down to and including hedge-hopping flights) and at high altitudes. By the use of this method the enemy attempted to do two things: to avoid great losses, and at the same time to disperse our fighter forces. His fighters and attack planes, emerging in big groups, flew at a low altitude, bombing and attacking our ground troops, while groups of "couples" operated

on the upper level at an altitude of 5,000 to 6,000 meters.

The "two-story" aerial tactics were countered by our command by the employment of carefully planned formations of large fighter groups. These formations changed depending on the situation. The idea of this special formation was to intercept and rout the enemy on the approaches to the battlefield.

zone of "free hunting." Here, because of the well coordinated operations of the fighter groups flying at various altitudes but maintaining contact by radio, the enemy was so battered that continued flying in a definite battle formation was impossible. Separate enemy planes which managed to reach the front line found themselves in the third zone—the zone of protection of the battle-



Yak 9 (Yakovlev) Fighters. (Sovfoto)

The whole area of operation of the fighter units was divided into three zones. The first zone extended over the enemy-held territory far behind his front lines. This zone was taken care of by a considerable number of planes. Their mission was free hunting. They flew in two- and four-plane groups and were piloted by experienced fliers. They detected the enemy, notified the aerial command post, and attacked the enemy without delay in order to disrupt his battle formation and confuse the German pilots. Having been subjected to a preliminary beating by the "hunters," the enemy planes were attacked by our powerful air patrols flying over the area comprised between the front line and the

field. Here they were intercepted and attacked by our air patrols.

Our aircraft were also employed in a series of raids on enemy air bases. Thus, during the days preceding the offensive, our Stormoviks and fighter bombers attacked several main airfields situated near the front lines. The combination of attacks by our "Iliushins" (Stormoviks) and fighter-bombers, "Yakovlevs" and "Lavochkins," was very effective.

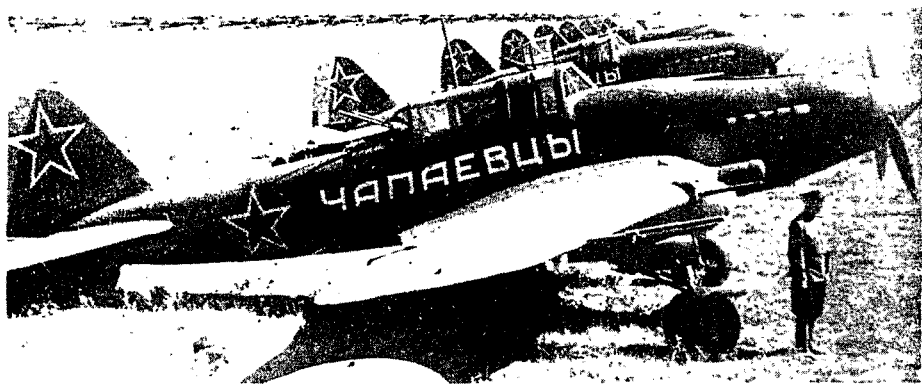
The attacks from the air launched by our bombers and Stormoviks in support of the ground troops breaking through several powerful outer defensive belts of Berlin and later engaging in street fighting inside the German capital were conducted on an ex-

exceptionally large scale and with great unity of purpose. It happened more than once that from 800 to 900 planes were over the battlefield simultaneously. Similar concentrations of air power could also be observed in other sectors of the approaches and outskirts of Berlin.

The character of the entire battle on the ground was determined by the unusual con-

bomber and attack planes in such a way as to enable a specially detailed group of planes preceding the bulk of the Stormoviks by one or two minutes to neutralize enemy anti-aircraft weapons. In addition to this, we employed dive-bombers to neutralize enemy weapon emplacements.

In the various stages of the historic battle for Berlin our aircraft varied the



Stormoviks. (Sovfoto)

centration of reinforcing weapons in German positions. In the outskirts of Berlin and in the city itself the Germans had thousands of guns of various calibers. The efforts of a considerable part of our attack and bomber aircraft, therefore, were directed against the enemy's fire system and the destruction and neutralization of his artillery. The operations of the Iliushin, Tupolev, and Petliakov planes were made difficult by the exceptionally large number of enemy fighters and by heavy flak. The German anti-aircraft artillery laid heavy area concentrations in the Berlin sky, and as soon as a group of our planes appeared in the target area, the enemy opened furious fire, trying to place the bursts at all levels. To counter these tactics we disposed the formations of

organization and the character of its cooperative action with the ground troops. During the first stage of the battle, its principal mission was to support the artillery and infantry in breaking through the German belt of permanent fortifications in the vicinity of the Oder River, whereas somewhat later the efforts of the bombers and Stormoviks were concentrated on escorting our tanks and mobile units enveloping the German strongpoints in the suburban zone of Berlin. Subsequently, when the actual fighting shifted into the suburbs and streets of the German capital, our fliers had two important missions to accomplish: to support our infantry in the fighting for city blocks heavily barricaded and transformed into fortresses, and to escort, at the same

time, our tanks which were maneuvering in the open country north and south of the city in an attempt to encircle and isolate the German troops in the Berlin area.

Furthermore, in the course of the battle it became necessary to subject to aerial action a large German group which had been encircled and subsequently liquidated by the troops of the First Ukrainian and First White-Russian Army Groups in the area between Berlin and Frankfurt-on-the-Oder.

In the course of the battle for Berlin, the German command varied the tactics of its aircraft. During the first few hours, when the battle raged on the distant approaches to the city, the enemy had an air force of

about 1,500 planes, based on permanent and well-equipped airfields, and used them at first for the protection of our troops. By committing this mass of fighters and attack planes, the Germans intended to paralyze our aircraft and to disrupt the plan of our aerial offensive. They did not succeed, however, in attaining even a temporary aerial superiority. Soviet fighters maintained firmly their domination of the air and forced the Germans into costly aerial battles. The aircraft units of one of the sectors of the First White-Russian Army Group alone engaged, within only a few days, in about 1,000 aerial battles in which the Germans lost more than 700 planes. The enemy losses in other sectors were equally serious.

Norwegian Air Force

Digested at the Command and General Staff School from an article
in *The Aeroplane* (Great Britain)

THE nucleus of the Norwegian Air Force of today was about 120 airmen, who escaped from Norway, all that remained of her pre-war Air Forces. The whole Air Force had to be built up anew, and for this purpose the training camp, popularly known as "Little Norway," was established near Toronto. One hundred modern aircraft had been ordered from the United States by the Norwegian Government in March 1940, just before the invasion. These airplanes were soon delivered and taken over at "Little Norway." As more young Norwegians escaped from Norway more airplanes and equipment were acquired and other training units, radio schools, etc., were established. Because of expansion, "Little Norway" was transferred to Muskoka, 160 miles away, in April 1943.

The Norwegian Air Force, which in 1941 came under the joint command of Army and Navy, in 1944 followed the British example and became independent of both Army and Navy. The first squadron of modern Northrop seaplanes to be commissioned was operating for two years from bases in Iceland. In 1943

the squadron was transferred to a Coastal Command base in Great Britain, from where it engaged in hunting U-boats and escorting convoys, with four-motor flying-boats. Another Norwegian Coastal Command squadron -- one flight of two-motor flying-boats and one flight of Mosquitoes--also operated from bases in Great Britain. The flying-boats did submarine patrol and special duty. The Mosquitoes operated over the Norwegian coast, especially reconnoitering for German shipping.

Two all-Norwegian fighter squadrons operated with Tactical Air Force on the Continent. These squadrons did brilliant work.

Norwegian airmen helped to bring bombers across the Atlantic to Britain ever since the regular delivery service was inaugurated. They have also ferried Allied aircraft to the Near and Far East, and two Norwegian squadrons operated with Coastal Command; their special knowledge of their own coast coming in useful. Norwegian airmen also dropped food parcels and medical equipment to their own countrymen.

Sea Power in the War

An article by Captain Russell Grenfell, Royal Navy, in *The Navy* (Great Britain) June 1945.

JUDGED in terms of newspaper headlines and columns of print, there has been little reason to attach excessive importance to the contribution that sea power has made to the overwhelming victory gained over the Germans. The relative scarcity of sea news has been largely inevitable. The conditions of sea warfare are not conducive to good publicity. Naval information is often kept secret because, unlike army or air operations, it can be kept secret, and when published a month or two later most of the interest has gone out of it. Again, the Navy is essentially the invisible Service. The tank and the army lorry have been a common spectacle on our roads and the roar of bombers going to attack Germany an equally common sound. But the Navy was out of sight at sea.

Nevertheless, there can be little doubt that sea power played a fundamental part in determining the course of the war. But for their possession of the command of the sea, the Allies could not have won. No bomber assault could have been launched against Germany for lack of fuel and no army could have crossed the sea to take the land war back to the Continent. Everything turned on the command of the sea, the struggle for which commenced on the very first day of the war and endured without intermission to the very last. During the so-called "phoney" period of the war, while the Army was inactive and the Air Force was dropping leaflets, the Navy was already at grips with the enemy and it and the Merchant Navy were suffering appreciable losses from submarine, aircraft, and magnetic mine, the last an unexpected though not a new weapon which looked at one time like a deadly menace.

Then came Dunkirk and the evacuation of the army minus its equipment. What saved Britain in that somber hour were the few brief miles of the Straits of Dover and the fleet which was ready to defend them. It had often been alleged before the war that

air power had destroyed the value of that sea gap; but those allegations were shown to be false. The superior British fleet was still as much an obstacle to invasion as it had been in Napoleon's time, unless by some means it could be neutralized. Napoleon had tried invasion. Hitler experimented with air power. If the Royal Air Force could be eliminated, perhaps the German dive-bomber could deal with the Royal Navy. But in the Battle of Britain the Royal Air Force refused to be destroyed; and after that the invasion of England became no longer practical strategy. Brilliant as was the achievement of our fighter airmen, of whom Fleet Air Arm pilots formed a part, the significance of their victory lay in the fact that a superior British fleet lay behind them. Had the fleet not existed or had there been a land approach to the British Isles, the Battle of Britain would never have been fought.

It is really time we ceased marveling at our own courage in not collapsing at the time of Dunkirk, for such self-congratulation is as unmerited as it is dangerous in breeding false values. There was no reason why we should have collapsed. With a superior fleet and an undefeated Air Force we were as safe from invasion as we had been in the days of Napoleon or Louis XIV. There was nothing miraculous about the failure of Hitler to attempt the invasion of this country in the summer or autumn of 1940. He did not come because, with the command of the sea against him, he knew it would be hopeless to try.

Sea power—the ability to control movement across the sea—had delivered Britain from mortal peril once again; and it was to be the key factor in the resumption of the offensive. Britain is not a self-feeding country and, to make matters worse, all her European sources of supply were now closed against her. If she were to avoid starvation, the whole of the balance of her

food supply must come across the Atlantic. So must all the raw materials she would need for a vast expansion of her output of war equipment. So must all the finished articles she could obtain from American factories, and (later) the great American armies themselves. And having arrived, the command of the sea was the condition of their eventual redispach to their operational areas, whether in the Middle East, Malta, Russia, North Africa, or, when the time came, the Continent itself.

The enemy knew this as well as ourselves and he embarked on the greatest assault on our Atlantic sea routes in the history of naval warfare. For three years the battle raged at full intensity. Our shipping losses were enormous and many thousands of our seamen lost their lives. But despite his utmost efforts and the use of the boldest tactics, the enemy could prevent supplies, munitions, and reinforcements in sufficient quantities neither reaching nor leaving this country. For five years Britain was a great entrepôt of warfare, whence succor and battle strength went by sea to every Allied area where they were needed. The earliest recipient was Russia, whose fate, trembling for long in the balance, may well have been determined by the munitions which reached her by Murmansk and the Persian Gulf and Egypt.

The last-named destination involved a supply line 12,000 miles long, the longest by a considerable way of any such line in any theater of war, either then or later. We do not take sufficient credit to ourselves for our achievement in this respect, for it was the greatest feat of sea transportation in history. The Eighth Army in Egypt was facing an enemy whose lines of communication extended for only about 400 miles across the Mediterranean. By rights, the enemy's build-up in Africa should have been far swifter than the British. But at Alexandria was the Mediterranean Fleet, and at Malta were our submarines, the Fleet Air Arm, and the Royal Air Force to dispute the passage of the Italian convoys. There could be no better object lesson in the significance

of sea power. In spite of the huge disparity in the distances involved, in spite of the fact that the U-boats in the Atlantic were at the peak of their activity and were operating as far south as the Equator, the competition in Mediterranean reinforcement and supply went so markedly in favor of the British that Montgomery struck in October 1942 with a decisive superiority in every respect. Alamein had virtually been won at sea before a shot was fired.

The victory was the herald of the remarkable series of amphibious landings which distinguished the years 1942, 1943, and 1944. The Dunkirk evacuation had been a blessing in disguise. Driven off the Continent, we were compelled against our will to contemplate the necessity for amphibious operations as the only means of getting back there. Hitherto, amphibious warfare had been under a cloud. A convention had grown up before the war that an amphibious landing against opposition, especially in these days of air power, was no longer a practical operation of war. The consequence was that in 1940 there was neither amphibious equipment, experience, nor confidence.

Necessity overran all objections. A large program of up-to-date landing craft was commenced, training centers were opened, and a separate Directorate of Combined Operations set up. In two years all was ready and the great landings began. The results were astonishing. Every landing was a success; and with one exception every one was a walk-over. The contrast between pre-war prophecy and subsequent reality could not have been greater. Instead of disaster there was triumph.

This evidence points to the pre-war view being wholly false; and history can actually give no instance of a reasonably well-organized landing backed by superior sea power being a failure. Through force of circumstances, the true value and possibilities of amphibious warfare have in this war been strikingly brought out. We shall be blind indeed if we ignore the lesson.

The Deliverance of Strasbourg

Translated and digested at the Command and General Staff School from a French article by General Brossé in *Délivrance*, published by the Ministry of War, Paris, 1945.

THE space of ninety kilometers which separates the valley of the Vezouse from Strasbourg by way of Sarrebourg and the Saverne Pass (see sketch) is composed of three very different portions—the upward slope of the Vosges, the mountainous zone of the Vosges themselves, and the plain of Lower Alsace.

From the northern part of Baccarat to Phalsbourg, the hilly terrain rises gently toward the Vosges, forming a corridor some ten kilometers in width between the spurs of the Vosges to the east and a covered and difficult region to the west. Cut up into sections by wooded hills, it is traversed, at Sarrebourg, by the deep channel of the Sarre. From Sarrebourg to Phalsbourg the National Highway stretches across an open plateau.

Between Phalsbourg and Saverne is the narrowest part of the chain of the Vosges. Here the wooded zone is not more than eight kilometers in width. It reaches fifteen kilometers farther to the north at La Petite Pierre Pass, and twenty kilometers farther south in the vicinity of Dabo. Five routes cross the mountains from one side of Saverne to the other within a space of thirty kilometers. They are, from north to south, La Petite Pierre, the Eschbourg, the Phalsbourg, the Lutzelbourg highways, (the latter following the narrow, winding valley of the Zorn which is likewise utilized by the Nancy-Strasbourg railway and the Marne-Rhine canal), and lastly, the picturesque Dabo highway.

In spite of their slight altitude, the eastern slopes of the Vosges at this point form a cornice, so to speak, surmounting steep slopes and dominating afar the Alsatian plain.

At Saverne, one drops all of a sudden into the broad plain of Lower Alsace which is open as far as the Rhine. The National Highway follows the course of the Zorn

River as far as Brumath, then turns toward the south and heads straight for Strasbourg.

The German Defenses

From Blâmont to Phalsbourg the Germans had prepared three successive lines of defense (see sketch) which did not appear to present a continuous front at all points.

The first of these was established on the line Val-et-Chatillon—Cirey-sur-Vezouse—Blâmont, and extended toward Avricourt and the Marne-Rhine canal on the west. The second followed the course of the Saare below Sarrebourg, embraced this city, then turned southward across the spurs of the Vosges, which are separated from one another by narrow ravines. A series of villages—Imling, Hesse, Niederhoff, Saint Quirin—constituted its strongpoints. Antitank obstacles barred certain passes.

Lastly, the main position followed the military crest of the Vosges, facing the west. It passed to the west of the old fortress of La Petite Pierre and to the east of Phalsbourg. It continued after this in the direction of Dabo in a rugged, forested region.

There did not appear to have been mobile reserves of any importance in Alsace. The forts of Strasbourg were occupied by reduced garrisons, yet these were provided with the necessary weapons for stopping incursions of armored vehicles, and the positions were protected by antitank ditches.

Then, to the east of Strasbourg on the left bank of the Rhine, the Germans constructed a group of very strong concrete bunkers containing antitank guns in case-mates in order to protect the approaches to the Kehl bridges.

Mission of the Leclerc Division

On 31 October the 2d Armored Division

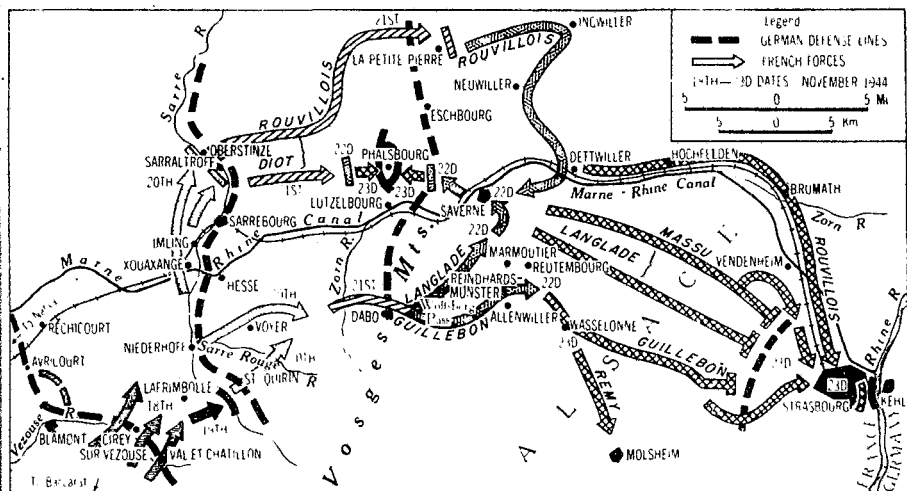
took Baccarat. The Germans were hurled back to their advanced position on the line Cirey—Blâmont.

The period from 1 to 15 November was employed by our command for regrouping their forces, for getting their formations in place, and for making the most minute of preparations with a view to engaging in a major offensive the objectives of which were the breakthrough of the enemy front in the vicinity of the Saverne Pass and the invasion of Lower Alsace.

The plan of action was simple. The

Breakthrough of Advance Positions

The attack began on the 15th. On the 18th the first German position was broken through and Blâmont was in the hands of the Allies. But the American divisions were stopped by powerful resistance west of Cirey-sur-Vezouse. On their right, a part of the Leclerc Division, broken up into three groups with one of them held in reserve, hurled itself on Cirey-sur-Vezouse, penetrated into the enemy lines, cut them into several pieces, took the village, and, passing through the completely disorganized enemy position, con-



Americans were to attack in the center on the axis Blâmont—Sarrebouurg—Phalsbourg, covered on their right by units of the Leclerc Division. The latter was charged with the mission of dispatching powerful armored units in such a way as to outflank the enemy resistance, move into his rear areas, and disorganize his command facilities and his reserves. Its mission was then to open the road to Phalsbourg and Saverne to the American forces.

tinued its march toward the north.

The exploiting of this important success was undertaken without delay, and the division continued its attack, maneuvering behind the German lines.

On 19 November at 1100 o'clock in the morning, an armored group which had received orders to penetrate toward the Lutzelbourg and Dabo routes, bore down on Saint Quirin, but it was stopped by an impassable antitank obstacle north of Lafrimbolle.

The next day this group broke the resistance of the defenders, passed Saint Quirin, and arrived in the upper valley of the Sarre Rouge. One column of the same group made use of a route farther to the north, attacked Niederhoff, seized possession of it, and then continued on toward Lutzelbourg. It was stopped before Voyer by strong resistance.

Finally, taking advantage of the success achieved by the Americans on the left, a third group, held in reserve, surged forward suddenly at Xouaxange on the Marne-Rhine canal, effected a surprise crossing, advanced resolutely toward the north, and passed Sarrebouurg on the left bank of the river. It did not stop until it was several kilometers down stream from the city at the Sarraltroff and Oberstinze bridges, which had been blown up.

The Crossing of the Vosges

The successes obtained during the last three days had been of considerable magnitude and justified the hope of still more important results. The first enemy position had been broken through and passed to a large extent, and the second had already been penetrated in its turn.

On the night between the 20th and 21st, General Leclerc took account of the fact that ahead of him there existed no coherent and really solid defense. He was aware of the importance of exploiting as quickly as possible the surprise caused by the sudden attack of his units and of depriving the enemy of the time to recover himself and reorganize his forces. Without waiting for the arrival of the American forces, he decided to make a bold move and bear down on Strasbourg with all his troops.

The 21st was a day of great significance, for it saw the Vosges line completely broken through and the Vosges Mountains crossed by the greater part of the division.

For this operation, the 2d Armored Division was divided into four columns which were to move forward over three different routes: on the south, on the Dabo highway, the groups of Langlade and Guillebon; in the center, on the Phalsbourg highway, the Diot

group, and to the north, the subordinate Rouvillois group.

Langlade's column moved forward over a winding route with a fairly gentle grade. It was slowed down by numerous abatis which barred passage but which were rapidly cleared out of the way. It had an engagement at Dabo, but the resistance was quickly bypassed. At 1100 o'clock the group arrived at the Wolfsberg Pass. From this point, German elements were seen heading back from Saverne to Strasbourg. The tanks started down the grade and came out at 1300 o'clock into the Alsace plain. The column immediately headed north in the direction of Saverne, following the base of the eastern slope of the Vosges. By the end of the day, it reached a point eight kilometers southwest of Saverne.

The Guillebon group, which had followed the same route, established a solid line of defense facing the Alsace plain.

Farther to the north, the Diot group was blocked before Phalsbourg by a strongly-held German position which barred the Pass of Saverne.

Still farther to the north, Colonel Rouvillois, in place of entering the narrow ravine that is skirted by the Eschbourg highway, moved on northwards. The tanks bore down on La Petite Pierre, ran onto a German division, the 361st, which was falling back to occupy the main line of resistance on the crest of the Vosges, routed it, cut it to pieces, killed 500 men, and took more than 10,000 prisoners. Hundreds of horses were killed and two or three artillery batteries were completely destroyed. La Petite Pierre was taken at 1600 o'clock.

The overrun position comprised deep shelters, an antitank defense line, dense wire obstacles, and buried lines for signal communication. Enormous supplies of ammunition remained intact. The firm intention of the Germans was to defend to the very limit of their ability the Vosges line, and the importance they attached to it was evidenced by the thoroughness of its organization.

Thus, during the course of this decisive

day, the position of the invader which was to bar entrance into Alsace like a mighty wall had been completely broken through on both sides of the Saverne Pass. South of this city a considerable part of the 2d Armored Division was still in the Alsace plain. In this area the disorder of the Germans was complete, numerous groups first retreating southward, then retracing their steps northward in an attempt to reach Phalsbourg. In the north, one division had been annihilated, and the gateway to Alsace stood wide open before the detachment which was stationed at La Petite Pierre. Phalsbourg alone was still holding out. The resistance of the little city which bars the National Highway was a thorn in the flesh to the division, for its supply units had to pass through it. Special measures had to be taken to insure its speedy fall.

This same day, the 21st, the American forces also made a deep advance. An infantry division relieved the units of the 2d Armored Division at Oberstinze and Sarraaltroff on the Sarre and occupied Sarrebourg, as well as the villages on the right bank of the Sarre south of the city. Two battalions of motorized infantry were placed at the disposal of General Leclerc. He made use of them for protecting the north and south flanks of his large unit.

Consolidation in the Alsace Plain

The situation of the 2d Armored Division, isolated twenty-five kilometers in advance of the main body of the American forces from which it was separated by the Vosges Mountains, presented serious risks.

What would be the reaction of the Germans to this sudden breakthrough into territory to which they attached special importance? Would they not make every possible effort to separate the division from the Allied armies on the Sarre by blocking the only routes to its rear that permitted a passage across the mountainous zone? What reserves did they have at their disposal in Lower Alsace? Would not a counteroffensive starting from the Strasbourg—Brumath—Wasselonne area attempt to drive back the

French armored units which were still scattered and which had barely entered the plain? It would be extremely risky for the Leclerc Division to continue on its way before consolidating its position in Alsace and establishing at the foot of the Vosges a solid base from which it could continue with safety its drive on its final objective, Strasbourg.

This was accomplished during the course of the 22d. It was necessary, on the one hand, to cover the various portions of the division in the plain; on the other hand, to provide strong protection for the eastern end of the Saverne Pass in order to assist in the removal of the road block which barred the main communications route in the vicinity of Phalsbourg.

The four detachments which had operated on the preceding day maintained the same composition.

The Langlade group, coming up from Reindhardtsmunster, attacked Saverne on the south, while at the same time Colonel Rouvillois completed the movement of his forces through the pass at La Petite Pierre, came out into the plain at Ingwiller, and then moved straight southward along the foot of the mountains toward Saverne. At Neuwiller he had a brief but violent engagement with a German detachment which vainly attempted to stop him. He then directed his forces against Dettwiller on the Zorn, which was taken at 1000 o'clock, and turned westward toward Saverne where, at noon, he effected a junction with the units under Colonel Langlade. Under the converging pressures of the two groups, the resistance of the city was quickly broken.

The Guillebon group extended its positions toward the east by taking possession of Marmoutier, Reutembourg, and Allenwiller.

The Diot group was still stalled west of Phalsbourg. A detachment taken from the Langlade group was sent toward Phalsbourg with the mission of attacking the old fortress from the east. It mounted the slope of the zigzag route leading from Saverne to Phalsbourg and, at a point about four kilometers east of Phalsbourg, fell on the

rear of a powerfully organized German force whose defense, however, was turned toward the west.

Thus, the objectives fixed for the 22d had been partially fulfilled: Saverne was taken and a line of villages occupied farther to the south. Phalsbourg alone still remained, but was strongly threatened both from the west and from the east by units which were only five kilometers from one another.

The Attack on Strasbourg

On the 22d at 1900 o'clock, General Leclere received from a liaison officer the following verbal order: "Help the 6th American Corps in attacking Strasbourg. If the 2d Armored Division is ahead of the 6th Corps, it will attack Strasbourg alone."

But this long-range offensive, executed under such delicate conditions, required certain precautions. It was necessary that the flanks of the column, which was to make a leap of forty kilometers, be protected. In addition to this, it was necessary to continue the attacks on Phalsbourg till the surrender of this large strong-point had been obtained. Hence, the division of the forces had to be modified as follows: The security of the right flank of the units moving on Strasbourg was to be insured by the Remy reconnaissance group. It received the mission to reconnoiter the zone comprised between Strasbourg and the Vosges and to constitute a flank guard as it progressed toward Wasselonne. A portion of the Diot group, supported by American units, was to renew the attacks on Phalsbourg and cause the fall of this city in order to clear the supply route. Lastly, the Langlade and Guillebon groups and the Rouvillois subordinate group, divided in such a way as to form four columns, were to move simultaneously and at maximum speed on Strasbourg.

On the 23d at 0700 o'clock in the morning, the armored units moved forward over the selected routes. The weather was very bad.

On the right and in the center, three columns followed the routes which, from the Saverne-Wasselonne area, converged in the western outskirts of Strasbourg.

At 0930 o'clock, Colonel Massu announced that he had reached a point five kilometers from Strasbourg, but that he had run up against stubborn resistance coming from forts, protected by antitank ditches surrounding the city.

At 1030 o'clock, Colonel Guillebon reported that he was in contact with the forts.

The third column also had found the route barred by the line of forts.

On the north, Colonel Rouvillois, who was following the Saverne-Strasbourg highway through the valley of the Zorn, passed through Hochfelden and Brumath without incident, and at 1000 o'clock announced that he was just south of Vendenheim; that is to say, less than ten kilometers from Strasbourg. Then, at 1030 o'clock, he sent the following message: "I have left a covering force at Headquarters and am attacking the Kehl bridge."

As soon as this information was received, Colonel Langlade changed the course of Colonel Massu's units, which were unable to make any further progress, and directed them toward Strasbourg over the route that was used by Colonel Rouvillois. The mopping up of the northwest part of the city began immediately.

Farther to the south, Colonel Guillebon's group succeeded in forcing a passage of the antitank barrier. His first units entered Strasbourg from the west at about 1230 o'clock.

Colonel Rouvillois made several attempts to seize possession of the Kehl bridges, but was not able to overcome the concrete works guarding their approaches.

Langlade's group cleaned up the southwest part of the city and cleared out completely the approaches to the cathedral. On its tower the French flag was raised at 1400 o'clock.

Finally, Colonel Guillebon's group cleared the southwest part of the city and began the reducing of the northeast and southeast quarters. More than 5,000 Germans were picked up and made prisoner.

The surprise was complete. Streetcars filled with passengers stopped suddenly at sight

of the tanks in the main streets of the city. German officers strolling about as in time of peace had no chance to escape and were shot dead in their tracks.

While the liberation of Strasbourg was in progress, the Remy group had seized possession of Wasselonne and had continued on their way in the direction of Molshelm.

During the course of the day the com-

bined efforts of the Diot group and the Americans against Phalsbourg overcame the resistance of the defenders of the city. The axis Sarrebourg—Phalsbourg—Saverne was completely cleared.

The liberation of Strasbourg had been effected. It was the magnificent prize of a maneuver that was as daring as it was well planned.

Independence of Subordinate Commanders and its Limits

Translated and digested at the Command and General Staff School from a German article by Major Erich Weniger in *Militärwissenschaftliche Rundschau* August 1944.

THE question of the lines that should be drawn between a strong-willed supreme command and the need felt for independence by responsibility-loving subordinate commanders is one of the most difficult problems that faces any military doctrine.

This problem makes its appearance in time of war under the most varied of forms and in the most varied of relationships. First we encounter it in the relationship existing between the various grades of the hierarchy of command—the General Staff and the troop commanders, as well as between these commanders and their subordinates. Further, it appears in the form of arguments as to what constitute the actual operational and tactical units. Then with a different aspect, it again arises in the relationship between order and mission, guiding principles and regulations, between discipline and responsibility, unqualified obedience and obedience contingent on circumstances, between independence in the matter of execution and dependence in choice of means. Lastly, it embraces fundamental differences of opinion regarding the line of demarcation between strategy and tactics, and, invading the field of moral problems, poses a question relative to the distinction between capable commanders and commanders without capabilities, and the relationship between authority and manly pride.

In this article we are concerned only with the subject of the independence of the subordinate commander.

Up to 1914, it was definitely required that as little be ordered as possible and that the superior commanders grant freedom in the choice of means, limiting themselves to the assignment of missions and the expression of governing principles. This must have been thoroughly impressed on the young officer who definitely conceived of war as a series of bold, independent, individual operations in which orders from superior commanders were altered and expanded in accordance with the dictates of one's own initiative.

General von Seeckt, however, believed that in carrying out military operations it was not always possible to act in accordance with this principle, for over and above all basic theories, there existed the unqualified demand for unity of command in war, and to insure this, there must of necessity appear, in place of directives, the order which limits independence, yet insures unity.

Von der Goltz, too, sought to establish a limit for independence: "On the basis of experience, the rule has come to have acceptance by the entire Army Command that no army, especially when working in connection with another, dare undertake any movement

affecting the whole without orders from the supreme command. Within these limits, however, subordinate commanders have complete independence."

General Ludendorf, in his postwar writings, also demanded unconditional subordination of subordinate commanders: "Today, more than during the period of the [first] World War, I am thoroughly convinced that the commanding general of field armies must demand the most unconditional subordination both to his directives and to his definite commands. In the same way, army group and army commanders are to expect the same subordination to their wills. Only in this way is it possible to insure unity of command. If, in the estimation of subordinates, a departure must be made from instructions, it will yet be possible, as a rule, to ask permission to do this of those in the higher posts. This might create the impression that I am urging a condition of dependency for subordinate commanders. I am not advocating this, but unity in the conduct of military operations. I desire, on the basis of the experiences of war, to see the strictest of submission. Subordinate commanders shall retain independence, but this should be coupled with such submission." But he himself, before assuming command of the Armies, became aware of the two-sidedness of this concept when Falkenhayn's sanction of the plans of Oberost was denied. This reversal of concept is very indicative of the obvious difficulties inherent in this matter.

With the beginning of positional warfare, there appeared immediately, both on our side and on the side of the enemy, the most insistent of complaints to the effect that subordinate commanders were given too little independence. And, as a matter of fact, some of these complaints came from very high up, from the commanders of army groups and armies. Divisional commanders, especially, felt their independence jeopardized, particularly since the commanding generals had to a large extent become

rooted in their positions and were in consequence inclined to mix into all the details of command. Regimental and combat-group commanders and on down to company commanders felt that they had just cause to complain of tutelage on the part of the divisions and of dogmatism in the matter of orders received. The officer in the trenches felt that things were being made hard for him by the "gentlemen at the green table," by the warfare of paper, by useless requirements and senseless commitments; and he also complained of missed opportunities and inadequate support. Not infrequently, however, we find that the very commanders who complained of tutelage from above were themselves accused of allowing their subordinates too little freedom.

While there was a definite inclination to differentiate between strategy and tactics and to trace definite boundary lines between the fields of authority of higher and intermediate commanders, there arose the strange obstacle in positional warfare—which also stood in the way of all efforts to put an end to it—namely, that tactics began to be shaped and handed down in complete detail from above, both on our side and on the side of the enemy.

Looking down from above, the army commander must, of necessity, demand a strict system of subordination and a fixed form in the issuing of orders. And regarded from the bottom, from the rifleman upwards, the requirements of an independent and autonomous hierarchy of commanders, fully responsible within the sphere of their authority, would be just as imperative. In addition to the struggle with the enemy, there would then exist, as a result of this natural dualism, the continuous struggle between the various commanders involved. On this very account the Supreme Command cannot endure any such dualism, but must attempt to break it up with all the means at their disposal.

They could not do otherwise, if this contradiction were actually a vital one, than

to insist on strict observance of subordination.

Another way would be to accord strictly defined tactical independence to certain commanders in the military hierarchy. For example, this could be accorded to the division and the battalion but not to the regiment or company. But we can see in advance that this is fundamentally impossible. We have already seen how, for instance, commanders who were able to maintain their independence with respect to those above them were criticized by those under them because they gave their subordinates too little freedom. The attempt to accord independence to subordinates in certain forms of action and to require complete subordination in others seems more likely to be successful; for example, to grant independence in a war of movement but to demand strict centralization in the case of positional warfare.

However we may turn and twist the problem, every attempt at a formal bounding of functions between upper and lower command must, of necessity, fail. In military missions and the realities of war we are not concerned with principle but with the tactical requirements of the moment, with the factual seizure of positions, and with concrete decisions. We are not dealing in the changing situations of war with decisions on the basis of principles, with solutions that have been previously worked out on the basis of some theory or other, but with the accomplishment of missions for which ways and means must be found by the higher commands. Our problem is the achievement of victory.

It is no wonder that modern Service Regulations are able to give suggestions only, but no fixed boundaries and rules for the various functions and spheres of authority. The instructions relative to the line of demarcation between unified command and independence of subordinate commanders possess a peculiar, unstable, almost paradoxical character—as is to be expected in the nature of the thing. On the

other hand, the Service Regulations are not able to impart a logical form to the highly discordant lessons of war they desire to make use of for purposes of instruction and future activities. That would destroy the simplicity of the instruction, a characteristic which is so necessary if the instruction is to be understood. And so the Service Regulations simplify the contradictory lessons of war relative to independence of subordinate commanders. They place contradictory statements immediately alongside one another in the effort to make each sentence, in itself, an adequate stimulant for the will and a guide for action. We do not always find a "however" or a "but" to express the contrariness through which one sentence limits another. Often we do not discover the lack of harmony till we reach another section. Thus, for instance, Section 9 of the Regulations (*Truppenführung*) reads as follows: "Each commander, without fear of assuming responsibility, must put his entire personality into every situation. Joy of responsibility is the chief characteristic of a commander. But this must, *however*, not be sought in independent decisions without regard for the *whole*, or in refusing to follow orders carefully and in replacing obedience with one's own assumed superior wisdom. Independence must not become *free will*. *Independent action* that stays within the *proper bounds*, however, is the basis of great success." The italicized words express the effort that is being made to suppress the real contrariness in the requirements and to work out a rule for unified action. But the contradictions are only indicated and the lines of demarcation are not determined. Evidently, a certain privilege is accorded independent action over and above independence in a general sense which, however, is not denied either. The only limit designated is free will, yet there is no objective criterion for this. Hence, only a possible line of demarcation is indicated, but the rule for determining it is not given. This is clearly apparent when we consider Section 71: "The issuing of too many orders

harbors the danger that the independence of subordinate commanders will thereby be made to suffer." Section 37 specifies that "the commander must grant his subordinate commanders freedom of action *as long as* this does not endanger his own plans. He must not, *however*, leave decisions to them for which he himself is responsible." Then we read: "Orders must be binding only to the extent that the situation can be foreseen. Yet the situation often requires that orders extend beyond the point of what is known with certainty," and, "The order for attack must reveal clearly the way in which it is planned to carry it out. In the assignment of missions, the proper relationship between the required unity of action and independence of individual formations must be taken into account."

In spite of the strict and simple way in which they are expressed, these statements can be understood only when regarded all together. They provide us with no fixed plan, and therefore it is impossible for one to go onto the field of battle with the *Truppenführung* in his hand and be guided by its definite rules.

In war, however, the will of the supreme commander establishes balance and coherence between the various statements, or, rather, establishes unity of action in case of divergent requirements, by the exercise of his own will. The measure of independence enjoyed by subordinate commanders will be determined by this will itself. It gives the concrete relationship in which dependence and independence stand to one another, and in this manner independence remains at all times within the bounds of obedience.

There can be no doubt relative to this point. It is the supreme commander who wills and who decides. In this assertion of his own personality, the commander is able, with his knowledge of the situation as a whole and of the objective he has in view, to set the limits of place, time, and degree of independence on the part of subordinate officers. He is able to give free rein to the independence of the subordinate officer just

for the reason that it is to his advantage to do so, because he wishes to give the subordinate officer an opportunity to distinguish himself, or because he wishes to provide an opportunity for proving some idea or other, or perhaps because he wishes to train the future tactician, or because he wants to delegate a part of his functions to some subordinate commander.

From the standpoint of this will, no sort of fixed boundaries in the matter of command exists. They cannot be drawn because certain types of operations call for detailed technical regulations, such as barrages, battle formations, and cooperation with the air force. It can be said, however, that the conduct of a successful attack and the pursuit of the yielding enemy are legitimate opportunities for independent action, while during a period of retreat such independence is really unthinkable. Yet, under the conditions of modern combat, taking advantage of a tactical success beyond the limits of an assigned mission may result in serious operational consequences that reveal the advantages that would have followed by adherence to the limits set by the command.

During the period between the two World Wars, an extremely thorough study was made of those cases in the history of war in which the initiative of subordinate commanders had opposed the will of higher and supreme commanders. In nearly every case there was found confirmation of the rule that the independence of the subordinate commander cannot be extended to the point of disregard of superior tactical and, more especially, superior operational plans and intentions without causing trouble. Most cases of departure from the operational plans of the supreme command, as well as from the tactical plans of higher commands, are not justified in the history of war. It would nearly always have been better to obey.

The prerequisite for strict order is that a real supreme commander be in command and that he show his will to be a genuinely military will, applied in the proper direction, intelligent, and responsible. Otherwise,

absolute obedience would be tantamount to following a powerless phantom in his fateful and erring course. It is part of the tragedy of the existence of the soldier that, even in the absence of these prerequisites, obedience cannot be withheld.

Of course, the need for unified command, for subordination of all to the will of the supreme commander, does not exclude the possibility that friction and incidents may occur under the conditions of subordination which with freedom for independent action on one's own responsibility would probably have been avoidable. As is always the case in war, it is necessary to accept a great deal of evil in exchange for the greater good for all. Never does unity result from a recipe or from perfection of technical dispositions—in our own case, the perfection of the complex system of command—but from will, spirit, and keen intellect on the part of the supreme commander, his subordinates,

and the soldiers, and their harmonious and resolute action.

From perfect obedience, from heartfelt cooperation in the ideas and aims of the commander in chief, there springs forth, as everywhere in moral existence, true freedom of conscience and of intellect. This freedom clears the way for creative initiative and independence of action in such a way that the contrast between supreme command and the individual wills of subordinate commanders is no longer apparent. The decisions of the supreme commander coincide, then, in the minds of the subordinate officers with the laws that govern such decisions. Out of these conditions there is developed confidence, the basis of the obedience accorded the supreme commander by those who are under his orders and without which he could not really command and the troops could not obey.

Nazi Preparations for a Sixth Column

Digested at the Command and General Staff School from an article by V. Minayev in *Information Bulletin*, Washington Embassy of USSR, 23 August 1945.

LONG before the final defeat of Germany, Nazi leaders began both to draw up plans for a comeback and to carry these plans into effect. The cornerstone for these plans was the training of a secret army which, scattered in numbers throughout the world, would weave the brown web anew and create further plots against democracy.

The whole system of the so-called Politico-Education Institutions of the Foreign Affairs Department of the Nazi Party (*Politische Erziehungsanstalten*) was put to work on these lines. The training of the rank and file of the future underground organization was entrusted to the *Deutschen Heimschulen* (home school), thirty-five of which were set up by General Heimsmeier, the well-known specialist in the training of Fascist agents.

Along with their special training, the *Heimschulen* began to give its pupils courses in various trades—construction, farming,

etc.—accomplishments to be used later to mask the underground activity. In addition, there were courses in the several German dialects, so that a Prussian, for example, could work in Bavaria or a Bavarian in Prussia without detection.

The schools set up before the war were employed for developing the middle and senior ranks. The first school of this type was opened 8 February 1935, with its director Walter Schmidt, one of the close collaborators of Rosenberg, and well known for his subversive activities in Austria and the countries of the Baltic.

Soon after, three other schools of a similar nature were opened. In the city of Vogelsang, in the Rhine-district, men were trained for subversive activity against the Anglo-Saxon countries; the city of Sonthofen in Bavaria prepared men for work against the Mediterranean countries; and Falkenburg in

Pomerania developed an Eastern campaign (against the USSR, Poland, and the Balkan countries).

The Castle of Order

Although the methods and internal setup in all three schools were similar, the school in Falkenburg was the most interesting, for it was used by the Nazis as an "experimental station" for the training of agents (*Versuchsanstalt*).

The *Versuchsanstalt* near the small city of Falkenburg in Pomerania was officially designated, the *Ordensburg an Kressingsee* (Castle of Order on Kressing Lake). The school occupied an area of several square kilometers. Fenced off from the outside world, it was kept under strict guard by a company of SS. At all approaches to the school were signs reading, "Trespassing Punishable by Death."

Inscribed over the massive doors at the entrance to the main building were the words, "Unquestioning Obedience."

The student body of 300 had a three-year course of study. During the war the program was cut to one year, and the number of students increased to 700. In addition, the school had "special Hitler courses" (*Sonder Hitler Kursen*). The head of the school for the "eastern direction" was a certain Hodes, member of the Nazi Party since 1926, with a rank corresponding to lieutenant general.

The greatest precaution was taken in the selection of students. Each candidate for "the postgraduate course," as studies at *Ordensburg* were officially designated, had to pass an examining commission. The answers to the questionnaire and the autobiography, submitted by the candidate had to contain exhaustive data relating to himself and his relatives as far back as the third generation (his grandfather, brothers and sisters of his grandfather, all cousins twice and three times removed). The account of his life had to contain every personal and business event of the slightest importance and had to be almost a day-by-day account.

All material handed in by the candidate was checked by the Gestapo, who gave the final sanction on the candidate's enrollment.

During the war the age limit for admission to the school was extended to forty-five years. More and more of the candidates were members of the professions (lawyers, reporters, doctors, actors).

On acceptance, the "novice" was conducted to a room in the basement of the administrative building to take the oath. The ceremony, something like the accolade of knighthood, was held in a darkened room, the walls hung with such mystic trappings of the Middle Ages as brass heads of wolves and tails of horses. Here a personage clothed in a black velvet mantle pronounced the following words of the oath which were repeated by the neophyte: "He who betrays or is a traitor to the secret of *Ordensburg* must die. And not only will he himself be destroyed but his family, his wife and his children, as well."

Following this performance the initiate participated in a feast to celebrate the occasion, and from that moment on became a full-fledged member of a strictly conspiratorial organization whose aim was to sow death and destruction, to carry on espionage and provocation, throughout the world.

The All-Inclusive Background

The curriculum at *Ordensburg* had as objectives: first, to teach selected subjects in the field of espionage; second, to present a thorough study of the country in which the student was to work, including the language, manners and customs, economy, armed forces, administration of internal and foreign policy, laws, etc., particular stress being laid on conditions that the student would find in his future theater of activities in the country as a whole; third, to make possible complete mastery of the trade under cover of which he would operate after graduation; fourth and last, to offer a complete and strenuous military, physical, and sports training.

Political indoctrination was inherent in the whole program.

In the espionage department, particular emphasis was laid on various forms of active "intelligence" (sabotage, subversive activity, terror, bacteriological warfare, etc.).

Technical devices, screening, subversion, and particularly maintaining espionage connections had to be learned to perfection. In special "subversion studies" and "laboratories of explosives," where they could find models and formulas for the preparation of explosives and inflammable compounds, and tables describing their properties and the methods for use, the students were given an all-inclusive background in modern techniques of subversive activity and sabotage.

The laboratory of poisons contained all the means and apparatus for conducting secret bacteriological warfare, formulas and prescriptions for compounding poisons, the methods for employing them, and for distinguishing their effects.

The study halls and laboratories for espionage technique also contained equipment for secret writing, complex cryptographic codes, machines for making copies of photographs, instruments for opening and closing sealed letters, microscopes of various sizes, miniature cameras for snapshots, phonographs, portable receiving and sending radio sets, and dozens of other objects of an obviously involved nature.

The students received a thorough grounding in the speedy dismantling and setting up and repair of all kinds of apparatus. Radio-technical shops staffed by the students themselves produced radio sets designed for espionage purposes. In one of the laboratories were produced the numerous false documents essential to spies.

Finally, the student was given a course in make-up; and he was taught quick changes into various costumes and manners. Elaborate schoolrooms, cosmetic and make-up facilities, barbershops, costume shops, and scores of dressing rooms gave every scope to the impersonator.

Educational Devices

The lectures for espionage subjects were, as a rule, accompanied by visual aids. Wide use was made of cinema films, which were documentaries in the full sense of the word. At the lectures on terror, for example, there was a detailed study of the assassination of the Yugoslav King Alexander in Marseille and of the French Premier Barthou in shots of the film taken by a cameraman on the spot, from whom the film was purchased by Himmler.

In his preparation for a specific country, the student was required, first of all, to have a faultless knowledge of the language and a fluent mastery of one or two other foreign languages as well.

In the Institute of Country Study there were a number of scientific study halls in which the student investigated the structure and peculiarities of the customs and peoples of individual countries. Among the mass of visual aids were the photograph albums and notes and diaries of German "tourists."

The most scrupulous attention was given to the trade which the student was to learn as a screen in setting himself up in a foreign country. For this vocational education there were bookkeepers' offices, courses for office workers, shops for sculpturing and commercial art, laboratories for animal husbandry and agronomy, and a music room complete with every kind of musical instrument.

Given military training and kept physically fit, healthy, and tough, the aspiring agent was a good athlete with a knowledge of several sports. He learned sharpshooting and was taught to fire all makes of rifles and revolvers, practiced horseback riding, fencing and parachute jumping, drove an automobile, motorcycle, and airplane, and could row and sail boats. The final examination for graduation included tests in some of these skills.

The school had an information department, outfitted with true German attention to details. Enormous special card catalogs contained classified data for the most detailed nature on all questions relating to the country against which the student was being

trained to work. There was every available type of handbook, guide book, train and ship timetable, telephone book, tourist map, and similar materials.

In the course of the second World War the "experimental station" at Falkenburg trained over 1,500 agents in various specialties to work against the USSR alone. There were also large groups prepared to operate in each of the other countries of the "eastern direction."

Nazi leaders, who took a deep interest in the school, frequently visited it. Hitler and Rosenberg once brought Mussolini with them for an inspection tour.

Thus the school at *Kressingssee* was the center of the future Nazi underground. The last two years, the outskirts of Falkenburg became a kind of Nazi nursery where the cadres of the future "Sixth Column" were bred.

The last group of students at the *Ver-suchsanstalt* could not take their final examinations for graduation. The moment the gentlemen students and their trainers got wind of the fact that the hour of retribution was near, they scurried away. They were in such a hurry they had no time to destroy even the most compromising traces of their criminal activity.

Stilwell's Advance from Ledo

Digested at the Command and General Staff School from an article in *SEAC Source*, the Services' newspaper of the Southeast Asia Command (British).

EVEN in the worst days the Japs never tried to climb into India over the wall of the Ledo mountains. The Allies, however, proposed to climb back into Burma over this wall.

In early 1942, Stilwell was in China, charged with the mission of improving the training and combat methods of twenty Chinese divisions. An American Lieutenant General, he held the appointment of Chief of Staff to Generalissimo Chiang Kai-shek. Before he could start work, his task had already changed. The Japanese had changed it. Driving westward across the mouth of the Salween River they captured Rangoon, closing the great port of the Burma Road. They streamed up the valley towards Mandalay, and beyond, seizing the road itself. General Alexander's outnumbered forces withdrew, fighting a long rear-guard battle. With them went the Chinese divisions under Stilwell which had been hurried in to try to stem the invasion.

The withdrawal became a retreat, deemed from disaster by the fortitude and courage of the Allied soldier. Most of the Chinese troops in Alexander's command

pulled back across the Salween. His British forces he brought back into India.

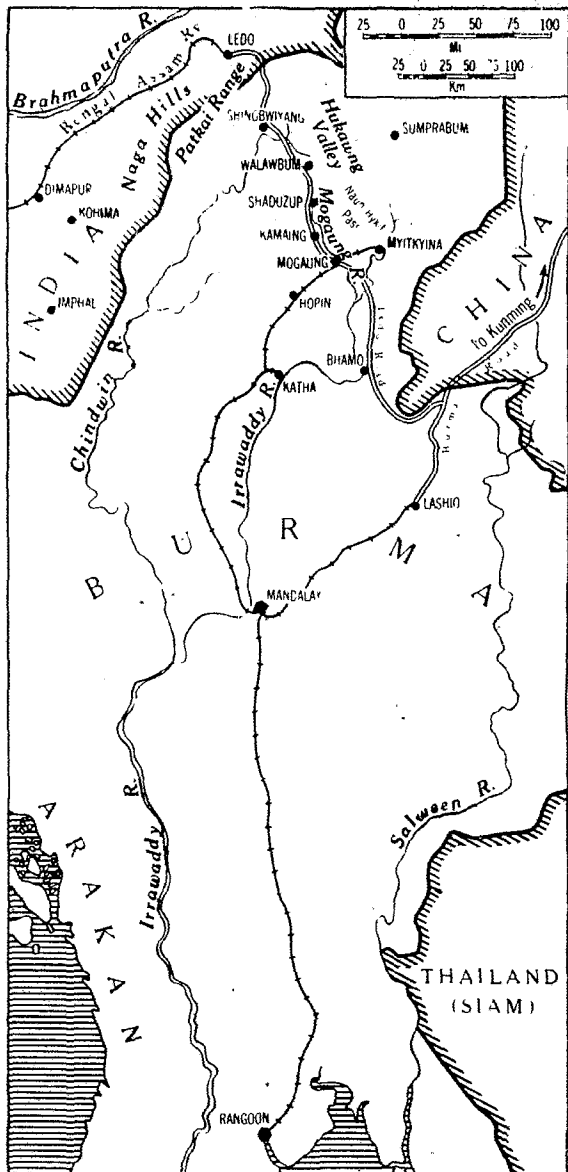
For Stilwell, three big jobs waited: first, to rebuild into an army the Chinese troops who had been evacuated into India; second, to create a chain of airfields in northeast India to supply the Chinese army in China and keep her in the war. This called for cooperation of a high order, and it was freely given. So the soldiers of one nation were trained by the officers of a second nation, within the frontiers of a third. With the aid of the British and Indian Army and civilians, and the labor of the Assam tea-planters and the Nepalese, Naga, and Kachin hillfolk, the airfields were constructed and aerial traffic over the perilous Hump to Kunming raised until it exceeded the total military tonnage ever shipped along the Burma Road.

Third came the greatest project of all, the building of the Ledo Road. This is the "impossible" highway which, starting from Ledo at the railhead of the Bengal-Assam railway, climbs the 5,000-foot ranges of Patkai Bum, and emerges at Shingbwiang. From there it crosses the broad bowl of the Upper Chindwin, mounts the Hukawng Valley to its

water shed, and descends again into the Mogaung Valley. This road was the axis of Stilwell's advance.

What existed previously was a path for mules. The Yanks would make of it a thirty-foot standard double-tracked highway, metalled, trenched, banked, bridged, and inclined. Bulldozers, power shovels, cranes, steam rollers, trucks would roll in massive mechanized procession from the American production lines 15,000 miles away, across two oceans, and past three continents to the wild Naga Hills. Thousands of men would drive the road and bridge the fords, pushing through forests of solid bamboo, scaling cliffs, edging along precipices. Under the blazing sun, in the choking dust, in mud, mist, monsoon, and blizzard, building by the moon and by searchlight's beam.

This was the method of the march. First went Stilwell's U.S.-trained Chinese divisions. They drove the enemy before them. On either side, in flanking movements which swept deep into the hills, moved Chinese patrols and Brigadier General Frank Merrill's Marauders, which included veteran infantry assault troops from Guadalcanal. These forces deceived the Jap, distracted him, cut into his rear, threw road blocks across his retreat. On the heels of the fighters—often alongside them—came the trail-blazers, engineer reconnaissance parties hacking a "trace" with axes across virgin jungle, working out gradients as they went. Behind them came the first bulldozer, shoving its way forward wherever it could get, scraping



out the urgent "combat road" for immediate battle supply. Last came the main highway builders. All were armed, for the Jap never wearied of sneak flank raids. Then men would drop the pick and seize the bayonet, or perhaps fight it out with the pick.

Stilwell moved on; the road followed, a mile a day. Down it flowed wagons, weapon-carriers, guns, and tanks.

The aircraft supply of the U.S. Tenth Air Force roared in between the jungle and the ceiling of the rain clouds. Airstrips were made in twelve hours under artillery fire. The advance of the army was often a maneuver of double encirclement. There was the Allied front. Then behind the Japs another Allied layer, more Japs, and farther on still more advanced Allied units. Kamaing was encircled by a long flanking march, and Mogaung, sixteen miles beyond, simultaneously threatened, for another Allied force was approaching from the south where they had inserted themselves by airborne invasion. This was the brigade of "Mad Mike" Calvert.

Stilwell's march began towards the end of 1943. He was over the mountains by the New Year and building up his base at Shing-bwiyang. He had to fight his way forward from this point. Held up by a road block, Uncle Joe sought to strengthen his attack with armor and accordingly signalled Colonel Rothwell Brown's Chinese tank unit, which was finishing its training at Ledo.

A few days later the Chinese 22d Division, reinforced by Marauders and supported by these tanks, broke the front of the Japanese 18th Division, the conquerors of Singapore, at Walawbum.

Stilwell shoved on up the Hukawng, his Chinese 22d Division sweeping the western slopes; the 38th Division, the eastern. It took him nineteen weeks of hard fighting. The road followed him like his shadow.

On 19 March Stilwell crossed the pass from the Hukawng Valley into the Mogaung Valley. The same day the Gurkha-Kachin column smashed their way in a hand-to-hand battle into Sumprabum.

The scene suddenly changed. The Japs were pouring over the Chindwin heading towards Dimapur and the Bengal-Assam railway that was Stilwell's lifeline. Joe looked over his shoulder, and he would have been crazy not to do so. He had been instructed by General Slim, under whose command at that time he still served, to occupy the Mogaung-Myitkyina area. Should he now halt and detach one of his Chinese divisions to guard his line of communications?

Slim weighed the same problem and reached two bold decisions. First he ordered Stilwell to continue his advance, relying on the arrival of reinforcements from Arakan and India to hold the invaders in check. Secondly, what should be done about the Chindits, who had been airborne into Burma with the purpose of assisting Stilwell's plans by cutting the Jap line of communications? Slim ordered them to carry on with their original task, which they did, immensely facilitating operations in the Mogaung-Myitkyina area.

So, while Imphal-Kohima's commanders parried the enemy's blows, Stilwell punched him. His infantry cut up Japanese garrisons. He slung in tanks manned by Chinese crews and overran their well-entrenched gun emplacements. Some of the Allied tanks got lost in the dense jungle and their crews would probably have been forced to abandon them but aircraft carrying out photographic reconnaissance took photographs of the surrounding country, which they dropped to the tank crews to show them the best way home to the main forces. Two years to the day after he had been "run out of Burma," Uncle Joe came marching back.

It would not be proper to leave Mogaung Valley campaign without a word about Stilwell's Chinese troops. They had been marching and fighting now for six months and had acquitted themselves with very great credit. The Chinese infantryman moves about his business in his own way and at his own pace. His courage and endurance are exemplary. Stilwell rates their capacity high.

The Chinese are surely the best walkers in the world. The famous Eighth Route Army

walked 6,000 miles across China in twelve months, fighting most of the way.

On 17 May, as Stilwell's main forces closed in on Kamaing, came the unexpected electrifying news that another American-Chinese column had seized Myitkyina airfield. On reaching the watershed of the Mogaung Valley, Stilwell had detached Merrill's Marauders and Chinese forces for an outflanking attack on Myitkyina, railhead of the Burma railway. They scaled the 7,000-foot Naun Hykit Pass, and by a forced march of twenty days, along secret paths, appeared suddenly on the Myitkyina airstrip. The Chinese actually seized the greater part of the town by surprise assault but, in the confusion of the night, some units came under the fire of their own machine gunners and a withdrawal was ordered. They continued to dominate the railway station and thus isolated Myitkyina from all communication with Mogaung, the next big station down the line.

The besiegers were, of course, themselves cut off from all land communication. But—they had the air. Five hours after the Marauders seized the airstrip, gliders loaded with airborne engineers and their equipment came sailing in.

In the town, which stands in a loop of the upper Irrawaddy, the Japs had 1,500 determined fighters deeply dug in. They reinforced this garrison to many over its original strength before the town could be enveloped. Beyond the river, north and south, General Lentaigne's Long-Range Penetration troops operated, cutting main Jap communication with the garrison. By night, however, the enemy managed to ferry fresh troops across the river. Westward, "Mad Mike" Calvert's troops stormed Mogaung, promptly effecting a junction there with the Chinese division which had taken Kamaing. Thus all Jap rail communication with the south was finally severed.

The battle for Myitkyina continued—a long, grim, foot-by-foot struggle. The garrison was prepared to fight it out to the last man in the last bunker—and to give them credit for their courage, they did. The task of the besiegers was to prize them out

one by one, for the depth of their bunkers defied field artillery and all except direct hits by live-bomber.

The besiegers, however, were being rapidly reinforced while the besieged steadily diminished. The problem of supply became the main one. Throughout the entire action everything was borne in, or out, by air. Artillery (the 75-mm field pieces were Chinese-manned, the ack-ack batteries British-manned), ammunition, food, medical supplies, all were carried on to the strip in every kind of weather. American fliers finally crowned their previous supply efforts by transporting, in pieces, a 155-mm howitzer. Transport planes landed in darkness, under fire (the enemy line was 3,000 yards away), in a cyclone of mud created by their own propellers.

But now the ring had closed round the doomed garrison. Lentaigne's troops (they had passed under the overall command of Stilwell on 17 May, the day the airstrip had been seized) now completely barred escape towards the eastern bank of the Irrawaddy. Parties of Japs who made the attempt by raft were spotted and wiped out. At 3:45 PM, 3 August, the last enemy post fell, and Myitkyina was ours. The siege had lasted seventy-eight days.

The strategic values of Myitkyina were considerable. Its airfield was capable of immense expansion. By the first week in September as many as 250 planes were landing and leaving daily. Secondly, Myitkyina was a further giant stride along the Ledo-Burma road to China. Thirdly, Myitkyina stands on the broad Irrawaddy, navigable for barges and rafts. From this river port, as from Mogaung, stores could be shipped downstream to the Allied armies already marching far southward. Finally, the Mogaung-Myitkyina line may be described as the fighter-bomber start line for the attack on Central Burma.

While Wessel's men mopped up in Myitkyina the British 36th Division arrived by air and at once took up the pursuit of the Japs down the railway towards Mogaung. In the nearby hills the retreating enemy linked up with the remnants of the expelled

garrison of that place. The first major engagement of the 36th Division was at Hill 60. Its capture considerably accelerated the advance along the railway corridor towards Hopin and Katha.

Within a few weeks of arriving on the Myitkyina front the new division had captured Hopin.

North Burma was liberated, and the way was paved for the Ledo Road to link with the Burma Road.

Antitank Attack Groups

Translated and digested at the Command and General Staff School from a Russian article by Colonel A. Vasiliev in *Krasnaya Zvezda* (Red Star) 23 March 1945.

ANY ground forces, whatever their mission, should be securely protected from enemy tank attacks. In accordance with our regulations, antitank defense is organized by commanders of all grades. Among other antitank means, the infantry makes extensive use of the guns of the antitank and regimental artillery. At the beginning of the attack, these guns move ahead together with the rifle units; in defense, they are included in the system of antitank zones. But to secure the main body of troops from armored counterattacks, to consolidate captured terrain lines, and to protect our own tanks, mobile antitank reserves are usually created.

However, as the experiences of war have shown, during the course of a continuous advance, still other methods of combat of enemy tanks are required. One of these methods is the employment of the so-called "antitank attack groups," which were used in the fighting in East Prussia. They not only protect our own forces from counterattacking tanks and self-propelled guns but also seek encounters with them. Their activities should be daring and full of initiative.

The antitank attack groups were organized in first-echelon infantry divisions and consisted usually of a battalion of self-propelled guns and a few batteries of antitank and 122-mm guns under the common command of the battalion commander. The mobility of the weapons constituting the group guaranteed a high tempo in the attack of the supported infantry. There was thus eliminated the necessity for a mobile antitank reserve in the division. Let us cite an example con-

firming the effectiveness of the employment of these groups.

The N-th Infantry Division was making the main attack. The antitank attack group of the division consisted of a battalion of self-propelled guns, two batteries of antitank artillery, and two batteries of 122-mm howitzers. The group was commanded by a captain. The commander of the division and the commanding officers of the various artillery units of the division informed the captain of the general mission of the division. They indicated the zones of action of the infantry regiments, the terrain lines where enemy tanks were most likely to be encountered, and the order of the support of the infantry and of the subsequent consolidation of captured positions.

A short time after the beginning of the attack, one of the units was counterattacked by an infantry battalion supported by fifteen tanks. The unit at this moment was in movement and the situation was a critical one. Then one battery of self-propelled guns of the antitank attack group went out to meet the enemy tanks, quickly deployed, and knocked out three machines. At the same time a battery of antitank artillery knocked out one tank. The enemy infantry following their tanks also suffered heavy losses. The counterattack was repulsed. In two hours' time a second counterattack followed. This time it was launched by twenty-five tanks. Four tanks were knocked out by the fire of the antitank attack group, and again the Hitlerites hurriedly withdrew. During the course of the day, the enemy undertook

four counterattacks in the sector of one of our regiments and one in the sector of another. In repelling them, the antitank attack group destroyed eight tanks while eight others were knocked out by the artillery regiment.

In another case, the antitank attack group did not participate in the repulse of counterattacks but supported the infantry in its advance and in the consolidation of the captured objectives.

As is evident from the examples we have presented, antitank attack groups had rendered substantial support to the infantry and at the same time saved the senior commander from the necessity of a premature

commitment of the mobile antitank reserve. There were, however, certain shortcomings which manifested themselves during combat activities. One of these was the inclusion of truck-drawn guns in the groups. Motor vehicles betray the presence of the batteries and under bad road conditions (in rainy weather, in snow, etc.) do not permit of sufficient mobility on the part of the artillery. The employment of the heavy guns of the group for standing barrages against enemy tanks did not turn out favorably owing to the difficulty encountered in the conduct of fire.

When you seem to be most prodigal of the soldier's blood, you spare it, however, by supporting your attacks well and by pushing them with the greatest vigor to deprive time of the means of augmenting your losses.

—Frederick the Great

He who wishes to conquer without having an overwhelming superiority at his disposal must assume the risk of sustaining a check in a secondary sector, yet be able to endure it. This check, however, will certainly be annulled by the success won at the decisive point.

He, who, in order to reply to the cries of alarm uttered by his subordinates or in order to avoid local checks, allows himself to be prevailed on to shift, for this cause, forces which should have participated in the decisive action, submits to the dictates of the adversary and permits the laurels of victory to be torn from his hands.

—From Colonel Frick's *Tactical Breviary*,
quoted in *Revue Militaire Suisse*.

All the great captains of antiquity, and those who in modern times have successfully trodden in their steps, performed vast achievements only by conforming with the rules and principles of the art: that is to say, by correct combinations, and by justly comparing the relation between means and consequences, effects and obstacles.

—Napoleon

Germany's Secret Weapons

Digested from an article by a Military Correspondent in *The Times* (London) 29 June 1945. Pictures from *The Times* (London) 9 July 1945.

THE more that is learned of German preparations and progress with new weapons, the more apparent is it that the Allies ended the war with Germany only just in time. It may, of course, be said that this was not all luck, because Germany's feverish re-

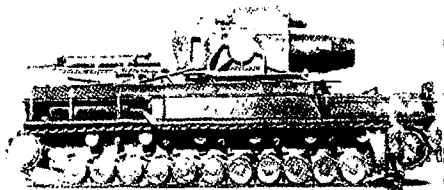
went forward on the heels of the fighting troops to take them over. Much was, in fact, taken intact. In other cases, vital objects which had been hastily buried or hidden were quickly found. One managing director of a great company was actually found addressing a board meeting on the disposal of dangerous secrets.

It is convenient to summarize results under seven headings, representing the seven groups of the organization which did the work.

The first of these concerns radio and optical equipment. Here, apart from the general high quality of output, there was only one surprise. That was in the Germans' infra-red photography. Photographs were taken at remarkable distances. Also in this category comes a fabulous ray which was to deal with tanks. This proved to be only infra-red searchlights to blind tanks crews and was used in conjunction with the 88-mm gun. It was more humdrum than the fable, but it was deadly against tanks moving at night, as ours did.

The second category embraces guns. So much has already been written about long-range guns that no emphasis is required to the enemy's inventive capacity. But there were other unpleasant novelties, such as rocket-assisted shells. At a certain point in the shell's progress the rocket took over and provided further propulsion. Then there was at least a scheme in the pre-development stage to provide the V-2 rocket with wings, which had great possibilities.

The third category is chemical warfare. The Germans had a new gas in great quantity with certain qualities more deadly than any yet used. It could have been mastered, but would have given trouble and caused much loss, especially as anti-gas discipline in England was naturally not as good as at the outset of the war. It is known that Hitler was the man who prevented its use, in spite of continual urgings from the party



A 54-cm self-propelled mortar, one of Germany's secret weapons. The projectile weighs one ton; range, 14,000 yards. The complete weapon weighs 120 tons. The man standing at the right gives an idea of its size.

search for new aggressive inventions starved the forces which had to fight her battles, notably the air and artillery arms, and thus contributed to the Allied victory in the field, the only kind of victory to which there is no reply. Nevertheless, the dangers faced, above all by Britain, were many and terrible. I am now learning a great deal about them from men willing to talk, partly from professional pride and partly, let us hope, to prevent further wars.

The British entered Germany with machinery organized to prevent the destruction or concealment of research work or plants of special kinds, and they were more successful than they had dared to hope. First there was an arrangement with the air forces to avoid bombing them. Then special teams

bosses, not through altruism, but because he did not believe it would pay. Another invention in this field was a very light and non-inflammable synthetic rubber of a sponge-like consistency, admirable for motor tires because it is nearly indestructible by bullets.

In the fourth category, that of air warfare, in addition to their various jet planes the Germans were experimenting with a piloted V-1 flying bomb with a retarded take-off and an obvious increase of accuracy. They had also made considerable progress with controlled projectiles directed either from an aircraft to a ground target or from aircraft to aircraft.

The fifth category covers vehicles. The British did not find much heavy tank industry in their area, but there were a number of half-track models with fantastically low fuel consumption. Amphibious vehicles of types not dissimilar from those used by the Allies in production.

The sixth category concerns naval construction. Here all the most notable work was on torpedoes and submarines. There was a torpedo with a range of eighty miles and an acoustic head which "listened" for its target. There were controlled torpedoes which would follow a zigzag course with deadly possibilities against zigzagging ships. There was a glider released from an aircraft and in turn releasing a torpedo, so that the aircraft could avoid the full blast of ships' antiaircraft fire. There was a jet-propelled submarine going into production with an underwater speed of twenty-five knots—a nightmare to deal with—and one in production with a submerged speed of fifteen knots. These were made possible by a new fuel, also employed to propel the Me 163, and to be utilized either as a propellant or an explosive fuel.

The seventh category, which can be labeled documentary, includes the records of the Gestapo and the Nazi Party. Some illuminating information has been unearthed here. The Gestapo would run a firm, supply it with slave labor, and then dodge income

tax on the profits, which were sometimes enormous.

The inventions mentioned were in all stages from pre-development to full production. When it is realized that full preparation was made by the Germans to carry out all



A German secret weapon discovered in the American zone. It is described as a "rocket-propelled guided missile in the experimental stage."

essential production in underground factories totally impervious to bombing, the full extent of the peril becomes apparent. It is not too much to say that the Germans were in the act of switching from one kind of war to another and that many developments of the kind I have enumerated would have been as deadly as those already disclosed in, for example, the V-1 and V-2. Allied bombing had delayed the switch-over and would have hampered development, especially by attacks on communications, but could not have stopped it.

The Future of Airborne Forces

From *The Aeroplane* (Great Britain) 20 July 1945.

By their success in the use of airborne forces the Germans sprang a surprise on the United Nations. They should not have been able to do so, since, some years before, pictures had been shown of massed parachute descents during Army maneuvers in Russia. The existence of parachute battalions in the German Army was well known, but when they were used at Rotterdam the Dutch were quite unprepared. The attitude of the latter is excusable, for we remember a lecture given to the officers of the Aldershot garrison in the autumn of 1939 in which the lecturer mentioned the parachute battalions of the Germans. At the end, after the audience had shown considerable interest, the senior officer present said: "You don't really suggest that the Germans will use parachute troops?" The chief success of the Germans in the use of airborne forces was the capture of Crete, but had the antiaircraft defenses been stronger and better organized the project almost certainly would have been a failure.

The Allies were slow to use airborne forces, chiefly owing to the lack of suitable aircraft, and in earlier attempts made a number of mistakes. They learned quickly, however, and none will deny that the use of airborne forces greatly hastened Germany's defeat.

In Germany, although parachute battalions were originally part of the Army, they were later transferred to the Air Force. The difficulty of arranging aircraft for training purposes was given as the reason. In Great Britain, airborne forces were raised and trained by the Army, although the crews of the aircraft and of some of the gliders were members of the Royal Air Force. There is, in time of peace, anyhow, a definite advantage in having all parts of an airborne force under one control. If the aircraft are provided by the Air Force, there is a natural tendency for the Army to disregard economy and to make exorbitant demands. At one time during the war with Germany all the aircraft

in Bomber Command would have been insufficient to take the number of troops that the Army proposed should be carried by air. On the other hand, once the troops have landed they must form part of the Army, and their action must be coordinated with that of the other land forces.

We believe that airborne forces should remain part of the Army, but their strength and composition requires very careful thought. The first essential is to have a force that can be dropped by parachute to seize an airdrome or a site on which airstrips can be constructed. The main body of troops can then be landed in the ordinary way, and will not need to have had any special training other than in rapid emplaning and deplaning. Gliders may become obsolete in the future, but they are a necessity for the present. The chief difficulties for an airborne force are its lack of mobility when landed and its weakness in fire power. At present, gliders provide the only means of overcoming those drawbacks. Motor transport, mortars, and guns have now to be carried in gliders, but there is urgent need for research into the development of airborne weapons.

There should be no necessity to design special aircraft for the transport of airborne forces. Airplanes should be designed to carry alternate loads of personnel or bombs, and both should be delivered in the same way. When this is achieved the troops will arrive concentrated at their objective, and one of the present difficulties of collecting dispersed men will have been overcome.

One of the reasons for the advantage that Germany enjoyed in the matter of airborne attack was the number of Ju 52's in use by Lufthansa's heavily subsidized civil airlines before the war. The air crews, too, had a liability for service in time of war. Civil aircraft sent to Merville with supplies for the Army during the withdrawal to Dunkirk were flown by civilians, who were not in military uniform and had no military com-

mitment or status. The designing of peace-time civil airplanes so that they can be converted quickly to carry bombs, cannon, and rockets is quite impracticable. But civil passenger and freight-carrying airplanes will always prove useful for war employment. Armies in the future will have to be equipped with, or have at their disposal, large numbers of transport airplanes which may well prove a vital factor in the ultimate balance of power.

As we said earlier, the first objective of an airborne force should be to obtain facilities for aircraft to land. In the past, the provision and maintenance of airdromes overseas was the responsibility of Army personnel, and they cannot claim to have shone in that role. In spite of the obvious inadequacy of the landing grounds allotted to the British Expeditionary Force when it went to France in 1939, little improvement had been made

before the German attack came. Landing-ground specifications are constantly changing with alterations in equipment. Requirements that are adequate one year are out of date the next. We believe that is a matter that can only be dealt with satisfactorily by Air Force personnel, and that, in future, airdrome construction companies will be one of the most important components of an airborne force.

No war has ever been like the one that preceded it, and speculation on the uses of airborne forces in any future wars cannot be guaranteed with any accuracy. During the years following the cessation of hostilities in Europe, however, airborne forces will probably play a large part in maintaining peace, and may become a vital and major influence in preventing future aggression both in Europe and throughout the world.

Psychological Warfare

Digested at the Command and General Staff School from an article in *Aim*, army magazine of the British Middle East Command, No 44, June 1945.

LET us examine the work of Psychological Warfare Branch (PWB) in various theaters of war. PWB, MEF (Mediterranean Expeditionary Forces), was British, and was part of the integrated British and USPWB, Mediterranean Theater. They have used quite a lot of "time" on Cairo, North African stations, and have a big station at Bari.

For a long time they produced a weekly air-dropped newspaper, giving up-to-date war maps and news in the language of the country, for both Yugoslavia and Greece. This was part of their successful efforts to boost the morale of the Greeks and Yugoslavs, and of all friendly civilians in enemy-occupied territory.

They also dropped verbatim reports of speeches made at the Lebanon Conference so that the Greeks might read them and judge for themselves. This all formed part of the daily strategic task against the Balkans

which showed little immediate result, but which we know has helped, in particular, to break down the morale of Bulgaria and Rumania.

In Normandy and Italy, psychological warfare operational units, by their Public Address equipment and loudspeakers, called upon enemy troops to surrender. They prepared surrender and news leaflets to be thrown over the enemy lines by shell or aircraft, and used their field radio stations to broadcast to the enemy troops, particularly enemy signals sections, giving up-to-date news or items obviously calculated to depress the enemy's morale. They were able, by means of their equipment and training in monitoring work, to produce for their commander and for the front-line troops up-to-date news bulletins and information which would be much delayed through any other source.

As a result, many successful calls were made on the enemy to surrender. This happened to various German garrisons in Albania, and on one occasion in Normandy a single Allied loudspeaker van with three PWB personnel succeeded in capturing 600 Germans.

The use of Psychological Warfare teams behind the front line was also widespread. In Cherbourg, for example, newspapers were published within a matter of days after the fall of the city. In Rome, within twenty-four hours of our arrival, the garrison commander's orders were being transmitted to the people by loudspeaker vans. These vans also gave the news of the Allied landings in Normandy to crowds of 100,000 or more—all this long before the normal methods of news distribution were in operation. In short, Psychological Warfare teams have been employed in all the major military operations since the North African landings.

In the leaflet war PWB often has to act very quickly, and occasionally forces the enemy to act with equal speed. Within forty-eight hours of the attempted assassination of Hitler on 20 July, millions of specially prepared leaflets were carrying the implications of the High Command revolt to German soldiers and civilians.

After the first daylight leaflet raids on Berlin, Himmler found it necessary to issue a decree threatening the death penalty to anyone caught reading our leaflets.

In Southeast Asia, no big propaganda organizations have been established and Psychological Warfare is mainly local and tactical. Nevertheless, an average of a million and a half leaflets were dropped on the Japs per month last year.

A prisoner who had seen some Allied leaflets in New Guinea told us that he thought them truthful, but some of his friends did not. He was particularly impressed by one because it admitted the great initial success of Japanese conquest, and by another because

it blamed Jap generals and the weakness of the Japanese Air Force for defeats. He could see the air situation for himself. So could many others, as this extract from a captured diary shows: "Our planes only run away . . . in the end, we might yet believe the enemy propaganda leaflets. I am getting sick of war."

Surrender pamphlets have also been disseminated among the Japanese by natives loyal to the Allies as well as from the air. During mopping-up operations on the Rai Coast, natives approached an Allied officer of their own accord and suggested that they could bring in a number of Japanese stragglers if given a "government pass."

Successful efforts have been made to deny native labor to the Japanese and recruit it for us.

When the Allied landing was made along the Rai Coast, it was found that the native population had evacuated en masse as previously instructed.

In the China-India-Burma theater propaganda activities have so far been limited chiefly to Northern Burma, where a Psychological Warfare Team (PWT) has been active along the route of advance of Allied forces.

To the local populations, news leaflets in Burmese and two hill dialects, Kachin and Shan, stressed the bombing of Japan and the fighting in Northern Burma itself.

Good results were also obtained with commodity-type propaganda, such as seed packets. Those who could read explained to the others that the packets were from the American-Chinese Forces, who were their friends. Villagers took the seeds and planted them in the jungle clearings; they were later able to subsist on these while evading the Japanese forces.

And as those seeds grew, so ideas grow, once they are sown in the minds of both our enemies and our friends; for that, reduced to the simplest terms, is what Psychological Warfare is all about.

How the French Fought the Japs in Indo-China

An article by Colonel D. M. Renucci, Military Attaché for France in Australia, in *Salt*, Australian Army Journal, 13 August 1945.

DURING the night of 9-10 March 1945, the Japanese Forces of Occupation in French Indo-China surrounded French garrisons, most of which were located in Tongking. French camps, barracks, and all military establishments without exception were encircled and, at dawn, Japanese tanks, field guns, and automatic weapons were ready to open fire on French troops.

What had happened?

Through information received from its Intelligence, the Japanese High Command had realized that the French were raising a resistance movement aiming, in due course, to assist the Allies with the full weight of methodically organized forces throughout Indo-China.

With this aim in view, the French had appointed leaders responsible for the operations, organized their forces, and prepared demolitions which were to paralyze the Japanese troop movements. Many useful lessons had been learned from the Resistance Movement in France. Instead of dealing only with scattered minor risings, the enemy would have to oppose strongly organized, well officered troops carrying out a carefully prepared plan.

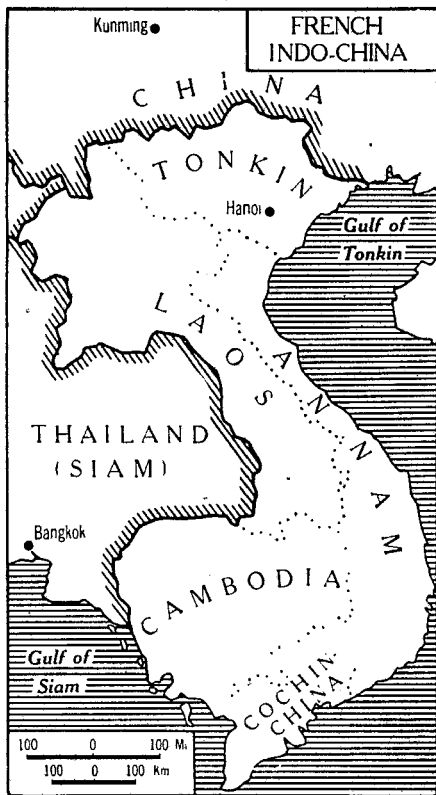
What was the composition of these French troops which up to then had been theoretically free but who actually were prisoners of the Japanese?

There were French Colonial troops—infantry and artillery; two battalions of the famous Foreign Legion, and some regiments of local troops, with a few French officers and noncommissioned officers.

Their equipment consisted of rifles and medium and light machine guns; the artillery mustered the equivalent of one group of field artillery (75-mm guns) and one group of mountain artillery equipped with 65-mm light guns. (In the French Army a "group" of field or mountain artillery consists of twelve guns; three batteries of four

guns each.) Their transport was made up of a limited number of lorries without fuel, and the Air Force had some ten aircraft, all very obsolete.

In spite of their appalling inferiority in numbers and of their insufficient and obsolete



equipment. French and Indo-Chinese troops, though surrounded by the Japanese, refused to surrender. They accepted the challenge to fight a battle which was lost from the start.

Garrisons held out everywhere and, at times, even took the offensive. Troops continued to resist although their lines of communication had all been severed and many of their officers had been killed in their quarters.

This determination to fight transformed an apparently useless and futile demonstration into a well-coordinated operation which surprised everyone—the Japanese High Command included.

Thanks to their knowledge of the country and of local languages, French garrisons in the large centers managed to break through the encircling enemy lines.

Our troops were able, by their guerrilla tactics and demolitions, to threaten seriously the Japanese communications at a time when the siege of Mandalay made the supply problem of the Japanese divisions engaged in Burma more acute.

In the Tongking area (north of Indo-China) fighting was bitter. French troops under Lieutenant Colonel LeCoq—killed in action 12 March 1945—heroically opposed the Japanese attacks in spite of crushing enemy superiority.

Four Japanese forces supported by tanks and airplanes furiously attacked the French and native elements. But American aircraft based in China supported our scattered detachments. The RAF dropped arms and ammunition.

The Indo-Chinese "Tirailleurs" fought side by side with the French, with admirable loyalty. Everywhere, even in Laos, volunteers were numerous. Unfortunately, the lack of arms and ammunition prevented the enrollment of all. But these volunteers could still be useful for obtaining information and the evacuation of the wounded.

The Europeans who were then fighting had been in Indo-China for more than six

years. Their physical condition was very poor, and medical supplies exhausted or deteriorated. Yet morale was excellent.

Up to 19 April 1945, the French order of battle showed:

Higher Laos (under General Alessandri): 1,450 French and 2,250 local troops.

Lower Laos: 300 and 700.

Annam: 150 and 80.

China (over the border from Indo-China): 700 and 1,580.

Which makes 2,600 French troops and 4,610 local troops—7,210 in all.

Nevertheless, the struggle was hopeless. It became imperative to withdraw and to withdraw again until the Chinese border was reached.

Referring to the ordeal of troops in this withdrawal, an Australian correspondent in China wrote:

"The Japanese hurled overwhelming strength against the rebels, and severely defeated them. The survivors set out from Hanoi on the long march to escape into Chinese territory.

"Many of the legionnaires struggled on, although wounded and suffering from anemia, brought on by constant attacks by voracious leeches, or with the flesh of their bootless feet reduced to the condition of raw steak. Many died of snake-bite, of malaria, of typhus, and blackwater fever. Yet in spite of the unbelievable horrors of the trip, many of the soldiers carried wounded, sick, or dying comrades on their backs for the last hundred miles of the nightmare journey."

It is possible that French resistance in Indo-China may be called madness, but it did at least show the world: first, the attachment to France of the local population of Indo-China; and second, that the French tradition of self-sacrifice and honor is as strong as ever.

Discipline, like courage, is the soul of an army, but in battle the first is more important than the second.

—Simón Bolívar, quoted in *Revista del Ejército, Marina y Aeronáutica, Venezuela*

Antiaircraft Artillery versus Ground Targets

Translated and digested at the Command and General Staff School from a Russian article by Lieutenant Colonel K. Lavrentiev in *Krasnaia Zvezda* (Red Star) 4 April 1945.

DURING the Patriotic War our antiaircraft artillery destroyed or damaged many thousands of enemy planes, and, in addition to this principal mission, fought enemy tanks and infantry. When the correlation of forces in the air had changed in our favor and the Germans were forced to use their aircraft only in particularly important directions, our antiaircraft artillery was able to give more attention to enemy ground forces and lend support to our infantry and artillery fires.

Antiaircraft artillery should be used in accordance with the situation prevailing in the given sector of the front. Only after establishing a reliable antiaircraft defense of the front troops and rear installations may part of the antiaircraft artillery be used against ground targets.

Careful and systematic study of reconnaissance data enables us to determine the probable grouping of enemy air forces, as well as their composition and mission, and even at the slightest indication of the enemy's intention to commit large air forces, the antiaircraft artillery must immediately revert to its primary mission. All such decisions concerning the shifting of antiaircraft artillery from one mission to another must be made by the senior artillery commander. Exceptions are allowed only in cases of extreme emergency.

Some considerations as to the employment of antiaircraft artillery against ground forces during the various phases of the offensive are outlined below.

In *breakthroughs* it is not advisable to use antiaircraft artillery for firing from special positions during the period of artillery preparation. The antiaircraft defense of a large concentration of troops and matériel in positions of departure constitutes the most important moment in the activity of the antiaircraft artillery, for enemy aerial counterpreparation or aerial counterattacks

are always to be expected. Under these conditions, the pulling out of entire units from the general system of antiaircraft defense, thus decreasing the density of antiaircraft fire, can by no means be justified. Should this, however, be absolutely necessary, then, after the occupation of a number of enemy positions, platoons and even separate small-caliber guns from the nearby batteries may be displaced forward and used against ground objectives by decision of the command. The positions for these guns should be equipped in advance and their occupation performed with particular caution and under the cover of darkness.

Small-caliber antiaircraft guns are able to fire successfully on embrasures of all types of fortifications, on visible machine-gun nests, and on personnel. Particularly good results are obtained by firing on targets located along the edges of woods and groves and in bushes, or targets concealed from observation by trees, shrubs, etc. High-explosive shells with quick fuzes burst upon hitting even the slightest obstacle and split into numerous fragments which affect the men under cover. In fighting for populated places, firing on wooden buildings results in setting the buildings on fire.

Medium-caliber antiaircraft artillery batteries can be used for firing from concealed positions during artillery preparations. In exceptional cases, separate guns may be employed for direct fires, but must always be in readiness to transfer their fire on enemy planes, according to the plan of antiaircraft defense.

When the troops begin advancing, the antiaircraft batteries displace forward. If the enemy counterattacks on the ground only, the antiaircraft artillery within the battle formations of the troops must participate in repulsing their counterattacks. At times, it is compelled to fight the enemy both in the air and on the ground simultaneously,

distributing its forces as dictated by the situation. The commanders of the antiaircraft artillery, being in personal contact with the commanders of the supported troops and observing the battlefield and the battle formations, are able to use most effectively their guns and antiaircraft machine guns to support the infantry in repelling counterattacks. Immediate preparation for opening direct fire on the enemy's ground forces wherever they appear must be the guiding rule of all the small-unit commanders. If it is suspected that the enemy is concentrated behind a ridge, it is necessary to select alternate positions to which the guns can be easily rolled out to open direct fire.

One of our antiaircraft batteries was once stationed behind a hill in front of which our infantry was engaged in combat. The counterattacking enemy threatened to capture the hill and an important road necessary for our maneuvering along the front. Enemy aircraft was absent. The battery commander did not wait until the enemy would be visible from his main firing position. He placed all his guns on the hill and opened point-blank fire on the German infantry. Within a short time the battery disrupted the counterattack and killed more than 200 Germans.

It happens in the course of offensive operations, especially in overrunning the enemy's successive positions, that new targets appear when the entire ground artillery is busy destroying the objectives assigned to it. Antiaircraft artillery can be advantageously used to neutralize such targets. An antiaircraft unit, for example, was ordered to destroy an enemy battalion assembled for a flank counterattack. Firing from concealed positions, two medium-caliber batteries dispersed the battalion and covered the flanks of our troops. The mission was accomplished without regrouping the batteries. The antiaircraft weapons, without being diverted from their direct assignment, acted as an artillery reserve of the command and operated very successfully. Contributing to the success of this operation was the fact that the antiaircraft artillerymen not only had been prepared for conducting direct fire but

also had established observation posts and had registered on several reference points.

Not infrequently, antiaircraft batteries covering advance units approaching water barriers effectively supported the infantry in capturing and retaining bridgeheads. When our infantry, for example, had forced a wide river and captured a small bridgehead, the enemy counterattacked. Several antiaircraft batteries which had covered the crossing from air attacks were dispatched to the rescue of the defenders of the bridgehead. The guns were sited on the western bank of the river with the defending infantry, and repulsed several enemy counterattacks. The enemy was forced to withdraw. In this battle the antiaircraft men killed more than 900 Germans, destroyed three guns, one mortar battery, twenty-five machine-gun nests, and a self-propelled "Ferdinand" type gun.

Very frequently clashes between the antiaircraft units and German ground troops occur when the former accompany mobile groups in the enemy's rear areas, particularly during marches. Here, close cooperation with the supported units and their attached elements is of particular importance. The principal mission of the small-caliber antiaircraft batteries is the destruction of enemy infantry and its fire means. The medium-caliber batteries may be used for both ground and aerial missions. The antiaircraft artillery columns and positions should be covered by motorized infantry.

Upon one occasion, four of our tanks and two tank-destroyer batteries, moving on the flank of a mobile group, were attacked by seventeen enemy tanks and an infantry battalion. A furious battle ensued. Our tanks and artillery repulsed the German tank attack and destroyed several vehicles, but the enemy infantry pressed on, conducting strong fire. At this time a battery of small-caliber antiaircraft artillery joined our fighting group. Its commander deployed his guns from the march formation, opened fire on the German infantry, and forced it to withdraw with heavy losses.

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In *parade* and in the regrouping of our troops, the antiaircraft artillery accompanying the troops participates in repelling sudden attacks in cooperation with other arms. In marching, all antiaircraft guns should be in full readiness for immediate firing, and it is the duty of each gun commander, before the start of the march, to prepare his gun and ammunition to be able to open fire at any moment. When antiaircraft artillery marches independently, it should be provided with combat security elements. Antiaircraft machine guns are distributed along the column to protect the guns from sudden attacks. They are used sometimes for "combing through" spots where German ambushes are likely to be located.

During halts, the antiaircraft artillery column should detail some of the weapons and men for combat security formed into circular defense so that the whole column can deploy under the cover of their fires.

Antiaircraft artillery protecting communications, bridges, crossings, and populated places may also be charged with the ground defense of these objectives. The experiences of recent engagements prove the ability of the antiaircraft artillery to accomplish this mission.

In one sector of the front, our mobile groups captured an undamaged bridge and kept on moving westward. An antiaircraft unit was sited near the bridge. Inasmuch as some German troops were still in the rear, all necessary preparations were made for ground firing. At dawn, several German groups approached the area held by two small-caliber batteries. When the Germans had reached open ground, all the antiaircraft guns suddenly opened fire. The stunned Hitlerites fled in panic, suffering heavy losses. Later on, the enemy's infantry, supported by mortars, launched several attacks, but all of these attempts failed.

In conclusion, let us briefly review the fundamentals discussed above: First of all, ground missions should by no means interfere with the antiaircraft defense of troops and rear installations. As a rule, direct fire should be resorted to only to repel enemy counterattacks and, in exceptional cases, for firing on fortifications. Generally speaking, antiaircraft artillery should always fire from its antiaircraft positions and use positions for ground targets according to the instructions of the aircraft artillery commander, which in turn are based on decisions of the senior artillery commander.

Bombing Pinpoints in the Jungle

From an article in *Flight* (Great Britain) 15 March 1945.

WHEN aircrews in Europe were briefed before a mission, they studied photographs of the target they were to bomb. Landmarks were pointed out to them; the intersections of wide roads, reservoirs, great warehouses, and marshalling yards showed up like arrowheads pointing to the place where their bombs were to fall.

In Burma, pilots, navigators, and bombardiers do not often know such luxuries as these. Too often the target is a place without a name, a mere pinpoint on a large-scale map. And when they are shown a photograph of the spot, they are lucky if they see much more than the top of trees—a few hundred of the many millions of

identical-looking trees above which the airmen of Eastern Air Command daily fly.

Yet as the Army advances steadily southward it moves over tracks littered with smashed equipment, across wrecked stores areas, and through strongpoints which have become graveyards for the Japanese—all this the work of Allied airmen.

How is such accuracy attained? What decides why one small patch of jungle, looking very much like the surrounding forest, is the point which must be attacked?

As in all other aspects of air warfare in southeast Asia, this problem is one which must be met by special measures. But behind all of them is the need which is funda-

mental in every theater: precise navigation. Without this all the tricks would fail.

VCP [visual control post] bombing is one of the methods of obtaining pinpoint accuracy, but it can only be used when the target is within sight of our own lines. VCP is manned sometimes by a flying man, sometimes by an Army officer, equipped with a small radio transmitter and a pair of binoculars.

An enemy position giving trouble to our land forces is to be attacked from the air, and a formation sets out to the approximate position. As the aircraft approach his concealed transmitter, the VCP officer calls up the lead aircraft on his radio and guides the force to its objective, using all the little local landmarks which no map, however large, could show. A peculiar rock formation, a gap among the trees, the scarred earth where a shell has fallen: such irregularities as these are the aids to VCP bombing. And when the first bombs have been dropped, the ground observer corrects the aim until the target is wiped out.

This method is so effective that frequently congratulatory messages reach the airmen from the Army thanking them for neutralizing an obstinate Japanese pocket.

As in air warfare in the West, Allied flying men over Burma occasionally have Path-

finders to direct their strikes. But they are much more literally Pathfinders in the Far East.

Sometimes a pilot on reconnaissance over enemy territory notices an unusual movement beneath him. The Japanese are masters of the art of camouflage, but some change in the monotonous green landscape catches the pilot's eye. He circles, noting every distinctive feature on the ground, makes a careful check of his position, and then flies home to report his suspicions to Intelligence.

An attack is ordered against that small point, so like its surroundings that only the man that has seen it once can recognize it again. And so he leads the squadron to the spot—a true pathfinder—to put his suspicions to the test of fire and high explosive.

Bombs dropped in thickly wooded country may hit and destroy some cleverly concealed Japanese objective, but the success of the mission will also be concealed if high explosive alone is used. In this specialized warfare the backroom boys are engaged as much as they are in Europe. Experiments have been made on secret testing grounds until the best mixture of explosive and incendiary has been evolved, not only to destroy but also to reveal what damage has been done to targets screened by the effective camouflage of jungle growth.

We must select for our attack one point of the enemy's position (i.e., one section of his troops—a division, a corps) and attack it with great superiority, leaving the rest of his army in uncertainty, but keeping it occupied. This is the only way that we can use an equal or smaller force to fight with advantage and thus with a chance of success. The weaker we are, the fewer troops we should use to keep the enemy occupied at unimportant points, in order to be as strong as possible at the decisive point. Frederick II doubtlessly won the battle of Leuthen only because he massed his small army together in one place and thus was very concentrated as compared to the enemy.

—Clausewitz