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ARMORED CAVALRY JOURNAL

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"Further, in its appeal to those who are now serving with, or will in the future serve with mechanized and Armored units, it will help to build up the spirit of coordination and team play so essential to the future success of our armed forces.

Jacob L. Devers

General, United States Army,
Commanding, Army Ground Forces."

The 11th Armored Division Society Headquarters is now permanently established in the offices of the Armored Cavalry Journal. Address all communications to the Secretary, 11th Armored Division, c/o The Armored Cavalry Journal, 1719 K St., N.W., Washington 6, D. C.

Colonel W. A. Holbrook, Secretary.

The Armored Cavalry Journal is glad to welcome the 11th Armored Division Society and will be glad to hear from any of the other Armored Divisions or Cavalry Reconnaissance units that have formed a society. We are planning to devote a section in each issue of the Armored Cavalry Journal exclusively to any news or notes that these societies would like to have published. Write to Colonel E. M. Sumner, Editor, for further information.

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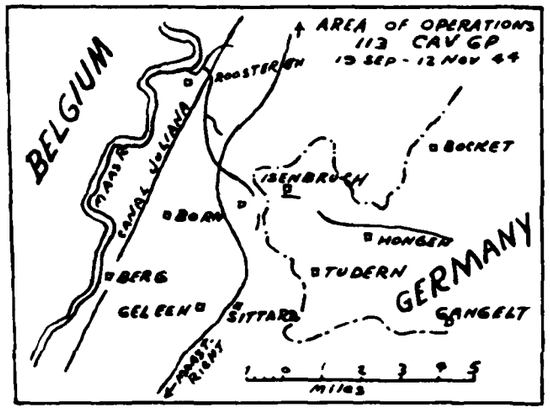
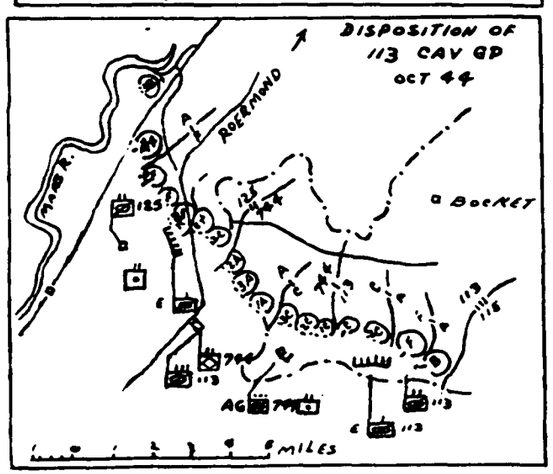
The 113th Cavalry Group

Defense of the north flank of the 12th Army Group, Sittard area, September 19-November 12, 1944.

SECOND OF A SERIES

DURING the night of September 19-20, 1944, the 113th Cavalry Group—composed of the 113th Cavalry Reconnaissance Squadron, the 744th Light Tank Battalion (less one company), the 246th Engineer (C) Battalion, Company C, the 702d Tank Destroyer Battalion, an engineer company (less two platoons), and a tank destroyer platoon—took over the defense of the north flank of XIX Corps (the First Army and 12th Army Group), in the Sittard area. The area extended from the Maas River to the Holland-German border, along a front of about six miles. On the right was the tank battalion (less two companies), with a cavalry reconnaissance troop and engineer company and the tank destroyer company (less one platoon) attached.

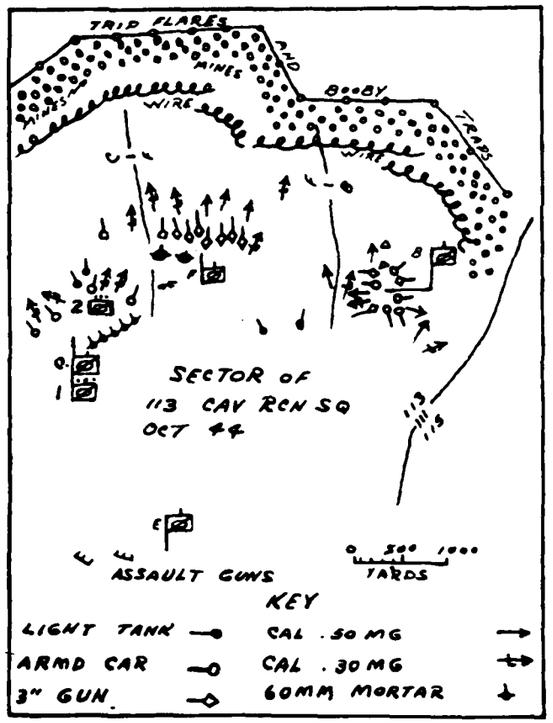




On the left was the cavalry squadron (less a reconnaissance troop), with a company of engineers and a platoon of tank destroyers attached.

Early September 20, the work of organizing the position was begun, and aggressive reconnaissance was initiated to the north where contact was established with the enemy elements of the 176th Infantry Division, which were supported by artillery and tanks. The terrain east of the German border was open and gently rolling, and provided excellent fields of fire and observation. West of the border, the ground was generally flat and wooded and cut with numerous drainage ditches. At 1200 September 22, the 113th Cavalry Group assumed responsibility for a widened sector which extended to Gangelt, Germany, four miles to the east.

From September 29 to October 3, the 113th Cavalry Group (the 125th Cavalry Reconnaissance Squadron, less Troop B, rejoined it on September 30) advanced its line four miles to the left, forced a temporary vehicular crossing over Saeffelen Beek near Isenbruch, and took



part in a general offensive action launched by the 29th Infantry Division. Thereafter, the group resumed the defensive, with three units abreast from left to right in the following order: the 113th Cavalry Reconnaissance Squadron, the 744th Light Tank Battalion (less one company), and the 125th Cavalry Reconnaissance Squadron (less Troop B). The only reserves available were one platoon for each unit. Up to three light and two medium artillery battalions, whose organic assault guns proved invaluable, supported the group. Aggressive patrolling was conducted, and much information of the enemy was gained. Every practicable measure was taken to strengthen the defense of this vital line, which was based upon no appreciable water obstacle.

On November 2, the 17th Cavalry Reconnaissance Squadron, normally a part of the 15th Cavalry Group, took its place in the line and relieved the 125th Cavalry Reconnaissance Squadron, which passed into group reserve. From then on, it was possible to rotate complete units from the line into reserve, and the effect of this system was very beneficial. However, it was not used long, for on November 12, the Guards Armored Division of the 30th British Corps relieved the 113th Cavalry Group, which then passed into reserve.

To summarize this performance by the 113th Cavalry Group: a division-seized front was successfully held for six weeks while larger units of the corps were operating against the Siegfried Line; mechanized cavalry demonstrated remarkable staying power, although little rotation of units was possible; a need for a third squadron, to provide a mobile reserve and to make possible the relief of units long committed, was keenly felt.

The 113th Cavalry Group

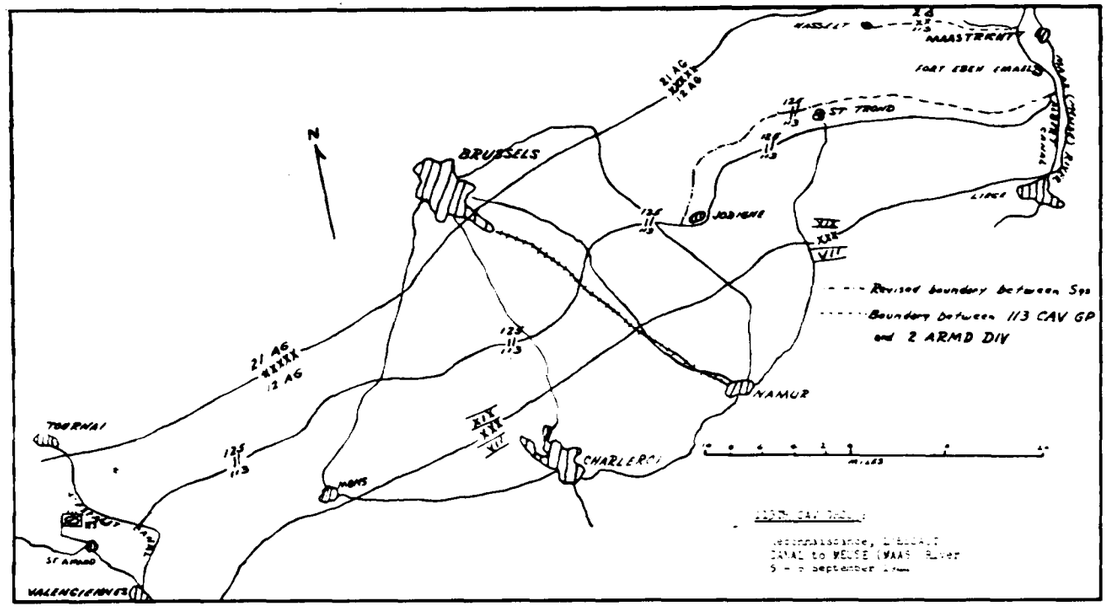
Reconnaissance of XIX Corps zone of action, L'Escaut Canal to Albert Canal, September 5-8, 1944.

ON September 4, 1944, the 113th Cavalry Group (Mecz.), which was bivouacked south of Tournai, Belgium, received the mission of moving across the L'Escaut Canal early September 5, to reconnoiter aggressively east and northeast in the zone of action of the XIX Corps. This zone comprised a strip of land 20 miles wide and 125 miles long, which passed between Charleroi and Brussels, both exclusive, and struck the Meuse River between Liege, exclusive, and Maastricht, inclusive. The enemy situation was to be determined. Strong opposition was to be by-passed. The condition of roads and bridges on the five principal routes, which the corps planned to use in its main advance, was to be reported. The 113th Cavalry Group, which comprised, besides group headquarters, the 113th Cavalry Reconnaissance Squadron and the 125th Cavalry Reconnaissance Squadron (less Troop B and Company F), was to be reinforced by Company B, 82d Engineer (C) Battalion, and Company C, 803d Tank Destroyer Battalion. No support could be expected from the main combat elements of the corps, for it was temporarily immobilized because of a gasoline shortage.

Early September 5, the advance was begun, with squadrons abreast, the 113th on the right, and with a platoon of engineers attached to each squadron. On September 6, a tank destroyer platoon was also attached to each squadron. Squadrons advanced with two cavalry reconnaissance troops abreast. By night September 5, the line of the Namur Brussels Railway had been reached against enemy resistance, which was scattered and generally light until late in the day when the 113th Cavalry Reconnaissance Squadron encountered stiff opposition. Early September 6, the advance was resumed, with the 113th squadron in sharp contact throughout the day and the 125th squadron making favorable progress on its left, although delayed on its right at Jodigne until this resistance was by-passed.

On September 7, the 113th Cavalry Reconnaissance Squadron fought its way to St. Trond, where strong resistance was encountered, while the 125th Cavalry Reconnaissance Squadron, now reinforced by Troop C of the 113th Cavalry Reconnaissance Squadron, advanced to the vicinity of Hasselt, which was captured before dark.

By this time, the 2d Armored Division had refueled, and its reconnaissance elements had overtaken the 113th Cavalry Group. The corps commander decided that the 2d Armored Division would operate in the left portion of the corps' zone; and at 0800, September 8, the 113th Cavalry Group received orders to close in to the right. By midafternoon the Albert Canal was reached by all troops, and by dark it had been determined that all bridges over the canal and the Meuse (Maas) River had been destroyed by the enemy. The 113th Cavalry Group screened the line of the canal, and at the same time reconnoitered Fort Eben Emael and the area lying between the canal and the river. When the 30th Infantry Division came up on the afternoon of September 10, the group disposed itself to cover the division's flanks.



Mechanized cavalry's self-sufficiency was well illustrated in this operation. It is also of interest that although this was a reconnaissance mission, most of the resistance encountered had to be fought and defeated in order to permit the 113th Cavalry Group to advance and accomplish its mission.

★ ★ ★ ★

The 2d Cavalry Reconnaissance Squadron

Crossing of the Moselle River and seizure of Wincheringen as a diversion for an attack by the XX Corps, February 19, 1945.

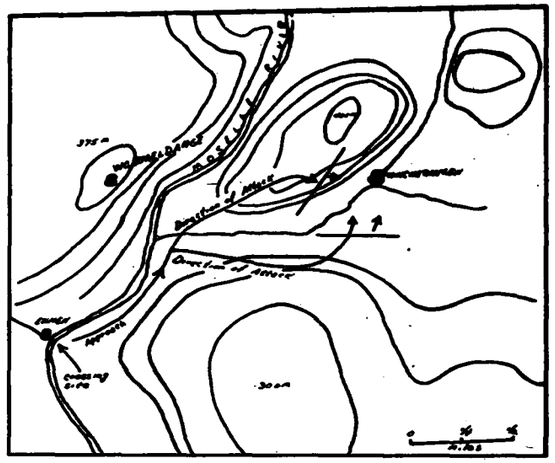
THE 2d Cavalry Group, heavily reinforced as Task Force Reed, was ordered to make a crossing of the Moselle River during the night of February 18-19, in squadron strength, and to seize and hold the town of Wincheringen. At the time orders were received the 2d Cavalry Group was defending the west bank of the Moselle River from Haute Kontz to Mertert. The purpose of the operation was threefold: to create a diversion to assist the offensive of the XX Corps, scheduled to attack north at 0600 hours, February 19; to clear the Saar-Moselle triangle; and to capture Trier. It was expected that leading elements of the 10th Armored Division with one chemical smoke generator company attached would reach Wincheringen by 1600 on February 19.

At this time, the enemy troops in the Saar-Moselle triangle comprised elements of the 11th Panzer Division, the 416 Volks Grenadier Division, and two fortress machine-gun battalions. The divisions were generally facing south, opposing the XX Corps. However, combat groups of the 11th Panzer Division were in reserve east of Wincheringen, and the line immediately around Wincheringen was held by the 44th Fortress Machine-Gun Battalion, one company of which occupied the town and manned outposts on the riverbank. Some artillery and mortars supported this company.

The battalion reserve was located several kilometers to the east.

Wincheringen was dominated by hills on the west, north and south, and possession of these hills would assure capture of the town and assist in repelling counterattacks. Secrecy in crossing the river and launching the attack before enemy reinforcements could arrive was considered essential. It was decided not to cross opposite Wincheringen but at Ehnen, one mile up the river, where good covered approaches existed and there were good shore lines on both sides. No artillery preparation was contemplated; however, a total of two battalions was available to deliver counterbattery and defensive fires on call. In addition, six towed 3-inch guns were ready to give direct fire support after daylight, and the chemical smoke generator company was ready to "smoke" the river and cover the reinforcement of the attack and the evacuation of the wounded. Boats were to be manned by engineers. The assault force was to comprise the 2d Cavalry Reconnaissance Squadron (less Troops C and E and Company F), with Company C 285th Engineer (C) Battalion attached.

The crossing was started at 0100, February 19. One platoon of engineers led and, upon landing, outposted the beaching site. The remainder of the attacking force followed, and the crossing was completed by 0300. Complete surprise had been effected, and no enemy resistance was encountered until the movement toward Wincheringen began. The force then received small-arms, mortar and artillery fire, the latter being generally



ineffective as it fell north of the crossing site. By daylight, the hills west and south of the town had been seized and the western end of the town captured. Fighting continued through the day, and attempts of the enemy to relieve the town were broken up by artillery concentrations and direct 3-inch gun fire. At 1730 a final attack was launched to clear the town. At 1800 leading elements of the 10th Armored Division arrived and supported the assault and by 1900 hours the town had been successfully cleared.

★ ★ ★ ★

The 38th Cavalry Reconnaissance Squadron

Defense of the Monchau area against German attack, December 16-17, 1944.

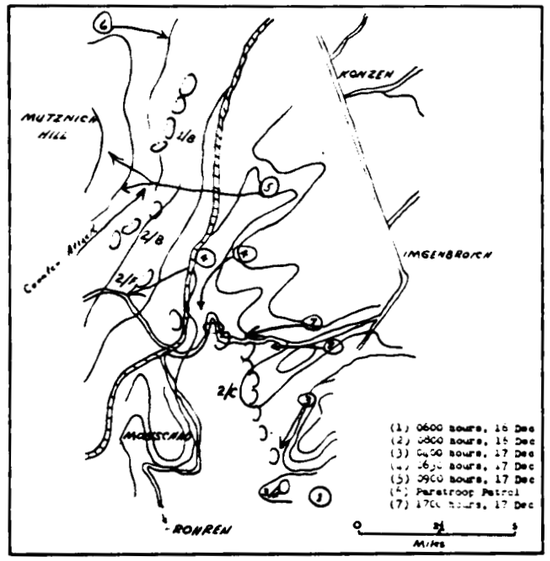
ON November 10, 1944, the 38th Cavalry Reconnaissance Squadron, under control of the 102d Cavalry Group, took over the defense of a sector of the V Corps' front which faced the Siegfried Line in the vicinity of Monchau. The sector was of particular importance because it guarded the approach to a network of roads which led to Eupen and Liege. On December 16, 1944, the squadron was disposed with cavalry reconnaissance troops C, B, and A abreast. Troop C was reinforced by a section of the 3d Platoon of Company F, while the 2d Platoon of Company F covered the 500-yard gap between Troops C and B. Troop A was in contact with the 102d Cavalry Reconnaissance Squadron, on the left, and Company F, less detachments, was in Monchau. The squadron had in support, besides Troop E, the 62d Field Artillery Battalion and two medium field artillery battalions.

Early December 16, German infantry struck this position, and made seven attacks during that day and the next. These attacks, which comprised the northern effort of the German winter offensive, were, except for the fifth attack, broken up by defensive fires. After the

second attack the squadron commander asked group for reinforcements, and Company A, 146th Engineer (C) Battalion, and six machine-gun crews from the 186th Field Artillery Battalion were sent forward. Troops C and B were each reinforced with a platoon of engineers, and the engineer company (less two platoons) was placed in squadron reserve on the high ground just west of Monchau. The six machine-gun crews were placed in support of the tank platoon in the center. There was considerable activity on both sides during the night of December 16-17.

At 0900 hours, December 17, a fifth attack, made between the 1st and 2d platoons of Troop B on Mutznich Hill (see sketch), broke through the position on a front of 200 yards and overran three artillery observation posts. The squadron commander sent a platoon of engineers and a section of light tanks to Troop B's support, and with these units and the 2d Platoon of Troop B, a counterattack was launched and the enemy driven from his forward position.

During the height of this action, the squadron commander had called upon the group commander for additional reinforcements, and at 1100 hours, Company A, 47th Armored Infantry Battalion and one platoon of Company A, 10th Tank Battalion, were dispatched to the squadron. Arriving at about 1200, the infantry company was directed to patrol the woods in the rear of Troop B's position and the tank platoon was ordered into squadron reserve. During this time, about 20 enemy planes, one of which was shot down, strafed the squadron's position. At 1700, the 47th Infantry Regiment of the 9th Infantry Division closed into the area just west of Monchau. The following morning, December 18, this regiment relieved the 38th Cavalry



Reconnaissance Squadron in that part of its sector which was occupied by Troop C.

The outstanding success of the 38th Cavalry Reconnaissance Squadron in defending its vital sector against repeated enemy attacks is felt to have been mainly the result of excellent organization of the ground, including very thorough laying of mines; installation of warning devices and erection of wire; very careful sighting of weapons and utilization of terrain; well-planned and effective supporting fires; excellent communications; and a determination to hold the position.

The 87th Cavalry Reconnaissance Squadron

Attack against Meinkenbracht, April 12, 1945.

ON April 11, 1945, the 87th Cavalry Reconnaissance Squadron, of the 7th Armored Division, then in the vicinity of Landbeck, was ordered to capture Meinkenbracht and reconnoiter the routes: Meinkenbracht-Erndorf, and of Meinkenbracht-Linnepe. The attack was part of the mopping up operation by the 7th Armored Division in the Ruhr pocket.

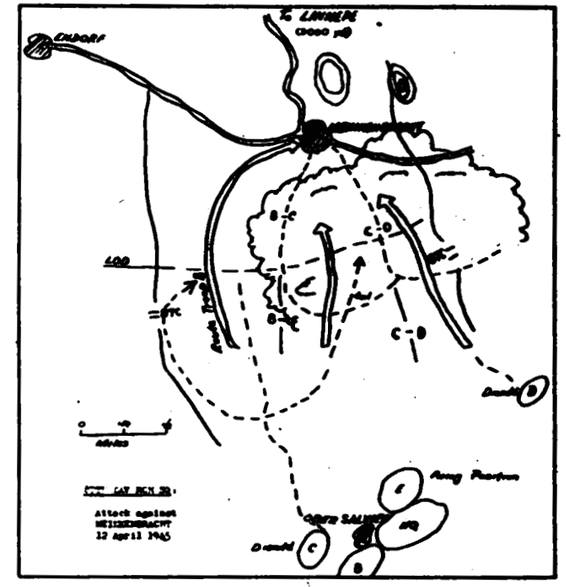
The squadron's plans called for Troops B, C, and D, each with one platoon of Company F attached, to advance dismounted through the woods and assault the town. Each troop was to operate in the zones shown on the sketch, and Troop E was to support the attack from the position indicated. The final assault on the town was to be made from the south by Troop C, while Troop D was to cut the main approach route from the west, take the high ground southwest of town, and

join the Troop C attack on squadron order. The 434th Armored Field Artillery Battalion was in direct support.

At 0600, April 12, the leading elements of the troops moved to the designated forward assembly area in the vicinity of Ober Salwey, where the reconnaissance troops—who were to be accompanied by tanks—dismounted and prepared to go forward on foot. Squadron headquarters was set up just east of Ober Salwey, while Troop E went into position as shown on the sketch. Troop A at this time was attached to Combat Command R on a separate mission.

As the reconnaissance troops pushed through the woods, the 434th Armored Field Artillery Battalion and Troop E fired artillery preparations on the town. Troop B, which had the least trouble with the terrain and met little resistance, pushed rapidly ahead of Troops C and D. Taking advantage of this fact, the squadron commander ordered Troop B into the town ahead of Troop C. This maneuver was accomplished with little loss to the attacking forces, and the speed of the attack resulted in the capture of 581 prisoners and a complete collapse of the defenses of the town. Troop B, moving rapidly through the town, pushed reconnaissance to Erndorf and Linnepe and found them occupied by the enemy. Troops C and D continued to advance to their zones and assembled at Meinkenbracht.

This action illustrates a rapid and successful dismounted assault by mechanized cavalry against a de-



fended town. The rapid advance of Troop B was promptly exploited to accomplish the squadron's mission, and also reduced the enemy's pressure on Troops C and D, thereby decreasing the number of casualties which might have been suffered in those troops.

The conclusion of the series of articles of which the above are a part, and which describe the employment of cavalry in combat in the European Theater, will appear in the next edition of the Armored Cavalry Journal. Remaining articles are:

86th CAVALRY RECONNAISSANCE SQUADRON
Attack against Meinkenbracht, April 12, 1945.

89th CAVALRY RECONNAISSANCE SQUADRON
Delaying action by Troops A, B, C and E, Befort area, December 16-25, 1944.

92d CAVALRY RECONNAISSANCE SQUADRON
Reconnaissance for the 12th Armored Division, Neustadt area, April 8-16, 1945.

80th CAVALRY RECONNAISSANCE TROOP
Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

104th CAVALRY RECONNAISSANCE TROOP
Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

Face-Lifting a Cavalry Squadron

*by Captain Kenneth T. Barnaby, Jr.**

THERE seems to exist in the Army an unpublished and unrecorded SOP which dictates: "No matter what the piece of equipment is, change it" . . . (for the better, of course). The 117th Cavalry Reconnaissance Squadron (Mecz.) was no exception. Some of the changes it made in matériel stuck with it. Others, while serving a specific purpose for a limited time, were later discarded. But all of them evidenced interest and ingenuity by the entire command. It was command's policy to encourage everyone to submit suggestions which would increase the efficiency and scope of the very excellent equipment with which we were supplied.

In one or two instances, the modifications were a combination of personal experience and theory, plus the experimentations of other outfits with which the squadron operated. In most cases the changes were strictly VOCO, VOCG, or field expedient. We felt especially grateful to the commanding generals of the VI Corps and the Seventh Army for their objective viewpoints in permitting us a latitude of liberal experimentation.

Brief Squadron History

The 117th went overseas in September, 1942, as the 2d Squadron, 102d Cavalry Regiment (Mecz.). The regiment landed at Liverpool, England, and moved to Southern England where it drew all new matériel in accordance with the then existing TO/E. In November, 1942, the 2d Squadron was assigned to Security Command, Allied Force Headquarters, and shortly thereafter sailed for Algiers, Algeria, where it assumed responsibility for the mobile security of General Eisenhower's headquarters, both forward and main. Some elements and officers of the squadron worked in Tunisia and Sicily during the campaigns in those areas.

In November, 1943, under the new TO/E for a cavalry squadron, the unit was reorganized and redesignated the 117th Cavalry Reconnaissance Squadron (Mecz.). The prescribed changes in personnel and matériel were made; three new troops, Headquarters, C and E were formed, and training was intensified.

In early 1944, the squadron was relieved of assignment to AFHQ, attached to the Fifth Army and after a short period moved to Italy where it received its baptism of fire as a unit when the Anzio beachhead burst from its besieged enclave. The 117th, with the Fifth Army, broke out of the Cassino-Terracina line and drove up the west coast of Italy. It was withdrawn from action after 39 days of combat, reassigned to the VI Corps of the Seventh Army, and prepared for the August 15 invasion of Southern France.

Landing with the advance elements of the invading divisions, the unit spearheaded the Butler Task Force up through Southern France and continued as the reconnaissance element for the VI Corps. It made contact with the Third Army at Darnay, France, and proceeded with the Seventh Army, breaking through the Siegfried Line, crossing the Rhine, and pushing southeast through Germany and Austria to the Italian border, where on VE Day it halted its march.

Two weeks later, at the request of General Eisenhower, the squadron was moved to Frankfurt A/M, Germany, to reassume the duties of mobile security for "Ike's" CP. It continued in this capacity until November 25, 1945, when it was officially deactivated.

Changes and Modifications of Equipment

Armored Cars, M8:

Because of the lack of armament on the bottom of the M8 armored cars, casualties were high among drivers and radio operators. To provide protection, a half-inch sheet of steel armor plate was laid on the floor of the driver's compartment from beneath the foot pedals rearward to behind the cushion seats, and from side to side over the drive shaft hump. This plate was welded at the sides and center. It proved invaluably effective, and no M8 or light tank was permitted to leave the squadron maintenance shop without it.

One of the troops which had suffered particularly from frontal AT fire experimented with sandbags stacked on the lower and upper slope plate on the front of the M8s as well as along the deck on either side of the driver and radio operator. A "lattice work" of thin steel sheets kept the bags in place on the front, and the weight of the bags held them firmly along the deck. The idea was similar to that used by some of the armored units on medium tanks. The result was not satisfactory. While it gave additional protection to the crew, and had a beneficial morale effect, the resulting strain to axles, springs and shock absorbers, plus the general distortion of balance to the vehicle, caused abandonment of the idea.

*Instructor, The Cavalry School.

1—Twin .30 caliber light machine guns mounted on the turret of an M8 Armored Car. 2—Bird's-eye view of the work bench installations in a half-track for radio maintenance. 3—Machine-gun jeep showing placement of extra ammunition boxes, modification of top bows, stowage of bed rolls and bags, and placement of 510 radio. 4—Rear view of gunner's compartment of M7 105mm Assault Gun showing ammunition stowage, and placement of grenades for demolition.

One of the inefficiencies of the M8, it was felt, was that automatic fire could not be placed at close range on either side of the vehicle. A bow and turret gun would have been the solution. Experimentation with mounts for the bow gun was never completely satisfactory, and the stowage of ammunition was a problem never wholly solved.

Opinions differed on the caliber of the turret gun. One faction favored the .30, the other the .50 caliber. But both agreed on three fundamentals: That there should be a turret gun, that it should be mounted forward of the car commander's spot on the turret top, and that it should be mounted as low as possible. It was a foregone conclusion that the antiaircraft rôle of the gun was out. There was a third school of thought that favored twin .30 caliber MGs on the turret of the M8. As a result, the final decision—subject to the approval of the Troop CO—was left up to the individual car commander who, after all, was going to shoot the weapon. Each car, however, had a turret gun of one of the approved types. (See illustration No. 1.)

The actual mounting of either gun was not difficult. The turret mount from a salvaged tank, cut down and welded to the turret, served admirably, as did the M30 or M31 pedestal mount from a jeep. (In the latter case, though, it was advisable to be prepared with a reliable explanation if Ordnance caught you hacking up good equipment.)

The biggest advantage of the .30 over the .50 caliber was the bulk of the ammunition. This was quickly solved, however, by welding ammo box racks to the outside of the turret. The danger of enemy fire igniting the boxes was disregarded in favor of accessibility; and, as a matter of fact, no boxes were ever so ignited.

Two of the reconnaissance troops crashed through with twin .50 caliber MG mounts for use on the M20 Armored Car as CP protection. The ammunition was carried in racks which were welded to the side of the hull above the deck. This worked reasonably well, except that rapid rotation of the guns was somewhat difficult, and the weight of the double guns was a strain on the skate and ring.

The ring mount for the turret of the M8 Armored Car was not used by the members of the squadron. We

preferred the stationary mount, as described above; but it should be pointed out that we did not have much opportunity to experiment or work with the authorized ring mount.

Half-tracks:

The squadron use of the half-tracks was somewhat varied. Squadron headquarters, assault gun and tank troops used them pretty much as per TO/E. The reconnaissance troops differed.

Troop C used them with the platoons—one as CP vehicle, and one with motor maintenance. This worked well.

Troops A and B thought them awkward and ungainly, unusable cross-country, and difficult to turn around in an emergency. There also was seldom enough personnel available to crew them properly. As a result they were used as follows:

Troop A: one as a troop CP vehicle; one as a troop supply vehicle; one as a motor maintenance vehicle fitted with welder, compressor, work benches, etc.; one as a general purpose vehicle for hauling ammunition to the platoons and for general dravage.

Troop B: one as a troop CP vehicle; one as radio maintenance vehicle fitted with work benches, tool racks, etc., for rear and emergency repair work (See illustration Number 2.); one as a motor maintenance vehicle fitted with work bench, welder, compressor, etc.; one to carry the one 81mm mortar and ammunition, and two barrack bags per section containing extra clothing for the personnel in excess of that which was carried on their vehicles.

The ¼-ton, 4x4 (jeep):

All jeeps were sandbagged at the front and back. This reduced the speed and shortened the life of the vehicle but gave it protection against mines.

One of the biggest problems with jeeps is the stowage of personal luggage in such a manner that room will be left for the necessary fighting equipment. Some units welded cages or racks onto the rear, others strapped the bedrolls and musette bags on the hood. In our case, we modified the top bows so that they did not lie flat around the rear body when collapsed, but hung about six inches above the rear tire and spare gas cans. The holding device, normally located on the outside of the body just back from the doorway, was moved to the rear about 15 inches and set at an angle. When the forward ends of the bows were set in the holding clamp, they hung high. The three musette bags were hung on the top of the bows, and bedrolls strapped either before or behind them. Thus the interior of the vehicle was left free from personal gear. (See illustration No. 3.)

In the machine-gun jeeps, the ammunition boxes were stowed along the left wheel housing and on the sandbags on the floor of the back seat, their weight holding them in place. A strip of angle iron along the inside edge of the wheel housing kept the boxes from slipping off.

The 60mm mortar jeeps (we had nine 60s per troop and an 81mm in addition) carried the mortar lashed by straps and D rings to a wooden block on the left rear wheel housing. The sight was carried in the glove compartment.

Ammunition was carried in a box which was built into the rear end of the jeep and replaced the rear seat. Although large enough to carry 85 rounds, the normal load was 60. The seat padding was removed from the regular seat and fastened to the top of the box cover.

Each mortar jeep was equipped with a .30 caliber MG which was mounted on the extreme right edge of the dashboard.

The skyhook or wire cutter was mounted on the front bumper of all jeeps.

Assault Guns (105mm Howitzer, M7)

The squadron was extremely fortunate to have been authorized 105mm Howitzers, M7, in lieu of the M8 Assault Gun just prior to the invasion of Southern France. The advantages are obvious and do not need discussion here. In our opinion, they are mandatory for a cavalry squadron.

The 105s were used in battery, indirect, except on the rare occasions when a troop was detached from squadron control. Only once were they used in direct fire, when they were employed from a hull defilade position from a high hill, and fired down on enemy vehicles on a highway.

Modification of this piece was limited to ammunition towage. Racks of angle iron were constructed that were the length of the encased 105 shell. These were mounted on the sides of the gunner's compartment to replace those already installed. There were two racks on the left side and one on the right behind the anti-aircraft ring. Each rack held 28 rounds and made the total carried by the vehicle 116 instead of the normal 69. (See illustration No. 4.)

Radio and Communication

It is doubtful whether any two units in the entire United States Army ever had similar communication systems. Each adapted its equipment to the missions it received, or according to the pet theories of its responsible officers. It is reasonable to assume that one set-up worked as well as another.

In the 117th Cavalry, the major communication items of interest follow:

Each troop CP had a command half-track in which was installed a SCR 193 and a SCR 508. Each radio was equipped with remote control facilities so that radio rooms could be set up indoors.

Each troop in the squadron had a jeep in which was mounted a SCR 193. This provided long-range communication when personnel was dismounted, and carried the radio over "jeepable" terrain, which for one reason or another was impassable for armored cars or half-tracks.

We were extremely fortunate in being able to draw

enough extra radios to equip every jeep in the reconnaissance troops, except those noted above, with a SCR 510. This arrangement proved of immeasurable value, particularly during dismounted defensive operations when it gave each gun position communication with the entire troop line. The portable "back-pack," described in The Cavalry Journal several years ago, was used by some of the platoons; others preferred the German "back-pack" with slight modifications.

The installation of the SCR 510 in the jeep is shown in illustration No. 3. In another instance, the men varied the procedure and installed the antenna on the outside of the vehicle. This was the only vehicle so arranged. The radio was mounted on the right rear wheel housing, the long axis of the set parallel with the axis of the car. This placed the controls to the front, where they were convenient for the car commander. The mount issued by the Signal Corps (FT-420 bracket) was discarded because it extended out into the interior and back, and took up too much room.

The antenna base was modified so that it fitted into the right tool box behind the rear wheel, where it was bolted to the outside of the vehicle. The tool box cover was removed. This kept the antenna mount on the inside of the car so that it could not be ripped off or damaged by trees or heavy brush. The battery pack for dismounted use was kept under the right front seat and was strapped to the bottom of the seat.

SOP for Demolition

Every vehicle in the squadron was equipped for demolition. Thermite grenades were installed on or near the engine where they could be ignited when necessary. A thermite grenade was fastened near all gas tank caps, conveniently placed to be dropped in the tank. Three one-pound blocks of TNT were kept in vehicles with caps handily placed but safely wrapped. All similar type vehicles were equipped in an identical manner. All car crews were schooled in destruction of vehicles and equipment. Demolitions were put in place on crankcases, etc., when vehicles were used in defensive, static positions—just in case. (See illustration No. 4.)

Camouflage

For operations in snow, armored cars and jeeps were whitewashed. Crews wore the white linings of their parkas, or mattress covers which had been cut like burnooses. In Africa, the squadrons' tanks were painted light tan and splotched with green to blend with the terrain.

Up until the last two or three months of the European campaign, the armored cars of the squadron were equipped with SCR 508s, and the old SCR 193 transmitter with the 312 receiver. This was done for a number of reasons. Primarily, it was a result of the initial issue of sets, which were SCR 193s, the SCR 506 not then being available. The operators were trained on the SCR 193, and the entire squadron was schooled in the use of these sets until they became thoroughly familiar with their capabilities and limitations. The installation of the SCR 193 required a rearrangement of the ammunition stowage within the vehicle, and after the new set-up was approved, it was considered superior to the old.

The SCR 506 became available to the squadron during an active phase of the war. At such a time, it was not believed advisable to take time out to substitute it for the SCR 193 and retrain operators since this would reduce the efficiency of the unit. Training, insofar as it was possible, however, was initiated on the SCR 506, and during the last few months of combat the M8s which came in as replacements and which were equipped with the SCR 506 were not changed.

Air-Ground Liaison

One of the most interesting communication set-ups was the communication radio link with the observation cub planes. During the entire Continental phase of the war, the squadron had one or two L5s or cubs assigned or attached, and the benefits were many.

The planes were equipped with a SCR 610, and one channel was linked with channel 10 in every armored car in the squadron as well as with each troop CP. One cub was usually in the air. And when the reconnaissance platoon or section ran into trouble—since it was already in communication with the cub—it simply requested the cub to reconnoiter the area ahead and inform it of the situation. If the situation warranted artillery fire, the cub reported this to the platoon or section and suggested artillery fire. The cub would then request direct fire from "E" troop (which was on the same channel), and adjusted the fire until the objective was reduced.

At the conclusion of the fire, the platoon or section was all set to go, since it had been listening to the fire directions. It then moved on the objective, continuing its mission. Because the troop CPs were listening, the troop CO also was kept informed of the situation, and considerable time was saved by avoiding delay, requesting permission, and repetitions.

Priority was set for missions of the cub by a policy of "first come, first served"; or, in case missions conflicted, by the tactical situation; and finally, if conflict still existed, by squadron or by the plane itself. Often the cub was able to cover two missions simultaneously.

When the cub took off from either the squadron strip (any field close to the CP) or the corps' field, squadron notified all troops to contact it. This word was passed down to platoon and in turn to the sections. Tight discipline was necessary on the net, which was a free net, but strangely enough, there was little or no confusion.

In addition to the above set-up, the plane was equipped with VHF radio communication to Corps HQ, where a flight of P47s stood by. If the cub sighted a target which required bombing or strafing (provided it had priority over other such missions) it notified the

P47s of the mission and when they arrived, indicated the target by diving, etc. The cub remained to watch the operation, and kept a weather eye open for other targets, or hostile aircraft.

Somewhat the same arrangement was in effect with "E" Troop. Each armored car and tank had one channel that linked it with the FDC of the 105s. Each troop CP was in this net. When a platoon or section ran into difficulty and required artillery support, it reported this to the troop CP. Clearance was secured either at the CP or from squadron. When permission was granted, the platoon or section contacted "E" direct, and requested and adjusted the fire. The troop CP merely monitored in order to keep abreast of the situation.

The platoon NCOs were trained in forward observation and probably directed as much artillery fire as the FOs sent up by the artillery troop.

An inestimable amount of time and trouble was eliminated by making it possible for the section or platoon to deal directly with the guns.

Each armored car and M20 was equipped with a SCR 508, and this made it possible to tie-in everyone with radio communication. The 10 push-buttons were broken down somewhat as follows: No. 1—squadron net, including all troop CPs and squadron rear. No. 2—A Troop net. No. 3—B Troop net. No. 4—C Troop net. No. 5—"E" Troop net. No. 6—F Company net. No. 7—1st platoon of each troop independently. No. 8—2d platoon of each troop independently. No. 9—3d platoon of each troop independently. No. 10—air-ground liaison.

The arrangement made it possible for every armored car to talk with any other armored car in the squadron by merely pushing the corresponding button. It reduced the necessity for changing frequencies when attaching tank platoons or other platoons to each other. It meant a variety of channels for communication with all other stations, and when a section was operating separately, it meant that it always had direct radio communication with either the troop CPs or squadron. It gave direct communication with cubs and assault guns, and with flanking units within the squadron. It made possible a quick and efficient relaying of information over long distances. It gave range and great flexibility to every large set.

Supply

Rations:

When possible, hot meals were served the platoons. In Headquarters and AG troop this was not difficult, but in the reconnaissance troops the problem was more complicated. When they could, the platoons sent a jeep to the troop CP, and the kitchen supplied each man with his meal in hot food containers; coffee was sent up in five-gallon water cans wrapped with heavy paper and burlap. Sometimes the food was carried for several hours before there was an opportunity to eat it. If the platoons could not spare a jeep, sometimes the troop CP M20 or M8 took the food to them.

Each armored car in the reconnaissance platoons and each two tanks in the tank troop carried a case of 10-in-1 rations to be eaten only on command of the troop CO. In one reconnaissance troop these rations were carried on the right front fender of the M8 in a rack made of angle iron.

The troop kitchen had on hand a full day C rations and occasionally a full day's 10-in-1 plus B rations.

The mess sergeant, who had a jeep, was encouraged to forage to fill-in the issue-meals with fresh vegetables and meats.

Tank platoons attached to the reconnaissance platoons usually were supplied with meals by the tank troop unless it was too difficult. This eliminated the necessity of constantly changing mess records and ration issue and was endorsed by the reconnaissance troop 60s and the tankers.

Fuel and ammunition:

Each reconnaissance troop had an armored trailer which was towed by the executive's M20 armored car and was kept at the troop CP. This trailer carried a full load of ammunition for the tanks attached to the troops. When the platoon with tanks attached went into action and there were indications of prolonged firing, the trailer was dispatched to the scene where it was readily available for immediate resupply of the tanks. At the same time, a call was sent back to Squadron S-4 for another supply of ammunition for the trailer. This method prevented the tanks from exhausting all their ammunition because before the trailers were emptied the S-4 truck had arrived with another load.

Each reconnaissance troop was given a 6x6 for transporting a base or fraction load of ammunition and gasoline in addition to its normal troop-supply load. It was realized that it was an infraction of safety regulations to carry gasoline and ammunition on the same truck, but even so the convenience of having extra fuel and ammunition handy was worth the risk. Incidentally, not one truck was ever lost or hit.

Under normal conditions, the troop CP was supplied daily by S-4, and the ammunition and gasoline was carried by the troop 6x6. When the platoons began to run low on gasoline, ammunition or oil, they were supplied from the extra 6x6 either directly, if feasible, or by sending the supply forward in a half-track. The value, convenience and efficiency of this arrangement is immediately apparent.

Mechanized Cavalry Operations

CAMPAIGNS in Western Europe proved the doctrine of "sneaking and peeping" by reconnaissance units to be unsound. Cavalry units had to fight to obtain information. Organization and equipment of mechanized cavalry based solely on requirements for reconnaissance missions was proved to be equally unsound. Both cavalry groups and squadrons were handicapped in the performance of their assigned missions because of lack of organic strength and firepower.

Mechanized cavalry accomplished the following assigned missions over the period covered by this report:

1. Dismounted attack of an important terrain feature.
2. Dismounted attack in a zone.
3. Seizing and holding a town or communications center.
4. Counter-reconnaissance, screening and blocking.
5. Filling a gap and maintaining contact between divisions, corps, and armies.
6. Pursuit.
7. Covering force and rear guard.
8. Defense of wide sectors of the Siegfried Line.
9. Reconnaissance in force.
10. Patrolling and mopping-up of an area.
11. Reconnaissance of routes and bridges including seizure and holding them.
12. Offensive operation in the enemy rear area.

Reinforcement of cavalry units with motorized infantry, tank destroyers, artillery, engineers and tanks was required for accomplishment of most combat missions. Such attachment permitted units to brush aside enemy resistance and push rapidly forward into enemy rear areas. Cavalry squadrons were the basic tactical unit. Vigorous patrolling of enemy positions convinced the enemy that our positions were held in force.

Assault gun troops were generally used in battery for indirect fire support and when artillery was available this unit was placed under the artillery commander for coordination of harassing and interdictory fires.

Mobility and speed made possible quick reduction of towns and villages by attack from the rear and by surprise.

Communication often was the key to success in moving rapidly, concentrating where resistance was weakest, by-passing heavy resistance, penetrating into rear area installations, cutting off routes of enemy withdrawal, preventing demolition of bridges, and close coordination and cooperation with fighter-bomber cover in reduction of strongpoints, neutralization of enemy armor, and scattering enemy units forming for counterattack. On August 31, 1944, when the VII Corps changed direction to the north, the 4th Cavalry Group filled the gap between First U. S. Army and Third U. S. Army, advanced on a wide front, captured Mezieres, established a bridgehead over the Meuse River, and saved a full infantry division to the corps for the decisive battle in the vicinity of Mons.

During the German counteroffensive, the 14th Cavalry Group fought a successful rear-guard action covering the enemy salient until the 7th Armored Division could be moved to that sector.

A definite need was demonstrated for the rifle trooper in cavalry organization and combat although there was no requirement for horses for mounting him. Cavalry retained its tactical importance and use, and the fact that horses were not required as a means of obtaining mobility and speed did not eliminate the necessity for troops to perform the cavalry mission. Lack of strength and firepower for combat necessitated battlefield improvisation.

The flexibility visualized in the group organization was not required; and the elimination of the regiment removed those elements of units, *esprit de corps*, history and morale which concern the preponderant part of the soldier's life, the importance of which cannot be minimized and which makes for the close association and cooperation required of cavalry on the battlefield.

A TROOP IN ATTACK

*by Major James W. Cocke**

IN a daring mounted attack that utilized speed and cohesion, Troop B, 106th Cavalry, effectively employed its individual weapons to achieve surprise and reduce the strongly fortified town of Salzbach, Germany. The troop CO was Captain Tom Coolidge.

The area around Salzbach is a scarpland which borders the Main River on the east and is favorable for defense—if an attack comes from the west. A main belt of the Siegfried Line extends north and south through the town of Aschaffenburg, and runs parallel to the Main River which flows south to north through Salzbach, Obernau, and Aschaffenburg, which is the strongpoint in this area.

The 106th Cavalry Squadron, of the 106th Cavalry Group (Mecz.), at 0800 hours moved to precede the 45th Infantry Division in the division's zone (See Plate 1). The 106th Squadron then struck with speed, employing two troops abreast: Troop A on the right, or south; Troop B on the left, or north. Troop B moved swiftly to the east, advanced almost unopposed to Obernau on the Main River (Plate 1), and then quickly crossed the river south of Aschaffenburg near Obernau on a railroad bridge which had previously been found intact by the 187th Infantry Regiment of the 45th Infantry Division. The 45th Division, moving eastward, was to strike the stronghold of Aschaffenburg from the west.

It was reported to the commanding officer of Troop B that friendly patrols from the 45th Infantry Division were on the high ground to the northeast of Salzbach, but that the town itself was held by enemy of undetermined strength. Orders were received from the 106th Squadron that when the troop arrived at Obernau, it was to continue reconnaissance to the south in the direction of Salzbach. Upon arrival at Obernau, the troop commander decided to determine the enemy strength and dispositions in Salzbach by sending a dismounted patrol on reconnaissance along the railroad tracks (See Plate 2). Two light tanks (M24s) were to go through the orchard on the left of the road into "Hull Defilade," from which position they could cover by fire the movement of the patrol. Two assault guns (M8s) from Troop E were laid and adjusted on the railroad station and the western edge of Salzbach, and were to deliver fire on call of the patrol.

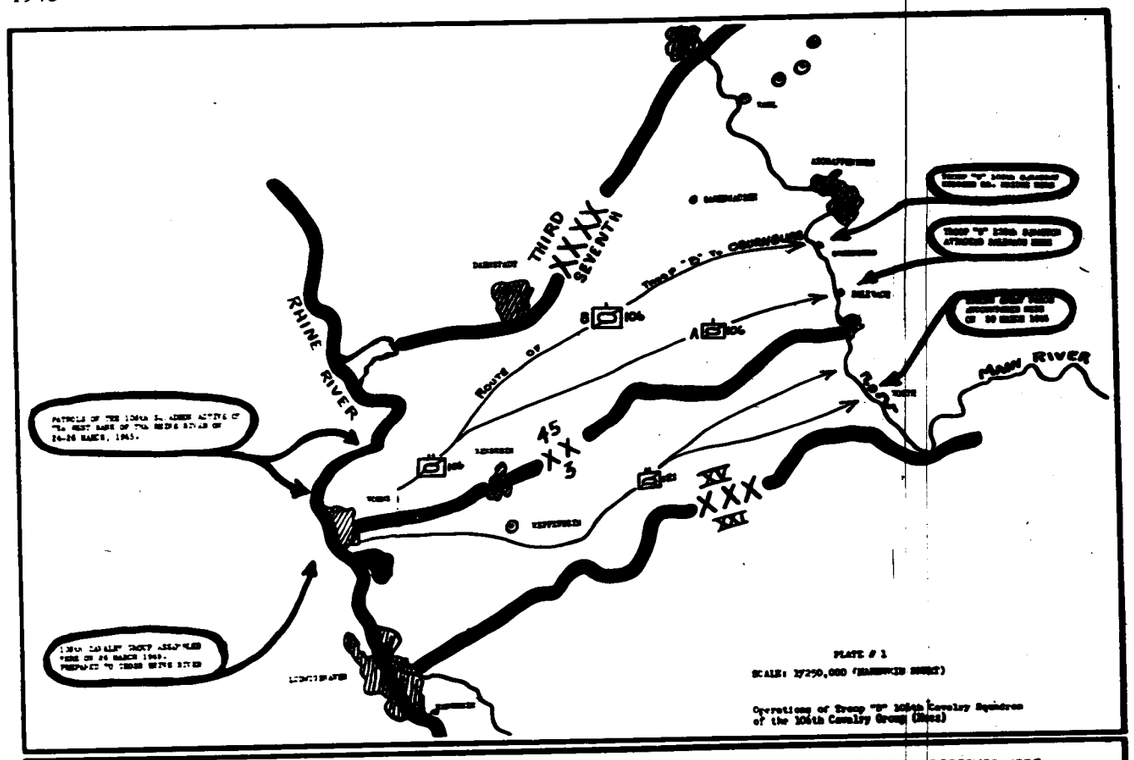
The dismounted patrol moved out from Obernau at about 1400 (Route shown on Plate 2), and was followed in 10 minutes by the tanks which took position in the forward edge of the orchard, as planned. The tank commander spotted a roadblock and some dismounted enemy near the edge of town. The tanks immediately opened fire at a range of 1,500 yards. The enemy near the roadblock scattered, and some fled into the woods southeast of Salzbach (See Plate 2). The tanks continued firing and demolished the roadblock. No self-propelled or antitank fire came from the enemy position; however, five minutes later enemy artillery fire, which apparently came from southeast of the town, began falling in the orchard very near the tanks. The tanks withdrew farther into the orchard to be out of enemy observation. The dismounted patrol, which now was moving along the railroad track, drew small-arms fire from near the railroad station. The patrol estimated the number of enemy at between 10 and 12 men. It withdrew under covering fire from the assault guns and reported to the troop commander.

After a consideration of the reports, the troop and squadron commander decided to make a mounted attack on Salzbach. When the tanks and assault gun observers left the orchard to return to Obernau, an enemy artillery concentration wounded several men. The town was not believed, however, to be strongly held and, since the tanks had received no antitank fire, it was felt that a rapid advance to Salzbach could be made without losses of vehicles.

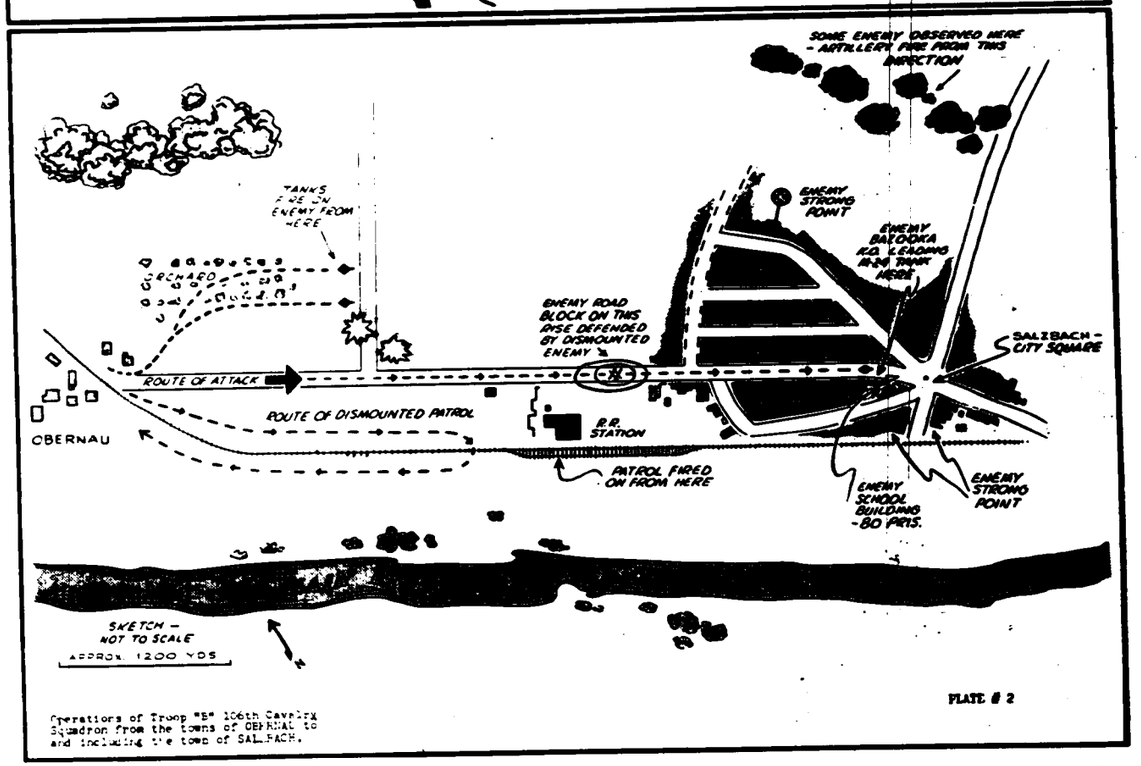
The Troop B commander ordered the following order of march: Lead with two light tanks (M24s), followed by one half-track, three armored cars, one half-track, three armored cars, two more light tanks (M24s) and another half-track. As soon as the town had been secured by the assault force, the remaining troop vehicles were to be brought into the town. It was believed that more protection against enemy small-arms and artillery fire could be gained by placing all dismounted men in the armored vehicles. At this time, enemy artillery fire began falling on the road between Obernau and Salzbach.

All vehicles were stripped of gas cans and extra equipment and all automatic weapons were carefully checked. Each half-track was loaded with about seven men and the following arms: two light machine guns, two Thompson submachine guns, five rifles, and grenades. As the men in the half-tracks entered the town they were to fire on all suspected or observed enemy positions. This mounted force was to continue through the town, then dismount, reorganize quickly, and re-

*Instructor, The Cavalry School. Former CO, Troop B, 106th Cavalry Squadron.



Operations of Troop "B" 106th Cavalry Squadron of the 106th Cavalry Group (Mecz)



Operations of Troop "B" 106th Cavalry Squadron from the towns of OBERNAU to and including the town of SALZBACH.

duce any resistance which might remain in the buildings.

The attack jumped off at 1600 hours. The column moved slowly through Obernau to its eastern edge, then quickly increased its speed and advanced rapidly across the open ground toward Salzbach. No enemy artillery fire fell on the column, and the two miles were covered in a few minutes. Intensive concentrations of small-arms fire were laid on the railroad station where earlier in the day the dismounted patrol had encountered the enemy in dug-in positions. The leading tank pushed aside what remained of the enemy roadblock and continued into the town, followed closely by the remainder of the column. Some small-arms fire was received from windows but was quickly neutralized by the automatic weapons fire from the half-tracks. The leading tank was fired upon by a *Panzerfaust*, apparently located in a basement near a school building. The troop commander ordered the leading half-track to pass the tank and neutralize the *Panzerfaust* position. As the half-track started around the tank it was fired upon by the *Panzerfaust* team which almost scored several hits before they were driven to cover by automatic weapons fire which was sent from the half-track. The half-track then continued through the town, but as the tank started forward again a direct hit on the turret killed the tank commander and wounded the gunner. The rest of the column continued past the spot, but were fired upon by the *Panzerfaust* team before the position was finally neutralized.

The troop arrived at the town square shortly thereafter and immediately organized dismounted parties to clear up remaining pockets of resistance. The 3d Platoon took the southern and eastern section of the town; the 2d Platoon the northern section; the western half was cleared by one section of the 1st Platoon.

One light tank and the two remaining sections of the 1st Platoon took the school building under fire from close range. When the dismounted party moved toward the building, the enemy hurled grenades which caused five casualties.

The armored car, which was outposting the town to the southeast, was harassed by enemy small-arms fire from about six or eight dug-in enemy, who in turn were kept under fire by the armored car's light machine gun. The position was finally neutralized with the aid of some dismounted men, who took 10 prisoners. The troop commander ordered the remainder of the troop, which was still in Obernau, forward to assist in the house-to-house search. When it arrived and began this task, about 80 enemy came from the school building and surrendered. A few minutes later the enemy placed a 10-minute, ineffective artillery concentration on Salzbach. A total of 150 prisoners were taken during the mopping-up phase. An undetermined number of enemy were killed and a few escaped into the woods to the east.

The situation quieted down after Troop B had organized its position for the night. Just about dark, however, one of the ¼-ton patrols was fired upon by enemy that were still in one of the houses, and two men were wounded. A dismounted party from Troop B was sent to reduce the resistance. The fight lasted only a few minutes, and after an exchange of grenades about 13 enemy surrendered. In the confusion attendant with searching the prisoners five of them escaped.

Darkness was now near, and elements of the 45th Division relieved the troop about 2300. The troop was then assembled, and on squadron order prepared for movement to the northeast.

The final objective of Troop B in the attack on Salzbach was not the houses or streets but strategic points such as railroad stations, telephone exchanges or other public utilities. Troop B attacked straight through the town to seize the important road junction, the schoolhouse and the pillboxes on the outskirts. The railroad was strongly defended by the enemy, which made it necessary to concentrate fire on that position. In this action it has been shown why all houses must be treated as "inferior" pillboxes: because most of them had basements from which the enemy had to be flushed by house-to-house action. Basements are favorable to the defender, as evidenced by the work of the *Panzerfaust* team which succeeded in knocking out the light tank.

Another point that should be noted is that buildings obscure visibility, which is further restricted by dust from the impact of projectiles or explosive charges. The point or origin of fire is very hard to locate because the report is drowned by the noise of the impact of the projectile, and because of the many points from which fire can be delivered even from a relatively small area.

Control is another facility of extreme importance in such an action. In no other form of combat, except in dense jungles, is observation as restricted as in village fighting. This condition makes centralized control by the troop commander very difficult. The small unit commander must therefore use every ounce of initiative and aggressiveness he possesses, because most of the action will be under the direction of small unit commanders. An example of this was the assignment of sections of the town to each of the platoons.

The neutralization of hostile fires is also of paramount importance. Most of the machine guns were well forward, as evidenced by the numbers and kinds of weapons used by the troops in the half-tracks. The troop commander utilized his weapons to the utmost when he directed the fire of all automatic and small arms at the railroad station, and at the known enemy positions in the windows of the town. Heavy concentrations of small-arms fire were directed at the enemy *Panzerfaust* position.

All the important points mentioned above are principles of doctrine laid down in FM 31-50, Attack of a Fortified Position and Combat in Towns.

Tanks and Infantry In Northern Luzon

Submitted by Captain Peter Marusek, 775th Tank Battalion, in a Training Memorandum

The notes on which this story is based were taken when we fought the Japanese in the mountainous terrain of Northern Luzon. Secrecy requirements prohibited their publication until now. It is interesting to observe that all of the points set down are now covered in regulations.

THESE notes are based on the combat experiences of the 775th Tank Battalion in operations in the Northern Luzon area from January through June, 1945, and are designed as a guide for future operations under the same terrain conditions. During this campaign, it was the usual thing to be confronted by situations for which there was no immediately obvious solution. A method of action could be devised to solve the problem in most cases, however, by the application of common sense. A thorough understanding between the Tank and Infantry team is a prime necessity if success is to be attained.

Terrain and Weather Conditions

Tanks were not primarily designed to operate in mountainous terrain, but notwithstanding their limitations in such terrain, they can be employed against the enemy with great and unexpected success. In spite of losing mobility and maneuverability, tanks in rugged areas gain a tremendous element of surprise and shock action.

In Northern Luzon the majority of roads are secondary, and are bordered by sheer cliffs rising or dropping abruptly from the shoulders of the roads. The roads twist sharply upgrade and downgrade, and usually follow the course of the winding rivers and streams, or circle around the sides of mountain ranges. During the rainy season, the shoulders of the roads cave away, and numerous landslides are encountered. The roads in most cases are wide enough to permit tanks to turn about, but it required four or five motions to complete such a maneuver. In many instances, bulldozers blazed a trail to enable the tanks to support the infantry by direct close-range fire from positions high atop mountains and cliffs. It was almost always impractical to assume covered or alternate firing positions.

Assignment of Tanks

In mountainous terrain, the employment of tanks in mass is impractical. The supply and maintenance problem requires that the tank units be assigned properly. The tank battalion is a normal unit of employment for an infantry division; the tank company for an infantry regiment; and the tank platoon for an infantry battalion. Any further breakdown is not feasible, but if the situation demands it, a tank company and even a tank platoon may be attached to an infantry division. For normal employment with the division reconnaissance troop, the light tank company should be under the direct control of division headquarters.

Surprise

Impassable or difficult terrain can be used to a great advantage to effect an element of surprise. In such areas, organized antitank measures are usually lacking, but hasty mine fields can be expected. The enemy had a tendency to underestimate the capabilities of our tanks under these conditions and as a last resort he employed suicidal and ambush tactics to correct his mistake. It was a wise plan not to underestimate his cunning.

Use of the Medium Tank M4

The medium tank proved more suitable than the light tank for the close support of ground troops in severe mountainous terrain. Its slow speed enabled the infantry to follow easily, and its armor and fire power enabled it to close with and neutralize or destroy the enemy. It was used extensively to lead the attack while supported closely by infantry; to support by direct fire the advance of ground troops; to accompany and assist the advance of the infantry; and, in a few instances, to supplement artillery and to feel out the enemy's defenses.

Use of the Light Tank M5A1

The light tank was found to be poorly suited for operations in mountainous terrain because of its lack of fire power and armor, and the loss of speed and maneuverability. The light tank with tank-borne infantry, however, was used satisfactorily to patrol and protect supply and communication lines; on reconnaissance and security missions around coastal plains and flanks;

and as a fast, maneuvering force to attack the enemy's flank.

Reconnaissance

The most effective means of reconnaissance in mountainous terrain was the liaison plane. Large areas that are difficult to traverse on foot can be reconnoitered quickly and effectively by plane for every possible tank approach or firing position. Every available means must be utilized to reconnoiter areas thoroughly prior to any contemplated action. Ground reconnaissance is always continuous and very important. When terrain will permit employment of only a single tank or tank section, dismounted reconnaissance is essential in selecting gun positions, and a route thereto.

Security—Assembly or Rear Areas

Tank units are responsible for their own security in the assembly area. The bivouac should be located close or adjacent to other units and the tanks should coördinate with them in the defense of the area against enemy infiltration or attack. Tanks should be placed in a circular arrangement at close intervals (five yards) with all thin-skinned vehicles in the center of the perimeter. Dismounted machine-gun outposts should be provided around the outer perimeter.

Extremely dense wooded areas should be avoided in selecting bivouac areas. When our forces have control of the air, concealment from air may be disregarded, but cover and concealment from ground observation must always be sought.

Tanks have no security while returning from the forward area and are very susceptible to ambushes and suicide attacks, and for that reason they must be released early enough to return to the assembly area before darkness. It is also imperative that sufficient time is allowed to resupply and maintain the tanks if they are to be employed the following day. In some instances it is advisable, if circumstances permit, to carry tank-borne infantry for security while returning to an assembly area over dangerous "ambush" terrain.

Security—Attack Position or Forward Area

Because of the conditions of the roads, or, as often, when tank units were compelled to operate until darkness, it was necessary to bivouac the tanks in the forward area. Under these circumstances, infantry commanders should provide adequate and complete security for tank units, whether company size or smaller. During the night, tanks should be pulled back to the forward infantry command post and placed inside the infantry perimeter. Because tanks draw heavy enemy mortar and artillery fire when they are in the forward area, the bivouac selected should have excellent cover.

Tanks normally should never be used during the night as road blocks or outposts. If possible, an antitank gun should be used for such a mission, for it was especially designed for it and is more effective than the tank. In addition, the tank crew would be denied its rest, which is essential for the next day's operation. In emergency, when there is a distinct threat of an enemy armor attack and antitank guns are not available, tanks in conjunction with infantry may be used on road blocks during the night.

Advance Guard and Main Body

No matter on what type of terrain tanks and infantry are operating, an advance guard is a necessity if the advance of the main body is expected to be uninterrupted. This is especially true if the enemy employs a delaying action and offers only sporadic resistance.

The advance guard, composed of tanks, infantry and engineers, must be employed at a safe distance where it cannot be overwhelmed before assistance from the main body can reach it. The guard's mission will be to push back and destroy small enemy parties, reconnoiter fords across rivers and streams, and to remove or by-pass mine fields and obstacles.

The size of the advance guard varies with the tactical situation, and in mountainous terrain constitutes only a small fraction of the troops. The advance guard should preferably be commanded by the tank officer, who should be directly responsible only to the main body commander for the tactical conduct of his force.

When an advance guard is employed, the remaining tanks lead the main body. The enemy is likely to allow the advance guard to pass, and then attack the advancing column with his armor, or he may employ other offensive or harassing measures. It is not advisable to have tank-borne infantry on any leading tanks in any leading column.

Cooperation in Offensive Action

A thorough understanding between tank and infantry units is a prime necessity. Every possible effort should be made for coordinated teamwork between the two arms. Mutual capabilities must be understood, and tactical suggestions by either arm should be duly considered by the other arm.

Artillery and air support can be used effectively to keep the enemy occupied and off-balance during the attack. A diversive type of action should be used whenever possible. Mountainous terrain can be easily defended by the enemy, is very difficult to seize and occupy.

Tanks in almost all phases of attack usually draw intense artillery, mortar and small-arms fire. While the fragments from such fire do little or no damage to the tanks, the richochets can cause considerable casualties to the accompanying infantry if it is not properly dispersed and in a suitable formation. The accompanying infantry should remain close enough to see the tank clearly, and yet remain within good rifle and BAR range. A tank does not provide cover for the infantry from these ricochets. A lead tank can, however, be used without accompanying infantry, provided it can receive sufficient fire support from another tank,

or is under cover of a mortar and small-arms concentration that will protect it from enemy suicidal antitank measures.

In mountainous terrain, tanks are, in almost all instances, restricted to movement on roads. The size of supporting tank units used in the attack will very seldom exceed one tank platoon. One section will be employed to lead or support the attack, while the other is held in reserve. It will usually be found that only two or three lead tanks or possibly one, can give direct fire support at one time to the infantry. Most of the time, the valleys or plateaus will offer an opportunity to employ more than one tank platoon. Every advantage should be taken of employing as many tanks at one time as the terrain permits, if the tactical situation warrants it.

In the event the terrain does not permit the use of two or more tanks, tanks for which there is close infantry protection can be used singly with good effect either as mobile or stationary pillboxes. When the enemy holds a strongly fortified entrenched position, it will be necessary to choose routes around the flanks over some usually "impassable" terrain to a high vantage point overlooking the enemy's defenses. Single tanks, if given infantry protection, can usually be placed in position where they can support by direct fire an infantry attack against a located enemy strongpoint. Tanks can be used with great success when employed as mobile or stationary pillboxes under the same existing conditions. It must always be remembered that direct tank fire is more effective than mortar or artillery fire against enemy strongpoints which are in prepared cave positions on hillsides.

Antitank Measures

When tanks operate on mountain roads that have overhanging banks they are very susceptible to attack by small enemy antitank groups. In such areas, enemy demolition squads armed with satchel charges, pole charges, thrust mines, or Molotov cocktails can frequently be expected. Overhanging banks generally provide excellent cover for an attacking squad which in most cases will be impossible to spot from the road. For this reason, it is necessary that the accompanying infantry scout out possible enemy positions atop the banks before tanks are sent below them. Many suicidal attacks also can be anticipated in almost every imaginable form, for the enemy has no regard for sacrificing lives to accomplish a special mission. And, without proper and alert infantry protection, tanks are vulnerable to such attacks.

The enemy can most of the time be expected to emplace artillery or antitank guns in caves, in draws, on a reverse slope, and occasionally in less suspected locations. He will nearly always defend passable tank terrain. Enemy gun positions will be thoroughly camouflaged, and frequently will have a very limited field of fire. The enemy's antitank discipline is excellent. Tanks usually will not be fired upon by antitank guns until they have closed to a very short range (40 to 200 yards).

Mine fields can always be looked for along roads. The mine field found was in many instances a hasty one, with no attempt by the enemy to camouflage or defend it. Organized mined areas can always be anticipated in tank approaches which lead to the enemy's main defenses, and most of them will be heavily defended by strong machine-gun emplacements. The tank gun can be used to clear hasty mine fields when they are detected, and are defended only by small-arms fire.

The enemy often formed road blocks by blowing roads away. When the entire roadbed was completely blown apart and no by-pass was available, this type of road block was highly successful, and was simple to effect. The enemy usually did not defend it.

Emplaced enemy tanks were found serving dual use as an antitank gun and a pillbox. They could generally be expected in mass, and heavily entrenched. The enemy avoided open tank action except on purely suicidal attempts.

The enemy many times set up strongly prepared ambush positions. These were located in densely wooded sectors of road and stream crossings that were likely avenues of armored approach, and were supported by antitank weapons and machine guns. Infantry troops, with tanks in position to support them by fire, should search out such spots. The infantry's reconnaissance should be preceded by an artillery preparation if possible.

When tanks move alone from one locale to another through wooded or mountainous terrain, local security should be established immediately when halts are made by one tank or the entire column.

Target Designation

Tanks are dependent to a great extent on the infantry to indicate enemy targets. A tank that is buttoned up is blind. A tank phone, colored smoke, radio, tracer or white phosphorus grenades should be used for target designation. Prearranged signals should be agreed upon between the infantry and tanks to simplify the procedure for target designation. Colored smoke signals should be changed daily. The enemy often confused our troops by using our smoke grenades.

Tank-Infantry Communication

Without radio communication, tank-infantry coördination would be difficult to maintain. Each tank should be equipped with a field phone to supplement tank-infantry radio communications. From our experience to date, the most satisfactory tank-infantry communication arrangement is for every tank to have an AN/VRC-3 radio to supplement the SCR 508 series.

Experiments are being conducted on installing the SCR 694 in tanks to net with the SCR 536.

TRAINEE--1946 MODEL

Prepared Under the Direction of the Commanding General, Replacement Training Center, Fort Knox, Kentucky

On April 1, 1946, the Armored Replacement Training Center officially became the "Replacement Training Center, Fort Knox, Kentucky." Actually it became the "Mounted Training Center" because to it are sent trainees for armored cavalry, field artillery and the cannon and anti-tank elements of infantry, all of whom are to serve in mounted units.

THIS article will present an orientation on the present mission of the RTC, and a prophecy for the future. By the time these lines are read, the organization and training policies of the postwar army may be more definitely known. Some of the predictions made here, therefore, may not be borne out.

A soldier enacts the part of a civilian as others undergo realistic training at Fort Knox for occupation duty.

Training for occupation duty is complete: here soldiers cover a searching party. Note Japanese "buildings."

Recruits may be turned into soldiers by either of two methods: at a training center prior to assignment to units—as has been the practice in wartime; or in recruit squads within their units, when assigned directly from reception centers or recruiting stations—as in peacetime. Obviously a unit in combat has neither the time nor facility to give basic training. Although both time and facilities for such training are available to all units now, it is not believed desirable for troops on occupation duty to be charged with the training of recruits. Further, in peacetime there is much to be said in all cases for the continuance of centralized basic training. Therefore we shall assume in the discussion which follows that the replacement training center is a permanent institution.

When the over-rapid demobilization of our overseas garrisons in early 1946 demanded a faster flow of replacements, basic training was cut from 17 weeks to its present 8 weeks. Although trainees are given branch instruction, specialization within branch is eliminated. Instruction is basic in a literal sense, although it has not been made branch immaterial.

The mission of the training center is to graduate a "basic" private who is capable of taking his place in a squad or crew of a combat unit of his branch that is engaged in occupation duty. The center does not train noncommissioned officers, leaders or specialists. It does train all men in squad or crew positions below that of leader. The qualifications of the graduate are more specifically, in the order of their priority, as follows:

- A well-disciplined soldier.
- A qualified marksman with the rifle (carbine for field artillery).
- A qualified assistant driver of 2¼-ton truck and basic combat vehicle (qualified driver as far as practicable).
- A qualified gun squad or crew member of his basic crew weapon (105mm, 90mm, 76mm, or 37mm gun) to include familiarization with duties of gunner.
- Familiar with his T/O individual arm.
- Familiar with the caliber .30 machine gun.
- Familiar with the duties of a private on occupation; bayonet, tear gas, search of buildings and individuals, riot formations, traffic control, guard duty, etc.
- Familiar with simple field duties.

All familiarization courses include use of service ammunition.

It is believed from experience that the above qualifications can be achieved by the recruit in eight weeks. The commander in the field cannot expect an expert combat driver, a qualified gunner, a radio operator, a cook or a mechanic. Neither can he expect a hardened field soldier. But he can expect a good "basic" private—one whom he can, without hesitation, place in a combat squad.

At the Fort Knox center, armored cavalrymen are trained on the M4 tank with 76mm gun, or the armored car; infantrymen are trained on the M45 tank (cannon) or the M26 (antitank); and field artillerymen on the towed 105mm howitzer. Training methods are a combination of centralized and decentralized training, with the trend toward the latter. As the cadre percentage of regular army men increases and brings an increase in more capable instructors, it becomes more practicable to decentralize instruction and give increased attention to the individual trainee. The instruction of small groups means more "do" and less "talk," and results in turning out a trainee who has actually done it, not just seen it done—or, as the expression goes, has been "exposed to so much instruction."

The Training Center exists solely to serve the units

Above, a front and rear view of a problem as carried out at the Center which shows the 1946-trainee how to deal with a mob. The demonstration shows the effect of "the organized few" on the "disorganized many."

in the field. Suggestions from field commanders are therefore welcome. Suggestions to field commanders are:

Check to see that the trainee you get is in the type of unit for which he was trained. The man trained for a cannon company is not a rifleman—although he has qualified with the rifle. The mechanized cavalryman is not a tank driver—he is an armored car driver.

Check to see that the trainee's records include a "Form No. 1" which shows the subjects in which he has qualified.

Don't expect a specialist or a well-trained field soldier.

Do expect a well-disciplined "basic" private, who is perfectly capable of taking his place in a line gun squad or crew, who can drive his basic vehicle, and shoot his crew and individual weapon.

As an example of the current instruction being given to prepare a trainee for occupation duties, there follows a description of the course in Civil Affairs.

In keeping with the Center's mission, the Civil Affairs Committee prepares the recruit for service with units engaged in occupation duty by giving him an introduction to the duties he, as private, may expect to perform when he joins such a unit. In addition to familiar instruction he receives as a member of an infantry, artillery, or tank squad or crew, he takes part in an eight-hour course in the technique of seizure and search, traffic control, riot duty and other matters that daily confront the occupation soldier.

Training is conducted by the "country fair" system for groups which average less than 40 men. Emphasis is placed on the individual's participation in the training, and on the necessity for a soldierly bearing when dealing with civilian personnel in occupied countries.

A carefully rehearsed skit in which two soldiers search a "suspect" in his room opens the instruction in this subject. While the group looks on, the instructor keeps up a running commentary as the action unfolds. The soldiers enter the room, inform the "suspect" of the authority for the search, then search him for weapons. While one soldier guards him the other carefully searches the room and its furnishings, and uncovers weapons, explosives, contraband, and other suspicious items. These are listed for the suspected man's signature. Then, as the soldiers relax their vigilance, the "suspect" snaps out a concealed pistol, "killing" them both. In the critique this, and other planned mistakes, are discussed to drive home the necessity of care and caution in all searches. Trainees then practice guarding and searching each other for contraband which has been previously hidden by the instructor.

Following the skit, the instructor defines restraint and custody, and demonstrates the right and wrong way to approach, arrest, and control prisoners when using military weapons. This is followed by guarding arrested persons, during which the coach and pupil method is employed.

The class on traffic control includes the demonstration and practice of hand signals by a driver, coupled with correct daylight and night traffic control signals by an MP. When the group has learned these signals, it is divided into subgroups and at prepared street intersections each man practices controlling traffic as other recruits act as "vehicles" and approach the intersection.

A review of gas mask drill, and a test of the effectiveness of the mask against tear gas, opens the period on the use of chemical agents in riot duty. A discussion is given on the use of chemicals against mobs, which covers the methods of firing, tactical use, and physiological and psychological effects. This is followed by a problem in which smoke, tear gas, Adamsite, and white phosphorus are used, and in which recruits take part on the "sending" and "receiving" end. Each recruit throws one tear gas hand grenade during the instruction.

Bayonet training emphasizes the use of the weapon in riot duty rather than in battle. Artillerymen use the carbine bayonet, all others the rifle. It is assumed that guard duty in occupied areas will be conducted by personnel whose bayonets are fixed, and that police patrols bent on search, seizure and arrest will fix bayonets. A simple drill to meet this requirement is practiced. Fixed bayonets are carried in all civil affairs instruction except traffic control.

Squad and platoon riot drill is conducted with bayonets which are fixed and bared. Throughout the drill, emphasis is placed on precise movements, soldierly bearing, and a steady and determined manner in the execution of all formations. The object is to impress the recruit with the psychological effect that "the organized few" have on "the disorganized many." Instructions include the "when" of firing, the care and recovery of wounded, and the seizure and disposition of the key agitators in a mob. Recruits alternately take the part of both riot squad and mob.

For instruction in house-to-house seizure and search against armed resistance, the group is divided into five "waves" which are conducted on a "tactical" walk through the village. During the walk a picked team demonstrates as the instructor describes and explains the following: the organization of the wave into search and support parties; fire and movement; firing from a window; and the seizure and arrest of occupants and persons who resist. Each wave is then conducted through a similar course and required to negotiate the same obstacles and solve the same problems met by the demonstrating team. Concurrent with house-to-house search, instruction is given on methods and techniques of saboteurs, featuring likely targets such as power plants, industries, food supplies, communication lines, and military installations. A display of instruments and explosives which might be used is shown.

Organizations receiving replacements from this Center can expect that, in the foregoing aspects of occupation duty, a sound basis for additional training has been made by the Civil Affairs Committee.

ARTC's Contribution to Victory

by Captain Harold W. Keyser, Cavalry

THE power and striking force of the armored troops, which contributed heavily to victory in both theaters, can be traced in a large measure to the training provided by the Replacement Training Center at Fort Knox, Kentucky. This was the nation's only training center for replacements for the men who fought and directed the armored vehicles on the world's battlefronts.

Even before the war, the necessity for a definite training for the special troops required to handle the highly technical equipment of the Armored Forces had been recognized. The first steps toward the organization of a centralized training set-up for these men were taken in October, 1940. It was designed primarily to give basic training to filler replacements for the newly born and rapidly expanding Armored Force.

The Center embodied many innovations in training techniques, and encountered many of the same problems experienced by any new army training camp. Its original cadre was drawn from the 1st and 2d Armored divisions, and was supplemented by Regular Army and Reserve officers who were particularly qualified as instructors.

Operation was begun in the last week in February, 1941, when the first trainees arrived at the Center. The T O at that time called for 36 companies of 220 trainees each, which were organized into battalions of three companies, and into Groups of four battalions.

Eleven weeks after the arrival of the first increment, the Center was handling the training of 5,431 enlisted men for duty with the existing armored units, and those in the process of formation.

Two phases made up the original training program: The initial phase, handled by the various companies under battalion supervision, and including all basic subjects; and the second phase comprising the more advanced technical subjects peculiar to the needs of the Armored Force. Upon completion of the latter, many of the enrollees went to the specialist schools in tank maintenance, communications, etc.

Because of the highly technical nature of the work involved in the operation of the Armored Force equipment, efforts were made to establish a minimum mental standard for trainees, and to obtain men with at least a high school education. The heavy demand for this type of man by other branches, particularly the Air Force, precluded the realization of this effort by the ARTC, but the results obtained with the men assigned were highly satisfactory.

A major problem during the early stages was the difficulty of obtaining necessary equipment for training. No tanks were available and the trainees were instructed in driving and gunnery on borrowed tanks. Only 10 to 12 tanks per day were available, and men were forced to wait a long time before their turn came for driving practice.

Major changes in the original training set-up were made during the summer of 1941. The training of auxiliary troops—such as armored, infantry, signal, quartermaster, medical, engineers, and ordnance—was taken over by the regularly established replacements centers in other parts of the country, and the ARTC began training armored units only.

To the original two Groups, a third was added in October, 1941, to train replacements for reconnaissance, assault gun and mortar companies.

An additional course was included in the operations of the Center in the fall of 1941 with the inauguration of the Officers' Orientation School. The purpose of the school was to introduce newly assigned officers to the tactics and technique of the Armored Force. Early sessions of the course were beset with difficulties as may be gathered from a request submitted by the G-3 of Armored Force to G-4 for one medium tank for exhibit to officers in the orientation course. The request stated, in substance . . . "It is not expected to give any driving or firing instruction, but the officers should at least see the medium tank, M3, prior to joining tactical units."

The first class of this orientation school was graduated in November, 1941, and the classes continued until February, 1943, by which time practically all newly assigned officers had armored force backgrounds and it was felt that the necessity for the school therefore no longer existed.

When the United States entered the war, 7,469 men were undergoing training at the Center on a 13-week basis. Speed was needed and the War Department ordered a reduction of the training time to 8 weeks. This plan was abandoned when it was determined that the quality of the training was materially reduced by the cut.

A material increase in the amount of training equipment soon made an advance in training efficiency possible. Field training was increased. Road marches were longer, and additional experience was given the men in entering and leaving bivouac areas after dark, as well as in night blackout driving.

In 1942, lessons gained in combat in Africa were applied. Increased time was given to the physical hardening of men, and more emphasis was placed on land navigation, mines, booby traps, and night operations. The number of specialist classes in the Center was reduced, and all trainees were required to complete the seven-week basic course before acceptance for specialists' training.

The committee method of training, with specialized teams of instructors handling instruction in the various technical subjects, was adopted by the Center.

By the end of 1943, the training program had been broken down into five major categories: 1. Subjects taught under company or battalion direction. 2. Small arms, taught by the weapons department. 3. Heavy weapons, by the Center Gunnery Department. 4. Driving and maintenance, by the Vehicle Department. 5. Map reading, sanitation, first aid, communications, and tactical training of the individual soldier including special battle courses, taught by the General Subjects Department. The only specialist school retained was the Bakers' and Cooks' school.

Battle indoctrination courses were set up using live ammunition rather than the "canned" noises formerly used. The original one-week battle training course was divided into six phases, including Combat Driving, Tank Crew Training, Tank Crew Firing, Close Combat Firing, Booby Traps, Grenades, Reconnaissance and Miscellaneous Training which included instruction in field expedients, infiltration and obstacle courses.

The trainees were moved into bivouac for this phase of their instruction, and spent the entire period living and operating under field conditions. A "Nazi" platoon gave realism in all problems, and raided the bivouac areas in "attacks." Operations also included construction of booby traps and surprise gas attacks to promote the alertness of the trainees under all phases of combat training.

Opening phases of the battle for Europe during the last half of 1943 brought no major changes in the tactics and uses of armor. Limited use of the armored vehicle in the Sicilian and early Italian campaigns showed only one weakness in the ARTC's program—a deficiency in night operations, which was promptly corrected with an increase in night work. The Center's program was found to be well balanced and practical.

By the closing months of 1943, more than 98,000 trained replacements had been turned out.

The fighting in Normandy brought, for the first time, large combination tank-infantry operations. This matter had been a source of continual study from the beginning, and its practical application in combat was instantly recognized. A further change in the Center's training program was instituted to cover this phase in August, 1944, in a course designed to give each trainee the fundamentals of all branches of the service.

Because of the heavy demand for replacements, an expansion program for the ARTC was set into motion at the close of 1944. The new program was designed to add two full regiments to the capacity of the Center.

Losses in the heavy fighting along the German frontiers brought demands for replacements to a peak, and in a move to offset the shortage of trained armored personnel it was decided to convert personnel from other branches into tankers. Originally it was planned to convert six battalions of infantry trainees who had completed their six weeks of basic at an IRTC. This plan was changed when the inactivation of several tank destroyers, airborne and cavalry reconnaissance units was ordered, and their personnel shipped to Fort Knox for conversion into tank crewmen. Some 5,000 men were converted from other branches in this phase of the program.

Trainee number 150,000 was graduated from the ARTC during the week of February 19, 1945. The major portion of these men had been shipped to the European Theater. Tank outfits in the Pacific area, however, were operating with men who had received their training at the Fort Knox center.

As the heavy fighting died down in Germany, training schedules at the ARTC were modified and by the time of the German surrender the Center's program was already well organized in the instruction of the different techniques of fighting which characterized Pacific warfare. Size of the training companies was reduced at this time to 200 men per company, with a resultant increase in efficiency.

Gunnery courses were altered to fit the reduced range requirements and methods of the Asiatic fighting, while village fighting courses were also changed to conform with the altered tactical methods of the Japanese.

With the end of hostilities in the Pacific Theater, wide modifications were made, among which were new phases of instruction to prepare the men for occupational duties, with emphasis on civil affairs and control rather than on combat training.

Major General Robert W. Grow assumed command of the Center on February 28, 1946. General Grow came to the Center from the 6th Armored Division which he commanded in the European fighting. Further changes were made in March, 1946, to accommodate additional units. These included a reversion to part of the original plan for the Center, and called for the training of mechanized cavalry, field artillery, and infantry as well as armored troops. The name of the Armored Replacement Training Center was changed on April 1, 1946, to the Replacement Training Center. The new set-up called for a Center headquarters and four regiments consisting of 28 battalions or squadrons and 75 companies, batteries or troops. Under this plan the Center is concerned with the training of mounted crews for all types of combat vehicles.

During the period of operation of the Armored Replacement Training Center, the organization at Fort Knox turned out a total of 200,261 men. These went out not only as replacements for combat units, but also aided in a large measure to fill armored divisions of the army while these were in the process of organization in the United States.

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The Interphone System in Armored Vehicles

*by 1st Lieutenant John F. Moran, Infantry**

Evolution of the Interphone System

BEFORE 1938, a tank driver's back was sore and bruised after each day's operation. All signals to the driver from the tank commander, who sat behind him, were made by the commander's foot. If the commander wanted the tank to move forward, he tapped his foot against the driver's back. To move faster, the tapping was increased in tempo. To turn right or left, the foot was put either on the right or left shoulder. To back, it was pressed against the driver's neck or head. To stop or slow down, a steady pressure was used against the back of the driver.

Realizing the inefficiency of this method of communication, The Infantry Board and The Mechanized Cavalry Board, began experiments to improve it. In 1938, the first interphone communication equipment, incorporating amplification, was designed exclusively for use in tanks and other armored vehicles. The equipment was designed by the Signal Corps laboratories, and in the fall of 1938 was mounted in the M2A2 light tanks of Company E, 66th Infantry Regiment (Light) at the request of The Infantry Board. The tank crew consisted of four men: commander, turret gunner, driver, and radio-operator bow-gunner. This system allowed one-way communication from the tank commander to driver, and from commander to turret gunner; and two-way communication from the tank commander to radio operator. The interphone amplifier was a separate component, and not part of the radio set. The radio sets which were installed in the tanks for the experiment were SCR 193s and SCR 245s. No provision was made for the remote operation of the radio by the tank commander.

The interphone system later was wired to the radio through a junction box and modified to permit the tank commander to operate the radio remotely through the interphone system. At this time, microphone jacks were installed at each position in order to make possible a two-way communication with all members of the crew. Transmission over the radio by the tank commander would not disrupt the interphone system because the interphone communication between other members of the tank crew was still possible.

The basic interphone system of World War II vehicles consisted of one interphone box (BC-606) for each member of the tank crew, and some means of amplification, either as an integral part of the vehicular radio set, as in the SCR 508 and SCR 608 series, or as a separate component, as in the RC-00 or BC 605. Provisions also were made for the operation of the radio from the tank commander's position in the turret.

In the Normandy campaign, it was desirable for the tank commander to communicate with the infantry squad following the tank. Many field expedients were used, from dragging-wire with a telephone on each end, to an elaborate hookup of interphone boxes wired to the tank interphone system. In 1944, a modification work order was issued which standardized the method of external tank-to-ground interphone communication, and which has been incorporated as an integral part of the tank interphone system. At the same time, the use of the individual radio-interphone selector switches was eliminated, and the tank commander's selector switch was spring-loaded, so that when no pressure was applied to the switch it automatically returned to the interphone position. In cases of emergency, a break-in operation by a member of the tank crew is accomplished by his merely pressing the "Press-To-Talk" switch on his microphone. This automatically causes the radio to shift from radio to interphone operation, regardless of the position of the tank commander's selector switch.

The latest modification of the interphone system consists of the addition of two interphone boxes, BC-658, and the necessary cordage to install radio for infantry communication (AN/VRC-3) within the tank. The tank commander is able to operate the vehicular radio, the interphone system, or the AN/VRC-3 set by using the two selector switches on the interphone boxes. Also, the loader-radio operator is able to monitor either the vehicular radio, or the AN/VRC-3.

POSITION OF THE SELECTOR SWITCHES

	TANK COMMANDER'S BC 606	TANK COMMANDER'S BC 658	LOADER'S BC 658
Tank commander operates the interphone. Loader monitors the AN/VRC-3	Interphone	Interphone	Radio
Tank commander operates the vehicular radio. Loader monitors AN/VRC-3	Radio	Interphone	Radio
Tank commander operates the AN/VRC-3. Loader monitors vehicular radio	Interphone	Radio	Interphone

*The Armored School.

The preceding chart illustrates how this is done, giving the position of each of the switches on the three interphone boxes when the tank commander operates the vehicular radio, the interphone system, and the AN/VRC-3.

Interphone Operations

(The following material was compiled and revised from FM 17-67 Crew Drill, Medium Tank M-4; FM 17-68 Crew Drill, Light Tank M5; FM 17-74 Crew Drill, Heavy Tank T26; and FM 17-75 Crew Drill, Light Tank M24 by the Communication Department, The Armored School. It has been recommended that this information be incorporated in TM 21-305, Driver's Manual, to furnish a standardized system for interphone operation.)

The achievement of perfect teamwork in a tank crew requires a thorough knowledge of interphone procedure, language, and equipment, and the highest degree of discipline.

As in any other operation, the preoperative stage of maintenance or the "check" stage is used in the interphone operation.

As soon as the entire crew has mounted the vehicle, each crew member plugs in his headset and microphone in the respective jacks. The commander orders, "Check interphone." Each crew member then calls the designation of his position, followed by the word "Check." This sequence of reporting is as follows:

M26, M24, and M4:
1. Gunner.
2. Bog.
3. Driver.
4. Cannoneer.

M5:
1. Gunner.
2. Bog.
3. Driver.
4. ———.

During this procedure, each crew member adjusts to the desired level the volume-control on his interphone control box. He must check to see that the microphone switch does not remain in the locked position.

All crew members should understand that, by pressing the "Press-To-Talk" switch on the microphone, all external radio communication is interrupted. Therefore, if the tank commander is transmitting or receiving a radio message, the "Press-to-Talk" switch on the microphone should be pressed only in case of emergency.

Efficient operation demands that interphone conversation be kept to the minimum. The following terms are prescribed for interphone language:

Tank commander ..... "Lieutenant" or "Sergeant"
Gunner ..... "Gunner"
Driver ..... "Driver"
Cannoneer ..... "Loader"
Bow gunner ..... "Bog"
Any tank ..... "Tank"
Armored car ..... "Armored car"
Any unarmored vehicle ..... "Truck"
Any antitank gun ..... "Antitank"
Infantry ..... "Doughs"
Machine gun ..... "Machine gun"
Airplane ..... "Plane"

The following are commands for movement of the tank:

To move forward ..... "Driver, move out."
To halt ..... "Driver, stop."
To reverse ..... "Driver, reverse."
To decrease speed ..... "Driver, slow down."
To turn right 90°
"Driver, clock three . . . steady . . . on."
To turn left 90°
"Driver, clock nine . . . steady . . . on."
To turn left 60°
"Driver, clock ten . . . steady . . . on."
To turn the tank right (left) 180°
"Driver, clock six right (left) . . . steady . . . on."
To have driver move toward a terrain feature or reference point, the tank being headed in the proper direction.
"Driver, march on white house (hill, dead tree, etc.)."
To follow in column ..... "Driver, follow that tank."
To follow on road or trail .... "Driver, right on road."
To start engine ..... "Driver, crank up."
To stop engine ..... "Driver, cut engine."
To proceed in a specific gear
"Driver, third gear (first gear, fourth gear)."

The following commands are for the control of the turret:

To traverse the turret "Gunner, traverse left (right)."
To stop turret traverse "Gunner . . . steady . . . on."

Interphone operations differ in various armored vehicles; however, all interphone systems in full-track armored vehicles are dependent on either the radio set or an interphone amplifier.

Based on the most recently authorized modifications, the following operational conditions exist:

1. In the light tank, M5, both the tank commander and the gunner are able to transmit on the radio when the "Radio-interphone" selector switch is held in the "Radio" position. All other crew members can talk and listen on "interphone" when no transmissions are being made.

2. In all other tanks, only the tank commander can transmit on the radio. All other members are able to talk and listen on "Interphone" when no transmissions are being made.

REMOTE CONTROL

*by Captain William E. Felty**

REMOTE control equipment for radios was used extensively by soldiers in the European campaign, especially during the extremely cold and uncomfortable winter months of 1944 and 1945. The making of remote control equipment by which he operated his radio set, usually rested with the individual. The types and models designed were therefore of various sizes, shapes, and all degrees of practicability, but they all consisted of the same basic types of equipment: the necessary plugs, and long wires to the outer ends of which were connected either a control box of some sort, a microphone, headset, loudspeaker, or a leg key. Such equipment kept many men in communication work from suffering frostbite, and uncomfortable tours of duty as radio operators. In the separate tank battalion, of which I was communication officer, a workable remote control system was used which was easily installed in any CP location. It consisted of a 50-foot extension wire (Spiral Four telephone wire), on one end of which was connected a jack for the microphone plug of the transmitter, and the receiver plug. On the other end, which was to be used inside the CP, a headset and microphone was connected. This worked well until it became necessary to operate on more than one channel. Someone then had to go to the radio vehicle to select the proper push button. This was eliminated, however, by laying two sets of wires running into the CP, each connected to a radio on one of the two net frequencies. It proved a very convenient and worthwhile remote control system.

Another system, which was effectively employed by the 3d Armored Division, was to bring a complete radio set into the CP and run extension cables out to the vehicular battery. While this isn't necessarily a remote control hookup, it did reveal that communication personnel were working on means of operating radios without having to undergo withering shell fire, in addition to cold and wet weather. These ingenious devices were quickly noted by commanders and communication officers, and work immediately was started on some method to standardize remote control equipment. Through trial and error we today have a remote control unit for radio sets that will serve practically every situation.

The Remote Control Equipment RC-289 (consisting of the Remote Unit RM-39, and to be used in conjunction with a Field Telephone EE-8) will remotely operate any radio set we have. It provides for remote operation of voice, tone, or CW transmissions by radio from a field telephone connected by telephone wire to the remote unit, which in turn is connected to the radio to be used. The equipment can be used with either FM or AM sets, separately or together. This is particularly important because this one type unit can be employed in a headquarters to operate all types of radios whether they are AM, FM, voice only, or CW.

The RM-39 has a four-position selector switch covering Telephone, Radio, Through, and CW. This is used to select the type of operation to be employed between the telephone and the radio (s) being operated by remote control.

The field telephone, being connected to the RM-39, can also be tied-in to a switchboard circuit, thus making every telephone in the switchboard circuit a remote control station for the radio set.

In Figure 1 it will be noted that the arrangement is such that by talking into the telephone handset at A, the radio at D can be operated remotely to transmit a message to E. This could be a very desirable set-up for an OP utilizing equipment at A. It not only eliminates the necessity of having a bulky radio or vehicle at the OP, but provides radio communication with its headquarters or unit. (It would also have been very desirable during the month of January, 1945, in Europe, where the radio operator could have efficiently operated his radio from a cellar or from inside a building rather than having to sit in a cold half-track and nearly freeze.)

With this equipment, telephone communication can also be established from A to C by putting the selector switch on the RM-39 to "Telephone." The operator would, of course, have to be at the RM-39 unit to make the change.

Again referring to Figure 1, if the radio at D is an SCR-506, and a leg key is connected to the telephone at A, we thus provide an operator at A with a means of operating the SCR-506, even though he may be at an OP some 1,500 yards or more away. Incidentally, that would be ideal when the OP was in a tall building, because the observer could transmit information whenever he saw it. This saves time and reduces the chances of error through relaying a message to a radio operator.

In considering further possibilities of remote control equipment, it must not be overlooked that one field telephone can be used to remotely operate a number of radios on the command net frequency, one on the administrative net, and the mortar platoon net—provided a radio for each net has an RM-39 connected by wire to the telephone in the battalion commander's CP.

*Communications Department, The Armored School.

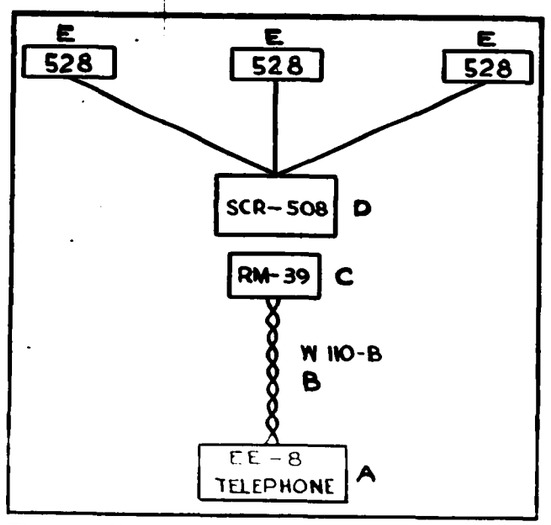


Figure 1—Showing one SCR 508 remotely operated from field telephone.

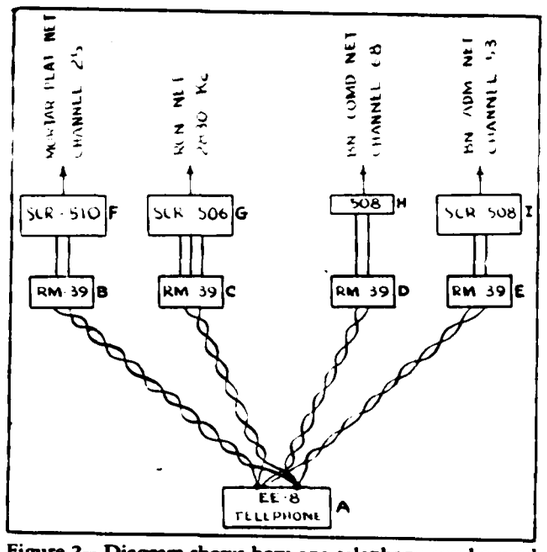


Figure 2—Diagram shows how one telephone can be used to remotely operate four radio nets, both FM and AM, simultaneously.

In Figure 2, note that from the field telephone A, one man can simultaneously transmit messages over radios at F, G, H, and I, even though they are all on different frequencies. In effect, this means that the battalion commander or a member of his staff can send a message over four radio sets at the same time. Think what a time saver that could be. Naturally, this type of arrangement would be used in either static positions or defensive operations.

It is also interesting that from the telephone in Figure 2, CW transmissions can be made over the radio at G by turning the channel selector switch of the RM-39 at C to the CW position. Also, if desired, a message can be transmitted from A over only one, or as many of the connected radio sets as desired. For example, if it is desired to transmit a message over the battalion command net and the mortar platoon net, the selector switches that were on B and D would be placed on "Through," while those on C and E would be placed on "Telephone." As a result, when the transmission is being made over the telephone at A, the operators at C and E may monitor while the message is being transmitted over radios F and H.

Note that in Figure 3, the field telephone A is connected to a telephone switchboard, "X." There are also three other telephones in this switchboard hookup. This arrangement, in effect, gives a radio-telephone switchboard to which six telephones and two radios are connected. This is true because the RM-39 units at B and C can be used as telephones. They are equipped with a ringer and bell just like the field telephone for the purpose of ringing and signaling to answer.

Figure 3 shows a very flexible arrangement whereby the operator at telephone A is in the telephone switchboard circuit. At the same time he can operate, by remote control, the radios at D and E, either singly or simultaneously, depending upon the position of the selector switch on the remote units at B and C.

Now, a matter which might be of great importance, and is particularly interesting, is that the telephone operator at Z can also operate by remote control the radios at D and E. In doing this he must be connected through the switchboard to the telephone at A. By using the same connection, he can also receive a radio message over both or either of the two radio nets. This might be of particular importance in many instances of defensive operations. It would certainly provide a means of close coördination between units. For example, if a tank battalion commander is at the infantry CP, "X," and has an urgent message for his company commanders, he can call by telephone and personally make the radio transmission to his company commanders by going through "X," A, B, and D. Many commanders can no doubt recall at least one instance during combat when they could well have used a communication link such as this.

(For technical operation instruction, attention is invited to TM 11-2667, as amended.)

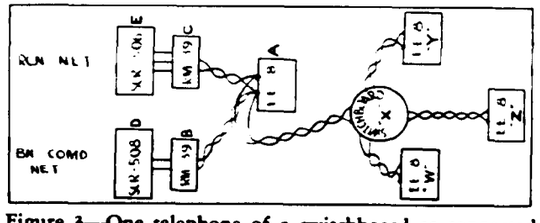
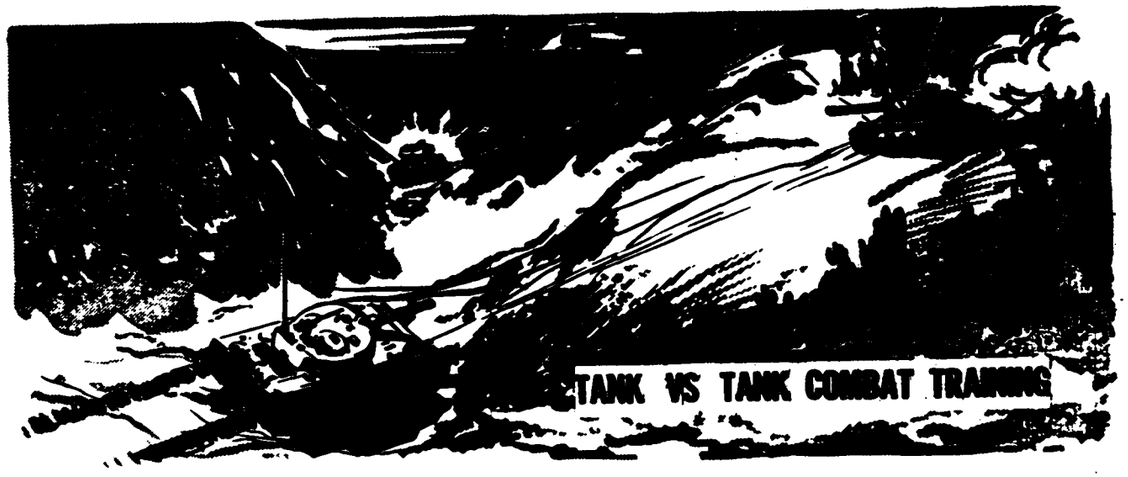


Figure 3—One telephone of a switchboard as connected to remote control units.



*by Major C. P. Miller, Infantry**

The words "Tank-vs-Tank" in the title are somewhat misleading. The purpose of the training outlined in this article is not to teach men how to fight one tank against another. Although it does give a few pointers in that phase of combat, its principal advantage is in teaching men things about their tank and equipment that cannot be obtained from a book or through drill.

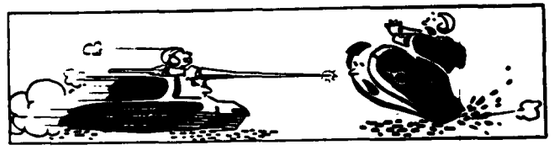
A MEDIUM tank crew is rolling into its first combat. Suddenly there is a terrific clattering against the turret as enemy machine-gun fire is encountered. An odor of burned paint and hot lead drifts through the tank. At the same instant the gunner's periscope is shot away, and he finds himself looking straight upward through his sight, down which bits of glass are falling. He reaches up quickly, unscrews his periscope locking screw and withdraws the shattered pieces. A few seconds later he has replaced the shattered 'scope with another, and is searching for a target. In the meantime, the tank has continued to move forward, and the commander has maneuvered it so that the bow gunner has brought his weapon to bear and knocked out the enemy machine gun.

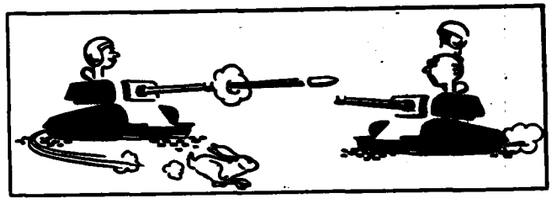
This action was successfully and efficiently carried out in battle because exactly the same thing happened before to this tank crew when they were in training in the States. This crew knows the sound of the impact of machine-gun bullets against their armor plate, and had periscope heads shot away before they embarked for hostile shores. They went through the uncomfortable feeling of having their tank shot at and hit in combat firing problems in the California Desert early in 1943—and they knew what to expect.

Members of the 35th Armored Regiment of the 4th Armored Division, developed "tank-vs-tank combat training" when their commanding officer desired a practical way of training tank crew teams for combat.

The training that was evolved taught personnel the necessity for crew teamwork. It forcefully drove home to tank commanders the opportunity of applying the basic principles of tank tactics, and it made them realize the problems and the importance of control. It afforded a faint taste of combat which, at the time, loomed large in the men's minds, and which cannot be described by words or pictures. It was a type of training that aroused the interest of the men, impressed them with the need for every member of the team doing his part, and in-

*Instructor, The Armored School.





stilled in them a definite confidence in their tank. The training developed platoon leader and company commander control; and improved communications at a level where their use is vital to success, and their misuse spells disaster. The success of this kind of training was well shown in combat.

The first steps taken to set it up were comprised of making test runs during which .30 caliber ball ammunition was fired from all angles at the M5 Light Tank and the M4 Medium Tank, as issued. Cardboard dummies were utilized to detect points of entry of bullet splash, and to estimate possible damage to the tank itself. Other than negligible scarring of the tank hull, the only damage was to antennae bases and aerials, and in shattered periscope heads and punctured air cleaners. Only the coaxial machine gun was used, making it necessary to plug the muzzle of the 75mm gun and the bow gunner's ball mount opening. All outside accessories were removed. Turrent crew members of the light M5s wore shatterproof goggles to protect their eyes from occasional bullet splash.

Problems confronting the officer who is setting up a tank-vs-tank combat training exercise are many. The biggest is suitable terrain. An extensive area is needed because bullets fly in all directions. The California Desert was perfect in this respect because of its many, and often dry, stream beds, which are surrounded by high ground.

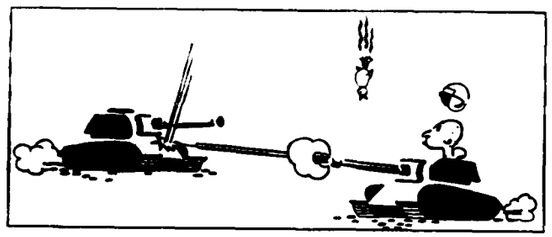
The problem of control is next in importance. One turn of a buttoned-up turret can easily confuse a tank commander's sense of direction. Accordingly, close radio control is desirable. In the training course, control was obtained through three Control Officers—Master Control, Control One and Control Two. Master Control remained stationary in a location overlooking the entire problem area, while each of the other two controls was attached to one of the elements participating in the exercise and followed it through the problem.

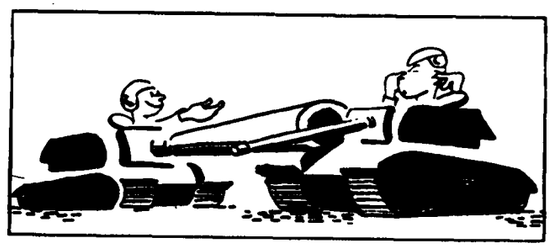
Master Control rode in an M4 Medium equipped with an SCR 508, and was in contact with the two controls as well as with each element engaged in the problem. Controls One and Two rode in M5 Light Tanks equipped with an SCR 528 (preferably a 508), and were each in contact with Master Control and also with their respective elements.

Master Control was responsible for the setting-up, coordination, and the execution of the problem, and the enforcement of the necessary safety precautions. Controls One and Two assembled their elements, and saw that they were ready to start the problem on time, and that the safety precautions were carried out. Controls also prevented tanks from moving outside the boundary lines, and saw that no gunner fired at the rear end of another tank so that air cleaners would not be damaged.

To show the general procedure, the following typical problem is described:

Master Control sets up an exercise for two medium tank platoons in a situation wherein each platoon is to destroy an "enemy" tank platoon advancing toward it down the valley. Control One, attached to Platoon A (so designated in order to follow the action), checks with the platoon leader to determine that all accessories have been removed, gun muzzles and bow gun ball mounts plugged, ammunition spaced in groups of four rounds to simulate the loading time of the 75mm, and that light tank turret crew members are wearing goggles. He then checks communications, and also sees that a medical aid man with equipment is riding in his own tank. Over Platoon A's radios, Control One can be heard telling Master Control that his element is ready. Prior to this the platoon leader has given Platoon A the situation and has issued his orders. Master Control orders "Button Up," and all hatches are closed. Control One checks all tanks, closes his hatch and reports his element ready. Master Control then orders "Move Out," and as the platoon moves forward, the light tank of Control One, clearly marked by a green pennant on its antennae, moves into position behind the platoon leader's tank. Platoon A moves down the valley in formation for about a quarter-mile, going slowly in order not to raise dust. Apparently the "enemy" has not considered the dust, for a cloud of it can be seen ahead. The Platoon deploys and takes cover. Soon an "enemy" tank moves out of the brush in front of the Platoon and rolls toward it with 'scope scanning from side to side. A Platoon gun hammers out its four rounds, and a tracer bounces off the "enemy" tank. It stops, and a yellow flag appears on top of the turret from the loader's periscope mount. The tank has been knocked out, and cannot be fired at again. But there is a terrific clanging against our own turret as a hit is scored by a tank coming out of the brush on the left flank. Our gun is cleared and up goes the yellow flag—"Out of Action." Control One can be heard





telling one of Platoon A's tanks to cease firing, and also "blasting" the tank commander for firing again after his tank had been hit. Master Control now orders, "Cease firing, clear guns and elevate muzzles"—and then: "Open hatches, report to OP for critique."

Two of the procedures in the training are contrary to those which would be used in combat, and the men should be warned against them. One is stopping the tank when it has been hit. Although this is necessary in order to retain control, it should be pointed out in each critique that such a practice is purely an artificial control measure imposed by training restrictions, and that in combat tanks must remain mobile when attacked, so that they may either outmaneuver their opponent, or seek the necessary cover to best fulfill their mission or to more fully contribute to the mission of their unit. The other falsity is in elevating the guns when the problem has ended. This is merely a visual sign that the guns have been unloaded. Crews have done this in action, and the tank has been drilled through the turret-face between the mantlet and the ring. Perhaps a better plan would be to use a flag in the latter phases of training, although this would leave loaded guns in a dangerous horizontal position.

As proficiency and control are gained in platoon exercises it is practicable, if the terrain permits, to enlarge them and employ two tank companies, each of which is reinforced by a reconnaissance platoon. The reconnaissance platoon should be mounted in light tanks. The two companies, preceded by reconnaissance, are started toward each other from points four or five miles apart. Their radios should be on different battalion channels. Information gained by reconnaissance is reported back to the company commander, who plans and directs the movement of his company. He controls his elements and directs their fire so as to mass it when necessary in order to establish a base of fire while a platoon is dispatched to effect the required maneuver. The same controls—one per company and one Master—are used as in the platoon exercises. It was also essential to add the additional precautionary ground rule of not shooting at dismounted men. For it was found, until forbidden, that the men did not hesitate to leave their vehicle in defilade and scout ahead on foot, signalling the information thus gained back to their crew for radio transmission to the company commander.

The critique covers the tactics employed by the element commander, and the conduct of their tanks by individual tank commanders. The entire problem is discussed and every man given the chance to comment on the exercise. Emphasis should be laid initially on encouraging the individual crews, and then the platoon, to talk about the difficulties encountered. During training, many crew obstacles were overcome by encouraging free discussion. Much interphone and platoon communication difficulty also was overcome.

QMG Shipping 300 Blooded Horses

APPROXIMATELY 300 additional Thoroughbreds, half-breds and Arabs will reach the Quartermaster Remount Depots in the United States by September 10 as a result of a second trip to Germany, Austria, and Italy now being made by Colonel Fred L. Hamilton, Chief of the Remount Branch, Office of The Quartermaster General.

These horses are in addition to the 152 shipped to the Aleshire Quartermaster Depot (Remount) at Front Royal, Virginia, last fall. The latter shipment included 64 Thoroughbreds, 40 half-breds, 22 Arabs, 16 Arab-Kinds, nine Lippizanners and one Russian horse.

Most of these animals were captured from the German Wehrmacht by the American Army of Invasion. A few were requisitioned from German citizens by our Army of Occupation. Still others were requisitioned from the ex-German government (other than the Wehrmacht).

"It is the intention of the Remount Service to assign the stallions and colts, as they mature, to civilian agents throughout the country in accordance with the Remount Breeding Plan," said Colonel Hamilton. "The Arabs, Grade Arabs and Lippizanners have been shipped to the Remount Depot at Pomona, California, for use or distribution. The Thoroughbreds have been held at Front Royal. Half-breds have been shipped to the Remount Depot at Fort Reno, Oklahoma. The mares and fillies will be held at the Army Remount Depots as prospective brood mares for the production of additional stallions. All of these horses represent some of the finest blood lines in the world.

"With characteristic German thoroughness, these horses have been bred for temperament, durability and thriftiness for generations," Colonel Hamilton said. "Thoroughbreds and grades alike have been thoroughly tried in many ways, and only those with exceptional records were sent to the government nurseries for breedings. This system of selective breeding is exactly in accordance with the objectives of the American Remount Service. We feel that we can advance our Army Breeding Plan many years through adapting to our own Remount program the experience of Europeans and the results obtained by them."

Mobilitate Vigemus

WITH this issue of the ARMORED CAVALRY JOURNAL we set forth on what we believe to be another step in the right direction—a step which embodies the spirit of the old traditions, in the trend of modern warfare.

Although many of us who have been readers of THE CAVALRY JOURNAL for many years have a feeling of nostalgia, we can be assured that under the present editorial policy (and we hope for many more years to come) the horse and all interests pertaining thereto either from a military standpoint or otherwise, will receive space in our JOURNAL—and "OLD BILL" will occupy his usual place on the cover. A good Cavalryman could never stand still—he always tried to go forward and we believe we, too, are marching forward.

The Executive Council of your Association discussed the proposed changes over a long period of time before submitting them to the members for action. A very comprehensive statement of the Executive Council which was presented at the meeting by Major General Verne D. Mudge, Vice-President of the Association (who formerly commanded the 1st Cavalry Division during its fighting in the Pacific) covers the situation so thoroughly that it is reprinted here as an editorial.

* * *

Minutes of the Special Meeting of the United States Cavalry Association, in Washington, D. C., Monday, July 8, 1946

THE special meeting of the United States Cavalry Association was held in the office at 1719 K St., Northwest, Washington, D. C. at 8:15 P.M., Monday, July 8, 1946 for the purpose of voting on the proposed amendments to the constitution of the Association. The meeting was called to order by the President, Major General I. D. White, U.S.A.

Six hundred and thirteen members were represented in person or by proxy. This number represented a quorum.

A reading of the minutes of the previous meeting was dispensed with.

Opening statement by General I. D. White:

"Gentlemen:

As you know, this meeting is called for the sole purpose of voting on proposed amendments to the Constitution, these amendments are as follows:

Article I. Title.

The name of this association shall be The United States Armored Cavalry Association.

Article III. Objects.

1. The aim and purpose of the Association shall be to disseminate knowledge of the military art and science, to promote the professional improvement of its members, and to preserve and foster the spirit, the tradition and the solidarity of the Armored Cavalry of the Army of the United States.

2. In furtherance of its aim and purpose, the Association shall publish with such frequency as may be determined from time to time by the Executive Council, a professional and scientific journal to be known as THE ARMORED CAVALRY JOURNAL, and conduct a book department for the sale to its members and the public, of books, maps, and periodicals.

Article IV. Membership.

1. No change.

(1) Active, for which all general officers of the Army of the United States and all officers, and warrant officers, commissioned in, and serving with, the Cavalry or Armored Cavalry of the United States shall be eligible. Active membership shall cease on the last day of the calendar year after the individual's relief from the Armored Cavalry.

(2) Associate, for which all present and former commissioned officers, warrant officers, and non-commissioned officers of honorable record of the military or naval service shall be eligible.

Before putting the articles to vote, the meeting is now open to discussion."

Major General Verne D. Mudge—"As General White has said, the purpose of this meeting is to vote on a proposal to amend the Constitution so as to change the name of the association from 'THE CAVALRY ASSOCIATION' to 'THE ARMORED CAVALRY ASSOCIATION,' as well as changes in regard to membership. As a member of the Executive Council I have been designated to give a brief résumé of the events which have led up to this meeting. My remarks will be confined solely to the change of name of the association and of the JOURNAL.

The composition and structure of the Army have always been quite fluid. During the war they were subject to continuous examination, resulting in many changes. This analysis is continuing, with the object of determining the best in the way of a postwar Army. Many important changes have already been conceived, evaluated and acted upon.

With the importance of our Cavalry influence in mind, the General Staff therefore approved the creation of a new Arm which would preserve this influence, and decided that such a recommendation should be made at the proper time. This new Arm would be so

constituted as to embrace the functions of large armored units, while at the same time maintaining the Cavalry doctrine which has been so important in our military thinking. On that basis the name 'ARMORED CAVALRY' was selected, and represents the present position of the War Department in this matter.

It might be well, at this point, to enlarge upon the proposed scope of this new Arm. It comprises all mechanized units, such as the Cavalry groups, all tank units, and all horse units of the postwar Army. It is felt that all these categories are implements of a common doctrine—the doctrine of aggressive mobility combined with great fire power. The War Department believes it unwise to attempt to maintain these three categories as separate Arms. Such a procedure would be extremely wasteful when measured against the actual troop requirements for each category in any particular theater. By combining these categories on the basis of a common doctrine a reasonable degree of flexibility is attained, permitting the organizing and employment of whatever balanced mobile force is necessary to meet requirements. It is well to realize at this point that it is not contemplated that the technique of horse units shall be abandoned. It is the intent of the War Department that horsemanship and horsemastership be retained in the Army to the extent necessary for implementation of the mobilization plan, or to meet future requirements. *We may thus regard animal elements, mechanized cavalry and armored units as the three components of the Armored Cavalry.*

What should we members of the Cavalry Association do about it? After no small amount of thought and investigation your Executive Council has concluded that three courses of action are open.

First, we can do nothing. We can await final Congressional action, following which we could survey the situation in a deliberate and orderly manner, and recommend a procedure. As a matter of fact, not to do this, is to throw ourselves open to criticism that we are acting prematurely, or unwisely, or at the least, hastily. Your Council considered that plan, and the obvious objection to it, seriously and at length. We discarded it with full knowledge of the risk entailed. But we feel that it is a calculated risk, and certainly not so great as to be avoided by a Cavalryman. The alternative—doing nothing—is distasteful, and also is fraught with the possibility that delay might prove most costly. The armored and mechanized elements are seeking today a basis for organizing, and cannot be expected to delay indefinitely. Also, many of our finest members belong to these other components. Unless we can provide some common basis we shall lose much of our strength, and be relegated to a very minor rôle. The result would probably be two or three relatively small associations, instead of one large one capable of meeting the needs of armor, mechanization and horse. Accordingly, we were not content to do nothing, notwithstanding the risks always inherent in aggressive action.

Secondly, we can circularize our own membership, as well as the officers *assigned* to Cavalry groups and tank units, in an effort to gain some sort of guidance from them. This would encourage a full discussion of the matter. It would provide many bases for future action. It might possibly even give a better solution. We don't think so. In the first place, this problem is not a new one—it has been argued and discussed within our membership for years. Secondly, it tends to cater to those who want two or more completely separate associations, to the disadvantage of our own.

Third, we can take vigorous and prompt action which should strengthen our Association at the same time recognizing the trend of coming events. After discussions with General Devers and some members of his staff, and with General White and the then commanding General at Ft. Knox, we decided to recommend bringing the matter to a vote without delay. We felt that, with the War Department committed to a course of action, the risk of a Congressional reversal on so strictly a military issue is small enough to offset its deterring influence. We feel that it is unwise to risk any fumbling, and that good judgment dictates a prompt recognition of this newly conceived Arm, and the taking of prompt and aggressive leadership therein.

Additionally, I might at this point again invite your consideration of the adverse effect which further delay may have upon the strength and prestige of our own Association. Also to the fact that many of our members are now serving with armored units, and look to our Association for leadership. And finally to the fact that the future of the horse cavalry is definitely not the issue; the issue is whether to expand the Cavalry Association to include the armored and mechanized elements, whose concepts are identical with our own, and thereby retain the leadership which our Association has always held in the field of Cavalry thinking.

Accordingly, we are recommending the changes which are on the agenda of tonight's meeting. And I wish to say that the Council makes these recommendations only after a careful study and evaluation of the situation, and certainly with a full measure of the respect for the opinions of all our membership to which their long and zealous service in the Association so justifiably entitles them."

General White—"Thank you, General Mudge. I think that clarifies the situation and I believe this statement should be published in the next issue of the JOURNAL. It will also clarify the situation in the minds of a great many of our members who were not able to be present."

After a short discussion and questioning, the Amendment to Article I was read and put to a vote. All members present voted unanimously "in favor" of the amendment. Proxy votes were counted and cast by the Secretary—440 in favor, 160 against. The Amendment to Article III was read and unanimously voted for in the affirmative by all members present—proxy vote

counted as 463 in favor—155 against. Amendment to Article IV was read and a discussion followed in which some of the members wanted clarification of the interpretation of the amendment. The following explanation was made by Colonel E. M. Sumner—"Inasmuch as active membership included all officers, or warrant officers, commissioned in, and serving with, the Cavalry and Armored Cavalry, this would include those of other branches. Therefore, a Field Artilleryman, Infantryman or those of any other branch, would be eligible for active membership during the period that he was serving with an armored unit. Active membership would cease on the last day of the calendar year after the individual was relieved from duty with an armored unit. We feel that even though the individual is commissioned in another branch, that he should be allowed active membership in our association because he would obviously be interested in the welfare of the branch in which he was then serving. The active membership would also include officers and warrant officers who are members of the Reserve Corps and National Guard. Inasmuch as this report will be published in the next issue of the JOURNAL, it is recommended that any of the subscribers who are in doubt of their status as active or associate members, should write to the Secretary of the Association, who will be very glad to advise them of their membership status."

There being no further discussion, Amendment to Article IV was put to a vote. All members present were unanimously in favor—the proxy vote counted and cast as 603 in favor and 15 against.

The Amendments to the three Articles were passed by the necessary vote of two-thirds of the active membership of the Association and therefore adopted and made a matter of record.

The Secretary submitted the proposed change for the cover of the JOURNAL and it was unanimously approved.

There being no further business, the meeting adjourned at 10:45 P.M.

Commendation By General Eisenhower

HEADQUARTERS 1ST CAVALRY DIVISION
APO 201

GENERAL ORDERS Camp Drake (Tokyo) Japan
NUMBER 29 13 May 1946

1. The soldierly appearance and performance of all ranks of the 1st Cavalry Division at the review and inspection tendered to General of the Army Dwight D. Eisenhower, Chief of Staff, United States Army on 12 May 1946 at Tokyo, Japan caused General Eisenhower to write the following letter, which is so gratifying that it is published in this general order for the information of all and to make the letter a permanent record.

"12 May 1946

My dear General Bradford:

The magnificent appearance of your troops this morning has made a tremendous impression upon me. In all of my visits during the past four years, I have seen no troops who have presented a more inspiring sight. I was very proud to view such a display of military perfection.

Please extend to all of the officers and men of the 1st Cavalry Division my sincere appreciation for the honor done me, and pass on to them my congratulations for a job well done.

With warm personal regards,

Sincerely,
/s/ Dwight D. Eisenhower
Chief of Staff."

2. This order will be read to all troops at retreat.

/s/ W. B. Bradford
Brigadier General U. S. Army
Commanding

1st Armored Division Association

THE 1st Armored Division Association has been organized and has approximately 100 members. Any EM or officer who served a period of 60 days at any time, or any period of time in combat is entitled to membership. Any officer or enlisted man who served as an observer for 30 days or more, or was on detached service with the division 30 days or more while in combat is also entitled to membership.

A handsome membership certificate is available for 50 cents.

No membership dues are contemplated at this time because the purpose of the organization is to maintain a roster of former division members who can be contacted from time to time with reference to veterans' affairs, and can meet as a group during national conventions of veterans' organizations.

For membership in the association both enlisted men and officers should contact Major Franklin W. Patten, ASFTC, Classification and Assignment Branch, Camp Crowder, Mo.

Back Journal Copies Wanted

ANYONE with copies of the various issues of THE CAVALRY JOURNAL listed below who no longer desires them, is requested to send them to THE JOURNAL at 1719 K Street, N.W., Washington 6, D. C. THE JOURNAL has had requests for the issues from subscribers who wish to complete their files, and will be glad to remunerate you for them. The issues are:

November-December, 1940.
January-February, 1941.
March-April, 1941.
March-April, 1942.
January-February, 1943.
May-June, 1943.
January-February, 1944.

OTHER BRANCHES

Major General John W. O'Daniel

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True battlefield coöperation is a prime factor in the reduction of battlefield losses.

Among the prime essentials to battlefield coöperation are these two:

A battlefield discipline which will permit each unit to count upon every other unit to perform its expected task.

An intelligent understanding by units of one branch of the capabilities and limitations of units of other branches.

The first of these can be obtained only through unremitting training in garrison, in maneuvers and on the battlefield. Efforts to this end can never be slackened nor suspended.

The second can be obtained by proper education and by arousing the interest of members of one branch in the problems of others.

The "Other Branches" department of the Armored Cavalry Journal promises to be a notable and intelligent contribution to mutual understanding and interest. The Journal is to be complimented upon this conception and upon the manner in which, thus far, it has been worked out.

I commend it to the careful consideration of every Doughboy.

Major General, U.S.A.
Commandant, The Infantry School

The Bronze Arrowhead*

TORCH. HUSKY. OVERLORD. TYPHOON. CYCLONE. ATOMIC. . . . words that have changed history and will dominate military thought for years to come. Long before the blast of the Atomic Bomb, the plodding Doughfoot emerged dripping from the sea to blast conventional military thinking sky high. He was basically the same old Doughfoot but he had landed successfully, in force and against opposition.

THE basic principles governing amphibious warfare are identical with those of land warfare, but the vital prerequisites for a successful seaborne operation are more exacting. The coördination and coöperation between arms and services must be projected to the nth degree. Both the higher commander and the landing team commander must be equally meticulous in the planning of the operation. Details such as logistics, supply, communications, and transportation must be thoroughly checked to assure that adequate plans have been made.

Ship-to-shore operations have long been considered as extremely hazardous ventures, capable of accomplishment only by highly specialized troops under the most favorable conditions. The abortive attempts made by the British to effect a seaborne landing at Gallipoli in 1915 occupy a unique place in military history, and have long been the subject of exhaustive study by military men.

At the beginning of World War II, no nation possessed a specialized amphibious force capable of forcing a landing against a determined enemy on a well-defended shore and then continuing overland to capture a strategic objective. The success of the Japanese in their landing at Lingayen Gulf in December 1941 was due to the extreme dispersion of our own forces, and to the superiority in numbers, air power, and supporting sea power of the Japanese forces. From the strategic standpoint, our forces in the Philippines were isolated far beyond our theater of operations, and their ultimate surrender came because of geographical conditions rather than revolutionary changes in the principles of warfare.

After the Japanese successes in the Philippines and elsewhere in the South Pacific, it became obvious that any successful campaign against them would have to be launched amphibiously. The concept that a seaborne landing could be made only by highly specialized personnel with a galaxy of unique material was laid aside. In its place was advanced the hypothesis that any infantryman, adequately supported by elements of other arms and services, could be quickly trained to launch his attack from the ramp of a landing craft and, once established on the ground, could locate and destroy the hostile force.

Battle experiences from the beaches at Anzio to the heart of the Nipponese-mandated Okinawa have converted this hypothesis into an axiom. But to the doughboy, with a pack on his back and a rifle on his shoulder, the problem is eternally the same—*to attack and destroy the enemy*. Whether he walks, rides a truck, drops from the air, or floats ashore on a rubber raft, his job is unchanged.

The only difference in an amphibious operation from the standpoint of an individual infantryman is that he must train twice as hard and as long, must learn twice as much about the enemy situation and about the mission of his own unit, and must be prepared to advance in the face of enemy fire for an unpredictable distance through water and sand before he can fire a shot in retaliation. To get the doughboy's personal viewpoint on the subject of amphibious warfare, however, the three logical phases of such an operation must be examined. These are: the preparations on the near shore, the preparations aboard ship, and the assault landing.

*From The Infantry School.

Rough coral bottom and Japanese machine-gun fire retard the progress of infantry assault waves on Butaritari, Makin Atoll.

Signal Corps Photo

Preparation On the Near Shore

Because of the special nature of amphibious operations, training and preparation are of the utmost importance.

Individuals must be in top physical condition in order to bear up under the intense effort expended in the initial phase of a landing. It is necessary for the soldier to carry much larger loads ashore than he would normally carry in land operations because of the uncertainty of resupply in the early stages of combat following a landing.

As a part of the extended training program preparatory to making a successful amphibious operation, all infantry battalions of the 6th Infantry Division, for instance, were given one week's training on an Australian troop transport, culminating with a "dry run" landing in New Guinea on terrain similar to that which was to be encountered in the actual landing at Lingayen Gulf. During this training the individual soldier learned how to go over the side of a ship and descend a cargo net into a landing craft, how to lash and lower equipment, to take his place in the boat, and to leave the boat when it reached the beach.

Several weeks before the contemplated operation, naval gunfire officers and their parties, an air liaison officer, and field artillery forward observers and liaison officers were attached to the unit. Consequently, all members of the battalion landing team had an opportunity to work together and to take part in a full-dress rehearsal before embarking for the actual landing. In these training rehearsals, communications were vastly improved, all attached officers and enlisted men became acquainted with the battalion staff and other key personnel, and an *esprit de corps* was developed among all members of the landing team regardless of their branch of service.

Organization of boat teams is one of the most exacting tasks required of the S-3 of a landing team. An ideal boat team consists of a rifle squad which is reinforced by elements of the company weapons platoon or the heavy weapons company. Care must be taken to balance each boat team, so that if a craft is knocked out before it beaches no organic unit such as a mortar section or a machine-gun platoon is lost. The assault waves are made as strong in fire power as possible. When a small beachhead is to be secured, armored LVTs are particularly valuable if they are used to transport the first waves a short distance inland and thus are able to protect succeeding waves landing in LCVP-type craft.

The boat team organization is usually formed long before the actual operation, and it must be flexible. While the 20th Infantry Regiment was en route to the Luzon beach at Lingayen, a Japanese suicide plane crashed into one of the transports. The casualties included the naval gunfire officer, the air liaison officer, and two operators for the naval radios which were to accompany the battalion ashore. Although no replacements were available on the ship for such key personnel, officers and men with similar skills were taken by a destroyer from another ship in the convoy and placed on the troopship prior to H Hour.

The problems confronting the battalion landing team commander are many and varied. Every detail of training and planning must point toward the far shore. Because the commanding officer's control of the situation is practically nonexistent in the early stages of the landing, he must assure himself that every possible contingency is covered in his field order. The complete order for a single battalion landing team which is operating as a part of a major task force will often cover 50 pages, and each page must be read and reread until all key personnel thoroughly understand the order.

Preparation Aboard Ship

Before boarding ship, every individual from private to battalion landing team commander is assigned a definite berth. Both teams have been carefully organized on the near shore so that each team is a tactical unit, and the integrity of these teams must be maintained until the last doughboy runs off the ramp of the LCVP and reorganization takes place on the objective.

Even in the most efficiently organized landing teams, many changes must be made in boat team assignment tables during the voyage. Men get sick and go to the ship's hospital; men fall down the ship's ladders and break a limb; enemy action causes some casualties aboard ship; or even worse, some of ship's small boats are out of commission and unavailable for use on D Day. Consequently, changes must be made in the boat team assignment table almost daily to maintain it on a current basis.

While he was on shore, the individual soldier was put into the proper physical condition. Aboard ship, he must be *mentally conditioned* to carry out his part of the operation. Usually troop mess halls are made

Infantry weapons squads pause to adjust equipment after wading ashore. Boulders in the foreground give an idea of what the Doughboys walked on while in the water.

Signal Corps Photo

available to troop officers for assembling and thoroughly briefing the men on the various phases of the operation. All component parts of the landing team field order are explained in detail to noncommissioned officers.

Landing team commanders arrange for maps, charts, diagrams, or other material that will assist in showing the soldier what he has to do when he gets ashore. Diagrams show the exact area where his unit will land, including the type of beach, terrain gradient, vegetation, water barriers, and other obstacles he may expect on the enemy shore. Air photographs of the objective, furnished by reconnaissance elements of the air force, are usually available down to the boat team level.

Physical training or periodic exercise aboard ship is frequently impossible because the decks are covered with a maze of vehicles. While en route, boat team drills are conducted frequently so that the individual will learn to instantly recognize his boat number when it's called over the loud-speaker system, and will also know the exact route to his debark station.

The Assault Landing

During the night preceding D Day, Navy personnel open the cargo holds and rig the ship for unloading; commanders make last-minute inspections of their troops and weapons; and landing craft designated for the first wave are loaded with weapons and other matériel. Troops are fed their last meal aboard ship and wait in their compartments for the signal from the loud-speaker system.

Initiation of bombardment of the enemy-held beaches is made by destroyers, cruisers, battleships, and all types of aircraft and when the call comes for the first wave to report to debark stations, the enemy shore is illuminated by exploding shells. As each succeeding wave is called to their debark station, loaded into landing craft, and lowered into the water, the tempo of the bombardment increases.

After all organized waves have been debarked from the transport, the landing craft move to an orbiting point outside the range of enemy weapons.

Casualties to the landing craft are most numerous during the last 2,000-3,000-yard run to the beach. The boats advance as far toward the shore line as possible, but on the rocky coral beaches of the Pacific, troops sometimes debarked as much as 800 yards offshore and had to wade waist-deep water in the face of heavy machine-gun fire. Normally, however, Navy landing craft debark troops in shallow water within a few yards of the shore. LVTs with armor plate and four .50-caliber machine guns mounted on the rail frequently carry troops several hundred yards inland, and thus establish a beachhead in depth.

As each boat team continues from the ramp of the landing craft toward its assigned objective, it makes an effort to contact other elements of the parent organization. During this phase, capture of the initial objective and reorganization of units must be carried on simultaneously.

Large-caliber guns from supporting ships increase their range and fire on enemy targets beyond the beachhead. Naval gunfire officers attached to each landing team maintain direct communication with the destroyer or cruiser in support of the landing team in order to adjust naval fire on any target holding up the advance. The air liaison officer maintains contact with aircraft flying overhead, and directs strafing or bombing of hostile targets. Thus, until supporting artillery is brought ashore, the Navy and Air Corps furnish artillery support for the first few hours of the operation.

Special arrangements are made for the evacuation of casualties from the beach. Not infrequently, a man goes ashore from one landing craft, is wounded, and sent back to a hospital ship on another landing craft within the space of minutes.

Although all of the weapons and resources in the combined forces have been trained and coördinated for several months prior to the operation, and unlimited thousands of men and tons of matériel are still aboard ships of the task force, it is some tired doughfoot and his team mates who finally send up the green flare which means—"Objective Taken—Beach Secure!"

ARROWHEAD—"in the assault waves of an amphibious landing on enemy-held territory—"*

*WD Circular 56, 1946.

The Chemics Hit the Jap

*by Captain John F. Carroll**

DURING the early days of 1942, the Japs experienced the efforts of a gallant group of Chemics who utilized their limited resources at Bataan and Corregidor to produce effective smoke munitions. During the ensuing three-year drive back by American forces, the Japs met a new Chemic, and gained a new concept of Chemical Warfare Service operations which caused more destruction to their war industries and homeland than even the Atomic bomb.

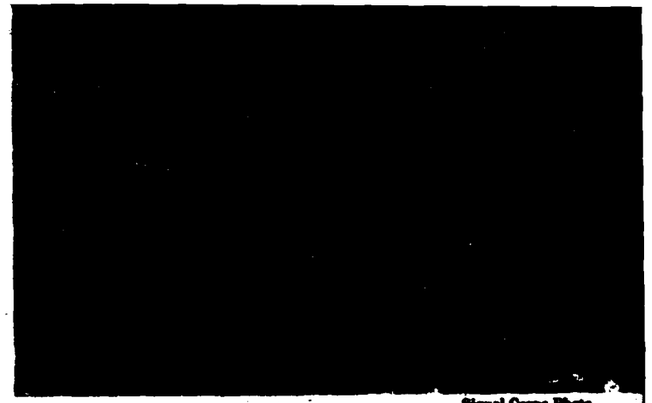
The technical devices developed by the Chemical Warfare Service, and operated by their own troops as well as other branches, found the soft spots in the relatively tough Jap armor. CWS incendiary bombs decimated Japan's war reserves by reducing the nation's war plants to ashes. CWS tank-mounted and portable flame throwers burned the Jap out of his foxholes and fortifications, and CWS 4.2 mortars, firing white phosphorus and HE, weakened his will to carry on.

To many people who are accustomed to look upon the wearers of the crossed retorts as "gasmen," it may be surprising to learn that from Australia to Okinawa every type of CWS unit was in action. There were mortar battalions, laboratory and smoke generator companies, decontaminating, processing, depot and air operations companies. And there were floating detachments of 4.2 mortarmen—something new—who in support of landing operations fired their "Goon Guns" from the decks of LCIs, and from speedy motor craft. Their mortars put smoke and HE shells in areas the big naval guns, because of their flat trajectory, could not reach with fire.

Hidden behind wartime security and hampered by the vast distance involved before a story reached the States, is the combat record established by such CWS mortar battalions of the 82d, 85th, 88th and 98th.

The 82d first fired their mortars on New Georgia, slogged through the steaming jungles of Bougainville, dragged their carts across the rice paddies of Luzon, and practically burned out their guns during the Battle of Manila. Biak, Hollandia, Tanamerah Bay, Leyte, Okinawa and Breakneck Ridge felt the impact of 4.2 shells from the other battalions. During the 141 days of continuous combat on Luzon, the 98th Chemical Mortar Battalion established a record of firing 106,000 25-pound rounds of high explosive and phosphorus.

*Chemical Warfare Service.



Signal Corps Photo

Mortarmen of the 82d CWS fire volleys of 4.2 shells in support of the 129th Infantry Regiment in Manila. Crew is grouped because Jap air force was not in strength.

They frequently had to inch their mortars and ammo over knifelike ridges, and fought in rags for two months without rest as they fired, what often was, the only artillery support for the armored units.

During the operations along Skyline Ridge, the mortar positions could be reached only by a sheer, narrow trail that was difficult to negotiate ordinarily, and when wet was hazardous. Traffic was entirely one-way, and the passing of pack trains was accomplished only at widened switchbacks, or embankment recesses. Although the gun positions were only 800 yards northeast from the trail, there was a difference in elevation of 1,000 feet between the two points. An hour was required to make the trip from one point to the other. Artillery and mechanized equipment were out. Because of the mobility of the mortar it could be placed in position, and it was the most important single ground weapon available. . . .

Men of the 82d Chem battalion on the north bank of the Pasig River in Manila were awaiting orders for a fire mission to clear the Japs from buildings on its south bank. A withering stream of small-arms fire came from the Jap-held Post Office Building.

After a four-hour wait, the order: "Chase out the Japs," arrived, and the first WP shells got under way. A direct hit on the roof caused several small fires. Japs came into full view, racing over the roof and attempting to beat out the flames with their rice sleeping mats. The fire-command then was for HE.

Alternating rounds of WP and HE on the building and into the surrounding area scattered the fires, and prevented the escape of building occupants. Within a short time, Manila's beautiful post office was an inferno, and a series of explosions rocked it as probing 4.2 shells found additional ammo dumps within.

Before the Japs were completely cleared from Manila, CW mortarmen lobbed more than 20,000 shells into their office building hideouts.

When the Japs were driven from the city, they fell back and dug in on their Shimbu Line in the Sierra Madre mountains and awaited, but not for long, the advance of the Sixth Army.

High up on the side of Mount Mataba, the Japs had carved out mazes of underground fortifications. On the mountainside were caves for big guns, and cliffside emplacements for machine guns and mortars.

Our planes and heavy artillery had blasted the entire area, and yet the Japs' big guns were still firing at our armor and infantry. With his infantry stopped for four days, the infantry commander gave the Chemics a free rein. Company B of the 82d Chemical Mortar Battalion, shooting from rugged mountain positions, began firing rock-crushing 4.2 shells, and WP shells whose flames and smoke drove the Japs into the open, where they were finished off, by either 4.2 HEs or infantry machine-gun fire.

Here is the way Captain Joseph Van Yush, of Lansford, Pa., told the story: "It was an eight-gun shoot when we supported the 63d Infantry in the attack on hills A, B and X of the Shimba. The Japs had heavy counterbattery on us—some of my men were wounded. Despite the fact that the Jap 150mm mortar was more than 700 pounds heavier than ours and threw a 50-pound shell, they didn't deter us very much. Besides, my men were experts. They performed the herculean task of firing 6,000 25-pound rounds from eight guns in one day. This was an average of 600 rounds per hour. As the battle raged, one gun fired 31 rounds a minute, which meant a 25-pound shell was in and out of the barrel each two seconds."

Sergeant John Wagener, of Indiana, Pa., whose gun fired 812 rounds that day, said, "If you have never been present when mass mortars are firing, you have no idea of the punishing effect they have on the crews. To make matters worse, we were in a ravine and thus caught every reverberation. That night all the men were pretty shaky and practically had to converse in the sign language, but that solid wall of smoke and fire we maintained was about the most permanent ever seen in the Pacific, to say nothing of how permanent the Japs on the other side of it were. . . . Work?" asked the sergeant. "George Pettit, my 125-pound gunner from Fort Laun, S. C., picked up, single-handed, and dropped down the muzzle of our mortar more than 10 tons of ammo that day. From dawn to dusk, we expended more than 300 2½-ton truckloads of 4.2 shells."

Frequently, the fighting in the Philippines was confined in such small areas that the evacuation of the wounded was extremely difficult. Furthermore, the Japs considered litter bearers and the medics to be targets of opportunity, and fired at them on every occasion. With most infantry outfits, when it was necessary to remove the wounded from the front lines, it became SOP to have the Chemics lay down a protective wall of smoke behind the medics.

Prior to the invasion of Palaus, it had been the policy to suspend naval and plane attacks for fear of hitting the assault troops. This deprived them of desperately needed water-level supporting fire. (This statement is amply borne out by a study of the newsreel shots of the early landings.) After some experiments, it was proved at Palaus that the amphibious 4.2 mortar was one answer to the prayer of the landing-barge passengers. The first results were so successful that the "Floating Mortarmen" had broader rôles in later invasions.

At first, it was planned to equip LCVPs and LCTs with 4.2 mortars. It was soon realized, however, that each landing craft of this type could mount but one mortar. Consequently, larger craft were used, which gave added stability and more accurate fire power.

It was also quickly learned that these trailer-mounted or soil-emplaced mortars would need baseplate modifications. The new deck-mount which was developed for the purpose consisted of a large wooden box that was reinforced with steel. The box was filled with a mixture of sawdust and sand on which rode a wooden subbase assembly, which in turn supported the mortar baseplate. The entire unit was lashed to the deck.

During the Peleliu operations, the seagoing Chemics mounted their guns on LCIs. The guns were emplaced on the main deck—one forward in the center of the craft, and the other two amidship on the port and starboard. The deck under each mortar was reinforced with steel plates. The two forward troop compartments served as the ammo dumps.

At Angaur, on September 17, 1944, the "topside" Chemics fired more than 2,500 HE rounds in support of the initial landing. The next day when the Japs infiltrated back into their previous sniper positions, they were quickly liquidated by 200 rounds which were fired as tree-bursts.

At Leyte, one group of LCI (M)s that was accompanied by rocket ships led in the first wave of assault troops, much like the blocking back in a football game punches holes for the ball carrier. These mortar boats laid down such a concentration—more than 1,200 rounds—that the landing troops failed to find a single live Jap within 500 yards of the beach edge. It was not that the Japs had withdrawn, for many were found heaped up in the trenches, the victims of concussion.

The natural versatility of these deck-mounted chemical mortars was again displayed at Lingayen and Okinawa. As the LCIs approached to within 2,000 yards, the seagoing CW men, by varying the powder rings as the ships approached to within 300 yards, were able to work over the entire area of the landing beach. They then began to cut off enemy armor and reinforcements by systematically "walking" their deck-mounted fire inland with rolling barrages which were laid at distances up to 4,000 yards. To quote one naval observer, "They are excellent artillery ships for firing into ravines and gullies which cannot be reached by other naval gunfire support ships, and their usefulness continues long after the initial assault."

It was not without cause that the Nazis referred to the 4.2 mortar as "Whispering Death," and that the Nips called it the "Automatic Cannon."

The "Sniperscope"*

THE "Snooperscope" and the "Sniperscope" have lifted the veil of darkness and made night vision possible for U. S. soldiers and marines by making it possible for them to observe and bring fire upon the enemy without visible light, and without revealing their own locations. These 'scopes operate by utilizing focused beams of infrared rays, which are electromagnetic radiations that are invisible to the eye. The two devices—which were among the most unusual instruments of World War II—were developed in 1943 by the Engineer Board, at Fort Belvoir, Virginia. As a war secret just recently released, the instruments are credited with playing an important part in jungle warfare.

For practical purposes, infrared radiation is invisible to the human eye. However, if an infrared beam is projected upon an area, objects in this area are illuminated, and reflect part of this radiation. By means of an electronic telescope, the reflected rays are picked up and converted into a visible image which corresponds to the infrared image when they pass through the electronic lens system. The eyepiece magnifies the image according to the power of the telescope. All objects viewed through such a telescope are green.

The "Sniperscope" is light and compact, weighing approximately 28 pounds, and consists of a .30 caliber M2 carbine upon which is mounted a spotlight, which has an infrared light source, and an electronic telescope. The infrared light source and telescope are powered by a portable power-pack and battery which is carried in a knapsack on the back of the operator.

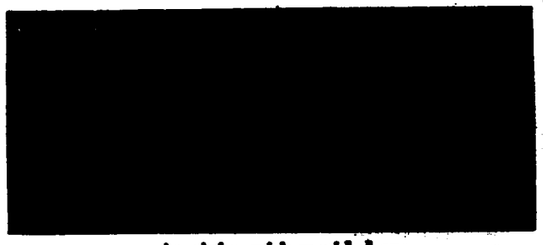
Use of the Sniperscope involves pointing the device toward some sound heard in the darkness, switching on the power supply, and scanning the forward area until the cause of the sound has been located. From the spotlight, from which all visible light has been removed, infrared rays, visible only to the operator, are projected upon the area. The reflected infrared rays are picked up by the electronic telescope and converted into a visible image. Since infrared rays are invisible to the naked eye, the enemy is unaware that he is being observed, and the operator has only to aim and fire.

The "Snooperscope," companion and brother to the "Sniperscope," is similar in construction except that it is not mounted on a weapon. It is used for viewing objects and persons that are in complete darkness—to observe enemy activity, signal communications to friendly troops, direct fire, and to detect possible enemy use of similar equipment.

The use of the Snooperscope and Sniperscope proved particularly effective in combating Japanese night infiltration tactics, and with them on numerous occasions groups of approaching Japanese were completely wiped out. It has been reported that in the early days of the Okinawa Campaign the "Sniperscope" accounted for approximately 30 per cent of the total Japanese small-arms casualties. Employment of these weapons went far to nullify Japanese tactics, and relieve the burden of infantrymen holding down a foxhole during a black jungle night. The 'scopes greatly raised the morale of U. S. troops, who, while unobserved, could keep key areas under continual surveillance.

Sniperscope on carbine.

Scene in daytime.



At night, with unaided eye.

At night, with Snooperscope.

*From *Corps of Engineers.*

Signal Corps Photo

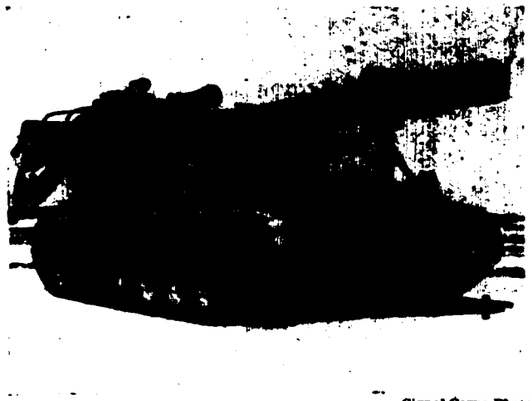
A U. S. Tank Destroyer M36 fires its 90mm gun point-blank at a Nazi pillbox emplacement to clear a path through a side street in Brest, France, in September 1944. The TD proved the master of any Nazi tank.

Signal Corps Photo

The 76mm Gun Motor Carriage M18 (Hellcat), the fastest tracked-vehicle in the world, is capable of a speed of more than 50 miles per hour, which enabled it to employ hit-and-run tactics. Its first use was in Normandy.

Signal Corps Photo

The 155mm Gun Motor Carriage M12, known as "King Kong," fired the first shot into Germany during World War II. It was the first large caliber gun motor carriage used in the war. A hydraulic spade absorbs the recoil.



Signal Corps Photo

The 240mm Howitzer Motor Carriage T92, supporting one of the most powerful weapons in the world, is a companion piece of the 8-inch gun. It can hurl a shell that weighs 360 pounds for a distance of 25,000 yards.

THE U. S. ARMORED VEHICLES

*by Major Thomas Gentel**

Everybody is fascinated by the biggest of anything. While size alone is no criterion of quality, "the biggest" is always intriguing. Hitler was no exception, and had a mania for the largest of weapons—but the two largest self-propelled artillery weapons in the world were built by the U. S. Army Ordnance Department.

GERMANY spent astronomical sums for huge guns that were used only once. Tanks weighing from a hundred to two hundred tons were under construction. Antiaircraft "guns" that shot jets of compressed air were built but were discarded as impracticable. Other "guns" had extremely long smooth-bore tubes in which after the projectile was started, blasts of compressed air were emitted at intervals to give it a high velocity. The tubes were incredibly long—up to 500 feet. To keep them from sagging was a major problem, and the Nazis solved it by burying the tubes in deep well-like holes in the ground. Obviously, the guns could not fire on more than one target except by reducing the velocity of the projectile. There were no adjustments for azimuth or elevation. The Nazis had aimed these guns at London, but as far as we know they were never used.

U. S. Had Largest Self-propelled Guns

Thus may be seen the fallacy of trying to build the biggest of anything. The two largest self-propelled artillery weapons in the world, however, were built by the U. S. Army Ordnance Department. These weapons, which will be described later, were no grandiose gestures but a practical rounding out of the most complete line of self-propelled artillery in any army.

There has been much discussion on the subject of what constitutes a tank and what a gun motor carriage (self-propelled artillery). At present there is no official description of either type of vehicle. The following differentiation is offered:

The tank is a combat vehicle which runs on full caterpillar tracks. It mounts armament in accordance with its mission, and its armor is designed to give overall crew protection against enemy fire.

An armored car, which, while giving full crew protection and carrying turret-mounted armament, is not a tank. The gun motor carriage, until late in the war, mounted its main armament in an open-top turret, and thus the distinction between the tank and gun motor carriage might be made on the basis of less "over-all" protection. The use of radio proximity fuzes and the fact that some gun motor carriages were employed in areas of friendly fire, however, made it advisable to close turret tops for crew protection, and so this distinction vanished. A further distinction might be made between the "assault" and "protective" purposes of these vehicles. The tank is a vehicle designed for mobile combat anywhere, while the gun motor carriage, with its main armament mounted for forward fire, is primarily a motor-transported type of artillery.

Other Self-propelled Weapons

The first self-propelled mount standardized in World War II—the 75mm Gun Motor Carriage, M3A1—provided mobility for the 1897A4 75mm gun. Standardized in November 1941 for antitank use, this half-track saw widespread action from North Africa to the southwest Pacific, and was the forerunner of our self-propelled weapons.

In size of caliber, the smallest self-propelled weapon is the Multiple Gun Motor Carriage M17, which mounts four caliber .50 machine guns in a Maxon turret. The Combination Gun Motor Carriage M15A1 mounts two caliber .50 machine guns and a 37mm antiaircraft gun. An experimental gun motor carriage mounting either four or six 20mm guns also was built. To provide an even more powerful self-propelled antiaircraft weapon to defend moving columns, twin automatic 40mm guns were mounted on a light tank, M24 chassis, and called the M19. Three tank destroyers were built for this specific mission. The first one to see action was the 3-inch Gun Motor Carriage, M10, the "Wolverine," which was basically an M4 tank chassis with an open-top turret mounting the 3-inch antitank gun.

Able to move at a speed of 50 miles per hour, the 76mm Gun Motor Carriage, M18, is the fastest full-tracked vehicle in any army. Its tremendous speed enables it to employ hit and run tactics by firing several rounds and speeding to a new position before the enemy can counterattack. Used first in Normandy, it ran up an impressive score in the destruction of German tanks, weapons and pillboxes.

*Ordnance Department.

Armor vs. Shell

As the armor of German tanks increased in thickness, more powerful weapons were needed to defeat them. For this purpose, the 90mm Gun Motor Carriage, M36, was built. Again the M4 tank chassis, which had proved so reliable, was used, and a 90mm gun was mounted in an open-top turret. Known as the "Slugger," it saw heavy action in Europe and was credited with some remarkable "kills." Firing a 24-pound armor piercing or HVAP shell, this weapon proved the master of any German tank in the field. At 300 yards an HVAP shell could completely penetrate 14 inches of armor! At ranges from 2,000 to 3,000 yards it was still devastating to Nazi tanks.

Practically every field artillery weapon has been mounted on a full-tracked vehicle. The smallest is the General Scott, 75mm Howitzer Motor Carriage, M8, which was used extensively and saw action in every theater.

Probably the most famous weapon was the M7 "Priest," and its 105mm howitzer, which helped chase Rommel out of Africa. It received its nickname from the pulpit-like mount for the caliber .50 antiaircraft machine gun. A newer version of this weapon, mounted on a light tank M24 chassis and called the "New Priest," was in action at the end of the war. The 155mm howitzer was also mounted on a similar chassis and nicknamed the "Gorilla."

"King Kong"

The first large caliber gun motor carriage used in World War II was the "King Kong," M12. Plans were started in 1941 to mount 100 155mm GPF guns on the medium tank M3 chassis. To help absorb the heavy recoil, a hydraulically operated spade was mounted at the rear of the chassis. This weapon, which fired the first shell into Germany, proved very successful. In two later developments, the 155mm gun, "Long Tom," was mounted on a General Sherman tank chassis, and the 8-inch howitzer was mounted on a companion vehicle, both of which were standardized in the fall of 1944 as the M40 and M43, respectively. In both, a new type track suspension system was used, which utilized horizontal volute springs instead of the vertical volute springs used in most of the M4s.

The field artillery pieces that have been developed by the Ordnance Department are made in "matched pairs"; that is, for every gun there is a howitzer as a companion piece. The howitzer, which is of larger caliber than the gun, has the same recoil mechanism and carriage. Companion vehicles are the 155mm Gun Motor Carriage, M40, and the 8-inch Howitzer Motor Carriage, M43.

The 240mm Howitzer

The two largest companion field artillery weapons are the 8-inch gun and the 240mm howitzer. These two weapons are carried on two transport wagons. A mobile clamshell bucket crane is used to dig the recoil pit and the holes for the spades. The bucket is then removed, and a hook substituted in its place so that the crane can lift the carriage from its wagon and emplace it. It then lifts the tube into place on its carriage. This process is time-consuming, and under favorable conditions of terrain and ground takes from two to four hours. This means that these weapons must be emplaced far to the rear of the lines where they will be out of the range of normal counterbattery fire of the enemy. Thus some of their powerful effectiveness is lost, for otherwise they could be used to demolish small highly fortified pillboxes and forts. For the first time, however, major field artillery can be used in the front lines if necessary . . . firing one or two rounds and withdrawing to a new position for a fresh attack.

Developing a chassis that could absorb the tremendous recoil forces involved when these weapons are fired was a major problem. The 240mm howitzer hurls a 360-pound shell a distance of 25,000 yards, and the 8-inch gun fires a 240-pound projectile 35,000 yards. The hydraulically operated rear spade used on the 155mm Gun Motor Carriages, M12 and M40, was adapted for use. As mounted on a chassis utilizing the suspension system of the Heavy Tank, M26, a side view of the chassis is similar to the M26, but one more bogie wheel has been added to give additional flotation.

A crew of eight men is the normal complement of each vehicle. When combat loaded, the weight of the 240mm Howitzer Motor Carriage is 127,500 pounds. The 8-inch Gun Motor Carriage weighs 5,000 pounds more.

Emplacement of these new weapons requires only a few minutes. While the tube is being released from its fastenings, the spade is being lowered. The vehicle is then backed up, which rams the spade firmly into the ground. The brakes are then locked. Meanwhile, other members of the crew are loading and aiming the piece. Ammunition is carried on a tracked ammunition carrier.

The war ended, however, before any of these new self-propelled weapons were used in action.

Future Trend

If there is a trend in self-propelled weapons, it seems to be toward making them more like tanks; that is, with all-round armor protection for the crews. It is difficult at present to visualize a tank turret mounting a 240mm howitzer and having a 360-degree traverse. Visionary, yes, but not impossible. When fired at right angles to the chassis, a powerful gun of this nature would tend to tip the vehicle over. Heavy guns, however, could be mounted in rigid turrets that had a limited traverse. There are also practical difficulties to overcome in transportation, such as limitations on weight and size which would be imposed by bridges, boats, railroads, etc. But whatever the trend, the ultimate in self-propelled weapons is undoubtedly far from being achieved.

WAR, PEACE, AND THE MEDIC*

All over the world—wherever an American soldier slipped a clip into an M1—the Army Medic picked up his first-aid kit and faced the enemy. As a result, in the ETO alone more than 2,000 Medics gave their lives.

THE medics' mission was, and always will be, the conservation of manpower by furnishing the disabled with aid that will speedily restore them to health and fighting strength.

As a result of their *esprit de corps*, 96 out of every 100 men who reached an Army hospital in World War II were saved. The disease rate was less than one man per 1,000 a year. In World War I, more than 16 men out of each 1,000 died each year. During the Spanish-American War and the Civil War, deaths were 26 and 65 respectively out of every 1,000 men a year.

To accomplish that great achievement in maintaining the largest and healthiest United States Army in history, Major General Norman T. Kirk, The Surgeon General, gathered together the best medical brains in America. They donned uniforms and went out with units.

About 47,000 American Medical Corps officers joined the ranks along with 15,000 dentists, 57,000 nurses, 2,000 veterinarians, 2,000 sanitary specialists, 1,600 hospital dietitians, 1,300 physical therapists, and 535,000 enlisted personnel.

Medical Department men landed with airborne outfits on D Day, battled arctic gales and fought disease in the tropics so that men might live.

"A Noble Breed"

The late Ernie Pyle wrote, "I hope somebody in this war writes a book about the Medics at the front—they are a noble breed. They deserve more praise than I

*From *The Medical Corps.*

Medics run in from No-Man's Land with a casualty on a stretcher as Germans fire on them. Tank in background has thrown up a smoke screen to aid in the rescue.
Signal Corps Photo

have words for—their work is deadly and it never ends."

Perhaps Pyle had witnessed incidents similar to that where the unit of Private Harold A. Garman, Albion, Ill., was evacuating three severely mangled men across the Seine. Enemy machine guns began firing. Garman instantly plunged into the icy water. Through heavy bursts of fire, he swam to the assault evacuation boat and towed it to safety. He received the Congressional Medal of Honor for doing his duty as a medical corpsman—saving lives.

Referring to other innumerable feats of daring and courage on the part of Medics traveling with combat troops everywhere, Colonel McFeyden, 26th Infantry Division Chief of Staff said, "Combat Medics perform several times a day acts of valor which performed one time by an infantryman result in a military award."

Making Evacuation History

Right where these combat Medics were making history—another type of history brand-new in the war just finished was being made. It was evacuation history. When a man became a casualty, the Medical Department took over.

First aid was administered where he lay. Then he was carried to a battalion aid station, still within range of enemy weapons, for emergency treatment and medical care. In a matter of minutes he was on his way to collecting and clearing stations where, after his case was diagnosed, he was prepared for transportation to an evacuation hospital.

From that outer fringe of the combat zone he was taken to a general hospital, far removed from combat noises, where complete medical facilities were available. Then, if the wounded man could not be returned to duty within a reasonable length of time, he was sent to a modern, general hospital in the United States by plane or ship.

No effort was spared in making the patient as comfortable as possible. He was constantly under the care of college-trained, experienced physicians, surgeons, and neuropsychiatrists, who were assisted by nurses and aid men. His welfare was their chief and only concern.

In one of his inspection trips, General Kirk interviewed wounded men in the European Theater of Operations. In answer to his queries as to when medical aid was given, battle-hardened wounded invariably answered, "Right away."

Immediate Action Called For

That pleased General Kirk. A surgeon in his own right, he is keenly aware of the necessity for immediate action when men are wounded. To facilitate that, he reversed the usual procedure of having the patient brought immediately to the doctor.

Under the new plan, the doctor went to the patient. That system holds even today as wounded soldiers in Army hospitals receive the best treatment possible.

When hospitals were being closed because of decreasing patient load and the discharge of medical personnel, an alarming situation developed. Specialists were becoming fewer. To meet the situation a page was taken from wartime experience, and the paraplegic, amputee, blind and neuropsychiatric patients were even more centralized then they had been within a geographic location in order that the country's great medical centers be more accessible. The specialists went with them. They were not transported needless miles nor were they without expert care for an instant. As their condition warranted, patients were transported to large Army medical centers in railroad hospital trains, especially constructed, litter-lined aircraft and ambulances. No interruption in their schedules was permitted. Feeding, medicinal application and surgical examination continued.

Skilled neuropsychiatrists, who returned to combat about 60 per cent of battlefield mental casualties, nurse the mentally ill back to normal in this country today. The office of The Surgeon General was instrumental in abolishing a previous practice of noting on a man's discharge record that he had been a neuropsychiatric patient, for a patient's civil welfare is also important to the Army.

The peacetime Medic is still actively practicing his profession as "family doctor" to Army men in the ZI, and in outposts in far parts of the world. Battlefield casualties are now a thing of the past, and in their place have come routine physical inspections, X-rays, shots for overseas assignments, food wholesomeness, sanitary living quarters and dental work. This is still a job for the Medical Department, and a big one. Research into cause and prevention of disease, intensive graduate training courses and improvement of prosthetic devices will always be of importance to the Medical Department.

With a postwar Army of 1,550,000 planned, the Medical Department has been hard-hit by discharge of skilled personnel. Experienced Army medical men, however, are attending advanced courses in civilian and government institutions throughout the country. In no instance will personnel be demobilized if it jeopardizes the health of soldier patients, General Kirk has said.

Already a sweeping program of employing civilian consultants in Army medicine is shaping up. Medical men, many of whom served in uniform during the war, are available to offer advice, keep the Army up with the latest in civilian advancements, and to inspect hospitals, their personnel and equipment for a firsthand, impartial report to The Surgeon General.

The QM's Job Today

by Henry Utley Milne

THE Quartermaster Corps' task of providing food, shelter, and clothing for the soldier of today is quite different from what it has been in the past. In World War II there were no restrictions on the conditions under which troops fought. The war theaters extended from the tropics to the arctic. We do not in the future wish to follow the disastrous military campaigns that resulted from operations in an unfamiliar environment —such as that of the Germans on the winter fronts in Russia.

In providing food, shelter and clothing for the soldier, the Quartermaster Corps must, therefore, first solve a larger problem. In the field of subsistence, it must anticipate and make use of the immediate and long-run effects of various foods on efficiency, comfort, and morale, besides studying the fundamental problems of types of rations for troops under varying climatic conditions, menus for troops in home posts and stations, types and manner of packaging and transportation, sizes and types of cans to be used, storage facilities, and refrigeration.

In the clothing problem there is not only quality, weight, texture, and color to be considered but also the mechanics of body heat production and the theory of clothing insulation in order to design warm but lightweight clothing which provides great freedom of action. Decisions must be made between the extra warmth of an additional pound of clothing as compared to the loss of mobility and energy expended by the wearer in carrying it around. Footgear must be designed to fit the requirements of operations in whatever theater.

Numerous changes in equipment, found essential from observation and use in the combat areas during the war, must be made. Means must be devised to protect clothing and equipment of all types against insects, mold, corrosion, and spoilage under new and different conditions with which the army has had little experience.

Major General T. B. Larkin, the first postwar Quartermaster General, recently said . . . "We are asking ourselves this question: 'What body protection do our people need against the gamma rays of the Atomic bomb?' It is logical that the Quartermaster Corps should supply the answer through its research into military clothing requirements. Other research will apply to each of the 75,000 items of Quartermaster supply.

"It is likewise considered important for our troops that research by the Quartermaster Corps disclose the relationship between food intake and energy expended and the amount of heat generated. Equally necessary is it to know the quality of clothing required for combat under widely different climatic conditions ranging from temperatures at 40 degrees below zero with a 40 mile an hour wind, to temperatures as high as 120 degrees above zero with no wind."

Now that the war is over and millions of soldiers have been demobilized, America's army is still approximately three times larger than it was before World War II. This increases the normal peacetime activities of the Quartermaster Corps although its personnel has been greatly reduced. The QM, however, is endeavoring to retain, even in face of the reduction, specialists of every kind—particularly those qualified in industrial management, research and development of all kinds, storage operations, petroleum engineering, textile engineering, and army supply and procurement.

The Quartermaster Corps will continue its training program. Plans call for enlarging the scope of training of QM Subsistence Officers in order that qualified personnel will be available for subsistence responsibilities necessary for maintaining the Regular Army.

Today the corps is taking stock of available items of issue at home and in all sections of the world, readjusting its program of procurement, and turning surplus articles back into civilian channels of consumption. It has developed a new field ration, made progress in the designing of a new uniform, and participated in a food conference conducted by the Army Ground Forces and the Army Service Forces at the Army War College. The purpose of the conference was the careful study of more than 200 recommendations pertaining to the improvement of field rations, including development, packaging and distribution, preparation and consumption, refrigeration, cooking and messing equipment, and the selection and training of food service personnel.

A great deal of emphasis has been placed on the immediate study and application of the lessons learned in the field during the war. The war was a proving ground for new foods, textiles and many kinds of materials and appliances. New materials were made available. New methods of manufacturing and handling were developed and, if properly applied, will improve the peacetime living for millions; developments in the processing and packaging of food may change the concept and scope of use of perishable goods; diet discoveries and food preparation may immeasurably improve the Nation's health; and countless other things are on the way to make living better and easier in the years to come.

The Quartermaster Corps will work in close alignment with every branch of industry. Its vast amount of wartime scientific research is now being released to the public. What has been done during the war and is being done today in Quartermaster Corps' research will be reflected in the consumer goods of tomorrow.

The AAF Works With THE JET*

THE jet engine, which creates a hot air hurricane to boost Army Air Force pursuit planes at supersonic speeds, is much simpler than conventional aircraft.

The jet plane is simple to operate and easy to maintain when compared with an 18-cylinder twin-row radial engine or with one of the liquid-cooled engines that powered World War II pursuit planes.

Air Force "hot pilots" have compared the jet engine with everything from a blowtorch to an oil burning lamp, but the swish—and that's about all that can be heard as it passes—is a bit more complicated than that. Its simplicity has not been overrated; but, jet power is, at best, a far cry from anything as fundamental as roller skating.

The jet engine was developed during World War II, but its greatest value was not clearly demonstrated until after the war. The original engine has been considerably improved and fuel consumption has been cut to extend range.

Today, after establishing sensational speed records in transcontinental flights, the P-80, "Shooting Star," a jet-propelled airplane manufactured by Lockheed, and powered by the General Electric "J-33" engine, has been adopted as the first plane for postwar pursuit outfits.

General Carl A. Spaatz, Air Forces Commanding General, has ordered P-80s for many pursuit and interceptor groups and the transition to this plane is well under way.

The pilot of a conventional aircraft experiences no particular difficulty in flying a P-80 because the flight controls are the same. He may require a few hours transition training, but this can usually be accomplished without delay. The change to a "Shooting Star" is largely a matter of learning how to "feel" controls at vastly greater speeds, and in becoming accustomed to the idea of staying ahead of the sound of his own engine.

Since the jet engine is totally different from conventional radial or in-line models, however, keeping these "hot shots" flying does pose the necessity of special training for the mechanics and the maintenance men that handle them.

Air Forces leaders have adopted the jets as standard for some pursuit groups, and the "keep 'em flying" lads of the AAF Training Command are cooperating.

The Training Command, commanded by Lieutenant General John K. Cannon with headquarters at Barksdale Field, La., is responsible for the training of all individual air crew members and technicians of the AAF. Flying crew members are trained through the subordinate Flying Training Command, with headquarters at Randolph Field, Texas.

The training of technicians is channeled through the subordinate Technical Training Command, Scott Field, Ill., which is pioneering the schooling of mechanics for jet engines.

The school, opened last October at Chanute Field, Rantoul, Ill., is busily engaged today turning out 40 graduates each week. Graduates are authorized to perform first and second echelon maintenance and are fully responsible for correcting day-to-day malfunctions and performing daily and preflight checks of equipment. Third and fourth echelon maintenance and overhaul will be done by maintenance shops.

The six-week Chanute Field course is the first of its kind. Most of the students encounter their first P-80 when they enter their hangar-classrooms; morale is no problem because of their enthusiastic interest in the plane.

All students were technicians on conventional airplanes before they began jet schooling. To be eligible for this specialized jet training, the trainee must be a graduate of an AAF basic aircraft maintenance school, or its equivalent. Upon graduating from the P-80 school, students are fully capable of acting as line chiefs, crew chiefs or engineering officers, depending upon their past training and assignment.

The course is of a new and distinct type, and the demand for P-80 maintenance experts is great, but Training Command officials are determined that it will be complete and adequate. Highly rated civilian jet engine specialists instruct the men. The civilians, all recognized experts, enable the Air Forces to offer its men the finest training available in this field today. All instructors are graduates of aircraft maintenance schools and have had specialized courses in aircraft electrical, instrument, power plant and hydraulic systems.

In marked contrast to the almost exclusive "learn by doing" expedient of wartime AAF training courses, the P-80 mechanics school devotes a considerable period of time to the study of theory.

This closer attention to background material is regarded as typical of postwar AAF training. Theory

*From *Army Air Corps.*

phases are expected to be continually enlarged during the interim training period, and to play a large part in peacetime training courses.

"The Training Command could not spare the time to devote long periods to a study of theory in wartime courses," General Cannon says. "Men were needed too desperately by the operational units. Theory was explained, but students graduated from technical courses during the war learned mostly by doing—graduating as men who knew their machines through the expedient of taking them apart and putting them together again. They learned how to locate malfunctions by working with equipment that had been deliberately put out of order by instructors. Learning by doing has proven an excellent system, and it will be augmented—not superseded—by theoretical study. More knowledge of theory will benefit the student enormously because it will enable him to assimilate new technological developments with greater ease."

Classroom study on the theory of the jet engine takes about one-fourth of the six weeks' course at Chanute. The remainder of the study period is spent in actual contact with the sleek P-80 and its engine.

This phase of training is highly complete. Engines are started in test blocks and run through the various speed ranges. Cut-away engines also are available that enable the trainee to see the interior and complete operating mechanism of the assembled unit. P-80s are used extensively in the training program in order that students may learn to remove and install complete engine units in record time.

The course is divided into four phases. Phase one is a study of airplane structure and hydraulic systems. Students learn to inspect and maintain the wings, fuselage, empennage, control surfaces and flight control mechanisms. Inspection and maintenance of landing gear, brake, fuel and oxygen systems is also a part of this phase, which lasts for two weeks.

In the second phase, which lasts one week, instrument and electrical system "trouble shooting" is studied.

Phases three and four, which students find most interesting, are taught in the final three weeks of the course. The jet engine, engine accessories, engine change and inspection, are studied thoroughly.

Students in these final phases begin to speak of "pounds of thrust" instead of horsepower, of "jet propulsion thrust" instead of propeller thrust. They learn to start the engine, run it through its speed ranges, check for any malfunction and stop it at the end of the check.

The blindingly fast, hard-hitting P-80 seems indicative of tomorrow's U. S. Army Air Forces. The Chanute Field course for jet engine mechanics is the Training Command's indication that regardless of how fast AAF planes may fly or how smoothly they may maneuver, the Training Command will be ready with the men to "keep 'em flying."

Ordnance Men Foresee Rockets Circling the Globe*

ORDNANCE scientists are probing the possibilities of using special warheads on antiaircraft weapons which will neutralize the threat of high-altitude bomber formations, according to a statement made by Major General Everett S. Hughes, Chief of the Army Ordnance Department.

It is anticipated that some of the bombers of the future will fly at altitudes far above effective antiaircraft gun ranges. It is difficult now for our pursuit craft to attack enemy bombers flying in formation because of the protection furnished by enemy bombers to each other, Army airmen state.

In order to solve this problem, the scientists of the Ordnance Department's Ballistic Research Laboratories at Aberdeen Proving Ground plan the development of a guided missile which would carry a charge intended to be exploded in the midst of an enemy bomber formation where it would be highly destructive.

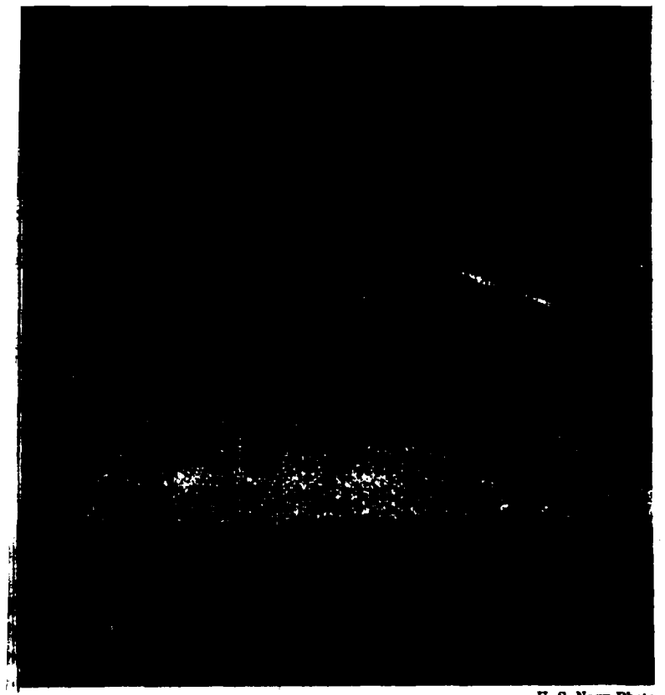
Ordnance scientific strategists think that if enemy bombers are prevented by the threat of such a weapon from flying in formation, they will become vulnerable to the attack of individual fighter aircraft.

The Ordnance Department is now testing rockets with potential ranges of 200 miles at White Sands Proving Grounds, N. M., but the rockets of the future are expected to travel thousands of miles. A joint Army-Navy Commission of which the Ordnance Department is a member is searching the United States, Caribbean and Pacific areas for a range where it will be possible to test contemplated rockets over a distance of 2,000 miles.

Long-range planning by Ordnance scientists, however, forecasts the ultimate range of guided missiles to 20,000 miles—weapons capable of circling the globe.

Army Times.

ROCKETS AT WAR*



U. S. Navy Photo

The "Tiny Tim" rocket—a projectile ten feet long and weighing 1,200 pounds—unloosens a demonstration of its offensive firepower from this Navy F-4U Corsair.

IF any one weapon symbolizes the flaring crash and swift destruction of World War II it is the rocket.

Every major participant used rockets. Each nation developed rocket weapons in answer to its tactical and combat needs. The Russians pioneered in the firing of antitank rockets from planes and in the use of massed banks of rockets for preassault barrages. The British used rockets for defense against attack from the air at a time when there were only 500 antiaircraft guns in the United Kingdom. With their *Luftwaffe* driven from the skies, the Germans employed the long-range V-2 weapon to attack England's cities. The Japanese futilely attempted to use rocket artillery to defend their island outposts.

The United States, too, developed and introduced a great variety of rocket weapons. By the time the war ended, American soldiers, sailors, and marines had fired millions of rockets at the enemy. For those rockets, our armed forces could thank the teamwork of American science, industry, and the military at home.

When the Japanese attack on Pearl Harbor catapulted the United States into the war, our Army and Navy had not a single rocket in service use. Plans for rockets were limited. By VJ Day, the Army was procuring rockets at the rate of $150,000,000 a year. The Navy had 1,200 war plants turning out rockets at the rate of $100,000,000 a month.

There was "Tiny Tim," a 1,200-pound aircraft rocket, a weapon which gives a fighter plane the punch of a 12-inch gun; other aircraft rockets; a "Super-Bazooka," more lethal and accurate than the original infantry weapon; the Navy's new rocket gunboats, the LSM-R's, firing 5-inch spin stabilized rockets from automatic launchers at the rate of 300 rounds per minute.

The Rocket's Advantage

A principal advantage of the rocket is its lack of recoil.

Anyone who has fired a gun knows that the burning of the powder in the combustion chamber drives the bullet out of the barrel and that the reaction to this forward push against the projectile is a backward push against the gun—and the person or the gun-mount holding it.

Compared to a rocket, the speed of combustion in a gun and the gas pressure developed are extremely high. Because of the recoil and the high pressure, guns and gun-mounts must be strong—which means weight.

A rocket is without recoil in the sense that no metal parts are pushed backward. One might say that a rocket reverses the recoil effect. It shoots gases backward at high velocity and is itself pushed forward by the recoil.

Lacking recoil, a rocket can be fired from a simple, light tube or trough which serves merely to point the rocket in the right direction when it starts its flight. As a consequence, rockets may be fired from structures which could not hold up the weight of a gun and its recoil-damping mechanism, nor withstand a gun's recoil force.

The comparatively light weight of rocket launchers gives the rocket a mobility enabling it to go many places impossible to a gun.

Disadvantages of Rockets

Although rocket launchers are usually lighter than guns, the rockets themselves, because of their motor weights, are usually heavier than shell and bombs of equivalent size and effectiveness. For repeated firing from fixed locations, this weight differential may complicate the problem of ammunition transport.

The blast of high-temperatures, high-velocity gases from the rocket is a hazard and inconvenience. Launchers must be so mounted as to leave a clear space behind them, or blast shields must be provided. Also, the flash of rockets may reveal firing positions.

Many rockets are slower than equivalent gun projectiles and hence less effective in the penetration of hard targets.

*U. S. Rocket Ordnance. Joint Board of Scientific Information Policy.

Although forward fired aircraft rockets have accuracy comparable to that of guns, most ground-fired rockets do not; a large number of rockets must be fired to hit a point target. This lower accuracy in ground fire, however, is of little consequence when it is desired to saturate an area target.

Rocket Characteristics

A look at an assortment of standard American rockets will show that their weights range from three to 1,300 pounds, their diameters from two to 12 inches, and their lengths from one to 10 feet. In many rockets, most of the length is in the motor. In some, the motor is of smaller diameter than the head.

The velocities of American military rockets vary from 65 to 1,500 feet per second and their maximum ranges in ground firing are from 40 yards to 10,000 yards.

ROCKET ARMAMENT FOR AIRCRAFT

When the scientists of National Defense Research Committee and their Navy colleagues produced "Tiny Tim," latest and biggest American aircraft rocket, it was as if they had put wings on a pair of 12-inch guns and lengthened the guns' range to that of a medium bomber.

This giant rocket was the culminating achievement, as the war ended, of a program of aircraft rocket development which gave the American fighter plane the ability to hurl at an enemy target more high explosive than is carried in a salvo from a light cruiser.

"Tiny Tim" was science's answer to the fighting services' demand for "a really big rocket."

Here, first told publicly, are its vital statistics:

"Tiny Tim's" over-all length is 10 feet 3 inches; its diameter is only a quarter-inch less than a foot. Its weight is 1,284 pounds.

"Tiny Tim's" usual head, one of several, is a semi-armor-piercing bomb with a total weight of 590 pounds, of which 150 pounds is an explosive charge of TNT. A charge of 146 pounds of powder drives it through the air. Though its development was not completed until shortly before the end of hostilities, "Tiny Tim" was on hand to hit the Jap on Okinawa.

Rôle of Aircraft Rockets

From early in 1944, on through the remainder of the war, forward-firing aircraft rockets played a significant and increasingly important part. First used in Burma, aircraft rockets later did their bit in the Normandy invasion and the advance across France and into Germany, in the Mediterranean theater and the invasion of southern France, they went to the Pacific where they really came into their own in the Saipan-Tinian-Guam operations and those that followed.

Aircraft rockets were a valued supplement to the bombs, machine guns, and cannon of the military airplane. Rockets are more accurate than bombs, but weight for weight do less widespread damage. Rockets are less accurate than machine guns and cannon, but pack a bigger punch.

Aircraft rockets were especially effective against warships up to destroyers in size and against smaller cargo, transport, and escort ships, or against large warships to silence their antiaircraft batteries.

In attacks on enemy airfields, rockets were particularly useful to destroy radios and radar installations and smaller buildings, parked planes, and fuel dumps.

Aircraft rockets were valuable in attacks on tanks, light guns, concrete pillboxes, and locomotives.

Other Rockets

Other rocket developments by the California Institute of Technology, and by another division, known as Section H, were as follows:

A rocket, known officially as the 5-inch HVAR (High Velocity Aircraft Rocket), was developed—and the vigor of its blast quickly won for it the respectful title of "Holy Moses." It was six feet long, weighed 140 pounds, and had a velocity of 1,375 feet per second. It went into combat use in July 1944.

Another, the 115mm aircraft rocket was developed to meet the demands of the air forces for higher velocity and better accuracy than the M8, especially against moving targets at greater ranges. Never used in combat, it could pierce five inches of homogeneous armor plate.

Finally, squadrons equipped for firing "Tiny Tim" sailed for the Pacific on the carriers *Franklin* and *Intrepid*. The *Franklin* was struck by a Japanese dive bomber before its planes could fire "Tiny Tims" in action. But the planes of the *Intrepid* did launch "Tiny Tims" against the enemy on Okinawa. Unfortunately, the results could not be accurately assessed. There were, it seems, so many things being thrown at the Japs on Okinawa that it was impossible to distinguish the wreckage caused by "Tiny Tim" from the general destruction.

D Day, Thunderbolts and HVAR's

Both American and British rocket-firing support groups, with Navy shells screeching overhead, moved up to the Normandy beaches and turned them into flaming floors of fire.

Shortly after D Day a few Thunderbolt fighter planes were equipped with eight HVAR rockets apiece. They were especially effective in supporting the breakthrough at St. Lou. One or two Thunderbolts hovered constantly over the smashing, advancing tanks of the Third Army and attacked German heavy tanks and 88mm antitank guns when they threatened to hold up the American advance.

Numerous attacks were made early in July on tanks, locomotives, rail yards, bridges, and airfields, and spectacular results were attained. The P-47 group scored hits on some of the heaviest German tanks, knocking them out of action, thus aiding our ground forces to move forward.

P-47s Attack

On July 17, 12 aircraft, carrying four rockets each, attacked the rail yard at Tiger-Quail. A direct hit was made on a flak tower on the first run, silencing it. In subsequent runs 25 locomotives were damaged, also three repair shops and a roundhouse. On the following day 12 aircraft attacked the airfields at Coulommiers. Thirty-seven rockets were launched at 1,000-yard range from a 30° dive. One large hangar, four small hangars were hit, an Me-110 and a fuel dump destroyed. Later a rocket was fired from 800 yards at two staff cars, passing through the first and exploding in the second. A rail bridge at Montford was claimed destroyed by seven rockets.

On July 25 and 26 a total of 64 rocket sorties were flown, destroying 12 tanks, damaging 13, scoring many near misses, and destroying three and damaging three other vehicles. From then on these rockets were continuously employed by the AAF in the European theater, with devastating results.

As more and more installations and rockets reached the forward lines, the effectiveness of the HVAR became more apparent. In addition to the actual damage inflicted on enemy material, the personnel of the German ground forces had such a tremendous respect for this new weapon that upon the approach of a rocket-bearing aircraft, it was reported, they would frequently leave their vehicles and guns in headlong flight for the security of foxholes and other hideouts.

P-47s firing 5-inch high velocity aircraft rockets also were used extensively in helping to turn back the German counteroffensive in August.

From February 1944 to the end of operations in the Pacific, aircraft rockets were an important weapon. Navy TBFs and TBMs fired them in the Marshalls, Palau, New Guinea, Carolines, and Marcus-Wake actions. In the Marianas operation, from June 11 to August 1, Navy planes fired a total of nearly 5,000 rockets against the enemy. By that time, rocket-firing F6Fs were in action and joined in this first large-scale demonstration of the aircraft rocket as a weapon for close-support work. Aircraft rockets, though in considerably lesser numbers, were used in actions in the western Carolines, July 25 to 28, and the Marianas and Bonins, July 29 to August 3.

Blasting Out the Enemy

As a weapon to dislodge the enemy from well-fortified positions, and to support our ground forces, the rocket was used more widely than in any other application and was ideally suited to its task. When our forces landed on Saipan, Guam, Tinian, Iwo Jima, and Okinawa, they found the Jap burrowed in caves, blockhouses, and pillboxes. These were artfully camouflaged and difficult to detect, so well protected that only direct hits were effective, and well defended by antiaircraft guns. Aircraft rockets with their accuracy and penetrating power proved superior to bombs against such targets. Effective and close liaison was set up between the ground forces

U. S. Navy Photo

The new LSM (R) is shown launching rockets with automatic firing and remote controlled rocket launchers. On island landings, such firing moved the Japs far back.

and the carrier forces supporting them. Wave after wave of rocket-equipped fighters flew in at low altitude sending their rockets into the heretofore invulnerable Japanese positions that were taking such a toll of our advancing ground forces.

The ground forces soon learned the value of the aircraft rocket and the rocket planes were called upon whenever tough obstacles presented themselves. An air coördinator, armed with rockets with smoke heads, was kept over the target continuously during the duration of the strike. Radio contact with the ground forces indicated the targets which were giving them the most trouble and which they wanted wiped out. The air coordinator marshalled his rocket planes, made an approach with smoke-head rockets to indicate the exact target, and left the rest to the planes armed with rockets with high explosive heads.

ROCKETS IN AMPHIBIOUS WARFARE

The Crucial Interval

Fired from American landing and support craft in the amphibious operations of World War II, barrage rockets saved thousands of American lives. In the Pacific, they were one of the factors which caused the Japanese to change the pattern of their resistance to American landings. With barrage rockets, American commanders were able to drench landing beaches for considerable distances inland. Barrage rockets helped give

assaulting soldiers and marines the fighting chance they needed to win a toe hold without that bloody slaughter in the surf and on the sands which made American leaders, after Tarawa, wonder how we could continue to pay the human cost of island conquest.

It became grimly plain, as American forces fought their way from island to island, from landing to landing, in the Pacific that the crucial phase in amphibious operations is that interval between the moment the naval and air bombardment must be moved inland and the time the first assault waves hit the beach. It is that interval which gives the beach defenders the chance—as at Tarawa—to organize and pour a murderous fire into the landing forces.

The barrage rocket answered the vital question posed by that interval. It enabled small craft, for the comparatively short period of the actual landings, to strike with the hitting power of destroyers against enemy strong points within small-arms range of the landing beaches. Before the close of the war, the enemy had paid final tribute to the effectiveness of the barrage rocket. The Japanese first line of defense—as at Okinawa—was pulled back from the beaches out of rocket range. Soldiers and marines came ashore against astonishingly light opposition—only it was not astonishing. The barrage rocket had imposed its powerful logic on enemy tactics.

Okinawa

In the last great amphibious operation in the Pacific, the conquest of Okinawa, rockets really came into their own. Here were combined to a degree never before realized the use of rockets on land, from the air, and from the sea.

A flotilla of 12 rocket ships went into action at Okinawa on March 26, 1945, and for the next 12 weeks poured ashore in support of land operations a total of more than 30,000 rockets.

In the closing days of the Okinawa campaign, four ships of the rocket fleet were assigned to the Tenth Army Artillery section. Directed by artillery aircraft observers, the rocket ships loosed day and night bombardment fire against last-stand Japanese troop concentrations.

It is noteworthy that, while eight of these rocket ships were equipped for firing improved, fin-type rockets, four of them were fitted to fire spin-stabilized rockets—representing a development in rocket design of major importance. These four ships, each with an installation of 85 automatic launchers, could get off a salvo of 1,020 5-inch rockets in approximately one minute.

Super-Rocket Ships

The part played by the rocket ships at Okinawa concluded the combat story of shipborne rockets in World War II, but it is not all of the story. For, good as the rocket ships were, they were hurriedly contrived interim vessels. On their way across the Pacific when the Japanese sued for an end to hostilities were more examples of the surprise weapons which never had a chance to hit the enemy. These were the first of 48 super-rocket ships planned by the Navy. These LSM(R)'s pack an even greater punch than the ships that fought at Okinawa. Each ship carries 40mm and four 20mm twin mounts, four 4.2-inch chemical mortars, a 5-inch dual purpose gun, and 10 rocket launchers, continuously fed and automatically fired, and aimed by remote control, each capable of firing 30 spin-stabilized rockets per minute, or 300 rockets per minute per ship.

ROCKETS FOR GROUND WARFARE

The explosive powder and the 4,000-yard range of the Army's folding-fin 4.5-inch aircraft rocket indicated that it could be used as a ground force weapon to supplement the artillery.

As compared with artillery, the rocket lacked range, velocity, and point accuracy, but the absence of recoil made possible the launching of rockets from lightweight devices which were easily moved and quickly set up in places where artillery could not go. Furthermore, by massing a number of launching tubes or rails on a single mount it was possible to fire a great many rockets from one launcher in a very short time.

When such multiple launchers were used, the inherent dispersion of the rockets became an advantage for certain types of fire; for without changing the position of the launcher the rockets were spread over a beaten zone of predeterminable size. Rockets were able in this way to lay down a drenching fire upon an area target such as a patch of woods, a town, or a supply depot so quickly that enemy personnel had no time to take cover. A similar concentration of fire, known as timed fire, could be laid down by artillery, but only after elaborate preparations. Rockets gained the same effect in less time and with only a fraction of the personnel.

The Pacific Theater

The rocket's ability to hurl heavy projectiles from light launchers provided a countermeasure to the Japanese tactic of holing up behind coconut log bunkers deep in the jungles of Pacific Islands. The folding-fin 4.5-inch rocket had the power to blast these bunkers, and the Ordnance Department developed an expendable plastic tube launcher in which the rocket was shipped and from which it was fired.

The advantages of spin-stabilized rockets over finned types for amphibious warfare—ease of handling and better accuracy from shorter launchers—were equally valuable in land warfare. In late 1943 the Army Ordnance Department initiated development of its 4.5-inch spinner. In comparison to the 4.5-inch folding-fin rocket, the spinner, though it retained about the same total weight, carried a heavier payload with better accuracy to a greater distance—5,250 yards instead of 4,000. This increased range allowed more flexibility in the choice of firing positions; it made it possible to fire from positions beyond the range of most enemy mortars.

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Bazooka Versus Tank*

Among the now-it-can-be-told weapons of the American rocket family, is the super-bazooka, bigger and better version of the foot soldier's famed tankbuster.

BY their surrender, the Germans and Japs missed feeling the impact of a rocket which travels at almost twice the speed and carries double the explosive payload of the standard bazooka projectile; which has an effective range of as much as 700 yards, instead of the 200 to 300 yards of the regular bazooka; and which can function safely through a considerably wider temperature range, thus affording greatly increased protection against the dangers of motor explosion and blast. Though the super-bazooka retains the 2.36-inch diameter of the original bazooka, and is fired from the same launcher, it is propelled by a larger motor, and its heavier explosive charge can penetrate thicker armor plate.

Another development of the original bazooka—still secret at the war's end—is a super-powered rocket of 3.5 inches in diameter with greatly increased power to penetrate armor plate and reinforced concrete.

The super-bazooka was the joint product of Section H, which produced the design for the motor, and Division 8 of the National Defense Research Committee, which developed the far more powerful head. The 3.5-inch rocket was designed by the Army Ordnance Department.

Bazooka Development

To arm United States infantry to fight tanks on more nearly equal terms, the Army Ordnance Department, in early 1941, had under development a rifle grenade, carrying a "shaped charge" of high explosive. A cone-shaped cup hollowed in the front face of the explosive filling focussed the blast energy into a narrow beam of great penetrating power.

These rifle grenades had too much recoil for field use as a shoulder weapon. Recoilless rocket propulsion was suggested, tried, and adopted. Colonel Skinner, then an Ordnance Department major, and Lt. (now Major) E. G. Uhl, with Section H at Indian Head, undertook the development of a suitable rocket motor.

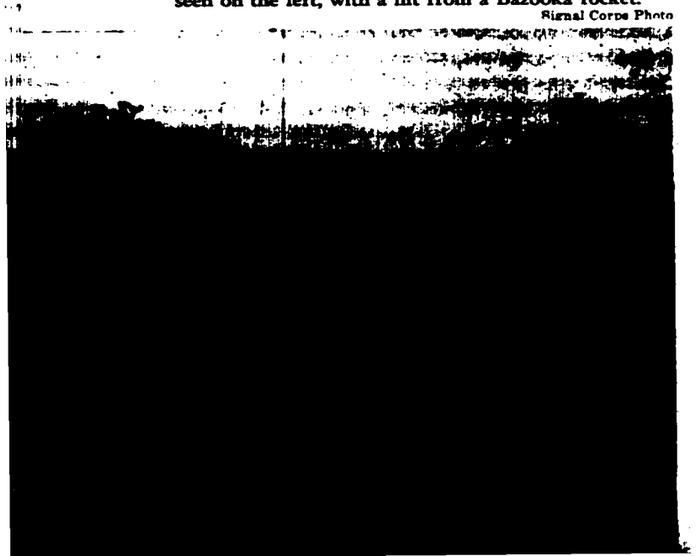
Following unsuccessful attempts to launch these rocket grenades from attachments to the service rifle, it was concluded that a separate launcher would be required.

To protect the gunner from the rocket blast, the launching tube had to be longer than the maximum burning distance of the rocket motor. To be portable and easily aimed from the shoulder, the launcher, and hence the burning distance, had to be short. By the use of a charge of several thin-web tubular grains of solvent extruded powder in a motor about an inch in diameter, the burning distance was made short enough for a 54-inch launcher, soon dubbed "the bazooka."

This launcher was designed to be fired from the

*U. S. Rocket Ordnance.

Using a knocked-out German tank in an action that was staged, an American trooper blows off the tank's track, seen on the left, with a hit from a Bazooka rocket.
Signal Corps Photo



shoulder and to discharge the rocket blast behind the gunner. It could be sighted and swung with a moving target as easily as a rifle.

The first model of this weapon, despite recognized imperfections, was rushed through production in 1942. It was used in the first Allied landings in North Africa. The weapon soon became famous for its tank-stopping power in Africa, Europe and the islands of the Pacific.

As is the case with most new weapons, improvements were necessary and development work was continued at high priority. Blast was particularly troublesome, especially at low temperatures which caused the powder to continue burning after the rocket had left the launcher. This was eliminated by using faster-burning powders. One such fast-burning powder, developed by NDRC's Division 8, was a new solvent-extruded powder containing a high percentage of special ingredients—this powder shortened the burning distance so much, even at extremely low temperatures, that it earned the name of "blastless bazooka powder."

Debut of the Bazooka

This was the weapon whose effectiveness was demonstrated first in the Allied landings in North Africa in 1942, knocking out pillboxes, tanks, and other enemy strong points.

In spite of its short range—it is most effective within 200 yards—the bazooka in the hands of concealed marksmen stopped enemy armor, gave a lift to the morale of the GI, and was feared by the opposition.

The success of the bazooka in action is best indicated in the unadorned stories of the men who used it. From his European combat experience a private recalled: "We had been hard hit and all of our bazooka men had become casualties. This Mark VI tank was really giving us a going over, and something had to be done about it. Although I had never used a bazooka before, I knew how to handle it. So one of my buddies loaded the weapon for me and I crawled up a ditch until I was so close to the German tank (he was within 40 yards) I couldn't miss, and let them have it. That one round really did the trick." The private won the Bronze Star for his feat.

Similarly, a sergeant, a mortar squad leader, had never fired the weapon, but during a savage German counterattack on American positions he halted a German Tiger with two rounds at a distance of 75 yards.

As the heavy tank lumbered toward him spearheading the Nazi attack, the sergeant seized a bazooka dropped by its wounded operator and fired at the track. The tank's machine gun as well as supporting German riflemen opened up on him. He reloaded and sent a second rocket crashing home, immobilizing the tank. The crew abandoned it and doughboy riflemen smashed the counterattack. The sergeant won the Silver Star.

Bazookamen found that their improved weapon frequently performed beyond their expectations. Combat reports tell of holes driven through a 6-foot pillbox wall, of masonry walls blasted with holes big enough for a man to crawl through, of tank crews killed by fragments spalled off the inside of 8-inch armor plating although the shaped-charge did not penetrate the armor.

Bazooka Versus Pillbox

Experience in the Pacific showed that even when the bazooka could not destroy the heavy Japanese pillboxes, its concussion could stun the occupants and give infantrymen an opportunity to rush in and dispatch the enemy at close range. The bazooka was highly effective against Japanese tanks, which were more lightly armored than the German.

In one frantic action on Luzon, soldiers of the 6th Infantry Division fought a close-range battle against Jap tanks, which, firing at point-blank range, were mowing down American antitank gunners as fast as they manned their weapons.

"We tore into them with rifle grenades and bazookas, the only weapons we could use under the circumstances," a sergeant reported. His battalion claimed 57 Jap tanks in the battle.

Combat experience was translated into modifications which made the bazooka a more convenient weapon. A two-piece launcher permitted easier carrying and better concealment from observation than was possible with the original one-piece launcher. A trigger-operated magnetic replaced battery ignition. The sights were improved.

Versatility of the bazooka was increased with the development of a bazooka smoke rocket loaded with white phosphorus; this was effective against Jap bunkers and caves. Ingenious American soldiers projected telephone wire over stretches of exposed ground by fastening the wire to a dummy rocket. They used dummy rockets to carry detonating cables out over minefields where the cables were set off, exploding the mines.

Nazi Imitations

A new step in the development of shape-charge antitank rockets began with the German capture of American bazookas in North Africa, particularly at Kasserine Pass. The *Panzerfaust* and the *Panzerchreck* were German bazookas based upon the American. Appearing some months after the North Africa action, they carried a heavier shaped charge which produced greater penetration, but were lower-powered and lacked the range of the American 2.36-inch rocket.

The American answer to heavier German armor and to Germany's large rockets consisted of the two improved bazooka rockets already mentioned—the super-bazooka and the 3.5-inch rocket.

The superiority of the super-bazooka motor over that of the original bazooka is achieved by the use of an improved igniter and a heavier charge of propellant, the latter consisting of many thin disk-shaped grains, stacked in a stepped-back column to allow freer flow of the gases toward the nozzle.

The Intelligence School

*by Lieutenant Julius S. Gassner**

THE new Intelligence School at Fort Riley, Kansas, was patterned from the War Department Military Intelligence Training Center, which during the war, at Camp Ritchie, Maryland, mass-produced intelligence specialists. When the Maryland center was inactivated in the fall of 1945, previously made plans were carried through for a peacetime intelligence training center under G-2, Army Ground Forces. Under them the school, after a brief establishment at Fort Benning, Georgia, where adequate facilities were not available, was moved to Fort Riley. Here, on March 29, 1946, the first graduates of the first AGF Intelligence School received their diplomas.

In this first graduating class were 45 officers and 50 enlisted men, who had completed a well-rounded nine weeks' course. The course ended with a 36-hour, continuous command post exercise, during which the students established and operated one corps and four divisional G-2 sections, and two regimental S-2 sections, complete with Photo and Order of Battle teams.

The school has been given the status of an advanced service school, and it is believed it will train about 250 officers and 250 enlisted men during the school year. Major General I. D. White, Commandant of The Cavalry School, and former commander of the 2d ("Hell on Wheels") Armored Division, is also Commandant of The Intelligence School.

The students enrolled in the first course were offered a choice of three specialties: General Subjects, Photo Interpretation and Order of Battle. The nine-week course was divided into periods of three weeks and six weeks. During the first three weeks the students were introduced to two of the specialities—Photo Interpretation and Order of Battle—and received an over-all view of the entire intelligence cycle, from the collection of initial information to the final dissemination of completed intelligence. The comprehensive view thus presented helped prepare them for whichever of the three specialties they chose to take during the last six weeks of the course.

The proportion of students who specialized in Photo Interpretation and Order of Battle was roughly 20 per cent, equally divided between the two. The remaining 80 per cent chose the Department of General Subjects.

Most of the school's work was practical, with a minimum amount of time spent attending lectures. This was especially true in photo interpretation, in which students constructed a 1/5,000 terrain model of the Fort Riley-Junction City area.

*Instructor, Department of Order of Battle, The Intelligence School.

The Order of Battle enrollees devoted more than a quarter of their time in working out problems, most of which were based upon actual situations in which original documents captured in the Pacific and European theaters were employed.

In the Department of General Subjects, students observed demonstrations of the function of the various intelligence agencies, went on night patrols, wrote periodic reports, and made observation flights over the surrounding countryside. This gave considerable stability to the extensive background-knowledge and theory which is inherent in advanced intelligence training.

The instructors who were to serve on the school's staff brought with them their own varied experiences, which covered virtually every field in intelligence work—and ranged from an analysis of German flak to scouting and patrolling in eastern New Guinea.

No radical changes have been made in the Second Interim Class of the school which began April 8, and graduates in mid-June.

Beginning in September, 1946, however, courses are to be organized along entirely different lines. An Officers' Course for four and one-half months will be conducted each fall and spring. It will begin with six weeks of training in reconnaissance and observation, which is to be conducted under the supervision of The Cavalry School. This preliminary work will stress the reconnaissance tactics of all arms in every kind of operation. It will include reconnaissance of all types; message writing; occupation and operation of an observation post; scouting and patrolling; and allied subjects. At the conclusion of the course in reconnaissance and observation, all officer graduates will attend the Advanced Intelligence Course, which will be conducted by The Intelligence School. This course will provide, under the Department of General Subjects, instruction in detailed staff duties, intelligence functions peculiar to all arms, the use and integration of intelligence agencies, counterintelligence, air-ground liaison, and allied subjects. The Department of Photo Interpretation will give the equivalent of a three weeks' course in the technique of photo interpretation. Future officer students will spend the equivalent of two weeks of study under the guidance of the Department of Order of Battle.

The purpose of the Officers' Course is to qualify personnel for duty as G-2s and S-2s of units from battalions to divisions, inclusive.

Plans are to offer two specialists courses for enlisted men. The Photo Interpreter Course of six weeks will qualify enlisted men as photo interpreter specialists.

Enrollees will receive instruction in basic combat intelligence, military and terrain identification, mechanics of photography, preparation of controlled mosaics, preparation of terrain models, and allied subjects. The combined Order of Battle and Prisoner of War Interrogators' Course, of six weeks, will include such studies as basic combat intelligence, order of battle techniques, and the organization of selected foreign or type armies as well as the technique of interrogating prisoners of war. The course will qualify students as order of battle specialists, and as experts in the technique of interrogating prisoners and processing captured documents.

For demonstrational purposes and as an aid in instruction, the school will employ fully equipped Photo Interpreter, Interrogation and Order of Battle teams as well as a counterintelligence corps detachment.

It is felt that the decision to locate The Intelligence School at Fort Riley is an extremely fortunate one. For both The Cavalry School and The Intelligence School have a common interest in reconnaissance, observation and security, and a coördination of the two schools therefore appears desirable.

Sand Models

THE latest addition to training at The Intelligence School at Fort Riley, Kansas, is a course in terrain modeling, which calls for speed, initiative and accuracy in the construction of scale models that are perfect to the minutest detail.

The models prepared by the students serve as useful aids for a large-scale intelligence field exercise which is held at the conclusion of classroom instruction.

The models, designed on a scale of one unit to 10,000, are constructed almost entirely of cardboard and sand and their three-square foot sections represent an area normally assigned to a division.

Students are taught to model terrain so that they can give troops not thoroughly schooled in the reading of contour maps an accurate picture in miniature of terrain over which they may operate.

The terrain to be used for the model is projected from a map through a balopticon onto thin paper and from there traced onto the model base.

After contour lines have been drawn on the base, cardboard is cut to form the hill effect on the model. Over the cardboard is spread sand mixed with glue, and the necessary coloring is added to produce the desired effect for trees and other growth.

A bluish or dark green hue is used to designate coniferous trees. The deciduous type of tree is shown in a yellowish or light green tone. To represent trees in spring, more yellow coloring is added; purplish brown tone is used to show trees in the fall; and a rich green in the summer.

All prominent objects on the landscape are shown on the finished model, with each building and hedgerow in its proper place.

Buildings are cut in miniature from wood and glued to the model, and roads and streets are formed by tracing a slight depression in the model base and then sprinkling it with talcum powder. Varying color shades are employed to denote different fields. Light brown may be used to show the location of ripening wheat or a plowed field while a greenish hue may represent an alfalfa field or pasture land.

Preparation of the sand is a tedious job. It must be sifted carefully so that no large pieces are contained in the finished product. The glue must be prepared to the correct consistency, and that is one of the student's many tasks. He has to keep double boilers of glue simmering on the laboratory stove, constantly adding ingredients and forever stirring.

Sand is the principal covering mixture used here, but sawdust, clay, pastelon, plaster of paris, pulverized nutshells, old paper, soft coal dust, ground coral, ashes or cinders are likewise recommended.

Glue is the best binder, but molasses or egg or resin will do just about as well. Sand and glue are the easiest to obtain here, but under field conditions students may be forced to revert to a score of mixtures and binders.

Trees can be made from sand, pebbles, pieces of sponge, Norwegian lichen, small branches, vegetables, paper, wire or a hundred other materials, depending upon the scale of the model and the type of tree.

Paint alone may be used to represent grass, but fine sand, wood flour, cement or any powdered substance will also serve the purpose.

Airborne Possibilities*

by Lieutenant Colonel John H. Swenson, Cavalry**

WITHOUT in any way contradicting or in the least detracting from the epic accomplishments of the airborne forces, an excellent résumé of which was presented by Lieutenant Colonel Cornett in the December 1945 issue of the *Military Review*, I should like to point out that the full possibilities of the arm have by no means been developed.

As was pointed out by Colonel Cornett, airborne forces are the child of the recent war. Their development was the result of a crying need. Hence it was largely determined by the exigencies of the situation. Technical developments, though amazingly rapid, were unable to provide the means for accomplishing all that was desired. This has left the airborne forces with certain inherent limitations, the outstanding of which are a lack of sufficient supporting fire, and a very limited tactical mobility, as well as a precarious and tenuous lifeline of supply.

Toward the end of hostilities, technical developments to overcome these limitations were just emerging from the test stage. They did not emerge fully from the crucible of combat usage. The principal developments referred to are the recoilless rifles and mortars which would have gone far toward eliminating the weakness of limited supporting fire, and the CG 10-A Glider which had the capacity to deliver means capable of providing tactical mobility to airborne forces. The supply situation might well have been remedied by the employment of newly developed technical means of identifying delivery points for air transported supplies.

In order to explain more fully what these remedies can mean in airborne developments, let us now take an hypothetical unit of a truly revolutionary type and consider its capabilities. For this purpose I would like to use a Horse Cavalry Glider Squadron. Let us say that the squadron is composed of a Headquarters, three rifle troops, and a heavy weapons troop. Its armament consists of sabers, M1 rifles, submachine guns, light machine guns, 4.2 recoilless mortars, and 57mm and 75mm recoilless rifles. Let us also assume that it is fully mounted and needs no transportation other than its horses.

The CG 10-A, which was constructed to carry a 6x6 2½-ton truck or 12,450 pounds of freight, makes transportation of such a unit a possibility. In the same space and within the same weight limitations, it would be possible to carry eight mounts with riders or loads. Assuming the combat strength of such a squadron would be 632 men and 800 horses, the squadron could be transported in 100 CG 10-A Gliders.

Now let us take a situation in which it would be feasible to employ any airborne force. The basic requirement is that we have air superiority, or can establish air superiority during the time we are convoying our troops by air, and can either maintain or reestablish that air superiority for a sufficient length of time to enable us to re-supply the airborne troops. The next requirement is that we can reasonably ascertain that the terrain on which we land these troops will be suitable for the landings, and that the area in which these landings take place will be sufficiently remote from enemy installations to enable the troops to assemble and organize before they are attacked in force.

Because the force we are considering is mounted, and each man has in his mount a rapid means of transportation, these troopers should be able to unload from their gliders and assemble or rally in considerably less time than Infantry troops committed to action by the same method. In fact, because of their mobility they might well capitalize on a deliberately dispersed landing. Under certain conditions troops or even platoons might land separately and destroy bridges and communication nets while en route to the squadron rendezvous. Were this done, it would further add to that pandemonium in the defender's mind that accompanies an airborne landing. It seems fair, then, to assume that their chances of success for accomplishing an assembly, the most critical phase of an airborne operation, would be equal to or better than that of any now existing glider unit.

Having then established the feasibility of landing and organizing our theoretical force in enemy territory, let us next turn to their capabilities. The best historical guide to the capabilities of such a force when deep in enemy territory can be found in the history of the Russian Cavalry raids behind the German lines. Although Russian security has prevented us from gaining many specific facts, enough information has seeped through to make it reasonably certain that when Horse Cavalry units were able to place themselves in the rear of the main German battle positions they were able to operate successfully against the highly mechanized and thoroughly modern German war machine. The main factors which enabled them to do this were surprise and mobility, which further contributed to the element of surprise.

Let us now change our role to that of the enemy G-2. Let us assume that we know the foe has a Horse Cavalry Glider Squadron, and that he has sufficient air force to enable him to employ it at this time. If we are to state the enemy's capabilities, we must state that he is capable of attacking with a strength comparable to one battalion at any point within an arc the radius of which is the operational radius of his transport aircraft and the center of which is his forward air bases. You must remember that you are the enemy G-2. Imagine your Commander's reaction to your profound pronouncements! Will he attempt to allocate sufficient troops to guard each and every vital area and installation within this area? Can he afford to? Will he build an unbreachable antiaircraft screen against this threat? He will undoubtedly try, but unbreachable static defenses have not yet proven practical. Will he, or indeed can he, construct obstacles which will render all possible glider landing fields unusable? Can he afford to ignore this capability?

Now let us reverse the situation and change our hats once again so that we become staff officers of an invasion force about to strike Northern Europe. In order to bring this closer to home for more of us, let us consider that it is late May 1944, that our forces are marshaled and poised for the invasion of Normandy. Assume that late one afternoon we receive information that hostile horse glider forces have landed in a specific area. When we consider the probability that this glider landing would be coordinated with diversionary and deceptive measures, we might well allow several hours during which we would be uncertain as to the actual location of the glider landings. At any rate, if the landing areas had been well selected and the operation well timed, it would be impossible to counter this action before nightfall. This, then, would leave us confronted with the task of ascertaining their capabilities for the period between their landing and daybreak the following morning.

Based on known Horse Cavalry actions, it is fair to assume a rate of cross-country march during darkness, off roads, and without benefit of bridges, of four miles per hour.

With ten hours between the landings and daybreak of the following day, this enemy force, which depends on neither roads nor bridges, might well evade our best efforts to fix and destroy it. It appears patent that we can no more ignore this small but potent force than could a man who suddenly realized he had a hornet in his trousers ignore that hornet.

We would immediately have to move sizable forces, forces in the process of embarking for an invasion, to protect all vital installations, bridges, communication, and transportation centers as well as headquarters. In addition, we would have to alert all troops within possible striking distance.

Next, we would have to set about to fix and destroy this enemy. Considering his independence of roads and bridges, this would be no small task. In addition to the usual advantages that accrue to the force with both the initiative and mobility, he would have in his favor the fact that forces sent against him would be loath to employ usual aggressive measures in friendly territory. This same condition would almost limit the employment of air forces to a role of reconnaissance.

True, the squadron would have to contend with a hostile civil population. Hence, their movement would continually be opposed and their progress reported. However, judicial and systematic destruction of communications and mining of roads (all part of raiding technique) should go far toward neutralizing the information services spontaneously performed by civilians. Civilian opposition, even considering the Home Guard (good though it was), could hardly do more than harass an organization with such flexibility and cross-country mobility. Hence, it would be necessary to commit a large number of the invasion troops to the mission of locating, fixing, and destroying this squadron.

The eventual outcome of the hunt will not be argued. Certainly the quarry would eventually, and perhaps rather speedily, be brought to bay and smothered. Yet it seems just as logical that before we can corner him, he will have committed considerable and probably serious depredation. However, reflecting upon the closely controlled and clocklike precision of both troop and supply movements so essential during the critical period just preceding and during embarkation for an invasion, it would appear that the greatest damage would grow out of the disruptions and dislocations that his presence would have caused. In fact, we are reminded of Aesop's fable in which the ant bit the hunter on the ankle and disturbed his aim, thereby saving the life of the elephant.

As indicated, this hypothetical operation would eventually come to a bad end. This would be because it lacks the essential element of *mass*—without which all airborne operations eventually become a struggle for existence. Nonetheless, it does illustrate the advantages that accrue to an airborne force when to that force's strategic mobility we add tactical mobility. Mass can be added. If and when it is, logistic support can be provided. We have the means if only we are willing to pay the price.

It is realized that to do so is an expensive proposition, and that both extreme selection and extensive training would be necessary for the establishment of any force capable of exploiting the characteristics portrayed in the example. Yet, would not the results logically expected of them justify their creation within the armed forces of a nation possessed of the material resources capable of their support?

*Military Review.

**Instructor, Command and General Staff School.

BURMA TRIUMPH*

by Squadron Leader Charles Gardner

ONE of the least known of the theaters of operations in World War II was that of the Southeast Asia Command. The story of the conflict in that theater has yet to be told, but when it is the struggle and eventual victory in Burma will be given an appraisal it well merits. Here was fierce and rugged campaigning that tested the strategical genius of the Allied command and the valor of our fighting men.

Three years of fighting over the devil's own country was finished on May 5, 1945, when the British captured Rangoon and hoisted the Union Jack over Burma's capital. For three and a quarter years the city had been in Japanese hands and had been a focal point in the "Greater Southeast Asia."

When Admiral Mountbatten came to his newly created Southeast Asia Command in the late autumn of 1943, the problems facing him seemed well-nigh insurmountable. Our forces were meager, our responsibilities great.

The Japanese were firmly "in" all over Burma, with great jungles and sprawling mountain ranges forming a buffer against any major Allied attack. A 200-mile belt of the world's thickest natural barrier and two great rivers protected them in the Central Burma plain. Through these ragged mountains and steaming, overgrown valleys there ran, from our side, but two roads and no railways. The Japanese, it seemed, could stay contentedly on their side of the Chindwin, nourished by good internal lines of communication which stretched back to the major port of Rangoon.

On the other side of the jungle barrier—our side—the picture was different. We had no nourishing network of roads and railways, no kindly port close at hand.

Where was *our* supply base?

At Calcutta, 900 miles back! Linked to our fighting front by but one railway, the Bengal-Assam line, already heavily laden with supplies to be flown to China; charged, too, with supporting General Stilwell's drive to reopen a land route to Chungking. What was more, there could be no relief from this state of affairs until we held Rangoon. For the whole of the next 1,300 miles of advance it seemed as if we were doomed to be tied to Calcutta.

Mountbatten took one look at the position and summed it up in a sentence: "the biggest logistical nightmare of the war."

How the Japanese must have smiled when they heard that! How safe they must have felt.

What could the British do? We had the weakest lines of communication that any army had ever had to fight from. We had no roads or space by which to deploy our superior equipment—when we got it. We were sealed off from Central Burma by trackless mountain and jungle. We were vulnerable to sudden attack from across the Chindwin.

On the face of it, then, all that the Japanese had to do was to sit tight, build up supplies on the Chindwin banks and then strike at India through the jungle of which they believed themselves to be all-time kings.

Yet, by May 1945, their dream was shattered. So were three Japanese armies and a Japanese Air Force! Over 120,000 of the Emperor's best troops were dead and Burma was British again.

How did it happen?

The story which follows is an uncolored, simplified account of one of the greatest military campaigns in the history of war. This campaign was planned audaciously, and carried through with courage and resolution by three British Imperial Corps of troops, one Anglo-American Air Force and a few divisions of Chinese, all supported by the big and little (but mainly little) ships of the Royal Navy and the Royal Indian Navy.

The first hurdle Mountbatten had to clear was that of the supply line. The solution of the problem of distance and lack of roads and railways was apparent to all the senior officers—to the "Supreme," to General Slim, GOC of the 14th Army, to Wingate. It was air supply.

"Bring your goods down the chimney," said Wingate, "there's no future on the jungle floor."

And so, painfully (for there were many urgent and competing demands on Allied production) a fleet of Dakota transports was gathered together. Squadron by squadron, British and American, they were assembled behind the lines, in India.

Said the Air Force Chiefs: "Before we can run this fleet of unarmed 'merchant ship' aircraft we must sweep the skies clear of Japanese fighters. The transports can't operate in the face of fighter opposition. First things first: we must gain complete air supremacy, or, further than that, we must have air monopoly."

So, gradually, the combat as well as the transport side of the Air Forces was built up. Spitfires, Mustangs, Beaufighters and Lightnings began to trickle through. Few enough they were, the bare minimum, but enough.

More detailed planning was not possible. The main airfields for the air-lift which was to beat the jungle

*Military Affairs, Journal of the American Military Institute.

were chosen. Bases in India and near the railway were earmarked for the first phase, and it was decided to supply from the Arakan ports and over the Somra mountains for the second phase or the "Central Burma" advance. The complicated organizations for the building of airfields and for the sorting and loading of stores were worked out.

For the purposes of this account, I will set on one side the Northeast Burma campaign of 1944 to 1945: the Stilwell-Wingate offensive which cleared the ground through Myitkyina and Bhamo to China. This important task was S.E.A.C.'s first charge on its charter, and it was a task triumphantly carried out. The first convoy went through to China in January 1945. This Northeast Burma fighting, however, was not concerned directly with the liberation of Central Burma, although our forces there naturally tied down Japanese troops and resources. What must be remembered, however, is that from March 1944, until the monsoon, Wingate's men were "in," and were a major standing charge on our air supply—a charge which had to be fulfilled, for the Chindits had no other resources save those which came by air. They were 200 miles behind the enemy lines.

Let us return then to the central theme: our planned offensive over the Chindwin.

As the air supply of Phase Two of the liberation depended on the Arakan ports of Chittagong and Akyab, those ports had to be freed from enemy menace. That was why, in early 1944, the 15th Indian Corps was pushing down Arakan toward Akyab. About the same time, the Air Forces began their long-term program of clearing the air to prepare for the Dakota "merchant shipping."

But, just as this preamble to our plans was under way, the uncooperative Japanese altered the shape of our commitments. They launched two major attacks toward India: the first in Arakan, where we were getting dangerously close to Akyab, and later, in the Central sector, at Imphal.

These two attacks had both been foreseen, and provided against, but they had the immediate effect of making us follow an enemy lead. In the long run, they speeded the whole business of the recapture of Burma but, for the time being, we lost the initiative.

In Arakan, the Japanese were decisively beaten, but only after they had completely surrounded the 7th Indian Division. The enemy's protecting air force was shot down and so mauled that it withdrew from the struggle early, and the Dakotas kept the isolated 7th going until they were relieved from the north, and a great slaughter of Japanese was made.

Result: on the whole beneficial to us and our plan. Many Japanese fighter aircraft were put out of the way, which saved us the trouble of seeking them out to destroy them, and the road to Akyab was made easier by the weakening of the enemy forces.

But right on the heels of this defensive victory of ours, the Japanese plunged into their Imphal-Kohima show. This was their big push—and a pretty stroke it would have been had it come off. It aimed at bursting into India, and cutting the Bengal-Assam railway line above Kohima, leaving Stilwell and his China road project on the end of a sawn-off limb. En route it would have destroyed the 4th Corps of the 14th Army and might have found the road to Calcutta more or less open.

The Japanese were convinced that success would be theirs. "On to Delhi," cried their radio, and there was no doubt that the shot was, as they say at billiards, "on."

General Slim, however, had seen the Jap chalking his cue for this "winning hazard" for some time. As the enemy surged round Imphal and isolated Kohima, he saw that, if we could hold those two places, this Japanese offensive would be the turning point of the Burma war. What appeared to be a serious reverse to our plans was, in fact, a golden opportunity that would speed up the whole process of liberation—providing Imphal and Kohima were held.

And they were!

The story of that struggle is yet to be told. The air supply machine took over and maintained a daily commitment of over 500 tons at Imphal. The fighters progressed yet further in their long-range task of destroying the Japanese air force, which again came out for a short time and then retired. The Dakotas had a full-scale tryout for air supply and troop movement. During the struggle they moved the 5th and 7th Indian Divisions complete from Arakan to the Chindwin battle. This removal of two of its divisions weakened 15th Corps which was not then in a position to follow up the defensive victory of February with the capture of Akyab before May and the monsoon. Thus their Imphal offensive kept Akyab in Jap hands for a further ten months, but this was now academic, as enemy offensive power in Arakan was broken and Chittagong, the main Dakota port for Phase Two, was no longer in danger.

By mid-June, the Imphal battle was over. The Japanese had lost heavily and had taken crippling casualties without gaining a thing. We, on the other hand, had done more than merely deny the enemy. We had proved the possibilities of air supply. We had killed the Japanese air force (prerequisite number one for the coming Dakota operations in Central Burma) and, on the west coast, we had secured an unmenaced Chittagong. All these benefits had accrued to us as by-products of two defensive actions.

Air Marshal Joubert, in March 1944, when the Japanese were at Kohima, said, "This is the enemy's big mistake. He has come to us and so saved us the difficult and costly business of going into the jungle to find him." He was now proved to be right.

As the monsoon started, the enemy, broken, starving and disorganized, fled back into the jungle belt.

It was an opportunity not to be missed—one of the

great opportunities of war. Rain or no rain, the pursuit was on. Spearheaded by the 5th Indian Division, our men pushed through the jungle, down the mudbath called the Tiddim road, and also down the Tamu road, a monument to our engineering skill. Once again, Dakotas brought the supplies and took out the wounded. The Japanese fled, fighting rearguard actions but still bewildered and defeated.

It was our troops now who were "King of the Jungle." The results of Slim's farsighted training plans, and the inspiring feats of Wingate in Northeast Burma were proving to the world that Japanese invincibility was a myth.

By the end of the monsoon, we were virtually through that jungle belt which the enemy had regarded as an impregnable safety zone in which he only could mount an attack. By November of 1944, we were across the Chindwin and, before us, was the "promised land"—the Central Plain, with the Chindwin and then Irrawaddy valleys flowing flat and invitingly southward to Mandalay and Rangoon.

This was the kickoff for Phase Two.

Six months of good weather lay ahead, there was room to deploy, and the base port of the air lifeline in Arakan was secure. The Japanese air force was already "out," and, in the northeast, Stilwell was practically through to China.

There was one danger—there could be no drawing back. Once the 14th was on its way south, it had "burned its boats." Every yard gained was a yard farther away from the port of Calcutta. There could be no relief from that dismal fact until Rangoon.

In other words, if and when the 14th reached the gates of Rangoon, it would be 2,000 impossible miles from its base port. *It would be entirely dependent upon the Dakotas. If their organization failed or if the safety of Rangoon was not reached before the monsoon of 1945, the whole 14th would be out in the blue.* Air supply might not be able to maintain the Army in South Burma in monsoon conditions, and a "bogging down" short of the objective could easily be the prelude to major disaster.

Mountbatten, Leese and Slim knew the risk, but it was one which had to be taken sooner or later, and now was the time to take it. So, in December, the 14th came over the Chindwin. The die was cast!

General Monty Stopford's 33d Corps crossed at two places, with the 2d British and the 19th and 20th Indian Divisions working together at the start of the plan which was to bring us to Mandalay. The 19th Division, after crossing the river, kept on due east to the Irrawaddy. The 2d Division and 20th Division turned south into the Burma plain. They, too, were headed for the Irrawaddy, but at the point where it bends westward from Mandalay and runs due east and west for 60 miles before turning back again on to its southerly course for Rangoon. On their way they captured the Kabo weir intact—a vital achievement this, as the weir is the basis of irrigation for that great rice-growing plain.

It was now that the 14th Army changed from a jungle to a desert army—not because Central Burma is a desert, but because militarily many of the problems are the same. The open spacious plain lent itself to Libya-like tactics.

Here, able to see 20 miles at a glance instead of 20 yards, they switched all their tactics to the new conditions. Great battles were fought. But by now, our superior equipment could have a real chance: the tanks, the carriers, the armored cars and our aircraft.

The Japanese tried the old stuff—foxholes, trenches and fanatical resistance—but Slim's men cut and thrust round them, forced the Irrawaddy, two to four times as wide as the Rhine, and swept on. And with them, however fast they moved, went that other half of Mountbatten's Burma forces, Eastern Air Command and the all-important Dakotas of Combat Cargo Task Force.

By the middle of January, 33d Corps was crossing the Irrawaddy, the largest of the river barriers. Nineteenth Division, after bloody battles, reached the east side of the river, north of Mandalay, while 2d and 20th Divisions crossed west of Mandalay, over that section of the river which runs east and west. All these crossings were heavily opposed and our bridgeheads heavily counterattacked.

This was a "touch and go" period. On the 2d and 20th Divisions' side of the battle, our flank was wide open to crippling counterattack. That counterattack was never launched. General Stopford in his tactical appreciation had forecast that the Japanese would not realize the weak position of the British flank, and he was right.

With the bridgeheads consolidated, two strong forces moved on Mandalay from the north and west. Nineteenth Division, under Major General Rees, got there first and took the city. Fort Dufferin fell on March 30. The time for the big drive south to Rangoon had arrived.

There was less than two months to go before the monsoon, and 350 miles of enemy-held country to cross. The 14th Army had to average over six miles a day to set the seal on the victories of the previous 12 months.

It was now that General Slim made his surprise stroke. As the three divisions of 33d Corps regrouped in the Mandalay area, he threw in against the bewildered Japanese another corps of the 14th Army.

The 4th Corps under Lieutenant General Frank Messervy had for some time been assembling secretly near the Irrawaddy at Pakokku. From there it made a brilliant dash across the river and flung an armored column 90 miles to the southeast to seize Meiktila. An airborne column was at once flown in, in support. The Japanese south of Mandalay now had their escape road to Rangoon cut and, after a bitter battle for Meiktila, 4th Corps plunged southward toward the Burma Capital. Meanwhile 33d Corps having regrouped moved across to the western flank and also began a drive toward Rangoon down the axis of the Irrawaddy river. It is doubtful if, for some time, the Japanese realized that they were facing twin drives on the capital, each drive being of a corps' strength.

Fourth Corps, especially geared for speed, with airborne and motorized brigades, leaped down the railway toward Rangoon at an average speed of over 15 miles a day, and by the beginning of May was only 20 miles from the port. Then, on May 2, 1945, Mountbatten sealed the fate of Rangoon. With the monsoon rains already threatening, he launched an airborne and amphibious assault to which the Japanese had no answer.

Troops of the 26th Indian Division captured Rangoon on May 4 and a few days later linked up with Messervy's 4th Corps drive.

The great plan had worked. We had brought our forces 1,300 miles from Imphal on a main basis of air supply. To do it, something like 200 Dakota strips had to be built by British and Indian engineers. The army routine had been to consolidate, build an air strip, receive supplies, and move on. Toward the last days of the campaign, Combat Cargo Task Force was carrying nearly 3,000 tons a day to the 14th Army, and in addition was moving something like 12,000 troops a week.

At the war's end, Southeast Asia Command stood on the threshold of new achievements. Mountbatten was master of the seas and skies. On his right flank, MacArthur reached Borneo. And the strangulation of Japan and of the troops in the territories she had stolen took shape.

Three Years of Jap Imprisonment Little Affected Minds of Americans

From a Report to The Surgeon General

THREE YEARS in Japanese prison camps, most of the time on starvation rations and subjected to frequent beatings, had surprisingly little effect on the minds of more than 4,000 American soldiers who survived the ordeal.

Wherever these men landed in the United States after liberation they were met by teams of medical specialists assigned from the Office of the Surgeon General. A report on the neuropsychiatric findings has been made by Lieutenant Colonel Norman Q. Brill, who was in charge of this phase of the examinations.

Tremendous Will To Live

Considerable importance was attached to early medical contact with the released soldiers because, said Dr. Brill, "never before in this country's history had such a large group been exposed to starvation, torture and humiliation." The psychiatrists were interested in the factors that were responsible for the survival of these men when so many of their comrades, in about the same physical condition when captured, had succumbed. The nearest they came to finding a common factor, however, was what is described in the report as a "tremendous will to live." Otherwise the soldiers differed in about every possible way.

"All of them," said Colonel Brill's report, "lived only for the day. Indeed when one of them would fail to concentrate on or begin to hoard food, or gave way to morbid thoughts concerning the seemingly hopeless situation, he was earmarked by his companions as quite likely to die shortly. A prisoner who would hoard his rice allowance for several meals in order to enjoy the sensation of one large meal was referred to as 'rice happy.' This was generally an indication of the beginning of deterioration and early demise.

Courage The Best Explanation

"When those of lesser spiritual strength became ill they were likely to give up, quit eating entirely, and frequently would die within a few days. One fails to find a scientific reason or an adequate term to explain survival. It seemed to some of the examiners that 'courage' was the best word. It seemed that the only common factor among the survivors was that they had courage. They never stopped in their struggle for survival. They ate anything available, including cats, dogs, silkworms and other things repulsive to normal human beings. When struck with dysentery and malaria they would nevertheless attempt to carry on. This strength and courage had no connection with social background or education."

The men themselves expressed no concern about their ability to readjust to life in the United States. Regardless of the future, they felt, they would meet any situation likely to arise after living through the prison camp years.

Japanese Horse Cavalry

by Major Hal D. Steward*

NEWS DISPATCHES from Northern China at the end of World War II reported that the Russians had captured 17,500 horses from the Japanese Army in that region. Recently revealed Jap documents establish the fact that these horses came from two Japanese cavalry brigades that had been stationed in Northern China all during the war. One of the brigades had been in Manchuria since 1932.

The two Japanese cavalry brigades were the Third Brigade (mounted) consisting of the 23d and 24th Cavalry Regiments, brigade artillery, a machine-gun unit of two companies, a signal unit and a transport battalion; and the Fourth Cavalry Brigade (horse-mechanized) composed of the 25th and 26th Cavalry Regiments, brigade artillery, a machine-gun unit of two companies, a signal unit and a transport battalion. Both brigades, according to Japanese Tables of Organization, had more than 3,000 horses.

The last report on the Third Brigade before the close of World War II was that it was carrying out security measures and reconnoitering the movements of the Soviet Army in the Usuri (Phonetic) region in Northern China. In all probability this unit was captured by the Russians while carrying out this last reported mission.

The Fourth Brigade was last heard of while carrying out a security mission in the Keihansen region of North China. It too was probably captured by Russian troops in North China engagements.

Following is a brief history of these two Jap cavalry bigades. The Third Brigade in 1939, was transferred to the Eastern Border of Manchuria from Morioko and was stationed in the vicinity of Hitoku. In the same year, the "Homohan Incident" unexpectedly occurred and the brigade was ordered to mobilize and advance to the Mongolian Plain to participate in the "Russo-Japanese Clash," however, the "Clash" came to an end while the brigade was en route. The brigade returned to Hitoku and was transferred to Takarawan (about 100 kilometers north of Hitoku). Here, the brigade was assigned the mission of reconnoitering movements of the Soviet in the Usuri Region until the end of the war.

In 1931, the "Manchurian Incident" occurred and the following year the Fourth Brigade was ordered to Manchuria. For the next two years, the brigade participated in the subjugation of the Rebel Army in various sections of Manchuria, and achieved great success, especially at Jehol. Later, the brigade was stationed at Tonan and at Hailer where it carried out unit training. In 1937, the "China Incident" took place and the following year the brigade advanced from Hailer into North China, where it was stationed at Hyukaisenjo Kitoku. Shortly after, the "Hankow Operation" in Central China began, and the brigade participated in capturing Hankow. After this campaign, the brigade was active in various operations in Central China and contributed to the defeat of the enemy. After the beginning of the Second World War, the brigade advanced in the direction of North China, where it was assigned the mission of security in the Keihansen Region until the end of the war.

Over a period of years before World War II high-ranking Jap officers, according to all reports, had argued over the advisability of completely mechanizing the cavalry. Several viewpoints were taken as to the degree of mechanization necessary, but, upon experimentation with organization and equipment, the Japs decided it was necessary to retain some Horse Cavalry to be used for reconnaissance.

Until World War I, Jap cavalry, as a reconnaissance branch of the army, was chiefly Horse Cavalry and was included within the general organization of a division. The Horse Cavalry served the division on missions concerned with short-range reconnaissance, liaison with neighboring units, and security patrols in enemy territory. This type of cavalry (generally known as divisional cavalry) was organized as a comparatively small regiment composed of two or three troops. Jap experimentation showed that mechanization of the cavalry was necessary, from the various standpoints of speed, combat power, and endurance—the Russian use of horse troops by the thousands to the contrary. Although Horse Cavalry was found by the Japanese to be weak and not suited to modern warfare, there was strong opposition from many high-ranking Jap officers as to the complete abolition of Horse Cavalry.

Thus, Horse Cavalry units, motorized units, and armored units were combined to form a unit known as the division reconnaissance unit, and the three types of cavalry were to be employed in accordance with the type of terrain encountered.

Following is a chart of the various types of organization of the division reconnaissance unit:

Type "A" (KC) Rcn. Unit

1 armored company — 1 Horse Cavalry troop
1 motorized company

Type "B" (OTSU) Rcn. Unit

1 armored company — 2 Horse Cavalry troops
1 motorized company

Type "C" (HEI) Rcn. Unit

1 armored company — 2 Horse Cavalry troops

The above types of organization were actually employed in combat after the "China Incident," according to Japanese sources, in the following manner:

"1. In the event that favorable terrain or good roads are present, the motorized unit, utilizing its speed, will precede the other units, occupy strongpoints, and reconnoiter the terrain and the enemy's position. The armored unit will follow the motorized unit and augment its combat power. In this situation the movement will not depend upon the Horse Cavalry because of its inability to maintain the same rate of speed as both the motorized and armored units.

"2. In the event that poor roads or unfavorable terrain are encountered which would hinder the advance of the motorized units, the armored unit will precede the other units and will be followed by the Horse Cavalry unit which will conduct further reconnaissance. In this situation the motorized unit will proceed at a reduced rate and will constitute a reserve.

"3. In the event that it is possible to use the Horse Cavalry unit, the motorized unit, and the armored unit simultaneously in combat, the motorized unit will usually dismount from its vehicles and carry out a frontal attack on foot. The Horse Cavalry unit will maneuver over the difficult terrain and reconnoiter, or attack the flank or rear of the enemy. The armored unit will support either the Horse Cavalry unit or motorized unit in attacking and destroying the enemy, or in carrying out reconnaissance, in order to accomplish the mission of the division reconnaissance unit.

"Although the mission of the reconnaissance can be accomplished by the aforementioned method, the result of the whole operation, of which the reconnaissance is a part, will not be completely successful because the reconnaissance units do not have sufficient strength to completely crush the enemy resistance and still reconnoiter the situation to the rear of the enemy."

Leading Japanese military leaders put forth the following arguments in favor of Horse Cavalry:

"The fact that cavalry activities were limited in World War I was due to the special nature of the combat area. When large armies are being deployed in a small area such as Europe there is hardly space enough to use cavalry groups in the proper manner. The difficulty in handling cavalry is not inherent to it as a particular branch of the army. The combat area in which Japan expects to use its armed forces is the large continent of Asia. Europe is not comparable to Asia in size. Therefore, the cavalry can be expected to fulfill its function in the Japanese Army.

"Fire power can be increased by future effort. But it cannot be concluded that in every case battles will be won quickly by decisive frontal assaults. Many instances will arise in which encirclement, flanking movements or raids will be the deciding factor. Mobile forces will be absolutely essential for these purposes. Hence the cavalry is indispensable."

It should also be added that it was difficult for Japan to organize a sizable mechanized cavalry force rapidly because of handicaps in mechanical ability and iron resources.

*Press Branch, War Department Bureau of Public Relations.

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New Regular Army Officers

The Armored Cavalry Journal takes great pleasure in welcoming these officers who have successfully passed the examinations for the Regular Army and have been appointed therein.

THE officers listed below were nominated by President Truman for permanent commissions in the cavalry branch of the Regular Army. They are among the 9,831 chosen from more than 100,000 applicants.

The grade given each officer in the following list is his permanent grade in the Regular Army. In practically all cases the officers hold higher temporary commissions in the Army of the United States.

1st Lt. (Lt. Col.) David D. Klous, 3000 39th St., N.W., Washington, D. C.
1st Lt. (1st Lt.) William J. Lynn, PO Box 744, Anniston, Ala.
1st Lt. (Maj.) A. T. Netterblad, Jr., Box 287, Miami, Ariz.
2d Lt. (1st Lt.) Alfred P. Jelley, 1038 East Fourth St., Tucson, Ariz.
1st Lt. (Lt. Col.) Willis G. Ethel, Box 2417, Bisbee, Ariz.
1st Lt. (Maj.) John M. Davis, 17 W. Missouri Ave., Phoenix, Ariz.
1st Lt. (Lt. Col.) Edgar T. Guenther, Box 111, Whiteriver, Ariz.
Capt. (Lt. Col.) John D. Striegel, 511 South Hill St., Globe, Ariz.
1st Lt. (Lt. Col.) Cecil Snoddy, 528 North Plumen Ave., Tucson, Ariz.
1st Lt. (Maj.) Eugene L. Keeth, Box 506, Wilcox, Ariz.
Capt. (Lt. Col.) Maurice E. Webb, 719 N. First Ave., Tucson, Ariz.
1st Lt. (Maj.) Art H. Davis, 908 E. Forth St. Tucson, Ariz.
Maj. (Col.) Carl N. Smith, 1808 E. Edison, Tucson, Ariz.
Capt. (Col.) Charles B. Layton, 505 First Ave., Safford, Ariz.
1st Lt. (Maj.) George R. Dunn, Lake Village, Ark.
1st Lt. (Capt.) Joseph W. Jarvis, Dept. of Natural Resources, Div. of Fish and Game, Ferry Building, San Francisco 1, Calif.
1st Lt. (Lt. Col.) Frank M. Muller, 3429 Divisadero, San Francisco, Calif.
2d Lt. (Capt.) Jack P. Libby, 4317 Garthwaite Ave., Los Angeles, Calif.
Capt. (Capt.) Victor B. Fox, 1125 Butte St., Redding, Calif.
1st Lt. (Maj.) Warren M. Hargrave, 1250 Lincoln Ave., Palo Alto, Calif.
1st Lt. (Capt.) Martin O. Soresen, 861 Sutter St., San Francisco, Calif.
1st Lt. (Lt. Col.) Leroy F. Clark, Jr., Box 544, Palo Alto, Calif.
2d Lt. (1st Lt.) James R. Drew, 311 Meyers Place, Inglewood, Calif.
1st Lt. (Lt. Col.) Claire S. Curtis, 348 Orange, Long Beach, Calif.
1st Lt. (Col.) George S. Downer, Rancho De Los Olivos, Los Olivos, Calif.
2d Lt. (1st Lt.) Jack MacFarlane, 8261 Romaine St., Los Angeles, Calif.
1st Lt. (Capt.) Donald F. Isaacson, PO Box 272 West End Station, Colorado Springs, Colo.
Capt. (Lt. Col.) Donald M. MacWillie, 7 Meadowbrook Road, Darien, Conn.
1st Lt. (Capt.) Jewett A. Dix, Fairfield, Fla.
Maj. (Lt. Col.) Thomas H. Sills, 403 Seybold Building, Miami, Fla.
Capt. (Lt. Col.) Wilburn L. Strickland, Carrollton St., Buchanan, Ga.
1st Lt. (Maj.) Thomas H. Stewart, 615 Crestridge Drive, Atlanta, Ga.
1st Lt. (Capt.) Harry J. Davis, 584 N. Milledge Ave., Athens, Ga.
1st Lt. (Lt. Col.) Walter B. McKenzie, Montezuma, Ga.
1st Lt. (Maj.) Harmon L. Boland, 208 2d St., Ocilla, Ga.
1st Lt. (Lt. Col.) John W. Yow, 2006 North Patterson St., Valdosta, Ga.
1st Lt. (Capt.) Jonathan R. Burton, 3509 Kenilworth, Berwyn, Ill.
Capt. (Capt.) William L. Blake, 462 Sperry St., Bushnell, Ill.
1st Lt. (Maj.) Charles E. Wright, 311 9th Ave., Sterling, Ill.
2d Lt. (1st Lt.) Milford L. Killian, Jr., Trenton, Ill.
1st Lt. (Maj.) Herman M. Marlow, Wyanet, Ill.
Capt. (Lt. Col.) Hal C. Pattison, Alexis, Ill.
1st Lt. (Capt.) William J. Walker, 1325 Sage St., Evanston, Ill.
1st Lt. (1st Lt.) Robert H. Von Burg, 1314 North 5th St., Quincy, Ill.
1st Lt. (Capt.) Gerald V. Reberry, 507 South Locust St., Jefferson, Iowa
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Maj. (Lt. Col.) Glen L. Schmidt, 422 Belmont Court, Waterloo, Iowa
1st Lt. (Capt.) Robert E. Honeyman, Madison, Kans.
Capt. (Maj.) Eugene J. Field, 22B Sheridan, Fort Riley, Kans.
Capt. (Lt. Col.) Wheeler G. Merriam, 14B Forsythe Ave., Fort Riley, Kans.
Capt. (Lt. Col.) Peter H. Dahmlow, The Cavalry School Mess, Fort Riley, Kans.
Capt. (Capt.) Franklin L. Quinton, Schwartz Apt., Junction City, Kans.
Capt. (Maj.) Wendell M. Broadus, Reading, Kans.
1st Lt. (1st Lt.) John S. Nickell, 133 Cherokee Park, Lexington, Ky.
1st Lt. (Lt. Col.) Wm. C. Rountree, 224 Poplar Drive, Elizabethtown, Ky.
Capt. (Lt. Col.) John R. Dey, c/o PM, New Orleans, La.
Capt. (Maj.) Eugene G. Hite, Box 8, Rising Sun, Md.
1st Lt. (Capt.) Clayton N. Gompf, Providence Road, R.F.D. 6, Towson, Md.
1st Lt. (Capt.) William R. Corv, 4710 College Ave., College Park, Md.
Capt. (Lt. Col.) Briard P. Johnson, 11 Pine St., North Amherst, Mass.
1st Lt. (Maj.) Arthur C. Avery, 19 Cosby Ave., Amherst, Mass.
1st Lt. (Capt.) James T. Burke, 26½ Summer St., Ipswich, Mass.
Capt. (Lt. Col.) Leslie D. Goodall, 45 Glen St., Holyoke, Mass.
1st Lt. (Capt.) Albert W. Aykroyd, 2 Warden St., Worcester 4, Mass.
1st Lt. (Maj.) Robert B. Crayton, 9 Newcomb St., Arlington 74, Mass.
1st Lt. (Maj.) Donald H. Cowles, 5 Cottage St., Fairhaven, Mass.
1st Lt. (Lt. Col.) Calvin S. Hannum, 58 Converse Ave., Malden 48, Mass.
Capt. (Maj.) Ritchie Garrison, 181 Pine Ridge Road, Waban 68, Mass.
Maj. (Lt. Col.) Arthur T. Kirley, Hayden Rowe St., Hopkinton, Mass.
1st Lt. (Maj.) Floyd W. Townsley, Valley Road, Ashfield, Mass.
Maj. (Lt. Col.) Rosewell H. King, R.F.D., Uxbridge, Mass.
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1st Lt. (Capt.) Ian F. Turner, 232 Washington St., Weymouth, Mass.
1st Lt. (Lt. Col.) Clifford A. Curtis, 75 East Main St., Hopkinton, Mass.
1st Lt. (Capt.) Richard F. Briggs, Hanover Center, Mass.
Capt. (Lt. Col.) Jerome L. Spurr, 62 Fiske Road, Wellesley Mills 82, Mass.
Capt. (Capt.) John H. Gibson, 15361 Prest Ave., Detroit, Mich.
1st Lt. (Maj.) Urcel L. Bell, 473 Pavone, Benton Harbor, Mich.
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Capt. (Lt. Col.) William E. Eckles, College Station, Tex.
1st Lt. (Maj.) Ted F. Douthitt, 3710 Hueco St., El Paso, Tex.
1st Lt. (Lt. Col.) Thomas Dooley, 1103 W. Lamar St., McKinney, Tex.
1st Lt. (Maj.) Jack W. Fickessen, 2912 Marrow Ave., Waco, Tex.
1st Lt. (Maj.) Charles T. Krampitz, 822 Booty St., Corpus Christi, Tex.
2d Lt. (1st Lt.) William G. Weaver, Jr., 240 Bushnell Ave., San Antonio, Tex.
1st Lt. (Capt.) William J. Boehmer, Box 224, Dainger field, Tex.
1st Lt. (Maj.) Albert H. Hislop, 64 Main, Ludlow, Vt.

1st Lt. (Capt.) George S. Andrew, Jr., Northfield, Vt.
1st Lt. (Col.) Emett R. White, Arch St., Pittsford, Vt.
Capt. (Col.) Alfred E. Stevens, 3207 First St., N., Arlington, Va.
2d Lt. (1st Lt.) Edward J. Stenger, 3221 Ellwood Ave., Richmond, Va.
1st Lt. (Lt. Col.) George T. Pitts, Jr., 3676 Gunston Rd., Alexandria, Va.
1st Lt. (Lt. Col.) Michael Popowski, Jr., 3514 S. Wakefield St., Arlington, Va.
Capt. (Maj.) John L. Peyton, Steephill, Staunton, Va.
Maj. (B. G.) Glen C. McBride, 4827 North 16th Rd., Arlington, Va.
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2d Lt. (1st Lt.) Erwin R. Brigham, 604 Pollard Park, Williamsburg, Va.
Maj. (Col.) Glenn McBridge, 3425 Martha Custis Dr., Park Fairfax, Va.
2d Lt. (1st Lt.) Arnold V. Anderson, 5406 Phinney Ave., Seattle, Wash.
1st Lt. (Maj.) Brooks O. Norman, 2518 21st Ave., South, Seattle, Wash.
1st Lt. (Capt.) Robert J. Bird, 1385 23d Ave., South, Seattle, Wash.
Capt. (Maj.) Norman W. Parsons, 8 Forbes St., Elm Grove, Wheeling, W. Va.
Capt. (Lt. Col.) Raymond B. Steiner, 2016 W. Walnut St., Milwaukee, Wis.
1st Lt. (Capt.) Arthur A. Olson, 913 22d St., Superior, Wis.
1st Lt. (Maj.) Matt W. Warve, 6119 11th Ave., Kenosha, Wis.

The table shows the breakdown by ranks and branches of the Regular Army appointees.

	Maj.	Capt.	1st Lt.	2d Lt.	Maj.	Capt.	1st Lt.	2d Lt.	Total
					Detailed to Corps of Military Police				
Infantry	54	263	1,123	144	14	32	71	3	1,704
Air Corps	77	353	3,150	553					4,133
Field Artillery	53	152	534	70					809
Coast Artillery Corps	25	107	301	30					463
					Detailed to Transportation Corps				
Quartermaster Corps	20	120	160	7	31	117	190	30	675
Medical Corps	62	111	20						193
Dental Corps	43	83	2						128
Veterinarian Corps	8	72	4						84
Adjutant General Depart.	11	47							58
Pharmacist Corps	46	168	229	50					493
Chemical Warfare Service	5	18	52	4					79
Corps of Engineers	13	31	33	1					78
Ordnance Department	22	88	156	16					282
Signal Corps	15	66	101	13					195
Cavalry	9	40	105	20					174
Chaplain	50	62							112
					Detailed to AGD				
Finance Department	10	26	34	2			50		122
Judge Adjutant General	13	36							49
									Grand Total
Totals	536	1,843	6,004	910	45	149	311	33	9,831

Activation of Organized Reserve Begins This Summer

ANOTHER step in the organization of the postwar Army of the United States will be taken this summer when activation of units of the Organized Reserve Corps will begin. The Organized Reserve Corps will continue to provide the units and personnel required to supplement the Regular Army and the National Guard in the event of an emergency.

Present War Department planning contemplates that reserve units will be organized under three classes:

1. "War-strength" units with a full complement of officers and enlisted men, supplied with essential equipment required for training and initial mobilization.

2. Units with a full complement of officers and a cadre of key enlisted personnel and essential training equipment.

3. Units with an assigned complement of officers only.

Initial activation will normally be in the third class, with progressive development through the second, into the first class. The final program calls for a large number of units under each of the above categories.

The fully organized units in the first class will form that portion of the Army of the United States designed to provide a balanced force when considered in conjunction with the Regular Army and the National Guard. These will be formed largely as "affiliated" units, and will be sponsored by business enterprises and organizations, and those civic organizations whose normal activities are closely allied with a military requirement. Examples of units in this group are Ordnance Motor Vehicles Assembly Companies, Heavy and Medium Maintenance Companies, Tire Repair Companies, Signal Operations and Construction Battalions, Quartermaster Depot and Sales Companies, Hospital Units, and Engineer Service and Construction units.

Although the exact number and types of units cannot be tabulated until the postwar program has been finalized and approved, Ground Forces units will include airborne, armored, and infantry divisions, and supporting units. Reserve units of the Air Forces will also be of all types, both combat and service.

Standards of training will vary, according to the classification of the unit. The war-strength units in the first class will be trained and equipped to take the field and function successfully in their assigned mission in the event of an emergency. Each of these units will have both active duty and inactive home training each year. Those of the second and third category will be given similar training to the extent required by their mobilization priorities.

Initial activation of units this summer will be based on the density of male population of military age, coupled with proper geographical distribution with the recently established Organized Reserve Military Areas, availability of personnel for units requiring technically trained personnel, and the availability of similar types of units of the Regular Army and National Guard in connection with active peacetime training facilities.

Initial activation of units this summer will be accomplished as follows: in each of the recently established Reserve Military Areas, the records of available reserve officer and enlisted personnel will be reviewed, and assignment of officers and enlisted personnel to individual units will be made, and the units activated.

The commanding generals of the Service Commands within the United States will be responsible for the administration of all personnel of the army within their respective areas.

In addition to personnel assigned to organized reserve units, there will be a requirement for a large number of officers and enlisted men as a reservoir to constitute the strength needed for expansion of the army in the event of mobilization and as replacements for all components. Such personnel will be trained as individuals or in some cases as composite units.

More than 225,000 officers of World War II have already accepted commissions in the Organized Reserve Corps. Procurement will be continued from ex-officers of World War II, graduates of accredited Senior ROTC units, graduates of officer candidate and aviation cadet training schools, flight officers who served creditably during the war, and specialists, including doctors, ministers, lawyers, and such technical experts as may be required.

Approximately 300,000 men have already enlisted in the Enlisted Reserve Corps, which is part of the Organized Reserve Corps, and it is expected that this figure will be materially increased before demobilization is complete. All enlisted personnel of the armed forces during World War II are eligible for ERC and army personnel may retain their present grade and ratings if they enlist within six months from separation date.

Promotion of officers under the present plan will be based upon length of service in grade, efficiency, and demonstrated command or staff ability at the appropriate level. Promotions for enlisted men will be based on the regulations prescribed for the Regular Army.

The Organized Reserve program is completely voluntary.

Service Medals and Decorations*

THIS is background information to help you recognize the War Department's decorations and medals, and to give you a brief history of each of them. You'll probably want to retain this list for future reference. They are listed in the order of their precedence (the Oak Leaf Cluster being issued in lieu of an additional medal with the precedence of the medal it represents). Also included are the various service medals awarded to Military personnel who have taken part in the campaign or during the emergency period the medals represent. These are earned by honorable service only. Here is the list:

Decorations for Valor and Achievement

Medal of Honor

This, the highest and most rarely awarded decoration conferred by the United States, was established by Act of Congress in 1862. It is awarded in the name of Congress to an officer or enlisted man of the Army, who, in actual conflict with an enemy, distinguishes himself conspicuously by gallantry and intrepidity at the risk of his life and above and beyond the call of duty.

The Medal of Honor is a five-pointed star, surrounded by a laurel wreath, suspended from a bronze bar bearing the inscription, "For Valor," and surmounted by an eagle. In the center of the star is a head of Minerva, encircled by the inscription, "United States of America." On the reverse of the medal are engraved the grade, name, and organization of the recipient, with the place and date of the act for which the award was granted. The ribbon is light blue, with thirteen white stars.

Distinguished Service Cross

Instituted by Congress in 1918, the Distinguished Service Cross is awarded to persons who, while serving in any capacity with the Army of the United States, distinguished themselves by extraordinary heroism in connection with military operations against an armed enemy.

It is a cross of bronze with an eagle on the center. Below the eagle, is a scroll bearing the inscription "For Valor." On the reverse the name of the recipient is engraved within a wreath. Its ribbon is a broad band of blue, bordered on both edges by narrow bands of red and white.

Distinguished Service Medal

Dating also from 1918, this decoration is awarded to persons who, while serving in any capacity with the Army of the United States, distinguished themselves by exceptionally meritorious service to the Government in a duty of great responsibility, and to all enlisted men of the Army to whom the certificate of merit had, on or before July 9, 1918, been granted under the provisions of previously existing law.

The coat of arms of the United States in bronze surrounded by a circle of dark blue enamel bears the inscription "For Distinguished Service" and the year of award. On the reverse is engraved the recipient's name upon a scroll on a trophy of flags and weapons. The ribbon is composed of bands of scarlet, a stripe of dark blue, a band of white, a stripe of dark blue, and a band of scarlet.

The Legion of Merit

The award of the Legion of Merit will be made to outstanding officers and enlisted men of the armed forces of the United States or of friendly foreign nations who shall have distinguished themselves by exceptionally meritorious conduct in the performance of outstanding services.

This decoration, like the Purple Heart, stems from the Badge for Military Merit, America's oldest decoration, established by George Washington in 1782. As was the case with the Badge for Military Merit, it will be awarded for "extraordinary fidelity and essential service." It will constitute a reward for service in a position of responsibility, honorably and well performed.

The design of the Legion of Merit has been developed from the Great Seal of the United States, also approved by Congress in 1782.

The obverse or front of the Badge of the Legion of Merit is a five-pointed American star, of heraldic form, in red and white enamel, centered with a constellation of the 13 original stars on a blue enameled field breaking through a circle of clouds. The star is backed by a laurel wreath, the symbolic award for achievement, which is interlaced with crossed war arrows in gold, pointing outward, representing the protection afforded by the armed forces to the Nation.

On the reverse are the words, "United States of America," inscribed on a circling ribbon. In the center is space left for inscription of the name and rank of the individual to whom the award is made. Surrounding this is a band which carries the words (taken from the reverse of the Great Seal) "Annuit Coeptis" (He (God) has favored our undertakings), and the date MDCCLXXXII, the year of the founding of the decoration. The ribbon is of purple-red color, edged with white.

Silver Star

The Silver Star was not instituted until 1935, but like the Distinguished Service Cross and Distinguished Service Medal is retroactively awarded. It is granted to persons serving in any capacity with the Army cited for gallantry in action which does not warrant the award of a Medal of Honor or the Distinguished Service Cross.

The design is a silver star superimposed on a bronze, star, the rays of the two coinciding. On the reverse is engraved the inscription "For gallantry in action" and the name of the recipient. On the ribbon are stripes of blue, white, blue, white, red, white, blue, white and blue.

*The Reserve Officer.

Distinguished Flying Cross

The Distinguished Flying Cross is awarded to any person, who, while serving in any capacity with the Air Forces of the Army of the United States, subsequent to April 6, 1917, distinguished himself by heroism or extraordinary achievement while participating in an aerial flight. No person is eligible for this award for any act performed prior to November 11, 1918, except (1) Officers or enlisted men who have heretofore been recommended for but have not received the Congressional Medal of Honor, the Distinguished Service Cross or the Distinguished Service Medal; (2) Officers or enlisted men who displayed heroism while serving as instructors or students at flying schools.

On a bronze cross patee is a four-bladed propeller. On the reverse are engraved the grade, name, and organization of the recipient, with the date of award. The ribbon's stripes are blue, white, blue, white, red, white, blue, white and blue.

Soldier's Medal

Instituted in 1926, this decoration is awarded to military personnel of the Army of the United States and to members of the Navy, Marine Corps and foreign military personnel serving with the Army who have distinguished themselves by heroism not involving actual conflict with an enemy.

On a bronze octagon is displayed an eagle standing on a fasces between groups of stars and above a spray of leaves. A shield on the reverse is inscribed "U.S." and supported by sprays of laurel and oak leaves. The words, "Soldier's Medal," "For Valor," and the recipient's name appear as inscriptions. The ribbon is composed of two outside stripes of blue, with the center containing 13 white and red stripes of equal width.

Bronze Star Medal

The Bronze Star Medal was authorized February 4, 1944, by President Roosevelt. It was established for award to any person, who, while serving in any capacity in or with the Army, Navy, Marine Corps, or Coast Guard, on or after December 7, 1941, distinguished, or has distinguished, himself by heroic or meritorious achievement or service, not involving participation in aerial flight, in connection with military or naval operations against an enemy of the United States.

The medal consists of a bronze star, in the center thereof a smaller and raised bronze star, the center lines of all rays of both stars coinciding. On the reverse side of the medal is the inscription "Heroic or meritorious achievement" and a space for the name of the recipient. The star is suspended by a rectangular-shaped metal loop with corners rounded from a silk moire ribbon. The ribbon is of Old Glory Red with a one-eighth inch vertical stripe of Royal Blue in the center. The stripe is separated from the red by white piping and the ribbon is edged with white piping.

No more than one Bronze Star Medal may be awarded to an individual, but for each succeeding heroic or meritorious achievement or service justifying such an award, an Oak Leaf Cluster will be given in lieu of the medal. The award of the Bronze Star may be made posthumously to a designated representative of the deceased.

Air Medal

Authorized by Executive Order of the President in 1942, the Air Medal is awarded to any person who, while serving in any capacity with the Army of the United States subsequent to September 8, 1939, distinguishes himself by meritorious achievement while participating in an aerial flight. This decoration is awarded in those cases where the act of meritorious service does not warrant the award of the Distinguished Flying Cross.

Pendant from a ribbon striped with the Air Corps colors of blue and gold is a fleur-de-lis which surmounts a compass rose. In relief on the rose is a swooping American eagle with lightning bolts clutched in his talons.

Purple Heart

Although originally established by General George Washington in 1782, the Purple Heart was not issued for many years. It was reestablished in 1932. While it was conferred for any singularly meritorious action or service performed in the World War, its award by field commanders is now restricted to its alternate occasion: a wound, which necessitates treatment by a medical officer, and which is received by Army personnel in action with an enemy of the United States. Also a posthumous award of the Purple Heart is made to the next of kin of officers or enlisted men killed in action or who die of wounds received in action.

On a purple enameled heart within a bronze border is a profile head in relief of General George Washington in military uniform; above is his coat of arms between two sprays of leaves in green enamel. On the reverse below a shield and leaves is a raised bronze heart with the inscription, "For Military Merit," and the name of the recipient. The ribbon is purple with white edges.

Good Conduct Medal

This medal is authorized for award to those enlisted men of the Army of the United States, in all its components, who on or after June 28, 1941, honorably completed one year of active Federal military service and who are recommended for the award by their commanding officers for exemplary behavior, efficiency, and fidelity.

Obverse: an eagle with wings displayed and inverted, standing on a sword which rests on a closed book; and encircling design is formed by the words, "Efficiency, Honor, Fidelity." Reverse: Within wreaths of laurel and oak, a five-pointed star above a scroll bearing the words, "For Good Conduct." Ribbon: scarlet, with three white stripes on each side.

Each subsequent additional three-year period (up to five), justifying the award of this medal, entitles the wearer to a bronze clasp in the form of a knot.

Other Decorations

The Fourragere was awarded to organizations of the Army of the United States cited by the French for distinction in the World War. It consists of a single cord, braided and knotted, of yellow and green threads for four citations and of dark green with scarlet threads for two citations, terminated at the shoulder end with a buttonhole and at the free end with a ferret of blue metal. Attached to it are distinctive marks identifying the organization which won it. It is won by officers and men on duty with that organization or, as an individual decoration, by former members of that command who were present on four or two occasions (for the respective types) when citations were made.

Gold wound and service chevrons, earned during the World War and worn on the right and left sleeves respectively, are not authorized for the present war but may continue to be worn during the present war. A gold bar, worn horizontally on the left sleeve, has been authorized to represent six months of overseas service in the present war.

Badges

Badges are awarded in recognition of services rendered by Infantrymen and members of the Medical Department assigned or attached to the Infantry. There are three badges—the Combat Infantryman Badge, the Expert Infantryman Badge and the Medical Badge. Badges do not represent individual feats of valor or achievement but are awarded in recognition of exemplary proficiency in those tasks which are characteristic of the individual's branch of service.

The Combat Infantryman Badge

The Combat Infantryman Badge is won by satisfactory performance of duty in ground combat against the enemy. It consists of a miniature silver rifle mounted on an infantry blue field with silver border, three inches long and one-half inch wide, with a silver wreath extending across the bottom and up the sides of the badge.

The Expert Infantryman Badge

The Expert Infantryman Badge is won by attaining the standards of proficiency established by the War Department. It is a replica of the Combat Infantryman Badge minus the wreath.

The Medical Badge

The Medical Badge is awarded in recognition of the important rôle being performed by medical personnel on duty with infantry units. It is intended that this badge shall be awarded only to those who are daily sharing with the infantry the hazards and hardships of combat. The badge is of silver metal, elliptical in shape with the Medical Department's insigne the caduceus and the Geneva Cross superimposed on a litter surrounded by a wreath of oak leaves.

Service Medals

Designs symbolize the country in which the campaign or service took place or the enemy against whom the war was waged. Similar colors of the enemy nation may appear in the ribbon.

Civil War Campaign Medal

Obverse: head of Lincoln, surrounded by the words, "With malice toward none; with charity for all." Reverse: the words, "Civil War," with the dates, 1861-1865, within a wreath of oak and olive branches. Ribbon: two bands of blue and gray.

Indian Campaign Medal

Obverse: a mounted Indian; above the words, "Indian Wars," and below a buffalo skull and arrowheads. Reverse: a trophy composed of an eagle perched on a cannon supported by crossed flags, rifles, an Indian shield, and a quiver of arrows, spear, a Cuban machete, and a Sulu kris. Ribbon: alternate bands of red and black.

Spanish Campaign Medal

Obverse: a two-towered castle within a circle composed of the words, "War with Spain"; the date, 1898, a branch of tobacco plant and a stalk of sugar cane. Reverse: same as that of the Indian Campaign Medal. Ribbon: two bands of blue, separated by one of yellow, with a border of yellow on each edge.

Spanish War Service Medal

Obverse: sheathed Roman sword on a tablet inscribed, "For Service in the Spanish War." Reverse: coat of arms of the United States, surrounded by a wreath displaying the insignia of the Infantry, Artillery and Cavalry. Ribbon: green with a band of yellow 1/8 inch from each edge.

Army of Cuban Occupation Medal

Obverse: coat of arms of the Cuban Republic, with wreath and fasces, surrounded by the words, "Army of Occupation, Military Government of Cuba"; above the shield the dates, 1898 and 1902. Reverse: same as Indian Campaign Medal. Ribbon: band of red, yellow stripe, band of blue, yellow stripe, band of red, with a border of blue on each edge.

Army of Puerto Rican Occupation Medal

Obverse: two-towered castle and the words, "Army of Occupation, Puerto Rico"; branch of tobacco plant and stalk of sugar cane. Reverse: same as Indian Campaign Medal. Ribbon: band of blue, yellow stripe, band of red, yellow stripe, band of blue, with a border of red on each edge.

Philippine Campaign Medal

Obverse: cocoanut-palm tree; a lamp of knowledge and the scales of justice; the whole surrounded by a circle composed of the words, "Philippine Insurrection," and the date, 1899. Reverse: same as Indian Campaign Medal. Ribbon: broad band of blue between bands of red, with a narrow strip of blue on each edge.

Philippine Congressional Medal

Obverse: Color-bearer with the United States flag and a color guard; on the rim the words "Philippine" and "Insurrection" and below the date, 1899. Reverse: the words, "For patriotism, fortitude, and loyalty," in a wreath of pine and palm. Ribbon: band of blue, with a stripe of white separating it from bands of red, white and blue.

China Campaign Medal

Obverse: the Imperial Chinese five-toed dragon within a circle composed of the words, "China Relief Expedition," with the dates 1900-1901. Reverse: same as Indian Campaign Medal. Ribbon: band of yellow with edges of blue.

Army of Cuban Pacification

Obverse: coat of arms of the Cuban Republic with wreath and fasces, supported by two American soldiers with rifles at parade rest; the words, "Cuban Pacification," and the dates, 1906-1909. Reverse: same as that of Indian Campaign Medal. Ribbon: band of olive drab with a blue stripe separating it from bands of white and red on each edge.

Mexican Service Medal

Obverse: the Mexican yucca plant in flower, with mountains in the background; above the words, "Mexican Service," and the dates, 1911-1917. Reverse: same as Indian Campaign Medal. Ribbon: green stripe, band of yellow, and green stripe.

Mexican Border Service Medal

Obverse: a sheathed Roman sword on a tablet inscribed "For service on the Mexican border." The tablet is surrounded by a wreath. Reverse: same as that of Spanish War Service Medal. Ribbon: green with a yellow band in the center.

Victory Medal

Obverse: a winged Victory. Reverse: the inscription, "The Great War for Civilization," and the coat of arms of the United States surmounted by a fasces, and on either side the names of the allied and associated nations. Ribbon: colors representing two rainbows placed in juxtaposition.

The nineteen clasps authorized to be worn on the ribbon of this medal according to the service of the recipient are: Cambrai, Somme Defensive, Lys, Aisne, Montdidier-Noyon, Champagne-Marne, Aisne-Marne, Somme Offensive, Oise-Aisne, Ypres-Veneto, Defensive Sector, France, Italy, Siberia, Russia, England.

Army of Occupation of Germany Medal

Obverse: profile of General John J. Pershing in uniform of the World War, above four 5-pointed stars; the General's name inscribed on the dexter side, and on the sinister an unsheathed sword, point up; within a laurel wreath the years, 1918 and 1923. Reverse: an eagle with wings spread perched on Castle Erhenbreitstein within a circle composed of the words, "U. S. Army of Occupation of German" and three 5-pointed stars. Ribbon: stripes of blue, red, white, black, white, red, and blue.

American Defense Service Medal

Issued to military personnel on active Federal service of 12 months or longer and who in discharge of such service served at any time between September 8, 1939, and December 7, 1941, Ribbon: yellow with narrow red, white and blue stripes near the edges.

American Theater Campaign Medal

For one year or more service in the United States between December 7, 1941, and September 2, 1945. Also for service less than one year, but more than 30 days, outside of the continental United States and in the American Theater, which included all areas outside the European and Asiatic-Pacific Theaters. Ribbon: blue with narrow red, white and blue stripes in the center, representing the colors of the United States; a combination of narrow black and white stripes, representing the colors of Germany; and narrow red and white stripes representing Japan, near each end.

European-African-Middle Eastern Campaign Medal

For service in the theaters indicated. Ribbon: green for the green fields of Europe, with narrow stripes of United States colors in the center flanked by narrow stripes of the Italian colors of green, white and red near the left end, and by narrow stripes of the German colors near the right end; edges are brown for the sands of the desert.

Asiatic-Pacific Campaign Medal

For service in the theaters indicated. Ribbon: orange, with narrow stripes of United States colors in the center, flanked by narrow stripes of the Japanese colors near each end.

The Medal for Merit for Civilians

The Medal for Merit is the counterpart of the Legion of Merit, for award to civilians.

World War II Occupation Ribbon

For service in Germany, Austria or portions of Italy subsequent to May 8, 1945, and in Japan and Korea after September 2, 1945. Appropriate clasps marked "Germany" and "Japan" have been authorized to be attached to the ribbon of the medal to denote service in Europe and the Far East. Service performed between September 3, 1945, and March 2, 1946, both dates inclusive, with the Army of Occupation of Japan and (or) Korea will be counted only if the Asiatic-Pacific Campaign Medal has been awarded for service prior to September 3, 1945. Ribbon: white, 3/16-inch wide; black, ½-inch wide; red, ½-inch wide; and white, 3/16-inch wide. The service ribbon will be worn immediately after the World War II Victory Medal service ribbon.

The Proper Wearing of Service Ribbons

*by Major Hal D. Steward**

HIDDEN deep in the masses of Army Regulations, War Department Circulars, changes to regulations, etc., are the rules governing the correct wearing of Service Ribbons. Because of inaccessible information, many members of the military service today are seen wearing service ribbons improperly.

A total of 1,725,344 Army decorations and awards were made to Army personnel from December 7, 1941, through November 30, 1945, the War Department has announced. In addition to this, millions of Theater ribbons were also awarded.

Taking for granted that each member of the service knows exactly what ribbons he is entitled to wear then the problem of assembling them and placing them in the correct position on the uniform presents itself.

Ribbons for decorations and service have an established precedence with the Congressional Medal of Honor ranking the highest. They are placed on the uniform according to the following precedence long set by the War Department:

1. Medal of Honor; 2. Distinguished Service Cross; 3. Distinguished Service Medal; 4. Silver Star; 5. Legion of Merit; 6. Distinguished Flying Cross; 7. Soldier's Medal; 8. Bronze Star Medal; 9. Air Medal; 10. Commendation Ribbon; 11. Purple Heart; 12. Medal for Merit (civilian award); and 13. Good Conduct Medal.

Service ribbons awarded for service in Theaters of Operations are placed in the proper position according to the date they were awarded. In other words, the service ribbon awarded you first ranks the highest in position on the uniform.

In placing the ribbons on the uniform the most junior ribbon is placed on the bottom row and to the wearer's left. The senior ranking ribbon is placed on the top row and to the wearer's right. Seniority of colors is also involved in placing ribbons in the proper place. Blue, the senior color, is always worn to the right.

Foreign decorations and service ribbons rank below all American ribbons and therefore must always be placed on the bottom row and to the left.

The normal number of ribbons in a row is three. If there are too many rows, four may be placed in each row. The shortest row is always on top and centered. Ribbons are centered above the left breast pocket with one-eighth of an inch between the pocket-flap seam and the first row. If more than one row is worn there should be a space of one-eighth of an inch between each row. Badges are worn on the left breast above the line of service ribbons.

Let us, for an example, suppose a serviceman is entitled to the Silver Star, Bronze Star Medal, Purple Heart, Good Conduct Medal, Asiatic-Pacific Theater Ribbon, American Theater Ribbon, Victory Ribbon and Philippines Liberation Ribbon. They would be ranked on the uniform in the order just mentioned. The Silver Star and Bronze Star would be on the top row, centered, with the Silver Star on the wearer's right. The second row would be from right to left: Purple Heart, Good Conduct Medal and Asiatic-Pacific Theater Ribbon. The third and bottom row from right to left would be: American Theater Ribbon, Victory Ribbon and the Philippines Liberation Ribbon, which is a foreign award.

Battle stars are placed on the service ribbons with the points down. The arrowhead, which is given for an assault landing, is worn on the ribbon with the arrow point up.

One point of interest to Enlisted Men who have joined the Regular Army after serving on active duty during World War II as a commissioned officer is the change in Army Regulations allowing former officers of the recent war as well as World War I to wear a band of forest green braid around both sleeves of the service coat and short overcoat. This green braid will be one-half an inch wide and the lower edge of the braid will be three inches from the end of the sleeve.

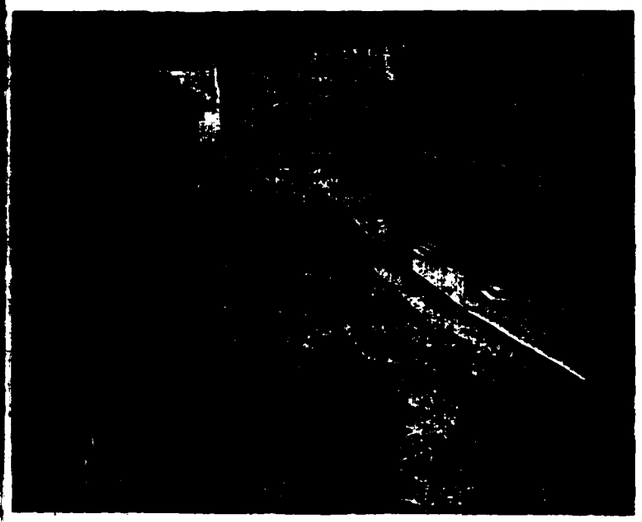
When a new ribbon is awarded, a rearrangement of all the ribbons senior to this new award must be made so that it will be in its proper place.

"Decorations are awarded in recognition of and as a reward for extraordinary, unusual, or outstanding acts or services and are cherished accordingly by the recipients," according to Army Regulations 600-45, dated September 22, 1943. This regulation with its current changes will keep you posted on the award of ribbons and their precedence.

The Congressional Medal of Honor and Purple Heart are not awarded to personnel of foreign nations. The Distinguished Service Cross and Legion of Merit can be awarded to foreigners only after the approval of the President. The Medal of Honor, Distinguished Flying Cross and Soldier's Medal cannot be awarded to civilians.

*Press Branch, War Department, Bureau of Public Relations.

Vehicles of the 13th Armored Division, Third U. S. Army, pass along road to Braunau, Germany, while hundreds of captured Germans wait by the roadside.



Tanks of the 14th Armored Division roll into newly captured Eichstatt, Germany, with other U. S. Third Army elements. April 25, 1945.

THE 16TH ARMORED DIVISION

Since no action pictures of the 16th Armored Division were available—probably because it reached the ETO in time to be in combat only one day—a brief history of the Division is given here. This concludes a series of photos and brief histories of all armored divisions which has been published in The Cavalry Journal.

The 16th Armored Division was activated in July, 1943, at Camp Chaffee, Arkansas, where it remained throughout its training.

It left the United States in January, 1945, for the European Theater of Operations, its components at the time consisting of the 395th, 396th and 397th Armored Field Artillery Battalions; 5th, 16th and 26th Tank Battalions; 18th, 64th and 69th Armored Infantry Battalions.

Arriving in France on February 5, 1945, and assigned to the Third Army, the Division entered combat on May 6 when it launched its assault on the city of Pilsen, furthest point of American penetration into Czechoslovakia. The city was taken during the Division's one day of combat, during which it rounded up 8,000 prisoners and many civilians fleeing the Russians. It subsequently was stationed at Pilsen.

ARMORED DIVISIONS IN WORLD WAR II

(Conclusion)

Signal Corps Photos

U. S. Seventh Army tanks of the 20th Armored Division, XV Corps, line up a street in Munich in preparation for advance into the heart of the city. 45th Infantry Division, Germany. April 30, 1945.

THE CONQUEST OF THE MISSOURI. By Joseph Mills Hanson. Murray Hill Books, Inc. $3.50.

This is one of the classic narratives of the American West, first published in 1909. This re-issue will undoubtedly meet a welcome audience of both old friends and new. Joseph Mills Hanson tells the story of the opening of the Northwest conveying to the reader the prevailing spirit of zest and enterprise. The story is told through the reminiscenses of Captain Grant Marsh, one of the greatest river pilots ever to navigate the Missouri—reminiscences of the years when the Northwest was being transformed from a lonesome wilderness inhabited by elk, buffalo, and hostile Indians, and small isolated forts and settlements to the mining and agricultural region of our time.

Through Captain Marsh, one learns of the surveying of the upper reaches of the Missouri, the Big Horn and Little Big Horn rivers, and the Yellowstone Valley, of the disastrous campaign of Custer's Seventh Cavalry, of the campaigns of General Terry and General Miles against the Indians, and of such things as the coming of the railroads and river boat races.

You will enjoy this complete account of the Missouri region from 1864 to 1883 if you read it for the first time, and welcome it as an old friend if you have read it before.

* * *

AMERICANS: A Book of Lives. By Hermann Hagedorn. John Day. $5.00.

Here is a volume of short biographical sketches of seventeen great Americans, Mark Twain, Oliver Wendell Holmes, Thomas A. Edison, Luther Burbank, Booker T. Washington, Theodore Roosevelt, Woodrow Wilson, Jane Addams, John Dewey, Louis D. Brandeis, George Washington Carver, Henry Ford, Helen Keller, Will Rogers, Herbert Hoover, Franklin Roosevelt, and Wendell Willkie. They are linked together to form an almost continuous story of great lives lived in the United States during the twentieth century. These seventeen lives are interwoven into a personalized history of the nation during the full century in which they lived. Beginning with the opening of the West (the life of Mark Twain), it takes the reader through the Civil War (the life of Holmes), and the industrial era (Carver, Edison, and Ford), and through World War II (with Franklin Roosevelt and Wendell Willkie).

These stories of great lives lived in the United States during the twentieth century were originally intended for publication abroad, as a step toward international understanding, but are now offered also to readers within the United States. These National sagas, familiar and dear to the heart of Americans will make a welcome addition to any library. The book can be read and enjoyed, just as one enjoys old friends.

ALL DOGS GO TO HEAVEN. By Beth Brown. Frederick Fell and Company. $2.50.

Have you ever heard the question spoken from young, inquisitive lips, "Mommy, will Rags go to heaven when he dies"; or perhaps had the self-same question occur to you? The ever-faithful, loving dog who is a true friend no matter what, the playful little puppy who drags away shoes and is generally a lovable nuisance—what happens to their personalities when death suddenly strikes? If you've lost a beloved dog, if you've longed for a pet you've never had, if you enjoy your own special dog's friendship from day to day, then you'll welcome this story by Beth Brown. It is the story of twelve little dogs in particular and all dogs in general. They live for you in a pet cemetery and speak to say that there is no death. There is only life in another form. You have not lost your dog; they are never lost.

This is the story of Hobo, who is welcomed to "Dog Heaven" by Old Buck, the patriarch; of little Rowdy, who left his earthly life when yet a pup; of Tramp, who still likes to drink beer with his master; and of frivolous, young Gwendolyn, the vamp. Hobo learns to overcome his sorrow at leaving his mistress and, in a loving dog-like manner, to soften his grief. He in turn welcomes others to the cemetery, among them Champ, the movie dog, and Young Buck, who lost his life in the war. Each dog lives for you in the pages of the book, and, though you may never have had a dog you'll find a warm spot in your heart for some canine—perhaps just a stray mutt you pass on the street.

This is a book for young and old. You will want to read and own it; above all, you will want your children, from youngest to oldest, to know its story. It is an ideal gift to a youngster for birthday or Christmas.

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LAST CHAPTER. By Ernie Pyle. Henry Holt and Company. $2.50.

Ernie Pyle, the most popular and widely read of war correspondents, pioneered in war reporting and, in bringing the war home to the people, made it real to millions for whom it had been too vast to comprehend. He accomplished this by his contact with the GI, by asking him how war felt, by living with him and sharing his experiences. *Here Is Your War* sold 1,320,000 copies, *Brave Men* 1,300,000 copies. When the European war was over, Pyle did not rest on his laurels, as well he might, but set off for the Pacific war, and here wrote his final book of war reporting. At best it is only a fragment—written as he went along while his memories were fresh—cut short by a Japanese bullet in the first part of the Okinawa campaign.

In *Last Chapter*, as in his other books, Ernie Pyle writes of the war with all honesty and no pretensions, seeing and telling the little things about war—the unheroic as well as the heroic, and thus making war become real. He reports the fight the way he saw it; he relates personal incidents; he names names and gives addresses; and, through it all, his facts have a sort of compassionate and wistful truth.

Of this brief, brave book—to which an Associated Press Correspondent wrote the last lines, "April 18—Ernie Pyle . . . was killed by a Japanese bullet through his left temple this morning."—and its author, the *New York Times* says, "Many of Ernie's stories were gotten at the risk of never living to write them. The whole Army, to him, was a sort of Lost Battalion which he rescued from the No-Man's-Land of the communiqué to bring as close to home as the written word can do. And it is not unfitting that out of all this Army he should have stayed with those who will not come back. He did not choose this—no soldier ever does. In his own words: 'They died and others lived and nobody knows why it is so. They died and thereby the rest of us can go on and on.'"

* * *

WRATH IN BURMA. By Fred Eldridge. Doubleday & Company, Inc. $3.00.

Among the unique personalities of World War II stands "Vinegar Joe" Stilwell—the General who was the central and dominating figure of the war in the Far East, the friend of the GI who marched with his men and led them over insurmountable difficulties, the determined and angry man who, after retreat from Burma, was not afraid to say, "We got the hell licked out of us." With this personality Fred Eldridge has embued *Wrath In Burma*. The book gives the reader the feeling that he was there, sharing with General Stilwell the trials and difficulties of this campaign. "Vinegar Joe" was never a brass hat, and this story is alive with anecdotes from his everyday life. Its pages are brightened by such characters as Braud, who drove the "Gen'l's" jeep, Buttercup, Stilwell's Chinese orderly, and Sergeant Jules (Gus) Reynault, his cook. It is full of incidents that tell why the men of the CBI were deep in sadness and gloom on receiving word of Stilwell's recall.

Though built around General Stilwell, the book is a political history of Asia as well. It is not a soft book; it faces the uncensored facts in an attempt to bring clarity and coherence to the controversy that raged over the management of affairs in the Far East. It is a story about how the United Nations should not get along. The writer endeavors to show the reader and the United Nations that in order to gain harmony, first and foremost, agreements must be kept. He tells frankly how the British and Chinese impeded harmony in the Far East by failing to keep agreements—facts that were not generally known in America before the end of the war.

This is another well-written phase of World War II—one that contributes greatly to the complete picture, but aside from that it is a story you will want to read for pure enjoyment.

* * *

TRAIL DUST AND SADDLE LEATHER. By Jo Mora. Charles Scribner's Sons. $3.00.

Jo Mora was born in Uruguay in 1876 but came to the United States when a child. He was educated in Massachusetts and studied art in New York. After several years of work as a newspaper artist, he went to the west and southwest to study the Hopi and Navajo Indians, and there he stayed. *Trail Dust and Saddle Leather* is a book about the West, about the cowboy—his origin and his working tools—about western lore in general. Why did he write the book? This question is answered clearly in the preface.

"A great wave for 'riding Western on Western-broke horses with Western rigs' is sweeping the country. Today you'll find rodeos well patronized in the extreme East, and the fiesta silver-mounted stock saddle is no stranger in that fringe, where, but a few years ago, most folks there only knew that cowboys rode on a big, funny sort of cradle with a great, round, flat-topped doodad sticking up in front. Half of them did not know whether this was used as an emergency field writing desk or a permanent tray for their afternoon tea when exacting range duties kept these semiwild muchachos in the saddle.

"It was to clear up so many of these natural misconceptions, and to answer ever-increasing requests to describe in greater detail the various tools and accoutrements of the cowboy, with their genesis and evolution, that I was spurred on to write and illustrate this book."

This is a book about waddies, vaqueros, Buckaroos, Punchers, Cattlemen, Cowmen, Cowhands, Cowpokes, and Cowpunchers—how they work and how they live, and how their art has developed through the years. It is cleverly illustrated with drawings by the author, of the cowboy, himself, his techniques and his tools. You will read the book for enjoyment, but you may be sure that, when you have finished, you will know a lot about the West.

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THE ARMY WRITER. By David Klein. Military Service Publishing Company.

This is a book for anyone in the army who writes—every commissioned officer, every first sergeant, every clerk in every headquarters. It tells how to write correctly, easily, and so accurately that there is no danger of misinterpretation. Grammar is presented, not in the dusty, dry manner of textbooks, but as a means of making words mean to the reader what they mean to the writer. Mr. Klein offers a cure for the "mysterious malady of speech that attacks many an officer when he first chews his pencil in composing a military memorandum. . . . The victim of this disease can be readily recognized by his writings. He never 'begins' anything; he either 'initiates,' 'inaugurates,' or 'commences' it." In this brief and clearly written volume, the author shows the army writer how to avoid the stilted, long-winded military form and give himself "At Ease." For instance: "*The transfer of ordnance equipment may be accomplished by means of the execution of a shipping ticket by the property officer concerned,*" really means "*A property officer may transfer ordnance equipment by making out a shipping ticket.*" He points out common faults which invite misinterpretation. "*In order to insure minimum injuries to crew members, bombs must be stacked neatly,*" and "*Hooks seldom break but usually fail by straightening under the load.*" This book, well indexed for easy reference, is a welcome deskside companion and one to be read for pleasure as well. An attractive feature is the last chapter, "In Business for Yourself," dealing with private writing. Even though writing may not be a part of your army routine this is a book for you. Whether you like to write, need to write, or have to write, *The Army Writer* will prove valuable.

* * *

COME OUT FIGHTING. By John Durant and Edward Rice. Duell, Sloan, and Pearce. $3.00.

Just as the title implies, this is a book about fighting. It is a pictorial history of the ring, containing over 200 prints and photographs, selected by Edward Rice, combined with text and captions by John Durant. Of interest, too, is the foreword by Quentin Reynolds. The authors give the history of pugilism from its beginnings with the Greeks to our time. They tell the stories of such great ring personalities as John L. Sullivan, Gentleman Jim Corbett, Ruby Bob Fitzsimmons, Dempsey, Tunney, and Joe Louis. They answer many questions, and among them, perhaps is an answer you've been wondering about.

As Quentin Reynolds says, "If you are one of us who sits tense just before the bell rings and for whom time stops when the referee, gray-clad and pale-faced under the piercing white lights, says "Come out fighting," you'll read this book with interest and excitement. And if you've never seen a fight before, nor read about one, nor looked at a fight picture, this is the book that will initiate you into the fraternity of fight fans."

EMPIRE AND THE SEA. By Fletcher Pratt. Henry Holt and Company. $3.50.

In this book Fletcher Pratt tells the story of British naval warfare from 1793 to 1805—twelve years which saw many engagements at sea, some large, others small. Beginning with the younger Mr. Pitt's request for war against the growing strength of the new French Republic, it tells of the "Glorious First of June," Aboukir, Copenhagen, Cape St. Vincent, and Trafalgar and the naval geniuses, Nelson, Jervis, Howe, and Hood. These were the men and battles that saved England from invasion, contributed to the downfall of Napoleon, and established Britain as ruler of the seas. An interesting picture of troubles with Ireland, mutinies in the channel fleet, difficulties over food and supplies, and political feuds is presented. A full and interesting account is given of the Battle of Trafalgar, which cost Lord Nelson his life but marked the beginning of the British Empire.

The author, well-known as a naval historian, has provided a clear and authentic account of war at sea.

* * *

THE AMERICAN. By Howard Fast. Duell, Sloan, & Pearce, Inc. $3.00.

This is the story of John Peter Altgeld of Illinois—the story of his rise from his lowly, uneducated beginnings on the farm of his immigrant parents to wealth and political power—the story of his sacrifice of money and position to champion democracy.

The Father of John Peter Altgeld was a hard man; between him and his son there was no love, only fear and too frequent and too hard punishment. Thus Altgeld's youth was spent with hard work, beatings, and only meager schooling. Then came the Civil War; and the youth, drawn by the glamour and the novelty, driven by a desire to escape his father, went to war. His war years were followed by more hard work—on his own now—in a struggle to become a successful lawyer and politician. With this success Altgeld's real story begins; now he emerges as a great American hero touching off a struggle between democracy and the forces that be, for as Governor of Illinois, he pardoned the convicted Haymarket anarchists. Before his defeat he captured the Democratic Party from Grover Cleveland and defied every newspaper in the land, winning an abiding place in the hearts of the American people. This is not the end however; his last days are even more dramatic, and it is now that he stands forth as the truly great *American*.

Howard Fast is a young novelist of great achievements, and *The American* is, perhaps, his best and warmest book. He has presented an intriguing portrait, against the background of America's coming of age, which hold one's interest from beginning to end.

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Doughboys and tanks going into action in the Philippines. This photo was salvaged from the camera of Lieutenant Robert Fields, Signal Corps Photographer, who was killed in action shortly after the picture was made.

Signal Corps Photo

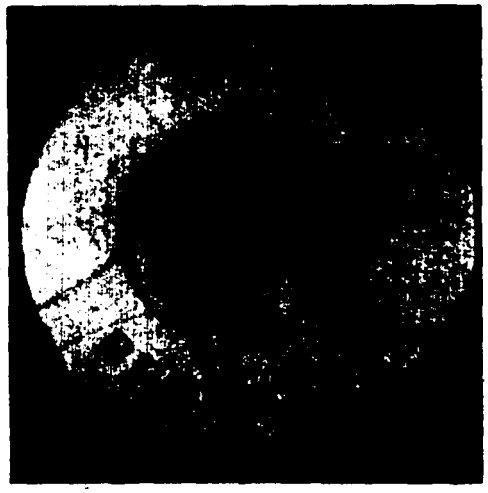
SEPTEMBER-OCTOBER, 1946

The Saga of Number 311

by Lieutenant Commander Norman Myrick, USNR

The hog fanciers knew her as a promising Duroc. The Crossroads scientists on the laboratory ship *Burleson* knew her as a number. The society with the long name knew her as a challenge.

She was a California pig who joined the Navy in company with several thousand other animals, pigs, goats, rats, guinea pigs, to serve as living instruments in the task of tracking down the secrets of nuclear fission. Like all good sailors she was given a number and a battle station. The number was three eleven, the battle station, the Japanese cruiser *Sakawa*.



On the morning of 1 July 1946 the little pig was a nobody. On the morning of 3 July 1946 she was a porcine celebrity. Such is the effervescent nature of fame. It happened in this fashion.

The *Sakawa* was anchored in Bikini Lagoon among the Marshall Islands. Surrounding her were some twenty-two other ships designated as targets for the Atomic Bomb. At nine o'clock on the morning of July 1 the bombardier of Dave's Dream, a B-29 airplane, pressed his release button and the first atomic bomb ever to be released against naval craft arced down on the target fleet. The *Sakawa* was sorely hurt and the following day she slid quietly under the waters of the Lagoon to keep a rendezvous long overdue. About four hours after the *Sakawa* went down the crew of a salvage boat found a pig swimming in the radioactive waters of the Atoll in the vicinity of the *Sakawa's* demise. It was number 311.

The little pig was picked up and taken back to the *Burleson*. The skill and knowledge of the nation's foremost scientists were mobilized to aid in the long struggle for survival that was to follow. On the U.S.S. *Appalachian*, Crossroads Press Ship, one hundred and twenty newsmen fed the story to the four corners of the world. Here was a heroine who had met the thunder of the atom and survived. Here was one who had swum in waters fairly sparkling with radioactivity and lived to grunt about it. Here was a story. The science people saw a profound significance in the pig's deliverance. The sob sisters found a great pig-interest story and the breeders of hogs from Maine to California grew expansive in the golden noonday of pig publicity. At Dallas the authorities made a bid for her personal appearance at the State Fair. At Seattle a swimming race exclusively for pigs, known as the Bikini Derby, celebrated her triumph over the atomic bomb. On the *Burleson* the bitter fight for life went on without surcease.

The will to live was strong in the little pig. The medical resources of a Joint Task Force are formidable. The old man with the scythe was forced to retire. The recovery was complete. Indeed there was talk that the heroine will soon fulfill her destiny as a girl pig. It is said that the patter of little pig's feet, perhaps somewhat radioactive, will bring added luster to the proud number of three hundred and eleven.

Whether or not the little pig resents this intrusion into the most intimate corners of her privacy we do not know. All that we do know is that she who was doomed to die in the interests of science and the atomic bomb has taken her place with the little pig that went to market and the conqueror of the big, bad wolf, among the pigdom immortals.

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by Captain G. Andrew, Jr.

Captain George S. Andrew, Jr. is one of the most exciting and interesting patrol stories to come out of World War II. This is the story of 36 American soldiers in their fight against a Jap-infested jungle. Captain Andrew is now establishing himself as a professional writer. See his story "The 41st Didn't Take Prisoners" in the July 27, 1946, issue of Saturday Evening Post.

YES, there're Japs in there, alright."

The stocky lieutenant sat down on a camp stool and looked ruefully at his bandaged hand.

The captain didn't say anything. Out in front of the troop headquarters tent an ambulance crew was loading into their vehicle a litter case, a wounded native and a walking casualty.

The captain was annoyed. Not because his patrol had been ambushed right on top of its objective, but because the man on the litter, with his guts full of grenade, was to have been made a first sergeant tomorrow. Patrols sometimes got themselves ambushed, but good First Sergeants were hard to come by, what with rotation, and jaundice, and Jeez knows what-all. Anyway, it was starting to rain again—great big drops that fell like tracers through the headlight beams of the ambulance. It was after midnight, and the patrol had spent most of the day and half the night bringing the wounded men back through the jungle to the camp on the beachhead.

The captain turned back to the lieutenant. "What happened?"

"In brief," answered the lieutenant, "we reached the ridge in front of Saoeri the second day, and left the trail to cut our way through the woods. After circling around to our right front, we climbed those damn coral cliffs and started down the other side, moving back in to where we thought the left flank of the Jap perimeter should be. Pretty soon Eddie, who was point man with a native, spotted a Jap getting water from a well at the foot of the ridge. We get ready to move in and give that 'skivvy' the heave-ho when all hell breaks loose. They had a machine gun in a tree, and there must have been other guys in the other trees right over us. They started dropping grenades on top of us like they were pickin' apples in an orchard. That first Jap stands up, and Eddie knocks him into the well with one shot. About that time a grenade lands at my sergeant's feet, and he dives sideways just in time to catch a lot of splinters in mid-air. Then somebody back in the rear guard uses his head and starts launching rifle frags into the tree tops in front of us. We hear a squawk and see another Jap dive down from the top branches. A knee mortar starts working on us, and our natives 'go to the bush', after chucking our radio down the cliff where we can't get it."

The lieutenant stopped his story a moment, fished a rather damp cigarette from his jacket pocket, and continued: "About that time I figure we've found out where one flank is anyway, so we scoop up the sergeant and get the hell out of there. Sometime later, it seems like a long time later, too, we get back to the trail and throw up a perimeter of our own while the medic works on my sergeant. Eddie needed some patchin', too. Then the medic says the sergeant is in bad shape and might need a surgeon. It's a question of spending a few more hours nibbling around those Japs while Bill bleeds, or of starting for home right now. We build a litter and start for home. If you think that jungle's rough travel-in the daytime, you should try it after dark—particularly that damn swamp. We wouldn't have made it before morning if Miller and his boys hadn't come out with flashlights to meet us, after the native brought you the message. Boy," he added, "am I bushed!"

A trickle of rain began to seep across the headquarters tent floor, and a dozen or so little green bugs buzzed around the Coleman lantern.

"Okay, Lee," the CO said, "get some sleep, and you and the clerk write a detailed report first thing in the morning. I'll see G-2 tomorrow, but I don't think he's going to like it too much."

G-2 was not overjoyed; neither was G-3. Here it was July 23, 1944, the Biak operation was supposed to be history by now—according to the papers back home—and yet native reports kept coming in to division headquarters which told of organized enemy groups gathering in isolated coastal villages on the other side of the island. Fifty Japs here, fifty Japs there . . . it all added up to more trouble, since these Japs seemed to be well armed, aggressive, and in some cases well stocked with rations which had been dispersed all over the island some weeks before D Day. Then there was that Jap battalion which had not been committed during the fight for the air strips. Prisoners said it had withdrawn to the north coast of Biak, and had evacuated large quantities of food and ammunition to an obscure place called Saoeri. Captured documents indicated a plan whereby the defeated enemy was to rally in platoon and company groups, each with an assigned village, garden, or jungle area. By keeping hidden from air observation, living from the produce of inland gardens and hidden ration dumps, and by maintaining contact by a well organized system of runners, these Japanese troops would rendezvous in the near future and launch a last, surprise *banzai* attack to drive the Americans back into the sea.

The enemy plan was, of course, a forlorn hope. Biak was taken from the Japanese Army for good and all. But G-2 and G-3, now in their second year of fighting Japs, could see how these enemy remnants—if given the opportunity to reorganize—might some night play hob with the efficient operation of an air base. It was impossible to throw a closely knit perimeter around miles of air strips, docks, dumps, hospitals, and beach installations. And those big, shiny bombers in the dispersal bays, the great stacks of gasoline drums, and the palatial encampments of the 5th Air Force, certainly were a temptation to any raiding body of troops—particularly troops with as much fight left in them as this gang of Japs seemed to have.

Early in the game it was evident to G-2 and G-3 that the future "rendezvousing" of the scattered enemy must never be permitted. But how? Of course, you could comb the whole island with large fighting patrols, but the poor Doughs had been pushing Japs around ever since the division went after Hollandia and Aitape months ago. In that time, the division pulled four full-scale assault landings in 36 days. In short, the men were tired, many were sick, and the division was waiting for badly needed replacements. Couldn't some other means of mopping up these Nips be found?

G-2 and G-3 thought, looked at the maps and then at each other, watched a squadron of fighters circling to land on the recently captured strips, and came up with a plan. The air-liaison officer was called in.

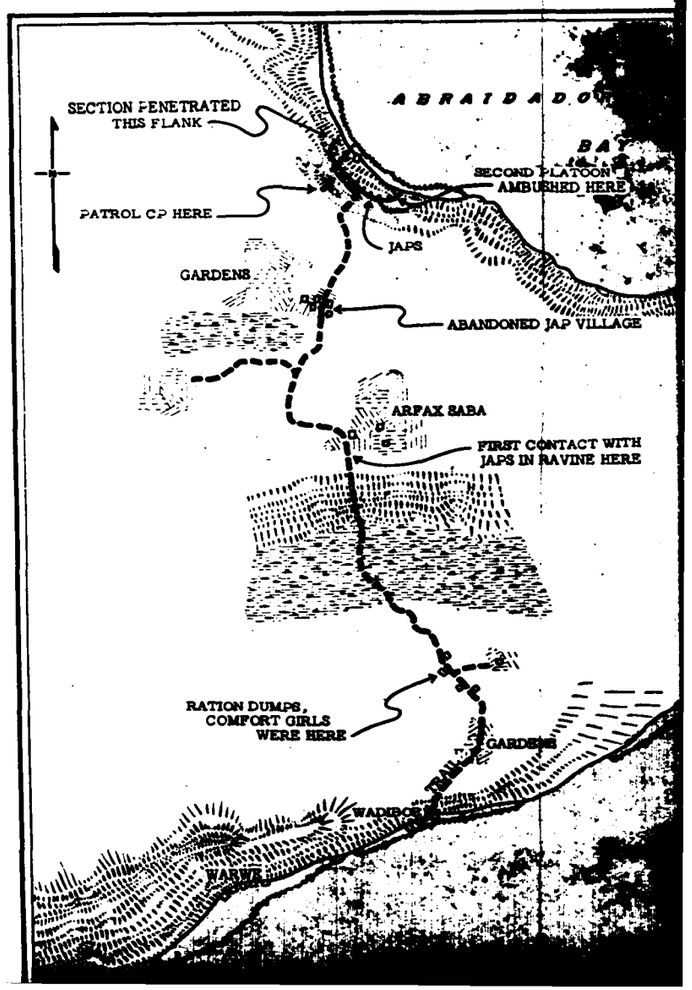
"Out there," said G-2, making a vague sweep of his arm toward the interior of the island, "are Japs. Lotsa little Japs hiding in bunches in the jungle."

Air-liaison blinked and nodded.

"If," said G-3, moving in for the kill, "if we found 'em, could your fighters bomb 'em?"

"Sure," said air-liaison.

Thus a strategy had been devised whereby reconnaissance patrols, investigating native reports, would locate the many enemy bivouacs, mark the locations on maps or air photos, then stand back while fighter-bombers encouraged the Jap troops to seek residence elsewhere. The plan was a good one. The Japs, reasoned G-2, are tired and somewhat discouraged, and they aren't eating too well. They don't like to be strafed. If they know our air force knows where to find them, they will keep moving. If they keep moving, they will become more



tired and discouraged. If they become more tired and discouraged they will stop moving rations from one spot to the next. If they stop moving rations they will starve, get weak, get sick, and die. If that happens, there will be no big *banzai* on the air base some night. Then, when we get our replacements, we can break them in on jungle fighting by letting them mop up the remnants.

It was a result of this strategy that brought the CO of the division reconnaissance troop to division headquarters the morning after his patrol had brought in their wounded. It was true, he told G-2 and G-3, that there were Japs at Saoeri, just as the natives said. They were somewhere up on the forest-covered cliffs overlooking Abraididori Bay. How many, he couldn't say, but they were apparently well armed, had grenades, maybe a knee mortar, and at least one machine gun. And because this machine gun was in a tree, it was a safe bet that there were few others on the ground. "The left flank of their position is about here," said the captain, pointing to a spot on an air photo. He could, he added, take his whole troop up and drive them out, but in those cliffs it would be tough, and he would need better supply and evacuation than it seemed possible to provide.

Again G-2 and G-3 considered. Saoeri was more rightly described as an "area," rather than a village, located on the shore of Abraididori Bay at the northeast tip of Biak Island. Behind a scimitar of palm trees that shaded the beach, and about 100 yards from the water's edge, a series of jungle-covered, coral cliffs rose in terraces reaching 200 to 300 feet above both the coast and the inland terrain. As on most of Biak, these cliffs formed a natural parapet which ringed the edge of the island, and guarded the comparatively flat, inland forest and swamps. Air photos of the area showed two native houses on the beach, and a trail which came from the interior, disappeared into the vegetation of the ridge, and reappeared again on the beach side some 200 yards or so farther to the west. Perhaps, reasoned the photo interpreters, the trail climbed the cliffs from the inland side, turned to the left and followed the top of the ridge for 200 yards, and then dropped down to the bay. "Any way," they said, "if there are Japs at Saoeri they are probably near the trail where it crosses the ridge, for we can't see anything else in these pictures.

No one had ever been to Saoeri except a few natives, and the recon patrol that was there long enough the day before to get a quick look and be ambushed. As the crow flies, Saoeri was only 10 miles from the beachhead, or six miles from the friendly native village of Wadiboe, which could be reached by truck. But American soldiers are not crows, and the trail that crossed the island from Wadiboe to Saoeri was not one to encourage Sunday afternoon strolling.

G-2 and G-3 regarded the recon captain. "Look," they said, "we don't want to start another war on the other side of the island just to chase out maybe only 50 lousy Japs. Just send another patrol to Saoeri, let them find the front and other flank of the Jap position, have them draw a circle on this air photo, and we will let the 5th Air Force lay eggs on it." And so saying they left for their afternoon swim off the reef at Bosnek.

The second patrol to Saoeri was going out loaded for bear. Upon his return to camp, the captain had summoned his most experienced platoon-leader-lieutenant away from a fast game of cribbage. "Look," he said, in the words of the staff, "leave for Saoeri tomorrow with a good strong force. Be back in three days to mark some Japs on this photo." Then he left for his swim off the reef.

The lieutenant called in his platoon sergeant. "Look," he said, "we are leaving for Saoeri tomorrow to locate those Japs on the ridge. Alert our boys, a section from the 1st Platoon, two aide men, and a squad of machine gunners. Have our operators tune up an SCR 284. Send an interpreter to Wadiboe to line up some natives to carry the radio and rations, and get three sound-power phones and a mile of combat wire. Have the non-coms report to me here."

A short time later the platoon sergeant, three section sergeants, and a machine-gun corporal were grouped around a plank table with the lieutenant. The air photo was passing from experienced hand to hand until the officer retrieved it and uncurled its edges on the table along with the not-too-accurate map of western Biak.

"As you probably know," said the lieutenant, "we are going to that place on the other side of the island where the 2d Platoon got shot up yesterday."

The noncoms nodded wisely and waited.

"According to G-2," the officer continued, "natives report at least 50 Japs and maybe more at this place called Saoeri." The lieutenant indicated the map. "Also, G-2 says there is a Jap battalion, or part of it, dispersed in groups somewhere in this part of the island. The Saoeri Japs are probably part of it. This battalion has not done much fighting, if any, since we landed, and should be in pretty good shape. Midway between this side of the island and Saoeri is a place called Arfax-Saba —which is a native garden area. Just beyond that, the Nips built a large village and recreation area. According to the best of speculation, these Japs we are after were in the rest area when we landed. But instead of coming down here to fight they are supposed to have taken all the rations and other truck from the village and withdrawn to the north coast of the island. Some of the rations are supposed to be stored at Saoeri."

Somebody was passing cigarettes and the lieutenant took one as the pack went by.

"Now," he continued, using a burnt match as a pointer, "the 2d Platoon followed a cross-island trail to about here," he pointed at the map, then circled through the jungle to the right, climbed the ridge, and ran into trouble about here." There really may not be many Japs at Saoeri, but even a few—if they're dug in and in caves—can cause a lot of trouble if you try to dig

them out. Besides, you know they probably have some machine guns."

Again the noncoms nodded, and looked even more wise.

"But!" And the lieutenant beamed, "We are not going to attack this bunch of skivvies—the air corps is—all we have to do is find exactly where they are!"

No comment from his audience, but a couple of sardonic grins were in evidence.

"Now I've got a plan, and if any of you guys have a better one, let's hear it. Tomorrow morning we will pick up some native scouts and carriers at Wadiboe, cross the island, and follow this trail to where it starts over the ridge at Saoeri. We should get there the second day, because we'll take it easy. I think that the Saoeri Japs probably have a perimeter, bivouac, or something grouped around that part of the trail. It must run along the top of the ridge before it drops down the other side to the bay. The 2d Platoon ran into trouble on the ridge not far to the right of where the trail disappears. Now, we'll leave the trail on the *left* side at the base of the ridge, and set up a small perimeter of platoon headquarters and a section in the bush. Then one section will climb the ridge directly to our front, and, if I am right, it will bump into the center of the Jap establishment. Another section will move along the base of the ridge—and parallel to where I think the trail must be on top—until the sergeant thinks he is past the point where the trail turns down to the bay. Then that section will climb the ridge to the top, turn back to the right again, and work its way down the crest until it contacts the enemy flank. We will take sound-power phones, and the two sections will lay combat wire as they go. We will have a radio to keep in touch with troop headquarters, and I will want progress reports as you go. Besides, once the wire is laid, you can follow it back down the ridge and eliminate the chance of getting lost in those weeds. Are there any questions so far?"

A short discussion ensued, the upshot of it being that the plan couldn't be so bad if no one was dumb enough to get his tail shot off in its execution. With that fine point decided, the lieutenant talked for awhile about rations, ammunition, when to be ready to leave in the morning, and finally dismissed the men.

The noncoms went off, first to talk with their men, and then to swim off the reef. The lieutenant didn't go swimming that day. He was on the field phone trying to talk division artillery into flying him over Saoeri that afternoon in an artillery liaison plane.

The morning dawned bright and dry. Before the breakfast mess kits had been rinsed, sweat had begun to appear on anyone who moved faster than an amble. One degree from the equator is not a locale for excess energy. But that was not why the patrol was late in hitting the trail from Wadiboe. The lieutenant should have known better, for he had been dealing with natives for some weeks now. The procedure was always the same.

"Tabe, Tuan," came the greeting from the first adult or child he met.

"Tabe, mana kepala?" he answered, asking for the local chief.

After an interminable period, he was passing out a cigarette to the *kepala*, and in lousy Malay was asking "whereinell" were the carriers and scouts the sergeant had yesterday made arrangements for. Eventually the required natives were gathered on the scene, and after a great deal of maneuvering among themselves for the lighter loads, plus general Neanderthal gold-bricking, the carriers were ready and the patrol got under way.

By midmorning the patrol filed out of Wadiboe, and was climbing the ridge in back of that village. If fever, foot rot, and a few casualties had not taken their toll, the patrol would have been composed of three 12-man sections of trained scouts, four machine gunners and two radio operators, two medical aide men, the lieutenant, and his platoon sergeant. As it was, the group totaled about 36 men, not counting the accompanying natives.

The men were not new at their business. Originally they had been cavalrymen—drivers, mechanics, gunners, motorcyclists, and what-have-you—of the division's mechanized reconnaissance troop. Back in 1942, when the Japs didn't get to Australia, the division went up to New Guinea to find them. At that time the troopers were deprived of their scout cars, and were reorganized and trained as dismounted scouts. In two years they had learned their new rôle, and considered themselves experts.

They were dressed mostly in camouflage herringbone twill, fatigue hats, and very light packs. Beside the machine gun, their arms were, for each, a knife, two grenades, and either a rifle, carbine, or Thompson submachine gun. Each man carried the gun he preferred, and there were as many of one as of another. Some men had brown handkerchiefs tied around their foreheads to keep the sweat out of their eyes. They all moved with the slow, relaxed step of men used to marching in the tropics. Once out of the village they stopped talking. They watched the tall treetops ahead, or the few yards they could see into the jungle on their flanks. A blind man 20 yards off of the trail might easily not have heard them pass.

As the patrol reached the top of the Wadiboe ridge and started down the rather gentle slope on the other side, a four-man scout group moved out in advance of the column—the first two men watching to the front, the other two keeping an eye to either flank. They were never out of sight of the head of the column where, with the lieutenant, a man with a BAR marched ready to give instant covering fire to this point group. At a word from the officer, a native in a pair of shorts and a dirty GI undershirt left the main body and ran to join the four men in front. He was Dimienoes, the 16-year-old son of the *kepala* of Warwe village, who had attached himself to this recon platoon ever since his first patrol with them. Dimienoes had already accounted for

one Jap with the long, pig spear he carried—and he could sense the presence of an enemy with the instinct of the native whose war-loving ancestors were feared throughout western New Guinea. He was, in short, the original jungle scout.

From the ridge, the trail wound through a lightly timbered area, crossed a ravine on a native bridge, and entered a large clearing that had formerly been a native garden. The patrol crossed the clearing without incident, after sending a four-man scout group around either edge, and filed into an expanse of that heavy, rain forest called, for good reason, jungle. For some distance, at intervals along this trail, the Japanese Army had now and again constructed large, native-type shacks. Rotting fish casks easily identified an occasional ration warehouse; another had been a bakery; a third, sitting off on a side trail, had very obviously been the quarters of a group of "comfort girls." Each house, before it was passed by the patrol, was checked for signs of any recently scavaging enemy who might have returned to the area.

Some time later, the winding trail began to descend. The men noticed that the big trees which had hemmed them in on either side were getting fewer in number until suddenly, upon rounding a bend in the track, the patrol was standing on the edge of what the natives called a "*sago*"—one of those swamps in which only the giant, fern-like sago palm will grow. As swamps in that part of the world go, this one wasn't so bad. The season was dry enough so that the area was not inundated. Instead, there was a footing of thick, sticky mud about the consistancy of the mess sergeant's chocolate pudding. It did not smell so good, though.

Many months before, the energetic Japs who had occupied the island had made a halfhearted effort to lay a corduroy footing of logs. But as time passed, frequent high water had floated most of them away, so that crossing the mile-wide area meant mostly wading through mud anywhere from shoe top to knee high in depth.

It was when the patrol had floundered about halfway into the *sago* that the point group stopped and took cover, while the native boy, Dimienoes, intently examined something in the mud surface of the trail. The lieutenant, after halting the column, moved forward.

"What's up?" he asked.

"I think we've been seen, sir," the advance corporal answered.

The officer followed the corporal's glance. There in the muck, leading in from the other side of the swamp, and then returning in the same direction was what on drier ground would have been called a set of footprints. Someone, walking steadily, had approached the spot now occupied by the point group, had stopped in his tracks, and then had retired with much longer steps. The lieutenant looked at the foot-hole in the mud and saw it was half-filled with water. Then, looking at one of his own tracks, he noticed that water was just trickling into it.

"I think," he said, after a moment, "that our friend, whoever he was, left here no longer than five minutes ago."

By way of confirming suspicions, Dimienoes added, "*Ada Nippon, Tuan.*" The native had already decided it was a Jap.

"It may," said the officer, turning again to the corporal, "be just a straggler, or it may be a scout for a bunch of Japs. We'll keep on until we get out of this damned mud, and then stop for chow. Move out, but keep your eyes and ears open. I don't want to fight out in this stuff." The point moved gingerly on through the swamp, and the lieutenant signaled the rest of the patrol forward.

The remaining slog through the swamp was uneventful. Where the trail began the ascent to drier ground, the patrol halted at a sluggish little stream, threw out a small security force, and proceeded to fill canteens and break open K-ration cartons. The biscuits, as usual, were thrown away or given to the native carriers; the cheese, or meat, was eaten without enthusiasm. The platoon sergeant moved among the men, chanting his litany of "use them damn Halizone tablets in this creek water."

Nearly two hours later the patrol was working its way up and down a series of small ridges, more rightly described as embankments. The brief halt for lunch was long past, and already the men felt they had been marching without a break since midmorning. The trail had widened to a degree that permitted the equatorial sun to cut through the canopy of rain forest, which ordinarily should have shaded the way. Even though the men proceeded slowly and cautiously and followed a set of hob-nailed footprints, now and again visible, the least expenditure of energy seemed to soak their jackets with perspiration. The lieutenant halted the patrol, held up five fingers to signal a five-minute break, and sat down in the shade at the edge of the trail to wipe the sweat streaks from the lenses of a pair of GI specs. Beside him, a lackadaisical conversation was being held in an undertone.

"Damn, I wisht I was back in Portland!"

"Aw, you ain't ever had it so good. Whatcha got in Portland you can't get here?"

"Lots of things, there's. . . ."

"Yeah, and two-bits she's livin' with a shipyard worker, now."

The officer took a long pull at his canteen, and looked at the map he had unfolded on his knee. God knows where they get the information with which to make these maps, he thought. Everything along the beaches and for 2,000 yards inland mapped to the last little bush; everything else just one solid color. They ought, he thought, to print the word "UNEXPLORED" in big letters across that part of this map indicating the interior of this island, like they do on maps of the South Pole. Yeah, here are some notes down in one corner. "*CAUTION: This map was produced from aerial photographs. Due to lack of accurate ground control, distances scaled on this map may be at variance with actual ground distances.*" And in small print under the scale, "*NOTE: Officers using this map will mark hereon corrections and additions which come to their attention and mail direct to The Army Engineer, Sixth U.S. Army, A.P.O. 442.*" "Sure, anything to oblige, Colonel! Corrections or additions which come to my attention . . . What a war!"

The lieutenant folded the map and signaled to the native, Dimienoes. In bastard Malay, plus much scratching of diagrams on the ground with his knife, the officer learned eventually that Arfax-Saba, the native garden area a little more than halfway on the route to Saoeri, should be no more than a few minutes march down the trail.

Arfax-Saba was one of those places along a jungle trail at which you arrive almost before you realize you are there. Years ago, no longer being able to ply their once-profitable diversion of raiding the villages of other islands, the coastal natives of Biak cleared large tracts of jungle on their inland plateau. There, communal gardens were established from which the women drew an assortment of tropical vegetables to supplement the native diet of fish, coconuts, and Dutch government rice. But since the coming of the *Amerika* to Biak, and the flight of the Japanese into the interior, few natives ventured far into the island, unless they went to hunt the Japanese—for which they were paid at the rate of one Guilder per right ear, delivered. Arfax-Saba was one of these gardens, perhaps a half-mile square, now abandoned and rapidly reverting to jungle.

The trail to Arfax-Saba did not cross this open area. Instead, it came out of the forest, and decended into a small, elbow-shaped ravine that bounded one corner of the garden. Standing at the elbow where the trail dropped into the ravine, the patrol leader was able to see to his right front the open sky over the garden, and the roofs of some shacks, for the bank of the ravine was higher on the garden side, and the clearing itself was in defilade. Directly in front of him, the trail ran along the bottom of the ravine for about 100 yards. There the ravine ended at a smaller embankment upon which was built a native shack. The trail climbed this embankment, passed to the left of the shack, and then turned abruptly to the left and away from the garden area. To his left front, the officer noticed that the bank of the ravine was not nearly so high on the left of the trail as on the right. In fact, it was only about head high, and was bordered partly by the wall of the jungle on his immediate left, and by the edge of a smaller clearing, to his left front, which was about 100 yards square. It was around the far corner of this smaller clearing that the trail turned to the left and disappeared, flanked by the jungle and the far, bush-lined edge of the clearing.

After one look at the ravine, at the high bank to its right, and the solid jungle beyond the embankment and shack at its end, a very obvious conclusion jumped through the patrol leader's mind: "Brother, what a place for an ambush." It was evident that he was not alone in his estimate. Ahead of him, about halfway up the ravine, the four-man point was advancing almost inch by inch, each man mentally selecting the log, bush, or tree behind which he was going to dive. In front of them, the scout Dimienoes had stopped; aware by instinct that something was wrong, but as yet unable to decide just what it was.

By this time, about eight men of the main body had descended into the ravine, or were making their way down the short embankment. With a low whistle, the officer halted his patrol. The point took cover immediately, and the remainder of the men in the ravine prepared to do likewise, if necessary, As yet, there had been no sign of anything amiss, but then there usually never was.

Two men from the head of his column and the patrol leader worked cautiously up to the high embankment to the right of the trail until they reached a point where they could observe the wide expanse of the garden of Arfax-Saba. All that could be seen was a tangled mass of weeds, dotted here and there with huts built on stilts, all in a state of general disrepair. The lieutenant was crouched on one knee, his back to the ravine with its trail. He was carefully watching the area for any sign of life. To his left, a few yards away, Private Arnett Putnam, a hefty, ex-combat engineer, was similarly engaged, while at the lieutenant's right, Private "Bunny" Barber, a 19-year-old ex-schoolboy, was looking the opposite direction, watching the terrain on the other side of the ravine.

"Hey, Lieutenant!!!" Barber's stage whisper might have wakened a corpse. He was gesturing across the ravine to his right, where—when viewed from the elbow of the ravine the trail had previously been seen turning away from Arfax-Saba—but where now some 50 yards of it was plainly visible, partly through the bushes which bordered the smaller clearing. Down the trail, marching in file as to a picnic and obviously unaware of the presence of the patrol, came three Japanese soldiers.

"Hey, Put!" stagewhispered the lieutenant, glancing away from the oncoming Japs, and trying to outwhisper Barber in order to alert Putnam. Putnam turned and he pointed. As he did so he saw the Japs, who now were running back up the trail. Raising his carbine, he suddenly discovered how hard it could be to get a running target into the aperture of that little rear sight. He fired anyway. Next to him he could hear the crack of Barber's carbine, and the rapid, reassuring bark of Putnam's M1. Jeez! All three Japs were still running! But by now they were nearing a few bushes. This, thought the officer, will be like firing at ducks in a shooting gallery. And so, he aimed at a bush in front of a Jap, and as the man disappeared behind the vegetation, the lieutenant fired a round, not at all like he'd been training his men to shoot. Almost simultaneously, Putnam's M1 barked again. The Jap, who had disappeared behind the bush

at a dead run, popped into view on the other side, hit face down on the trail and lay still.

As the Jap fell dead on the trail, eight other Japanese riflemen rose from a hollow behind the shack at the head of the ravine, and disappeared into the jungle without firing a shot. Only Putnam saw them go, and he, between curses, was frantically stuffing a new clip into the magazine of his rifle.

Some hours later, the lieutenant stretched himself out on his poncho, took a drag on a cigarette cupped carefully in the palm of his hand, and hoped that the last edges of daylight would stay with him long enough for him to finish the butt before dark. The patrol, now a mile and a half beyond Arfax-Saba, had pulled off the trail an hour before nightfall, and he had established a small perimeter on a knoll in the forest. The platoon was deployed, three men to a group, each group behind what hasty log breastwork it had found time to construct, and each within almost spitting distance of others on their flanks. The tight little circle enclosed a small patch of jungle wherein were settled the natives, the aide men, and the platoon headquarters group. Those damned natives, thought the lieutenant, were making too much noise. They always did. Although he was positive that the patrol had slipped off the main trail unobserved, he was always nervous just at dusk and dawn. If nothing happened before it was dark, he was sure the platoon would be unmolested by any wandering Japs. Anyway, the machine gun and his three BAR's were well placed.

He snuffed out his cigarette, started smearing mosquito dope on his hands and face, and mentally reviewed the events of the afternoon. At Arfax-Saba, when he fired the first shot, the platoon had automatically deployed under the watchful eye of Sergeant Miller. But it was unnecessary. The whole affair had been over in less than a minute. The Japs had faded into the bush, leaving their dead sergeant on the trail. He had sent a small force up the trail after the two that ran that way, advanced the platoon through or around the ravine, and halted to search the corpse. He had wasted a lot of time setting up the radio and trying to notify troop headquarters of the enemy contact, but had discovered that the radio wasn't working—as usual. The native carriers had probably dropped it too hard when the shooting started. After a thorough search, the lining of the dead Jap's hat had given up a brass dog tag and, more important, a crude pencil sketch of what might be the Jap position at Saoeri. He had immediately started four men back to camp with this find and a report. He couldn't spare four men, but you couldn't send fewer through an area well-known to the enemy, and you couldn't trust a native to get beyond his wife in Wadiboe before morning.

After packing up the radio, they had started down the trail again, and had rejoined his advance party at a trail junction a half hour later. The two fleeing Japs had been joined by others, according to the footprints, probably the group Putnam had seen pulling out from behind the shack. Some of them had taken the trail to Saoeri, and some had gone down the branch trail which led off further to the left. He had sent a party to follow them for a short way, and the group had been too long in returning to report another garden area some distance down the trail, but no further sign of the Japs. Before the whole patrol had again assembled and resumed the march toward Saoeri, a lot of time had been wasted, and it was getting late. They had gone only a short way before it was time to start looking for a bivouac. By this time, the canteens had only a little water left in them, and he kept hoping to find a stream. At length, they were all forced to make camp without refilling the canteens. They had crossed only one stream all day—the one at the swamp—which was rather unusual in that climate.

The officer wiggled his stockinged feet, leaned back, and propped his shoes under his head. "Miller," in a low voice he spoke to the sergeant stretched out at his side, "did you notice anything about that Jap we knocked off this afternoon?"

"Sure, Lieutenant, he was the biggest bastard I have ever seen wearing a Jap uniform," came the reply. "Jeez, he must have been over six feet."

"Anything else?"

"Yeah. That guy was healthy, and he was well fed. When we pulled his shirt up to search him, I noticed a roll of fat on his belly. Even if he was a 'sargint,' that's unusual for Japs on this island nowadays. Furthermore, his rifle was clean, oiled, and no rust, and his clothes were in better condition than mine. Lieutenant, that guy hasn't seen any action in this war since he left China."

There was no doubt about it. The Japs they had run into that day were from the missing battalion; the one that had withdrawn to the north coast of Biak early in the fight for the island. The lieutenant tried to reconstruct the probabilities. After the 2d Platoon had pulled the patrol to Saoeri, the Japs there had probably taken steps to prevent another Yank patrol from arriving unannounced. They probably had sent a security force down the trail into the interior of the island, or else they were growing short of rations, and were sending foraging parties out to the native gardens. At any rate: 1. a party of Nips was at Arfax-Saba today, 2. it had sent a scout along the trail toward the swamp, and 3. it had learned of the approach of his patrol. An ambush—and a lousy one at that—had been prepared at Arfax-Saba. Why the Japs had not spread out along the high edge of the ravine, he would never know. Instead, they were hiding in a depression at the head of the ravine, waiting, he guessed, to give the patrol hell when everyone got into the gulch.

But why the three Japs marching down the trail? The only way he could figure it, the three had left their main group earlier in the day, and had returned at a most inopportune time. They were walking down the

trail as if they owned it. In the few seconds he had been trying to get Putnam's attention, the three Japs must have received a signal from their hidden comrades, and taken off up the trail at a dead run. Anyway, the fat was in the proverbial fire now, because all except the dead Jap sergeant had gotten away. Their main body at Saoeri were wised-up by this time. Well, it was dark now, and there was not much chance of trouble before morning anyway. The lieutenant began to relax a little.

When he awoke, it was already well past dawn, and the platoon was eating its K-ration breakfast. As usual, the platoon sergeant had refused to awaken him—a fact for which he was secretly grateful. S/Sgt. Donald Miller, tow-headed and belligerant, from Wyoming, was younger than most of the men in his platoon. Known affectionately as "Stinky" by "them boys," he could make them jump through hoops by the lash of his good-natured ridicule, and the sheer weight of his personality. Although the sergeant never knew it, his platoon leader regarded him with all the affection of a brother. They had occupied the same hole together. They had drunk the same bottle of captured *sake* together. In short, they had grown up in the whole damned war together.

"Lieutenant, we've found some water," was the platoon sergeant's good morning.

"Where?"

"Over there, sir."

In an adjacent group of trees, a half-dozen men, under the guidance of two natives, were cutting leg-thick vines away from the trees. After cutting a vine loose, they would hack a point on the loose end. From this point a thin trickle of water would run into the canteen held beneath it. The lieutenant collected a half-cup full, and prepared the breakfast Nescafe.

Nearly an hour later the patrol was halted on the Saoeri trail at the edge of another garden clearing, which to all appearances was much larger than Arfax-Saba. Ahead of them the advance guard, reinforced by flanking groups, was feeling its way through light vegetation toward a group of the largest native-type shacks the lieutenant had yet seen on Biak. These shacks, sitting across the trail where it ran along the edge of the clearing, were evidently the abandoned enemy village that had once been the rest area of the original Biak garrison force. Each shack, large enough to house a company of Japanese infantry, was situated on its own knoll, which rose out of the bumpy terrain. And around each shack, the former occupants had dug a perimeter of foxholes, as if they had once anticipated defending each of the leaf-thatched barracks buildings. Orderly pathways led from building to building, blazed tree trunks were marked with Japanese lettering, and at the edge of the main trail, in front of one house that must have been a headquarters, a huge shinto gate towered above the entranceway. The whole area, as the advance party discovered, was deserted. It had been abandoned with an efficiency that had left behind only a few empty bottles and a broken sack of rotting rice. The platoon filed down a slope into the village, and halted in column on the trail. The lieutenant had reasoned that a village of this size would have been built near water. Four men, sent to reconnoiter a near-by hollow, confirmed his estimate.

A water detail, having collected the canteens, set off down the gully for the water point. The remainder of the patrol settled along the trailside for a smoke. The lieutenant had just lighted a cigarette when the radioman next to him jumped to his feet.

"Hey, Lieutenant!" He pointed toward the rear of the column. Just below the crest of the slope where the trail dipped out of the forest and into the clearing, a trooper was frantically pumping his rifle up and down over his head, signaling "enemy in sight!"

Most of the platoon had also seen. Already men were throwing their packs beside the trail, checking their weapons, and looking to him for directions. The officer ran stooped-over down the trail toward the rear. Midway through the village a small, black snake wriggled across the path in front of him, and disappeared in some brushwood. Later, he had time to remember that it was only the second snake he had seen in two whole years in the tropics. The other had been in his bed a year ago in Papua.

Before he had reached the rear guard, a tommy gun began to fire. It was quickly joined by a BAR, then a chorus of rifle fire. It stopped as suddenly as it had started, while an angry voice yelled, "You trigger-happy rummie! Next time you wait until I say to shoot!"

"But Sarge, I thought they had seen us and were starting to run."

"Listen, damn it, even a Jap can stop to scratch his tail. They would have walked right into us, but now look."

The lieutenant, arriving on the scene, also looked down the trail to where a Japanese soldier sprawled 75 yards away. Three rifles were scattered near him.

"There were three Japs, Lieutenant," the section sergeant explained. "They were following our tracks. We wounded the other two. They're in the bush somewhere. I don't think there were any others behind them, but we'll never know now." The sergeant glared at the man who had fired prematurely.

The officer signaled back to a section, brought them up, and started them cautiously combing the jungle on the side of the trail. They found nothing. Off in the distance he could hear a roar not unlike that of an approaching subway train. He called in the section and started back to the village. The rumbling sound grew louder as the heavy raindrops smacked onto the upper vegetation of the jungle. Within two minutes, while the lieutenant was giving a brief resume of the situation to his other sergeants, the rain rolled over them in an avalanche of water.

A half hour later, the rest of the patrol was feeling its way along the last, muddy mile of trail toward Saoeri.

The tropical shower had passed on as swiftly as it had arrived, and already the sun was drying the clothing on their backs. The officer, now somewhat worried at the delays encountered since leaving the swamp the day before, had decided to push ahead with the better portion of his three reconnaissance sections. The natives, and the operators with their doubtful radio, had been left behind at the village under the protection of the machine-gun squad and a half section of scouts. They had taken a defensive position on a knoll in the clearing, making use of one of the shacks, and the foxholes conveniently dug by the last occupants.

The patrol, now at a strength of about 25 men, was moving all the more cautiously along the trail. The terrain, slightly rolling, was again hidden under the same thick rain forest they had encountered most of the way across the island. The men were not marching. The point group was moving ahead slowly by bounds, searching the trail and vegetation around every bend, and only then signaling the main body forward. After an hour, the lieutenant knew he was drawing close to the inland slope of the Saoeri ridge. He had passed the cut brush at the point where the 2d Platoon had left the trail a few days before to work around the left flank of the enemy position on the ridge.

The lieutenant moved up and joined the point. As they climbed a short rise, the vegetation thinned before them, the trail turned out of sight, and a great bulk of trees and matted vegetation rose in tiers across an open space in front of them. The point man stopped, sniffed the air, and motioned to his platoon leader. The officer moved forward, joined his trooper behind a clump of brush, and peeked through the leaves. The trail wound across the clearing for about 50 yards, started up with a sharp angle at the foot of the first terrace, and disappeared again in the mass of vegetation covering the cliffs.

"Smell 'em?" the trooper whispered.

The lieutenant sniffed. There was no doubt about it. Anyone who had ever smelled that mixture of what stunk like pomade and unwashed carcass would know.

"Let's go back," came the order. Undoubtedly, there was an outpost at the far side of the clearing, covering the approach to the ridge.

The patrol backtracked silently down the trail. After retracing their steps for some 75 yards, a slight break in the bushes, found by Dimienoes, revealed itself as a narrow pathway leading off through the forest to the left of the patrol's original direction of advance toward the ridge.

The patrol filed off the Saoeri trail, worked its way into the jungle along the path, and halted on the edge of a slight hollow around which the pathway continued. As well as he could, the lieutenant estimated that he was now about 100 yards west of the main trail, and another 100 yards from the base of the ridge. He called the sergeants of the two reconnaissance sections forward, gave them instructions, and disposed the remaining half section around the edge of the depression to form a very thin perimeter. A BAR was set to cover the path where it led into them from the main trail.

The platoon sergeant was tying the loose ends of two reels of Signal Corps combat wire to a sapling in the center of the perimeter. To these ends he clamped a sound-power telephone. He handed a reel each to two men who began to unwind the wire as they followed their respective sections.

The two reconnaissance sections, averaging now from 10 to 12 men each, some of which carried additional reels of wire were already beginning to push their way through the vegetation. In no time they had disappeared, leaving only the thin strand of wire leading into the shadow of the forest. The lieutenant unslung his pack and sat down, the phone pressed to his ear as he waited for the first progress report from his section sergeants.

Some hours later, the lieutenant was still sitting. He was no longer listening at the phone, and he was not at all happy. Both of his scouting parties had run out of wire long ago, and he could only guess what was happening. The ridge was apparently rougher than anyone had known. It was a series of cliff-faced, knife-edge ridges of coral, each one rising higher than the one before until the aggregate formed a most formidable escarpment. Apparently, his men had been laying more wire up and down than they had unreeled in any horizontal direction. His sergeants had been emphatic in their phoned reports. "We're doing fair, Lieutenant. Worst damn terrain I ever saw, though." There had been no sign of the top, however, before they had run out of wire. To add to his troubles, a small party of Japs had been heard passing along the trail about an hour and a half ago. They had evidently been returning from inland to their present bivouac up on the ridge, and no doubt had scouted his natives and the few men he had left back at the village in the clearing. Most likely, they were the rest of the group first encountered at Arfax-Saba. Now that his patrol was split into four groups, the Japs, if they were smart, could come out of their ridge and try to deal with the patrol. "If I were the Jap commander," he thought, "I would hit that group in the village about dusk, and get their rations, radio, and machine gun."

He debated a long time. He could continue the scouting operation until dark, have everyone stand fast where they were through the night, and complete the job in the morning. This would leave the small group in the village by themselves, where they might have to fight off a sortie of Japs from the ridge. Or, he could order his scouting parties to return before dark, retire in full strength to the village, then get an early start in the morning and spend as much of the whole day as needed to scout the position on the ridge. This, however, might make him a day late in returning to camp, and they were running short of rations. He wished his unspeakable radio was working. Well, the patrol would have to

go hungry. He'd make up his mind. Thus when each of his sergeants had phoned in their last report, he told them to make plans for returning to his position at least an hour before dark, if they had not located the enemy position in time to return with the day's work completed.

Now it was almost time for the recon sections to be returning back down the trails of wire they had been laying through the dismal vegetation. Dimienoes was sent out along one wire line to see if there were sight or sound of men coming back down the ridge. In 20 minutes Dimienoes was back; with him was the group that had started straight up the ridge in an attempt to contact the center of the Jap perimeter.

The section sergeant dropped next to his platoon leader, took the cigarette that was offered, and sighed. "Lieutenant," he said after lighting it, "I have never seen the like. That ridge is a mass of roots, coral boulders big as a house, pinnacles and crevasses even bigger, and one vertical climb after another. It's up, then down, then up a little higher, then down a little farther, and all the time you can't see your hand in front of your face, there's so much greenery growin' around. About an hour after I called you the last time, we got to the top of the highest ridge, with still no sign of Japs or the trail that you thought ran along there. Anyway, we started down the other side, with the same results, but we couldn't go very far before it was time to start back." The sergeant took a long drag on his cigarette, thought a moment, then continued, "About that trail, sir, it's our guess that it must cross the top of the ridge and go part way down the other side before it turns to the left. It must run along the reverse slope up there. Anyway, it's not on the top and neither are the Japs."

The sergeant's explanation seemed logical. The officer looked at his watch. It was time the other section was returning. It was not much more than an hour before dusk now.

A sudden burst of firing from up on the ridge broke the late afternoon silence. The officer jumped to his feet. Miller, the platoon sergeant, came scrambling through the jungle underbrush to the platoon leader's side. The firing had started first with a burst from a tommy gun, then about three quick rounds of what might have been an M1, then silence.

"Miller, what do you think?"

"Them's our boys, Lieutenant."

"Yeah, but what the hell they doing up there? They should be back here by this time."

"Don't look like they're gettin' here tonight, Lieutenant. Sure hope they ain't gettin' into trouble."

"Tip," the officer turned to his other section sergeant, "if those boys started back here right now, how long do you think it would take them, if all that ridge is like what you were on?"

"Two hours—maybe three, sir."

"Hell, it will be dark in less than an hour!"

"Yessir."

"Could anyone move on that ridge in the dark?"

"Nossir."

The lieutenant looked at his watch again. "We can wait only 20 minutes more," he said. They waited. After a quarter of an hour had dragged by, the shooting began again up on the ridge. It started with a single rifle shot, then another and another, ending in a climax of rapid fire. The officer had counted about 20 rounds.

"Well, Miller?"

"Them wasn't our boys that time, Lieutenant." Then earnestly, "I hope to devil that Abner knows what he's doing up there."

"Did one of the medics go with him?"

"Yes sir, Rabinowitz."

"Good."

"What do we do now, Lieutenant?"

The platoon leader exhaled slowly through clenched teeth. "We get this outfit back to the village before dark. We dig in for the night. At daylight tomorrow everyone must be ready to go to Saoeri—hoping that they meet one complete section coming back down that damn ridge."

Already the shadows were getting thicker along the ground, and the heat of day was beginning to fade. The bulk of the Saoeri ridge could be felt, rather than seen, towering above the trees that surround the patrol. The men were beginning to move back toward the trail. As the lieutenant reached down to pick up his carbine, he had the feeling of having just murdered his brother.

The night that followed was perhaps the longest the platoon leader had ever endured. There was no enemy sortie upon the village, a possibility that ceased to worry the officer once he had established the balance of his platoon in one of the old Jap positions. It did not rain; the officer could find no fault with the weather. But he had not slept much, having spent most of the night lying awake in his poncho wondering what had happened to his section up on the Saoeri ridge. Apparently, they had found the Jap position, but then what? Had there been any casualties? If so, how many? Who? The Japs had done a lot shooting in that last, brief engagement. Was the section cut off up there on the ridge; surrounded by dirty little skivvies waiting only 'til daylight to close in on them? Why in hell hadn't the sergeant come back when he had been told to? So, it was with a mixture of relief and impatience that he had watched daylight begin to filter through the heavy forest and across the gardens.

The patrol had been on the trail back to Saoeri for 20 minutes now. The lieutenant was pushing his men forward as fast as he dared, and although they did not anticipate trouble, the point group had watched a dog come down the trail, stare at them a moment, and then turn back down the trail at a fast trot. It might have been a stray, and then again it might have been accompanying another enemy party. Now, thought the lieutenant, would be bad time to be ambushed. The patrol was winding up a slight hill. The lieutenant recalled that

on the far side the trail dropped into a little valley, fairly open, which it crossed only to disappear over the next rise in the rolling terrain. The officer was watching his point group as it reached the crest of the hill. Almost with one motion the four men took cover in the brush at either side of the trail. Then after a moment, one man stood up, looked again into the valley, then shouted as he waved the platoon leader forward. The officer joined his point at a dead run, and looked into the hollow beyond. Coming over the crest of the far side, and down into the little valley, were the men he had prepared to count as lost, somewhere on the ridge at Saoeri.

Ten minutes later Sergeant Charles Mann, section leader, ex-barkeep, and known as "Abner" to his buddies, was seated beside the trail with his platoon leader. His left arm was bandaged near the shoulder, and a patch on his chest showed where the same bullet, after passing through his biceps, had creased its way across the flesh under his jacket pocket. So relieved was the lieutenant to find this the only casualty, that he had forgotten his plans to bawl out the sergeant for not returning the evening before. The platoon leader and his sergeant were bent over a rather crumpled air photo the officer had fished from the bottom of his pack.

"We reached the top of the ridge about here, Lieutenant" . . . the sergeant pointed to the photo . . . "about mid-afternoon, not long after we ran out of wire. We tried to turn left and move along the top of the ridge like you said, but the going was so rough that we dropped down the far side—a little better than halfway down. Then we hit this place where a lot of jungle had been cleared. Not the big trees, just the underbrush along a sort of terrace. We turned left and moved along that about 200 yards, I guess, and damn if we didn't come onto the trail where it comes down off the ridge to the beach on the other side. Well, we started sneaking up the trail, and we got to where we could see a big shack on the side of the ridge. From what I could figure, we were right in the middle of the Jap perimeter, if you want to call it that. Just then, a big Jap started down the trail with a towel over his arm, going for a swim, I guess. Anyway, he came so fast we had to shoot him, and then things started to happen.

"We pulled off the trail, and started back parallel to the ridge top again, when we ran into the back of their flank positions. Everybody started shooting at us then, so we turned around, ran back into the perimeter, down the trail toward the beach, and sneaked out the way we came in. We were able to make it back over the ridge, and found the end of our wire just before dark. We took most of the night following that wire down to where we left you, spent the rest of the night there, and started back at daylight."

The sergeant stopped, flexed his wounded arm gingerly, then added, "We would have been back before dark yesterday, Lieutenant, except we kept thinking that just a few minutes and we'd be finding their flank positions. But when we did, it was already too late and we were kinda busy."

The lieutenant looked at his sergeant, started to say something, then changed his mind. Finally, he said, "Can you pick out the flank on this photo?"

"Yes sir," grinned the sergeant, pointing, "right about there, nearly 100 yards west of the trail where you can see it going down to the beach."

"In that case," the lieutenant sighed, "let's get the hell outta here."

Two days later, shortly after dawn, 12 fighter-bombers skimmed over Abraididori Bay, circled in the air over Saoeri, then one after the other dove toward the ridge at a point where a trail could be seen leading out of the trees and down to the beach. When their bombs were expended, the aircraft circled over the bay, not unlike a huge merry-go-round, each plane dipping to strafe as it passed the column of dust and smoke that still rose from under the treetops shading the Saoeri ridge.

Five days after the air strike, a troop clerk sitting in a headquarters tent wrote in the troop diary: "August 2d: The third patrol to Saoeri returned to camp. The patrol had seen only one Jap, and he was killed by a native guide. No sign of the enemy was found in the Saoeri area. Natives have brought in a report that there are Japs living at a garden near. . . ."

Over in a corner of the tent the troop commander was on the field telephone talking to G-2. At a table, another lieutenant and his sergeants were looking at another air photo.

"Now, some natives report . . .," the lieutenant began.

Outside, it had started to rain again.

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The Nazis Were Winning the Battle of the Atlantic -- Then --

Sonar Beat the Sub

NEITHER the Axis powers nor the Allies were prepared for extensive submarine warfare when World War II began. The Germans had about 20 500-ton and 10 750-ton ocean-going U-boats. The British had fitted their "ASDIC" (British word for sonar) on 165 destroyers, 34 small patrol craft and 20 trawlers, and the United States had about 60 destroyers fitted with echo ranging sonar.

The underlying principle of ranging sonar is the principle of the echo. Sound waves are sent through the water, and are echoed back to the sender when they strike an underwater object.

Sonar had progressed remarkably from 1918 to 1939. The capability of the World War I listening apparatus was limited to indicating the presence and general area of moving U-boats. At the beginning of World War II, we had ships equipped with sonar capable of detecting U-boats that were surfaced, submerged, underway or lying still. We also could tell their bearing, distance, and almost exact location.

When the United States indicated its intention of making common cause with the Allies, the exchange of scientific knowledge was resumed between this country and Britain.

The first year of World War II was a typical blitzkrieg. The Norway invasion in April, 1940, provided more U-boat bases, and Italy brought about 100 submarines into the war, of which 60 were ocean-going. The use of French ports, starting in July, 1940, extended the U-boat's westward range. The spotting of approaching convoys by French-based aircraft compelled Allied ships to take longer routes north of England. The obvious preparations for invading England during August, 1940, forced British antisubmarine ships to guard the coasts of the British Isles. This diversion of asdic-equipped escorts from convoy duty resulted in U-boats reaching their highest effectiveness —each sinking about 10 ships a month.

In 1941, the British captured the U-570, one of the only two U-boats taken during the war. It proved to be a valuable source of information. Its sound equipment included an underwater telegraph system containing a pair of small transducers mounted flush with the U-boat's skin. The German submarine also carried a long-range listening device containing an array of 24 three-inch diameter microphones on each bow which were fed through a phasing network to an amplifier and earphones. It was not accurate enough to fire torpedoes by, but convoys could be heard about 10 miles away under good water conditions.

When the United States entered the war, the Navy's 170 destroyers were the only United States surface craft fitted with echo ranging sonar. Three-quarters of them were engaged in cross-Atlantic convoying, the others were employed in the Pacific. Our unescorted Atlantic seaboard shipping was slaughtered at the rate of 75 ships a month by an average of 38 U-boats, of which we killed about three a month. Many of these sinkings occurred within sight of our coasts. The 75 Japanese submarines were sinking 10 ships a month in the Far East.

Meanwhile, the Bureau of Ships was equipping all available torpedo boats, sub chasers, motorboats and yachts with lightweight sonar. Production facilities were greatly expanded. The British lease-loaned us 10 Corvettes, having first trained our crews in England to use the asdic, and we obtained 24 asdic-fitted, small patrol craft from Canada. By March 1942, coastal convoying was begun with a small number of ships and land-based planes.

During this period U-boats were sinking ships faster than we replaced them, and we were losing the Battle of the Atlantic. Our success in attacking submarines after we detected them was less than five per cent—95 out of 100 got away. Sonar was detecting the U-boats, but in the crucial moments of the attacks, something was inadequate.

To find the solution, we adopted the best known methods of convoying, asdic screening and searching, and our attack successes increased.

The engineering groups enlisted the aid of additional manufacturers and furnished a gyro-controlled device to keep the sonar beam directed on the U-boat during an escort's maneuvers or turns, an electronic scope to indicate visually whether the sonar beam tended to lose contact due to the operator moving the beam either to the right or left of the U-boat, and a control device which reduced the heavy reverberations resulting from sudden sonar "pings" which cause the surrounding water to act like an empty hall with bad acoustics. The control device also reduced undesirable interfering echoes from seaweed, shallow water bottoms, tidal currents and ships wakes.

The effectiveness of the improved Allied antisubmarine measures was demonstrated when history's greatest invasion armada of about 1,065 vessels made passage in November 1942 from United States and United King-

dom ports for the coast of North Africa. Although some 40 U-boats were lying in wait, they sank only 23 ships during November. Gross Admiral Doenitz observed, "The surprise Anglo-American landings in North Africa called for a concentration of U-boats on both sides of Gibraltar. Every U-boat that could reach these waters within 10 days was mustered. Defense in these African waters was very effective—and U-boat losses were correspondingly high."

During 1942 some 1,573 ships were sunk. The average was 131 a month. The Germans kept an average of about 80 U-boats at sea out of their pool of about 360. The sonar-asdic-fitted escorts totaled about 800 ocean-going types. Eighty-two U-boats, 20 Italian and 16 Japanese submarines had been sunk, an average of 10 a month.

Early in 1943 the general locality of surfaced U-boats which transmitted reconnaissance data by radio signals was detected from long distances by high-frequency radio direction finders installed ashore and in escort vessels. The U-boat localities were then searched by land-based and escort carrier planes equipped with radar, which became increasingly effective since U-boat radar intercept receivers were unable to detect the short waves employed. Radar contact was lost once the U-boat submerged, which required about 40 seconds. Planes then parachuted floating expendable radio-sono buoys. Their suspended underwater sonar hydrophones could detect U-boat noises which activated the buoy's radio transmitter. Such transmissions, when received in the planes or near-by escort vessels, indicated the U-boat's area which was then swept by sonar-asdic-fitted escort ships for accurate location and attack.

In the early summer of 1943 an average of 120 U-boats were operating in the Atlantic. U-boat packs were frequently outnumbering the escorts by two to one. Two convoys traveling close together were attacked by about 40 U-boats which sank 20 ships. Another convoy of 33 ships protected by eight escorts was attacked by a pack of about 20 U-boats, which sank 12 ships during the midnight hour. The same pack re-attacked the next night, but none of the remaining 21 ships was lost. Twenty-four individual U-boat attacks were frustrated, and at least five U-boats were sunk. The escorts had been augmented by a score of newly built destroyer escorts and a dozen escort carriers. The carrier planes were sinking U-boats and frustrating their attacks by forcing them to submerge. Allied aircraft patrols also commenced 24-hour daily coverage over the Bay of Biscay. This intensified transit to and from their French bases and decreased the time they could remain at sea. During May, June and July we sank 108 U-boats. The crisis, or turning point, in the "Battle of the Atlantic" had been reached.

A Tenth Fleet and British Anti-U-boat Division analysis of methods in the summer of 1943 resulted in increasing the size of convoys from 40 or 50 ships to about 90 vessels without increasing the number of escorts because their effectiveness was increasing. Plane-ship coördination attacks also were improving. Towed "foxers," or underwater noise makers, attracted acoustic homing torpedoes away from ship's propellers. Faster-sinking, stern-dropped 300-pound depth charges reduced critical seconds of sinking time during which U-boats took evasive action. "Hedgehogs" and "Mousetraps," mounted on the forecastles of escort ships further reduced blind time by projecting a pattern of 30-pound charges several hundred feet ahead which upon striking the water covered a large circular area and exploded only upon contacting the U-boat.

The accumulated instruments which appended the sonar had been incorporated into the "console sonar" which contained new features. They included devices for detection of mine fields, calculation of U-boat depths with the echo-sounder, indication of oncoming torpedoes traveling as fast as 40 miles per hour, and accessories which indicated to accurate ranges, bearings and time to fire weapons. Unescorted fast ships were being fitted with hydrophone torpedo detectors. One merchantman detected an oncoming torpedo, avoided it by turning the ship, then rammed and sank the U-boat.

Only 598 Allied ships were sunk in 1943, while 219 U-boats, 22 Italian and 22 Japanese submarines were sunk, an average of 22 a month. During the winter of 1943-44, the average of 60 U-boats at sea took extreme care to avoid detection and operated mostly submerged, but detection by asdic-sonar was becoming increasingly effective, and we began sinking more U-boats than they sank ships. By April, 1944, the Battle of the Atlantic had been decisively won. Our scientists had shouldered detection problems as their contribution to the enormous Navy effort.

When the Allies invaded the Normandy beaches on June 6, 1944, the invasion waves were led by small naval scout craft equipped with an echo-ranging asdic whose recorder traced the outlines of the beaches. Mines, fencing and other obstacles were detected and blasted from the path of landing craft. The invasion forces were blanketed by heavy air coverage and a sonar screen so tight that no ships were lost to submarines until the end of June when the seven ships they sank cost them 21 U-boats.

Up to this stage of the war the U-boat had acted as a submersible torpedo boat, spending much time surfaced where it was visible by eye and radar and audible to radio interception and radio direction finders. Nazi submarine tactics, however, were revolutionized in the summer of 1944 when U-boats were equipped with the Schnorchel extension stack, which expelled diesel exhaust and drew in fresh air. The Schnorchel stack was about the same height as the periscope, and permitted operation on batteries at periscope depth which previously required complete surfacing, and six-knot speeds at submerged periscope depth instead of about three-knot speeds formerly employed to conserve batteries. The U-boats took up stalking positions at focal points of

convoy routes, from where they attacked by blindly firing acoustic and looping torpedoes into passing convoys. Periodically they came to Schnorchel depth to replenish air and re-charge batteries. Admiral Doenitz said, "The strain on crews who remained submerged as long as 70 days was surprising light."

The top of the Schnorchel stack contained an intake-exhaust valve which measured about one and one-half by three feet. This valve and the periscope were the only usual exposures above water while the U-boat operated at Schnorchel depth. The valve was covered with anti-radar material to make it practically invisible to radar. Visual detection range on the Schnorchel was only about a mile or two in daytime and practically nil at night. The U-boats also literally maintained radio silence to deprive the Allies of radio direction finder detection. The Schnorchel had effectively neutralized our antisubmarine air offensive and defeated our surface detection. But—whether Schnorchelling, submerged or bottomed—the asdic-sonar teams continued to detect and locate the U-boats.

During the winter of 1944-45 an average of 40 "continually submerged" U-boats and scores of submersible midget submarines were concentrated in the English Channel area against the bridge of ships carrying re-enforcements to hard-pressed Allied land forces fighting the Battle of the Bulge. Their operations during the last four months of the European war resulted in the sinking of only 56 ships while 88 U-boats and about 100 midget submarines were sunk. The submerged Nazis had been swept out by "Killer Group" escort ships equipped with asdic-sonar, which the Allies had developed to the stage where crevices and rocks of the ocean bottom no longer afforded safe hiding for U-boats.

About 50 U-boats which were operating in the Atlantic surrendered after VE Day and several score more were taken in ports. The Battle of the Atlantic had its finale when some 110 U-boats were carried out to sea and sunk in deep water.

The Japanese at this time had about 70 ocean-going submarines which they primarily employed to supply hard-pressed bases. Their speed of 22 knots surfaced and eight knots submerged compared favorably with submarines of other nations. They were pursued relentlessly by Allied antisubmarine groups and by our own submarines. During 1945, 26 Japanese submarines were sunk; only one Allied ship was lost to submarines between VE and VJ Days. Forty-three Japanese submarines were taken after VJ Day; others were scuttled.

The 72 months of war cost the Allies 4,773 merchant ships representing 21,141,000 gross tons of shipping sunk by enemy action. A total of 996 Axis submarines were sunk, and 221 large and scores of midget submarines were captured after enemy capitulations. The British received credit for sinking 70 per cent of the enemy submarines and the United States credit for 30 per cent.

In the last days of the war the Germans developed their submersibles into true submarines, which, according to Gross Admiral Doenitz, "with its great range of 22,000 miles was capable of scouring all waters of importance for the U-boat war without having to surface." The German designers claimed outstandingly submerged speeds of 24 knots. Allied opinion is that, "it can outdistance and probably shake off any of our present escorts who attack it." Such submarines, plus homing torpedoes, may be with us for the rest of history. They can be built in secret, and are certain to be used by the smaller naval powers.

We barely won a war against the submarines. The enemy attributed our victory to "superiority in the field of science." For the future, Secretary of the Navy James Forrestal has warned "that a military research program literally may be the price of survival."

ALL-AMERICAN TEAM

General Jacob L. Devers, Commanding General of the Army Ground Forces, made the following statement in one of his speeches given before an American Legion convention in Washington, D. C. recently:

"Out of another recent conference, at the Armored School at Fort Knox, Kentucky, came a decision to combine the Armored Force and the Cavalry, and that arm of the Ground Forces will henceforth be known as the Armored Cavalry. That gives us a triangular ground force team—Infantry, Armored Cavalry and Artillery—an All-American line-up."

U. S. CONSTABULARY

*by Major General Ernest N. Harmon**

Established to insure the success of the American occupation in Germany, the United States Zone Constabulary is a special force employed to provide adequate support for police, government, and intelligence agencies in the United States occupation area.

THE United States Zone Constabulary was organized for the specific purpose of insuring the success of our occupation of Germany. It is an "occupational force of lightly armored, heavily armed, mobile troops, that will be employed as an immediate instrument of law enforcement, in support of civil power, to quell effectively civil disorder, or to provide a covering force to meet and engage a hostile armed force pending concentration of the major elements of the Tactical Force."

Not the first specialized force in our military history, certainly—The Mounted Rifles, The Philippine Scouts, The Alaska Scouts are, to name but a few, earlier examples—nevertheless, the Zone Constabulary is one of our most ambitious undertakings. This complex corps-size organization has been formed in less than six months from a heterogenous collection of armored division combat commands, cavalry groups and squadrons, armored infantry and field artillery battalions, tank and antiaircraft battalions. Other than VI Corps and Headquarters, 4th Armored Division, there were no staffs of higher than group echelon. The entire force had to be integrated, equipped according to Constabulary TO/E, and trained, not only as soldiers but as soldier-policemen—as Constabulary troopers. As this is written on June 1, 1946 "on the job" training has begun; troopers are actually practicing the duties for which they have been trained, and the first of July will see Zone Constabulary fully operational.

While the area of the United States Zone may not seem large by American standards (44,248 square miles, or a bit smaller than Pennsylvania), the population exceeds 14,500,000 and is being augmented almost daily by refugees from former German held territory.

Horses play a part in the U.S. Constabulary in Germany. A horse platoon is seen in action in the photograph below. Animals are used in areas that are impassable for vehicles.

Signal Corps Photo

*Commanding General, U. S. Zone Constabulary.

The existing problem is aggravated by the numerous deportees from Silesia, the Sudeten land, and the so-called New Poland. The Zone is critically short of housing, which always provides an incentive for a population to migrate. The people are frequently hungry, and, of course, subject to the usual moral degeneration which is the aftermath of defeat. Limitations on the German police encourages marauders to some extent, particularly in rural areas. To the normal police problem is added the presence of displaced persons, who are either unable or unwilling to return to their own countries. Often they bear a grudge against the German inhabitants, and among them is included a lawless element. The police problems of our own Army with its own troops are, naturally, ever with us, and the occupation mission of the Army as a whole demands policing of the German population with an emphasis on counter-intelligence. Giving full credit to all the agencies involved, the need for a mobile, alert, highly trained re-enforcing agency is indicated. Constabulary has the mission of fulfilling that need.

Headquarters, United States Zone Constabulary, Major General Ernest N. Harmon, commanding, is at present in Bamberg, Bavaria. The Constabulary is composed of three brigades of three regiments each. Regiments consist of a headquarters troop, composed of a horse platoon, a motorcycle platoon and a communications platoon; a service troop, a light tank troop, and three squadrons, consisting of a headquarters troop, two motorized and three mechanized troops. Mechanized troops are employed on patrolling missions, and motorized troops on supporting or re-enforcing missions. A squadron in Berlin and a regiment (minus) in Austria have been formed, but are not under the command of the United States Zone Constabulary. The regiments are distributed throughout the Zone so as to provide adequate support for police, government, and intelligence agencies. Two squadrons of each regiment are tactically disposed in the regimental area. One squadron, usually barracked near the regimental command post, is in reserve.

The principal enlisted component is AUS, but the aim is a Regular Army Constabulary-volunteer force. Constabulary service demands a high-type, alert, intelligent soldier, capable of acting on his own initiative but at the same time sufficiently well-disciplined to be reliable when acting on his own. He must be level-headed and physically impressive—a scatterbrain or a physical joke might make all the difference in the world in controlling a riotous mob.

"Troopers do not wear a different uniform, but a distinctive one. The highly-lustered OD helmet liner is banded in yellow-blue-yellow, the bands broken in the front by the Constabulary patch, which is a blue-bordered yellow circle containing a blue "C" pierced by a red lightning bolt. For special ceremonies, Russet leather Sam Browne belt, magazine pockets, first-aid packet and holster (each trooper carries a .45 automatic) are worn on duty. Trousers matching the blouse are worn with paratrooper boots, and a white pistol lanyard completes the dress for the trooper on duty.

Constabulary is not intended as a replacement for existing law enforcement agencies, either American or German. Rather, it is intended as a patrolling force, supplementing present agencies when necessary, and providing them with a ready reserve.

Constant patrols, operating on irregular schedules visit every village in the Zone at least once every 72 hours, and key localities are occupied. The occupation of key localities, however, does not mean that the Constabulary abandons mobility at those stations. Reception of an alarm at any time, day or night, will bring a hive of troopers in peeps, trucks, motorcycles or armored cars. The Troopers motto, "Mobility, Vigilance and Justice," is not meant as an idle catch-phrase.

One of the principal agencies which Constabulary is required to supplement is the Military Police. Where MPs are present the Constabulary does not function unless called upon; when MPs are not available, however, Constabulary does assume their duties.

All authorized border crossing points, both international and interzonal, are to be under Constabulary control, and Constabulary also is charged with providing border security patrols.

Search and seizure operations, the well-known "swoops," are another Constabulary function. Blocks, sections of a city, entire villages or other potential "hot spots" are surrounded and systematically searched for hidden arms, evidence of subversive activity or black market goods. Constabulary will also frequently be called upon to support investigative agencies in planned raids with specific objectives. "Operation Grab-bag," recently headlined as a Constabulary raid upon Danube

All the equipment known to modern military operations is at the command of the U.S. Constabulary. Fast, heavy, hard-hitting tanks, light, flexible, armored cars, mounting heavy caliber rapid fire cannons, and overhead the "eyes" of the artillery. The entire unit is linked together by two-way radio communications.

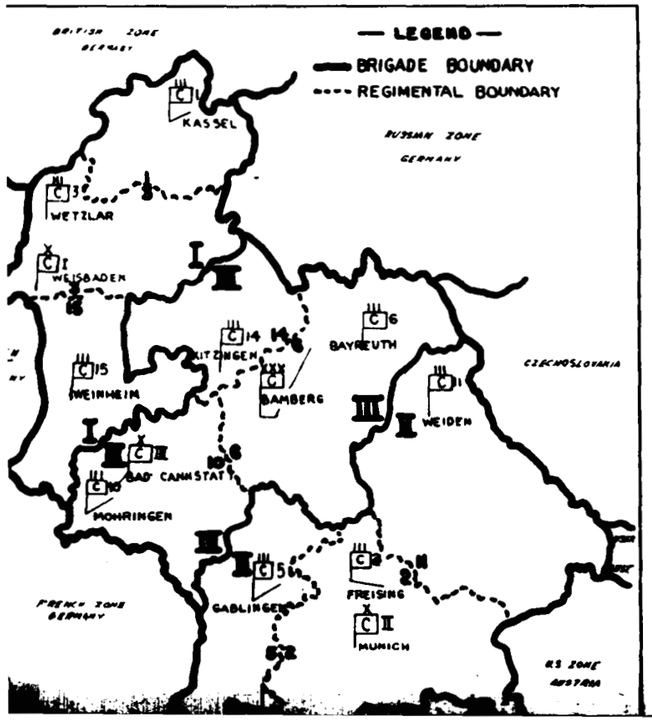
Signal Corps Photo

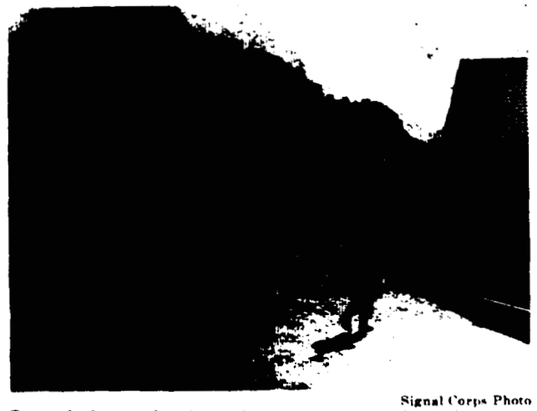
River shipping, was actually of the latter type. Although Constabulary had not become operational at the time of the raid, five squadrons, supporting the Regional CIC, were employed in sealing off and guarding ships on the Danube.

The German police, fairly recently reorganized, are hampered by shortages of equipment, transportation and personnel. Policemen are often inexperienced, and training facilities are limited. The prestige among their own people which the German police system once enjoyed was lost after the war for a number of reasons. Some of these reasons probably were the dissolution of the old police system immediately after occupation, the inability of the new Military Government police to implement their orders (they have only recently been armed), and a general breakdown of respect for German authority. All these factors cause a purely German police problem. Powerless to act against Allied nationals, the German police are occasionally disarmed and beaten by rowdy elements found in any Army or nation.

While members of the Constabulary on duty may assist the German police in efforts to arrest or to quell disturbances among the civil population, they do not normally interfere unless it is apparent that the police are unable to handle the situation. In the event of a breach of the peace by Allied or displaced persons, the individual German policeman is authorized to request Constabulary intervention. In most other cases, however —except in an emergency—requests for Constabulary assistance are made through Military Government channels.

Regimental and Brigade Areas, U.S. Constabulary.





Signal Corps Photo

Constabulary school graduates in Sonthofen, Germany, stage a demonstration for their commanding general, just after the completion of the intensive four weeks training course.

Very obviously, the mission of the Constabulary demands a type of training not normal to the average soldier. A glance at the curriculum of the Constabulary School at Sonthofen in Bavaria, illustrates the diversity of subject matter. Not too far from the beaten path of normal military schooling are subjects including tactical training, covering offensive and defensive combat, urban, rural and frontier patrolling, and riot duty, weapons, communications, maintenance, and mechanized tactics. However, other subjects are far different, and comprise police operations—including support and re-enforcement of existing American and German agencies, technique of arrest, rules of evidence, traffic control, law, orientation on CIC, CID, the military police —and Geopolitics, which includes the study of German history, geography, and legal structures as well as Military Government and Allied occupational forces.

Since the first class finished late in March of this year, graduates of the Constabulary School have offered invaluable assistance in training the units with which they have been posted. Much of the training task, however, has fallen upon heretofore unspecialized officers and men who have learned the hard way. Cadre training was conducted during March despite the formidable obstacles of unit movements, instructor shortages, lack of manuals and training aids, and the turning-in and drawing of equipment. Certain units were obliged to continue with occupation missions at the same time.

Beginning in April and through May, training continued in basic military subjects, with the addition of specialists subjects and topics peculiar to Constabulary. During this period for example, the Regimental horse platoons and motorcycle platoons acquired facility in the use of their mounts. Beginning in June, the Constabulary becomes operative in what amounts to a one-month shakedown "cruise," and present plans call for it to become completely operational by July.

The 86th Cavalry Reconnaissance Squadron

Screening of the 6th Armored Division near Muhlhausen, April 5-12, 1945.

*by Lieutenant Colonel Harry C. Brindle**

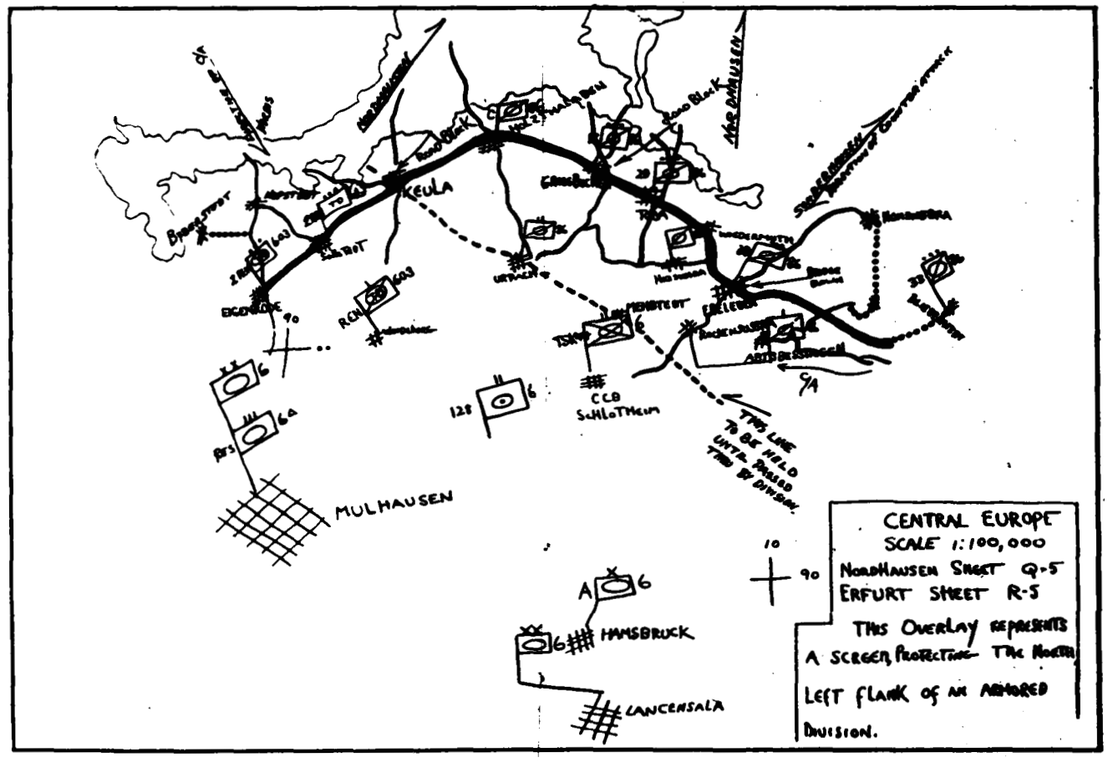
CONCLUSION

ON April 4, 1945, the 86th Mechanized Cavalry Reconnaissance Squadron, less Troop B, of the 6th Armored Division was given the mission of screening along a line northeast of Muhlhausen (WH9093).** The screen was to extend from Hohenebra (RD1405) through Gross Breuchter (RD0307) and Keula (RC 9407) to Huepstedt (RC8806). At this time, two combat commands of the 6th Armored Division were in assembly areas in the vicinity of Schlotheim (0498) and Lancensalza (WJ0382), while the third combat command had been committed to the northwest to wipe out an enemy pocket. The First Army had not yet come up abreast of the Third Army. The screening position was on the extreme left flank of the Third Army.

The squadron commander divided his security line into three sectors, and to each sector he assigned a mechanized cavalry reconnaissance troop, reinforced by one platoon of light tanks and one platoon of assault guns.

*Commanding 86th Mechanized Cavalry Reconnaissance Squadron.

**Maps: Central Europe 1:100,000, Sheets Q-5—Nordhausen, and R-5, Erfurt.



The three troops moved out at 0700 hours April 5 from Struth, in the vicinity of Muhlhausen. One troop advanced on Keula, one on Gross Breuchter, and one on Ebeleben (RD0802). The squadron, less the three reinforced troops and Troop B which had previously been attached to CCB, followed the route of the troop marching on Gross Breuchter.

Enemy resistance during the movement was light, consisting mostly of small-arms fire. All towns were cleared by 2000 hours with a minimum loss to the squadron. The squadron command post was located at Urbach (RC9903). By 1000 hours on April 6, roadblocks had been established on all main routes leading south toward Muhlhausen, Erfurt (WJ3270) and Weimar (WJ5271), and patrols were operating over unimproved roads between these main roads. Late on April 6, the squadron was reinforced by Troop B, reverting from CCB, plus the reconnaissance company of the 603d TD Battalion. Troop B was committed to reinforce and extend the screen to the east with the troop CP at Abtsbessingen (RD1100). The troop was ordered to send patrols to the east to Bliederstedt (1801) and to Hohenebra (1405). A counterattack was anticipated from the direction of Clingen-Greussen (2397). The reconnaissance company of the 603d TD Battalion was committed on the northwest flank with the company CP at Eigenrode to detect the presence or build-up of enemy troops in that area. The division previously had been hit by a counterattack from that direction.

During the ensuing week, the screen was constantly prodded by the enemy seeking to go south out of Nordhausen (RD1227), in the direction of Erfurt and Weimar. Several concentrated attacks were made by the enemy, but all were successfully repulsed, although not without loss to the squadron. This screen was maintained until contact was established with elements of the First Army at 1630 hours on April 12, 1945, in the vicinity of Nordhausen. It was later learned that as a result of the establishment and maintenance of this screen, the enemy was forced to move east rather than south, as had been his original intention.

This action reveals one method of setting up a protective screen with mechanized cavalry to secure a flank of an armored penetration. The planning provided for an alternate security line to the rear where the troops could be ordered to fall back (see sketch). However, the alternate line was ordered held until reinforced by other division units. The troops thoroughly understood the plan and made preparations to carry it out in case of a serious counterattack. The squadron CP was placed in the center of the screen and well forward behind the screen. This action illustrates the flexibility of mechanized cavalry units, and their capability to absorb counterattacks. Over the eight-day period, four counterattacks hit the screen at different places, but while the screen was badly bent several times, it was never penetrated and the original line was reestablished.

The 89th Cavalry Reconnaissance Squadron

Delaying action by Troops A, B, C and E in the Befort area, December 16-25, 1944.

AT the outbreak of the German counteroffensive, December 16, 1944, the 89th Cavalry Reconnaissance Squadron was in the vicinity of Bissen. The squadron commander was ordered to move Troops A, B, C and E without delay to the Haller-Christnach area, where they were to be attached to Combat Command A, whose mission was to defend the Befort area.

Upon arrival at Haller, Troop A was attached to the 60th Armored Infantry Battalion, and outposted Befort; Troop B outposted Waldbillig and Christnach. During

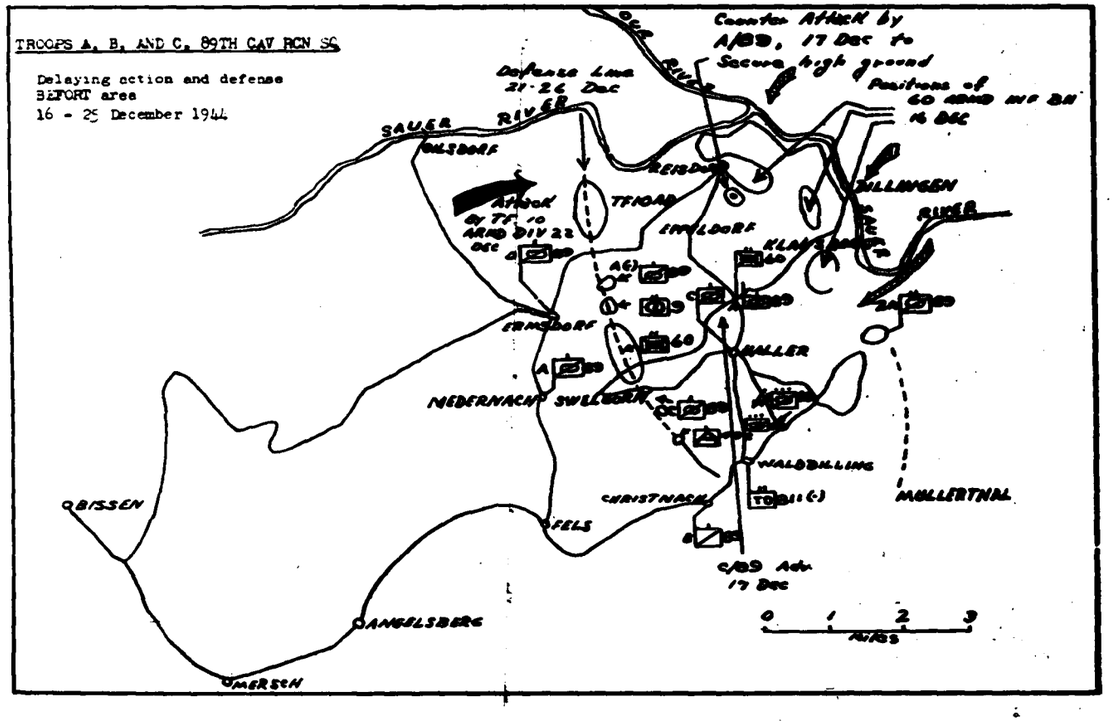
the night of December 16-17, the enemy infiltrated into the lines of the 60th Armored Infantry Battalion, and at 1000 hours December 17, Troop A counterattacked the position and drove the enemy from the high ground north of Befort. At 1930 hours, the commanding officer of Troop A received orders to hold Befort as long as possible, and to cover the withdrawal of the 60th Armored Infantry Battalion during the night of December 17-18 to the positions shown on the sketch, northeast of Ermsdorf. Under continuous heavy pressure from the enemy, Troop A completed its withdrawal to Waldbillig by 1400 hours, December 18.

Meanwhile, Troop B continued outposting Christnach and Waldbillig. It received orders to move toward Mullerthal at 1000 hours, December 17, and at 1230 hours was ordered to attack the town. Reinforced by four tank destroyers, Troop B attacked at 1330 hours and encountered determined enemy resistance which stopped its advance. Troop B then was ordered to withdraw, and to organize defensive positions on the high ground covering the approaches to Waldbillig.

Troop C arrived at Haller at 0730 hours, December 17. It attacked dismounted northwest toward Befort at 0800 hours, December 17, with one platoon of Battery B, 482d AAA Battalion, in support. The troop advanced to the line shown on the sketch, but continuing enemy pressure forced it to withdraw to the vicinity of Haller. At 0230 hours, December 18, Troop C moved to Sawelborn to defend the high ground along the north-south road in that area.

At 0400 hours, December 18, the troop organized its defensive position, using three platoons in line. Battery A, 482d AAA Battalion, covered the area on the south flank of Troop C. Troop A remained in Waldbillig until 1530 hours, December 18, when it was ordered to move to Medernach immediately. Here it received the mission of establishing active patrols in the vicinity of Ermsdorf, Eppeldorf and Gilsdorf. Troops B and C maintained their defensive positions, and Troop A continued its patrolling through December 21.

On December 21, a task force of the 10th Armored Division attacked and secured positions west of Eppeldorf, as shown on the sketch. Troop A was ordered on December 22 to maintain active patrolling between the task force of the 10th Armored Division and the strongpoints that had been established to the south (see sketch). All troops continued in these positions until December 26, when Troops A, B and C were withdrawn to a rest area.



The 92d Reconnaissance Squadron

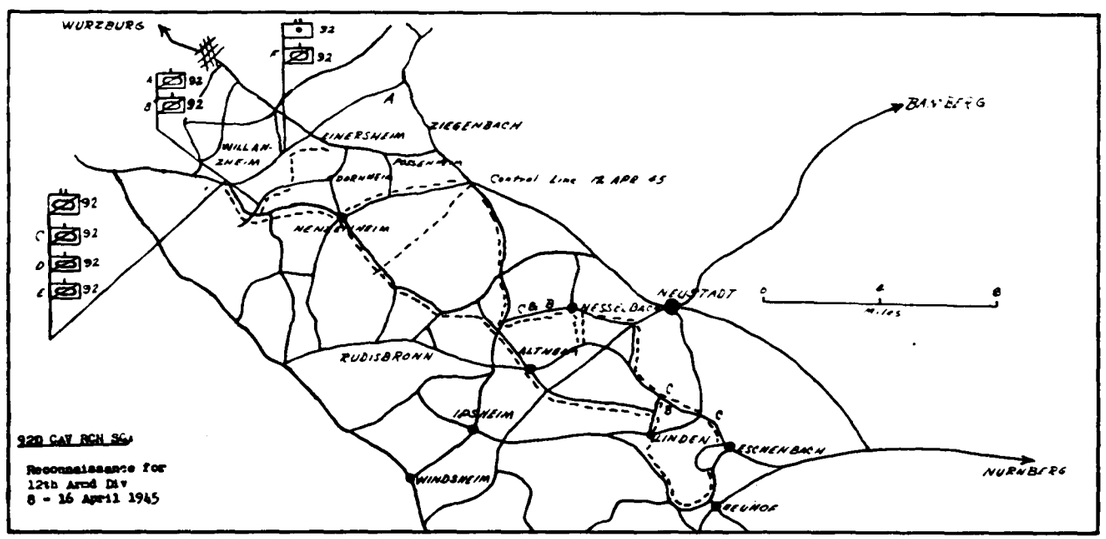
Reconnaissance for the 12th Armored Division in the Neustadt area. April 8-12. 1945.

ON April 8, 1945, the 92d Cavalry Reconnaissance Squadron, then generally south of Wurzburg, initiated reconnaissance from its assembly position east toward Neustadt. Two platoons of medium tanks were attached to the squadron, and one section, each, was attached to Troops A, B, C and D. One light tank platoon, each, of Company F, was attached to Troops A, C and D. The 342d Armored Field Artillery Battalion was attached to the squadron. The division mission was to continue the attack to the southeast.

At 1200 hours April 8, the squadron advanced, Troops A, C and D moving as indicated on the sketch. Troop B was in squadron reserve and Troop E, and the 342d Armored Field Artillery, initially at Willanzheim, were prepared to give supporting fire. At first the troops advanced against light resistance, but by 1800 hours had encountered a strong enemy line running generally from Possenheim-Dornheim-Nenzeheim. At dark, Troops A, C and D were all in enemy contact just west of this line.

On April 9, the Squadron observed and probed the enemy's positions to determine his strength and dispositions. On April 10, the Squadron received orders to continue its frontal pressure on hostile positions in conjunction with an attack of Combat Command B on the north, and to be prepared to pass through the gaps developed by this attack. On April 11, Troop A made contact with Task Force Norton of Combat Command B at Zeigenbach. The Squadron maintained its pressure on hostile positions through April 12, and that afternoon the troops were able to advance. However, prior to darkness all troops met heavy enemy small-arms and bazooka fire, and a line of contact was established, as shown on sketch. The Squadron also kept contact with Combat Command B on the north and the 116th Cavalry Reconnaissance Squadron on the south.

On April 13, the troops advanced again, and by dark Troop C was in contact with the enemy at Altheim, Troop D at Ipsheim, and Troop B at Ober Nesselbach. The remainder of the squadron moved on to Rudisbronn. Because of the road net, the advance was made on only two roads, Troop C being followed by Troop B, and Troop D by Troop A. On April 14, the squadron prepared to continue its advance to the east.



On April 15, Troop D, followed by Troop A, moved out on the route shown, encountering light opposition. By night, April 15, Troop D had penetrated the enemy position to Neu Selingsback, and the Squadron command post had moved to Linden. In the meantime, Troop A advanced against Neuhof, and by 1700 hours, April 16, had secured the town, in conjunction with Troop C, which moved in from the north. Meanwhile, Troop D remained in position at Neu Selingsback.

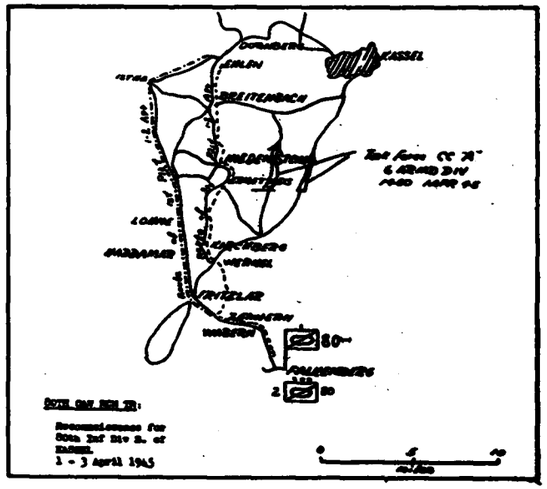
The Squadron had thus accomplished its mission of reconnaissance in force to the southeast, and had pushed against stiffening enemy resistance a distance of 30 miles.

The 80th Cavalry Reconnaissance Troop

Reconnaissance during advance of the 80th Infantry Division to Kassel, April 1-3, 1945.

AT 1400 hours on April 1, 1945, the two task forces of Combat Command A, of the 6th Armored Division, which were en route to seize Kassel, were halted six miles south of the town by corps order. The mission had been changed. By 1700 hours, the 318th Regimental Combat Team, of the 80th Infantry Division, passed through and relieved the combat command of the 6th Armored Division in its zone. The 80th Infantry Division was disposed with regimental combat teams abreast from east to west in the following order: 319th, 318th and 317th. The 9th Armored Division, under the First Army, was operating in the zone to the west of the 80th Division.

On the morning of April 1, the 80th Cavalry Reconnaissance Troop, of the 80th Division, assembled in the vicinity of Falkenberg and was assigned the mission of reconnoitering in the division zone, and of maintaining contact with elements of the First Army on the division's left flank. In executing the mission, the 1st Platoon reached Fritzlar, where it made contact with the 27th Armored Infantry Battalion of the 9th Armored Division, the 102d Cavalry Group, and the 2d Ranger Battalion—all elements of the First Army. The Platoon proceeded through Haddamar, Lohne, Merzhausen, and then went northeast to Niedenstein. In the meantime, the 3d Platoon followed the task force of the 6th Armored Division via Wahern, Zennern, Werkel, Wehren, Kirchburg, and Eermheis. No opposition was met by either platoon, but 15 POWs were taken during



the day. The 2d Platoon remained in troop reserve.

On April 2, the division met stiffening resistance on the outskirts of Kassel. This increased resistance was felt by the 1st and 3d Platoons as they continued north, and sporadic antitank and small-arms fire was received en route. However, the 1st Platoon reached Isttra and the 3d Platoon reached Breitenbach without difficulty. During this operation 15 POWs were captured, and two enemy trucks and two 88mm. guns destroyed. Contact was maintained with the 2d Ranger Battalion and the 102d Cavalry Group, and also was established with the 273d Infantry Regiment of the 69th Division. On April 3, the 80th Cavalry Reconnaissance Troop reconnoitered the zone of advance of the 317th Regimental Combat Team to Ehlen. Later that day, the Troop was relieved by the 3d Cavalry Reconnaissance Squadron (Mecz.) and was attached to the 319th Regimental Combat Team. The troop was then given the mission of reconnoitering the division's right flank south of Kassel.

This operation illustrates a typical assignment for a cavalry reconnaissance troop of an infantry division-reconnaissance, with security also provided. Enemy resistance was light and scattered, but was about the maximum which could be successfully engaged while maintaining the required speed.

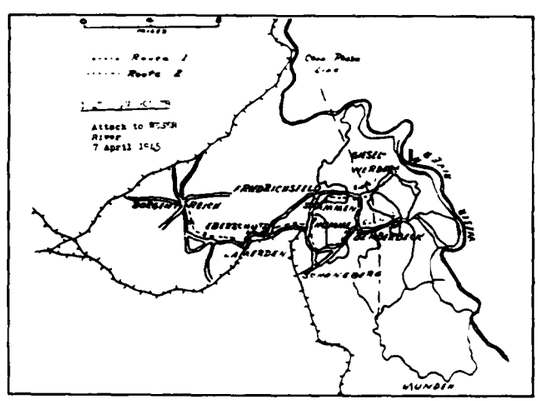
The 104th Cavalry Reconnaissance Troop

Attack from Borgentreich area to Weser River in advance of the 104th Infantry Division, April 7, 1945.

ON April 4, 1945, the 104th Cavalry Reconnaissance Troop (Mecz.), of the 104th Infantry Division, with a platoon of infantry and the assault gun platoon of the 750th Tank Battalion attached, moved from Padberg, Germany, to Hottheim. On April 5 and 6, this force, known as "Task Force Laundon," moved through Blankenrode and Borgentreich, protecting the division's left flank.

On April 7, 1945, Task Force Laundon, preceding the 413th and 415th Regimental Combat Teams, captured the towns of Lamerden, Eberschutz and Humme. At Humme, the force divided, with one platoon moving along Route 2 and capturing Schoneberg and Ederschutz. The 2d Platoon moved north from Humme and captured Stammen, then proceeded along Route 1 and captured Friedrichsfeld, and turned north again on Corn Phase Line and captured Gottsburen. The 1st Platoon moved along Route 1 and at 1505 hours reached the west end of Gieselwerder where it found the bridge over the Weser River had been blown. By 1700 hours, the final objective on the Weser River had been reached by all platoons. On the following day, the troop began a new mission of protecting the division left flank.

This operation demonstrated the ability of a mechanized cavalry reconnaissance troop, fighting on a lightly defended front, to operate with speed in advance of regimental combat teams, capturing successive key positions and making it possible for the bulk of a division to advance without loss of time.



36th Squadron in the ETO

Reconnaissance Platoon in Front of Infantry Division

*by Lieutenant Allen L. Zediker**

ON April 11, 1945, Troop B was relieved of the mission of flank security for the XIII Corps and attached to the 102d Infantry Division to perform reconnaissance in the division zone.

The 3d Platoon was given the right half of the division zone in advance of the 405th Infantry Regiment, mounted in trucks. Our mission was purely reconnaissance and we were not restricted to our zones if we found it necessary to move out of them to by-pass a strong point.

Our instructions were to report any enemy encountered or observed, and to report on phase lines one, two and three. When we reached phase line A we were to hold up and await further instructions.

The importance of phase lines in an operation of this type cannot be overemphasized. Even with the long-range radios which we have, it is the only sure means of control which higher headquarters have over their reconnaissance elements.

Until we reached phase line two we reconnoitered the zone quite thoroughly without meeting any resistance. We then received orders from the troop commander to push reconnaissance along a route through phase line A, phase lines 4 and 5, and hold up on phase line B. We reached phase line B at 1800, having encountered only a few straggling Wehrmacht and volkstrum troops. They surrendered readily, and were sent to the rear without escort.

After reporting our position we were instructed to outpost phase line B and await the arrival of the infantry, which, because of our 50-mile advance, was allowed to reach B plus attachments without dismounting any troops.

At 0600, April 13, we jumped off in our same zones toward our final destination, phase line C. As we progressed further into enemy territory we encountered numerous rear echelon troops who surrendered readily. By 1300 we had amassed a total of 250 prisoners. It was decided to send an escort of one machine-gun bantam and evacuate them to the troop CP 10 miles to the rear.

*3d Platoon, Troop B, 36th Cavalry Reconnaissance Squadron (Mecz).

We continued on our mission, reaching phase line 7 without further difficulties. After crossing this point we encountered elements of a German paratroop regiment firmly entrenched in a heavily wooded area. Forced to fight our way out of the situation, we lost one man, killed three Germans, and captured 6.

After reporting the disposition and location of the enemy, we were instructed to by-pass and continue on our mission. While attempting to by-pass into the left platoon zone we liberated 500 American PW's with a 40-man German guard. After arming the Americans with available German weapons, and giving them all of our rations, we continued on our mission.

It was believed that the platoon in the left zone had encountered elements of the same paratroop regiment. This was confirmed when we received a message from the troop CO to return to the CP.

Infantry and artillery units were used to clean out the woods.

Conclusions

The advantage of placing the platoon leader in the turret of the leading armored car is clearly shown in this action. Where the platoon is roadbound, he is able to use and control the maximum fire power in his point vehicles. This position also enables him to control his platoon, and send back information through the two radio sets.

It is important that civilian population in areas occupied be instructed to put out white flags as a signal to the following elements that the territory is in our hands.

Tank and Reconnaissance Combat Teams

*by 2d Lieutenant Leroy O. White**

A HIGHLY successful combat team made up of one platoon of light M24s and one reconnaissance platoon was used by the 36th Cavalry Reconnaissance Squadron (Mecz). Such a team could accomplish fast and aggressive reconnaissance. Occasionally a section of tank destroyers was attached to it if enemy contact was expected.

*36th Cavalry Reconnaissance Squadron (Mecz).

This type of combat team was employed the morning of April 3. We had just crossed the Rhine River and moved up to a small town southwest of Munster, which was under attack on three sides. Three platoons were given the mission of making a reconnaissance to the northeast in an attempt to reach the town of Telgte. They were to secure and hold any bridges that were found intact, which would mean dropping off a part of the small task force.

The platoons moved out at 0600 and were to report to the CO by radio every half hour. When our platoon, which was first, reached the next town it was joined by a reconnaissance team. With the assistance of the scout sergeant in charge the following plan was formulated: the point bantam would lead out, followed by the M8 armored car, the tank platoon, and the mortar bantam. The platoon would move forward until it hit something suspicious. If a personal reconnaissance showed 75mm fire from the tanks was warranted, it would be laid, and then the platoon would try to go through. If this was impossible the obstacle would be by-passed.

The platoon moved along between 10 and 15 miles an hour, and by 1130 hours was starting to cross the main road which entered Munster from the north. The CO came up and said that the Jerries had it covered with 88s, and that the 3d Platoon had lost one tank. He advised us to find another way across, and stated that since the Germans were using the east road as an escape route from Munster it must be closed.

The squadron CO then arrived and told us that all the bridges were out across the canal northeast of Munster, but that the British had one across the canal and for the platoon to cross there. We reached the bridge control line at 1430, and after awaiting our turn in a line of troops two miles long, finally crossed at 1730.

The platoon rolled to within a half-mile of Westbevern, which was on the road to be closed. Here it halted to fire at a German soldier who had run into the cover of near-by woods. The company CO dismounted and ran him down for questioning. The prisoner said no German or American soldiers were in the town and identified his unit as an antiaircraft outfit, whose positions could be seen to our left. At this time 4 or 5 German soldiers were seen running for a dugout. The platoon opened fire with both .50 calibers and 75s and scored a hit with a 75 HE in the middle of the group, which eliminated it.

A bantam now was sent forward to the town. It was fired on at the outskirts by a burp gun and the crew dismounted and took cover. Since no antitank weapons were visible in the town, our tanks entered it. When they reached the center of the town, two panzerfausts were fired at them but missed, and the tanks continued to the main road.

They rolled on to the road within 50 yards of a truck full of Germans who were either in the act of mounting or dismounting. Tank machine guns and 75s opened fire. A 75mm hit in the middle of the truck took care of things.

As the tanks started forward, dismounted German soldiers who had approached under cover of a bank, hit the first tank with a panzerfaust. The other tanks immediately opened fire, and kept the enemy down long enough for the crew of the disabled tank to leave it and mount the second tank. Things got pretty hot then so we moved out.

The tanks proceeded to the edge of the town and were deploying to shell it into submission, when the squadron CO arrived. Informed of what had happened, he instructed us to place three tanks on the road leading into town in order to keep our supply lines open, and to take the remainder of the force and try to capture the next town to the north, Lehmbrock. It was on the same road that the Germans were using, and its capture would mean an accomplishment of the mission.

We reached the outskirts of Lehmbrock just after dark, and as we turned the first street corner the lead tank was hit by a panzerfaust. Part of the second tank's crew promptly dismounted to cover the crew that was leaving the disabled tank. The German soldiers who had fired the panzerfaust turned the corner directly in front of us, and were shot. Troopers ran to the tank and found that the crew had escaped. They soon returned to our position and reported that the town was filled with Jerries. We decided to remain on the outskirts and attack early the next morning. Road blocks were posted and security established for the night.

Before morning the rest of the company, Troop A and part of Troop E, arrived. The author returned to pick up the three tanks which had been left at Westbevern. While there, I saw that a large force of Germans was concentrating in the town, and heavy enemy armor moving along the road from Munster. The three tanks had beaten off two counterattacks, and this information was reported to the squadron CO when I returned.

The next morning at 0730 hours Troop A supported by Troop E's assault guns began a dismounted attack on Lehmbrock. The town was cleared by 1030 hours, and 500 PWs, including 135 Hungarian soldiers, were captured, and about 150 enemy were killed. Our casualties were very light.

At 1230 hours, we received orders to move to Telgte, about 6 kilometers away. A reconnaissance team and a section of tank destroyers were attached to the platoon.

We moved out about 1300, and had gone about two miles when the point bantam received fire, which was returned. Seven German soldiers surrendered, and were sent to the rear. We had little trouble the rest of the way to Telgte, and took 89 prisoners en route. At Telgte the town garrison of 29 soldiers surrendered, and were sent to the rear.

We had proceeded about a mile and a half from Telgte toward Westbevern when we captured an enemy point. The NCO in charge said the point was a part of approximately 250 soldiers of all branches and two Mark V tanks which were moving from Westbevern toward Telgte. This was verified by reconnaissance. We turned back toward Telgte and were going to defend the town, but before we arrived there the CO radioed that Lehmbrock was under attack by a mixed force of tanks and infantry. He believed that we were possibly cut off and instructed us to return quickly. Our force was needed to help repel the attack. We reached Lehmbrock without trouble, put the tanks and TDs into position, and the Jerries were surprised when they started their next attack.

The described plan was used during the move to the Elbe River. At times, a reconnaissance platoon supported by a platoon of light tanks, were employed; at other times, a reconnaissance team was attached to a platoon of light tanks. It was found impracticable to send out a tank platoon unaccompanied by a reconnaissance element. Except for minor incidents this system was efficient. It enabled rapid movement, an effective reduction of minor resistance, and gave excellent protection to the units whose flanks it was protecting.

Deceptive Action by Reconnaissance Patrols

by Captain Roy L. Huckabee

MAJOR GENERAL GILLEM, commanding the XIII Corps, Ninth Army, visited the CP of the 36th Cavalry Reconnaissance Squadron (Mecz) in Willich, Germany on March 15, 1945, and stated that he had a mission that could only be performed by a cavalry outfit. It was required that aggressive patrols be sent across the Rhine River to make the enemy believe that a crossing would be made by the Ninth Army in the sector Lank-Latum-Mudrich.

At that time the 36th Cavalry Reconnaissance Squadron was performing a security mission, while the 44th Cavalry Reconnaissance Squadron (also of the 11th Cavalry Group) was responsible for the river line sector —Lank-Latum-Mudrich.

The squadron commander immediately called in the three reconnaissance troop commanders and gave them orders to reconnoiter at once for a probable crossing site during daylight hours. Each troop was to send a 7-man patrol across during the hours of darkness with the mission of reconnoitering by stealth over a route that would carry the patrols an average of 3,000 yards east of the river bank. These patrols were to determine: one, if the enemy had mined the waters or east bank of the Rhine; two, if he had constructed any obstacles on the far bank; and three, the location of enemy positions and installations, in preparation for combat patrols to go over on succeeding nights to take prisoners.

In the meantime the S-2 and S-3 called in representatives from the corps engineers and corps supporting artillery to coördinate plans for the patrol operations. The engineers were to furnish an assault boat and 7-man crew for each of the three patrols and an additional boat and crew for any emergency. The artillery was to prepare three separate fire plans to be ready to fire a numbered concentration, if called for by the patrols anywhere along the proposed routes.

Communication was to be maintained by an SCR-300 (Infantry set) with the patrol, one with the boat crew, who would establish a temporary beachhead, one on the near shore with the troop commander, who would have communication with the artillery OP by telephone and SCR-300, and communications to squadron headquarters by telephone and SCR-506.

Patrol plans were prepared early enough for the leaders and key members of the patrol to make a personal reconnaissance in daylight of the route to be covered. Plans were coördinated with units on our right and left, as there was always the possibility of the boats drifting off their proposed route because of the swift current (6-7 mph) and the wide river (450 feet).

Just one of the patrols encountered the enemy the first night and met only small-arms fire. It was evident that the enemy had a very light line and did not use any supporting mortar or artillery fire.

For 6 consecutive nights a minimum of three patrols crossed the river, alternating the routes, time of departure, number of men in patrols and type of boat, but always with the mission of: one, harassing the enemy; two, locating defensive installations; and three, making him conscious of increased patrol activity.

At the end of 6 days the enemy had definitely strengthened his line, as proven by successive patrols, PWs, and suppressed civilians who escaped across the river. In addition to the small-arms fire received the first night, the enemy fired 20mm, 60mm, and 80mm mortar, light and heavy artillery on patrols during the latter part of the period.

The patrols were aware that their mission of leading the enemy to believe a crossing was imminent in this sector could be accomplished only by aggressive action and boldly making their presence known. The success of the mission was evidenced by the increased activity in our sector after patrolling began, and the large number of troops trapped in sector Lank-Latum-Mudrich and backed up in the Rhur Pocket when several weeks later the Ninth Army crossed the Rhine River in the vicinity of Wessel.

The Assault Gun Platoon in Offensive Action

by 1st Lieutenant Robert L. McMahon*

DURING the drives from the Roer River to the Rhine and the Rhine to the Elbe, the 11th Cavalry Group was assigned the mission of protecting the left flank of the XIII Corps of the 9th Army. It was the responsibility of the two reconnaissance squadrons of the group, the 36th and the 44th, to protect the often exposed flank from a possible German counterthrust from the north. The leading elements of the British Second Army and the XIII Corps were not able to keep abreast in their advance, and it was necessary to employ a mobile flank guard.

In this typical cavalry mission of flank security, the assault gun troop was used to support the advance of the reconnaissance troops. One assault gun platoon was attached to each of the troops. This employment proved more successful than keeping the troop intact to fire as a battery.

First, in a swiftly moving, fluid situation there are few occasions when the 6 guns can be effectively and quickly fired in battery. In the mounted action between the Roer and the Elbe there were no occasions when the guns in battery would have been vital to the advance. No formal lines of concentrated resistance were encountered and howitzers in battery were not necessary.

Second, immediate light artillery on mobile mounts can prove invaluable to the reconnaissance troops in their advance from position to position. In the team which results in the grouping of an assault gun platoon and a light tank platoon with a reconnaissance troop there is the combination of armor, fire power, and maneuverability—the characteristics of modern cavalry. With the advent of the light tank, M24, with its 75mm gun, this team received the added punch necessary to carry it through most light opposition.

The formation of this combat command in miniature is left to the discretion of the commanding officer of the reconnaissance troop. His decision should, of course, be based on the advice and recommendation of the platoon leaders of the attached elements. The reconnaissance troop commander should have adequate knowledge of the capabilities and limitations of these elements prior to the employment in any situation.

An excellent example of the most advantageous use of the 75mm assault gun was displayed on April 9, when the 36th Squadron was regrouping at Godshorn, a small town 8 kilometers north of Hannover. Attached to Troop C was the 3d Platoon of Troop E, led by Sergeant Joseph Kuberski, and a platoon of light tanks.

The squadron was in column approaching Langenhagen, led by Troop C in command of Captain John E. Newlin. Lt. Marshall Bivins' platoon was leading when the point team ran into 88mm fire. He deployed his platoon and radioed the information to the troop commander. In the meantime the assault gun platoon had been called up to a railroad embankment which provided excellent defilade for the howitzers. The platoon leader of the 2d Platoon, Troop E, at that time attached to Troop B, was called forward to assist Sergeant Kuberski in firing the platoon. Leaving a radio ¼-ton at the howitzer position, Captain Newlin moved out to act as relay between Lieutenant Bivins, who was observing, and the howitzers.

Because properly scaled maps were lacking, all data had to be estimated, and corrections made at the guns with the use of the graphical firing table. The first few rounds that were fired were smoke in order to aid observation, but they were of little value. The platoon then changed to shell HE M54 and the fuze setting was computed to assure a high air burst. Once the round was located, the fuze setting was lengthened so as to bring the burst onto the target. The gun crews chose their own referring points, and recorded their referred deflections without command.

During the entire process of laying, the forward observer and the relay station were under fire from the enemy guns. The railroad embankment was protecting the howitzers from direct fire from the 88mm guns, but occasional ricochets were landing within 50 yards of the platoon. All the rounds which ricocheted were armor piercing so the efficient firing of the battery was not interrupted by this fire.

To add to the confusion which invariably accompanies such action, Troop B was assigned a mission which required the support of the 2d Platoon. Captain Vernon L. Poynter, commander of Troop E, substituted in control of the 3d Platoon and continued to deliver fire in support of Troop C until the enemy was routed.

The German guns proved to be dual-purpose 88s mounted in concrete emplacements. Their primary purpose was the antiaircraft defense of Hannover, but the proximity of the 36th Cavalry caused them to be pressed into use as antimechanized weapons. Upon later inspection it was clear that the combined efforts of the armored car 37s, the light tank 75s and the assault guns had destroyed 6 of the 9 guns in place. The remainder were abandoned when the gun crews withdrew.

It is obvious that without the help of the cavalry's mobile artillery the entire squadron would have been held up until the position was by-passed or enveloped by dismounted parties.

This action alone is evidence that the assault gun platoon can be used to the best advantage in a mobile situation by attaching it to a reconnaissance troop to provide it with immediate light artillery support. Seventy-five millimeter howitzers can, and do, take the place of field artillery in rapid offensive action.

*Troop E, 36th Cavalry Reconnaissance Squadron (Mecz).

GAPA---Aircraft of the Future

by Major Hal D. Steward

"Gapa City," Utah, consists of six shacks and miles of desert sand. But its importance is greater than its size for here the first Ground-to-Air Pilotless Aircraft weapon was launched in middle August.

A heretofore secret guided missile, designed as a potential defense against possible attack by high-speed, high-altitude enemy aircraft, the GAPAs are manufactured by the Boeing Aircraft Company. When perfected, they are expected to be capable of seeking out and destroying possible enemy weapons before they can reach their targets.

Pencil-slim and 10-foot long, 60 GAPA projectiles are to be fired in Utah this year in the first phase of an extended program scheduled to last several years. First test models of the new guided missile are propelled by standard aerojet rocket units. A booster power unit is attached to the tail of the projectile, accelerating the missile to high speed within a few seconds.

The firing range for the GAPA is located in the heart of the Great Salt Desert of Utah. Heat, alkali dust and the blinding glare of the white salt plains make this desert an unpleasant place in the summer.

Firmly embedded in concrete, the GAPA launching tower rises to a height of 40 feet. Made of steel, the tower is strongly stressed and painted a brilliant yellow.

Called "Old Needlenose" by the men who work with it, the projectile is armed after it has been hoisted into place on the tower. The missile is armed with remote control ignitor fuses.

Four theodolite stations are situated in the desert to track the missile from launching to landing so that a complete record of the GAPA's progress can be had for later study.

Three hundred yards from the launching tower is the "dugout," headquarters of the firing operation. Here the switch is thrown to send the missile shooting into the sky. It is an underground structure of heavily reinforced concrete thickly piled with sand.

Because of the tests being conducted at "Gapa City," sometime in the future it may be possible to develop man-carrying aircraft capable of bolting around the world in a matter of hours. These tests may well be the forerunner of rocket ships.

"Once problems of control and stability are solved," it has been pointed out by W. E. Beall, Boeing engineering and sales vice-president, "the principles involved in this new weapon may have far-reaching effects on the design of future passenger or cargo-carrying aircraft."

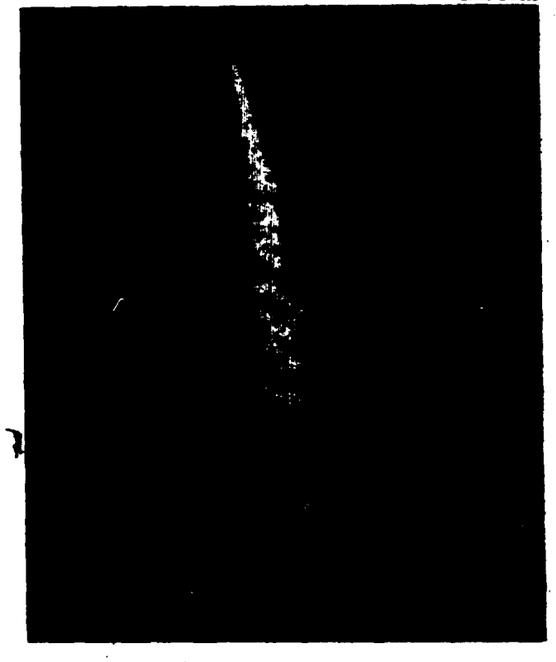
A 30-man staff operating out of Wendover Field, Utah, is carrying out the GAPA test program. Head of the Boeing GAPA unit is Richard H. Nelson, who served as project coördinator on Boeing's B-17 Flying Fortress construction during the war. Engineering staffs in the Boeing plant at Seattle, Washington, are working on further details of the GAPA program.

What is the speed of the GAPA? How high did she go? What is her effective range? The answer to these questions must be discovered by the engineers.

How the GAPA is manufactured and details of its design are War Department secrets. Only recently did the War Department make public the fact that work on the GAPA has been going on now for more than 15 months.

This heretofore secret guided missile, designed as a potential defense against possible aircraft, is being experimented with in the Great Salt Desert of Utah. It is pencil-slim and 10 feet long.

AAF Photo



Captain Heartsill.

CAPTAIN CHARLES E. HEARTSILL, our former Associate Editor, was relieved on September 1st in order that he could be discharged and returned to civilian life again. Captain Heartsill has served the JOURNAL staff for over a year and a half. Always a hard and conscientious worker, he had the bad luck to join us when the going commenced to get tough. He practically ran the journalistic department singlehandedly and the continued high quality of our magazine was due largely to his untiring efforts. He leaves the army to conduct his own business, a photographic studio in Marshall, Texas. The Executive Council joins the staff in extending our thanks to Captain Heartsill for his untiring efforts in maintaining the high standards of the ARMORED CAVALRY JOURNAL and wishes him the greatest of success in his new business venture.

NEW ASSOCIATE EDITOR

Major Hal D. Steward is our new Associate Editor. We are very fortunate in securing the services of a veteran journalist for this job. Major Steward, who was a newspaperman and free-lance writer in civilian life, spent nearly two years in the South and Southwest Pacific Theaters. He has five major Pacific campaigns to his credit and for a year was Public Relations Officer of the First Cavalry Division. He is the author of *The First Was First*, a short history of the First Cavalry Division and its Pacific campaigns. Before coming to the ARMORED CAVALRY JOURNAL he was assigned to the War Department.

* * *

STAFF MEMBER DECORATED

Master Sergeant William R. Rossow recently joined the staff of the ARMORED CAVALRY JOURNAL as Circulation Manager and it is a great pleasure to publish the following citation which he received to accompany the award of a Commendation Ribbon from the War Department when he was relieved.

"For outstanding service from 21 January to 18 June 1946. Master Sergeant Rossow trained and organized into an efficient operating force a group of personnel to record, route, and regulate the movement of cases coming before the Army Ground Forces Integration Board. By his initiative, dependability and success in meeting unexpected situations he contributed outstandingly to the progress of the Integration program."

* * *

SOLDIERS COMMEND LEADERS

In view of the widespread publicity given to adverse criticism of the so-called "caste system" the following letter is quite refreshing. It is dignified, sincere and spontaneous. It is a pleasure to print it in this column.

SPECIAL NONCOMMISSIONED OFFICERS CLASS No. 2
Fort Benning, Georgia

6 August 1946.

SUBJECT : Appreciation and Commendation.

TO : Brigadier General Whitfield P. Shepard, The Assistant Commandant, The Infantry School

THROUGH: The Commandant, The Infantry School Fort Benning, Georgia.

1. We the undersigned members of the Special Noncommissioned Officers Class No. 2 are so full of appreciation for the fine leadership which the officers listed below have given us and for the splendid example that they have set for us as soldiers to follow that we wish to go on record in this way in expressing our appreciation.

Colonel Theodore Andrews
Colonel William O. Blandford
Colonel Charles U. Knaub
Lt. Colonel Hubert C. Hicks, Jr.

Lt. Colonel Duke E. Jones
Lt. Colonel Clair B. Mitchell
Major Charles W. Sample
Major Charles H. Schrader
Major John E. Tilton
Major Warren E. Walters
Captain William K. Dielman
Captain Clifton C. Fox
Captain Edward Gorecki
Captain Edward B. Kitchens
Captain Roy B. Quinn
Captain A. Q. Smith
Captain William H. Wikoff
Lt. Norman L. Engard

2. We are fully aware of the current discussions in the press about the so-called "brass" in the Army which would lead the American public to believe that the rank and file of Army officers are hard-boiled and cold-hearted toward enlisted men. We feel that if the American public at large were aware of the type of leadership that we soldiers have enjoyed here at Fort Benning under the guidance of the officers listed that even the critics would change their attitude as reflected in part of the press.

3. The officers listed have not only been excellent instructors but they have demonstrated a sincere and intense interest in our welfare from every point of view. Thus, setting a lofty example worthy of emulation by us as noncommissioned officers who in turn must prove our value as such in the hearts of the privates.

4. It is hoped that the Commandant of The Infantry School will make known to these officers the contents of this letter as a humble and sincere expression of the appreciation of the signers of this letter.

SIGNED BY 92 MEMBERS OF THE CLASS.

* * *

LETTER TO THE EDITOR

HEADQUARTERS REPLACEMENT TRAINING CENTER
Office of the Commanding General

Fort Knox, Kentucky,
9 August 1946.

Colonel E. M. Sumner, Editor,
ARMORED CAVALRY JOURNAL,
1719 K Street, N.W.,
Washington, D. C.

Dear Sir:

It was quite a thrill to receive the first issue of the ARMORED CAVALRY JOURNAL. Only those officers who lived through the years of struggle hoping to see Cavalry regain its rightful place in the sun can appreciate the significance of this step. At last, true cavalrymen and not merely horsemen have ridden to the front. At last cavalrymen are recognized for what they really are—"soldiers who fight mounted," and not merely "soldiers who ride horses."

I look forward with confidence to the day when it will no longer be necessary to prefix the name of our branch with "armored." I do think it is necessary now, during the transition and educational stage. But the day will surely come when the word "cavalry" by itself will mean to all what it has always meant to true cavalrymen—"soldiers who fight mounted" regardless of what their mount may be.

There is no use to voice regrets now but I cannot help but be saddened by the thought that so many great cavalry units will go down in history by another name. Approximately one-fourth of our divisions in Europe on V-E Day were cavalry but the world may never know them as such. There is some hope, however, that in our school system of the future there will emerge an ever-increasing tendency to refer back to their exploits as "cavalry action," particularly if the JOURNAL and cavalry officers continue to point out the facts.

It should be apparent now more than ever before in history, that where there is ground combat decisive results can only be obtained by an army properly balanced between dismounted (Infantry) and mounted (Cavalry) units. We have the comparatively fresh examples of World War I where we were totally lacking in cavalry and World War II where we had a sound and proper balance. The student need only look at the comparative results from which a child can derive the reason.

It will soon be time to see that this step is carried to a logical conclusion in the designation of units. The term "armored infantry" is not applicable to mounted soldiers of modern cavalry. They are cavalrymen if there ever were cavalrymen. They now have "horses" from which they can use their weapons with deadly effect. No longer must they rely on the short-range pistol or the arm's-length saber from an unstable seat astride a horse. As they "gallop" toward their objective today, they confidently pour a sheet of fire from powerful long-range weapons that make their "charge" irresistible. Can you not imagine the sheer delight and cheers of Stuart, Forrest and Sheridan could they but return to command the cavalry of 1946?

I have heard officers express regret at the relegation of the horse to the fringe of the world's battlefields. But I have not heard such sentiments expressed by those who, like myself, have seen the roads and trails strewn with the bloated carcasses of faithful animals that were forced to pass through the hail of air and ground attack. *There were no foxholes for horses.* But the mounted soldier was not to be denied. He broke and trained new "horses." The record is conclusive. No scoffer can laugh it off. Once more, and for the first time since the days of '65, the cavalryman can hold his head high; he proved himself in battle. The mounted soldier clinched the most decisive victory in the history of war.

I congratulate the Armored Cavalry Association. I look forward with confidence to the successful restitution of cavalry in the teachings and thought of our mili-

tary school and in the organization and training of our ground army.

R. W. Grow,
Brigadier General, U. S. Army,
Commanding.

Jeb Stuart, sired by Gordon Russell, and grandson of Wilton Lackey, is dead.

Prewar devotees of the National and other well-known horse shows will remember this great horse as one of the best-known Army jumpers ever to appear in public.

Starting his career in 1933 he was selected for the 61st Cavalry Division Horse Show Team (New York) and stayed on the team until it was disbanded in 1940. His collection of military trophies and ribbons totals 304, of which 255 are in the first three grades of Champion, Reserve, or Blue. His shows included West Point; National; Piping Rock; Squadron "A," New York; New York Riding Club; Brooklyn; Staten Island; Essex Troop, Newark; Atlantic City; Orange; Westchester; New Haven; Chicago; Albany; Governor's Island; and Stamford.

Purchased at the age of three by Colonel Herbert H. Frost, Jeb was schooled and ridden by his owner. He was retired in December, 1941, at the time Colonel Frost went to duty with the Armored Force.

Jeb Stuart taking the triple-bar with his owner Colonel Herbert H. Frost.

11th ARMORED DIVISION ASSOCIATION NEWS

THE THUNDERBOLTS had plenty of problems to lick before they shoved through Linz toward Vienna, so we are not downhearted because our attempts to get the Division Association rolling, have run into some rugged obstacles. The Division files have been located in St. Louis and as soon as the bureaus with priorities to use them are satisfied, they will be turned over to us. Your help in getting every name and address you possibly can, to your Secretary, will be the best assurance that the records we have are correct—invest a penny post card and let us have all the dope you can. Address: The Secretary, 11th Armored Division Association, 1719 K Street, N.W., Washington 6, D. C.

The Division Association was not organized until August 15, 1945 in Gmunden, Austria, when it was found that there was no remaining record of the addresses of the 12,000 men who had already left and the secretary had only 6,000 names of eligibles. Since then, mainly through the efforts of a few men we have contacted, and others who have replied to a notice which appeared in newspapers throughout the country, our list has grown considerably.

We bumped into John Case of CCB in Sears Roebuck and he knew the address of Joe Bradford of the 22d. Luck also brought the two of us together at a soft drink stand in Franconia, New Hampshire, and we added to our group, young Dick Dufour of the 63d A.I.B. Milton Silver, CCA, writes of a group meeting in Brooklyn and John Janecek of the Band, has contacted quite a few more men on a recent trip to Milwaukee and Chicago.

Scattered around the map are these former commanders: Howard, Lowe and Palmer in the ETO—Mullins has the 25th Div. in Tokyo. Bell reported convalescing in a Long Island hospital—Yale in Paris—Kilburn in Vallejo, California and Brooks and Dager in Atlanta with the 7th Army.

We are working on a NEWSLETTER which we want to get out as soon as possible, so send us a few words about what you are doing, and your ideas as to where our reunion meeting should be held. So far, Chicago has the most approval, although St. Louis, Denver and Milwaukee have a lot of votes.

We will sign off with the reminder that we want to get that NEWS. If we get enough replies from the Executive Committee (made up of your unit representatives) we will give you the preliminary plans for our first reunion.

AN EDITORIAL

Atom Bomb Commentary

by Major Hal D. Steward, Associate Editor

(Author's Note: *Background material for this article was obtained from Commander L. V. Julihn, member of the Public Information Staff of Joint Army-Navy Task Force One. However, the opinions expressed and conclusions reached are the author's own.*)

SELF-STYLED "military and naval experts" have jumped to the conclusion that the results of the Bikini Atom Bomb tests are the final word on whether there will be an Army, Navy or Air Force in the future. Such talk and conclusions are foolish.

Cries of "the atom bomb eliminated the need for a Navy"; "the Air Force is now outmoded and from now on everything will be rockets" are heard everywhere. Nothing in any of the atomic bomb tests substantiates these contentions.

The purpose of the Bikini tests is greatly confused in the minds of many. Misconceptions of the results of the experiments have cropped up everywhere.

The Bikini tests in no way definitely prove that the Navy is here to stay, is subject to radical conversion, or that it will be obsolete in offense or defense in any future wars. From information available, it is not believed that the atomic experiments in the Pacific were held to determine what armed services will have to be eliminated from American defense plans. It is much too early in the game to reach any such conclusions. In all probability it will take years of research, experimentation and development to determine what the future of the armed forces will be in relation to the atom bomb.

Basic purpose of the Bikini experiments was to obtain information on a graduated scale from maximum to minimum of the effect of the atomic fission on a target array composed primarily of Navy ships, but also including many other types of military equipment. As an important corollary live animals were used to obtain data on the possible dangers to service personnel inherent in atomic explosions. From this basic information, Joint Army-Navy Task Force One (Operation Crossroads) officials hope to obtain valuable guideposts to the most efficient offensive and defensive strategy and military equipment in an atomic age.

The Bikini target array resembled no known naval array, either at an anchorage or at sea. Twenty-three ships were grouped in a tight circle which normally would have floated two or three ships at anchorage or one capital ship in a task group formation at sea. Had all 23 ships been sunk by the Atom Bomb blast, the question of the need for a future Navy would not have been settled. The results would have proved that 23 ships should not be grouped in a circle of 1,000 yards radius. This fact was learned long before atomic bombs were a reality.

The picture must be looked at objectively. The future of the Navy depends entirely on the ability of the scientists and inventive engineers to create a transporting medium and an attacking force capable of carrying out the present mission of the Navy more effectively than any other means. Perhaps atomic explosives and new developments in long-range aircraft may provide better methods of carrying an offensive across the sea than can be supplied by the Navy. As yet, however, no planes have been devised which can carry the personnel, heavy equipment, and all other incidentals which must accompany a large-scale invasion of a country.

This same reasoning can be turned on those who maintain that rocket warfare has outmoded both the Air Force and the Navy. American self-propelled rockets are still in the drawing-board stage. Drawing-board rockets can never replace aircraft as long as they remain on the drawing board. Until something else can take over their functions the Navy and Air Force will remain in existence.

Second basic fact of the Bikini tests is that the tests while not creating a medium for the replacement of the Navy or the Air Force are devised to show us how to make U. S. fleets as safe and effective as possible in an atomic age.

Test Able (air drop) at Bikini gave the sincere scientists much of the basic data for which they were seeking. The test indicated that protective alterations must be considered and developed if personnel on board naval ships are to be saved. Many other things about the bomb were discovered that will be revealed at a later date when the information has been fully evaluated.

Test Baker (detonation of an atom bomb just under the surface of the ocean) provided information on the ability of naval hulls to withstand blast effects of atomic power. It should indicate what means are necessary to improve hull designs, and what tactical formations are best to protect a fleet against an atomic blast.

Test Charlie (detonation of an atom bomb deep in the ocean) will take place in 1947 as scheduled.

Both military and naval experts know that the use of the atom bomb in warfare calls for radical changes in

equipment, tactics and technique. Certainly some method is going to have to be devised to protect industries from the blast of the bomb. Perhaps large industries will have to be moved underground or enclosed in solid walls of heavy lead or concrete. These things are under consideration now and only successful experimentation and development will find the correct solution.

But, in the meantime atomic bomb thinking must not go overboard. Military men especially should look at the atom bomb and its potentialities from an objective point of view. Persons must not be taken in by stories of the atomic bomb written by overenthusiastic and uninformed writers.

Legislation was passed by Congress on July 26, 1946, and signed by the President on August 2, creating a new civilian agency with complete control over atomic energy development. The new law provides for a commission of five civilians who will direct all future atomic developments.

The Army will have a consulting and advisory role in relation to this commission.

Supply of An Armored Division in Combat*

*Extracts from a Letter from Colonel E. Busch***

PRIOR to the invasion of France, it was impossible to obtain an agreement on the daily POL [petrol, oil, lubricants] requirements of an armored division. The estimates varied between wide limits—as nearly as I can recall, between 40,000 and 100,000 gallons of gasoline per day.

These data were compiled by Lieutenant Colonel W. A. Boyle, Division Quartermaster, 6th Armored Division, from records maintained by his office during the campaign through France, Belgium, Luxembourg, and Germany for the period 27 July 1944 to 9 May 1945, inclusive.

The 6th Armored Division played a full part in the campaign. During the initial phase, it operated in the Brittany peninsula, later moving to the Eastern Front.

POL and Rations consumed by the 6th Armored Division during the campaign of Third Army through France, Belgium, Luxembourg, and Germany, starting at the Normandy beaches and ending at Altenburg, Germany, for the period 27 July 1944 to 9 May 1945, inclusive—total 287 days:

Item	*Consumed*	*Average per Day*
V-80 Gasoline	5,497,770 gal.	19,156.00 gal.
V-80 per food ration		1.32
Kerosene	3,815	13.3
Diesel	6,552	22.8
White Gasoline	1,635	5.7
73 Octane Gasoline	3,830	13.3
SAE No. 10	13,457	46.8
SAE No. 30	60,675	211.4
SAE No. 50	45,205	157.5
SAE No. 90	7,105	24.7
GP No. 1	23,856 lbs	83.1 lbs.
GP No. 2	40,922	142.5
GP No. 3	6,883	24.0
GP No. 4	129	.45
[1]Coal	296 tons	1.00 ton

Approximate tonnage: 73.32 per day.

[1]Does not include quantities found locally within unit areas.

*Military Review.

**Quartermaster Corps.

Rations consumed during the 287-day period:

	Total	*Average per Day*	
"A"	2,344,605	8,169.35	
"10-1"	929,385	3,238.28	
"K"	576,566	2,008.94	
"C"	315,738	1,100.13	
"D"	(104,616)	(364.50)	No ration. Used as supplement.
TOTAL	4,166,294	14,516.70	Less "D's"

Approximate tonnage: 30.6 per day.

POL and Rations consumed by the 6th Armored Division during the last 98 days of the campaign, 1 February 1945 to 9 May 1945. This was a period of intensive operations starting in the vicinity of Luxembourg and ending in Altenburg, Germany.

Item	*Consumed*	*Average per Day*
V-80 Gasoline	2,422,620 gal.	24,721.00 gal.
V-80 per food ration		1.75
Kerosene	3,170	32
Diesel	2,975	30
White Gasoline	840	9
73 Octane Gasoline	3,830	40
SAE No. 10	2,605	26
SAE No. 30	26,925	274
SAE No. 50	23,245	237
SAE No. 90	3,965	40
GP No. 1	10,048 lbs.	102 lbs.
GP No. 2	20,070	204
GP No. 3	482	5
GP No. 4	77	.75
[1]Coal	66 tons	.67 ton

Approximate tonnage: 93.45 per day.

Rations consumed during the final 98-day period:

	Total	*Average per Day*
"A"	785,769	8,018
"10-1"	228,615	2,333
"K"	222,120	2,266
"C"	142,980	1,459
"D"	none	
TOTAL	1,379,484	14,076

Approximate tonnage: 29.48 per day.

[1]Does not include quantities found locally within unit areas.

OTHER BRANCHES

Major General Clift Andrus

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"The Field Artillery is vitally interested in this subject of 'Other Branches' which you are so ably presenting. Since Field Artillery is essentially a supporting arm, its success in battle will depend to a considerable degree on its knowledge of the tactics and technique, as well as of the viewpoint and mental and physical status, of those whom it supports. As a versatile and extremely powerful member of the team in battle, it renders the Infantry and Armor the most effective assistance when it knows how each executes its part in the effort of the whole.

"Mutual confidence and understanding are vital to success in combat. These can be built up through peacetime training and exchange of ideas. Your new department makes a most influential and forceful contribution to such peacetime training and exchange of ideas. I am happy indeed, to add my commendation to the Armored Cavalry Journal for this most praiseworthy development."

Clift Andrus

Major General, U.S.A.,
Commandant, The Field Artillery School

FIELD ARTILLERY

The Field Artillery

*by Colonel Robert F. Hallock**

The Artillery Mission

THE book says that the mission of the field artillery is to support the other arms. There are certain free-thinkers who claim that this is an understatement of the case, and that a bit more consideration of the effectiveness of the artillery arm as a means of killing the enemy, and less as a mere auxiliary weapon, would get the battle won more quickly and more decisively. Be that as it may, the artilleryman is trained to think in terms of the battle as a whole, and to seek the means and methods whereby he can further the action of the entire force. This has been accomplished by a generation of indoctrination in the concept of the "supporting arm," and there are few, if any, artillerymen who have any inclination toward "empire building" or toward the separation of the field artillery from its place in the close-knit fighting team of all arms.

On the contrary, every effort is being made—in training publications, in the schools, and in unit training—to tie the field artillery ever closer to the supported arms. It has long been apparent that the artilleryman must spend more time and thought on the study of the technique, tactics, and problems of the assault elements than those supported elements spend on the study of the field artillery. It is obvious that the impetus of support must come from rear to front, and that the job of the artillery is to *deliver* the necessary support, and not wait for anyone to come and ask for it.

Combat Efficiency

Nevertheless, it takes at least two to make a partnership, and the better the two partners understand each other the better that partnership will function. One of the greatest of the difficulties faced by the artilleryman during the past war was the problem of convincing the supported units of the effectiveness and power of the readily available artillery. A single example will illustrate the point. An infantry regimental commander was concerned about a certain heavily reinforced German pillbox. A forward observer took it under fire with his light battalion without visible effect. The FO said, "Colonel, I can get an 8-inch howitzer battalion on it if you will OK it." The colonel demurred, mentioning complicated channels of command and communication and long delays, but finally said, "Go ahead!" In a few minutes the pillbox had been destroyed, and from then on that regimental commander demanded 8-inch howitzers on any and all targets, including infantry patrols and rumored light mortars!

An Analysis of "Support"

Let us analyze this mission of "support." It does not necessarily mean the physical presence of the weapon with the supported troops. Modern self-propelled, high-speed, armored artillery can move and fight with the assault elements of infantry, and armored cavalry. It has done so in the past war, and will continue to do so whenever appropriate. But, with available range from 0 to 35,000 yards, and traverse up to 60 degrees—all available in a few seconds without moving the carriage—a primary attention should be given to the maneuver of the fire of the artillery, and only a secondary attention given to the maneuver of the pieces themselves. Of course, if the pieces are located well forward, it facilitates communication, liaison, and the smooth operation of that "close-knit fighting team." Range is built into artillery cannon, not for the purpose of permitting them to sit well back of the front lines, but to permit them to reach out into the depths of the enemy position and hit him where it will hurt the most.

The Three Artillery Missions

The Air Forces have thoroughly indoctrinated us all with the fact that they have three missions: first, to gain supremacy over the enemy air forces; second, to isolate the battlefield; and third, to render close support to the ground forces. There is a close parallel between the missions of the air forces and the missions of the field artillery. First, the artillery must engage in counterbattery operations to protect the supported units from enemy artillery action and to secure its own freedom to pursue its other missions. Second, it must disrupt and destroy enemy communications, supply, and other movement and installations in the rear areas. Third, and finally, it must neutralize or destroy those enemy forces and installations which interfere with the action of our own forward elements.

What are the priorities of these phases of the artillery mission? That is a highly debatable question, and the best answer is the good old stock phrase, "It depends on the situation." If the enemy artillery is strong, active, and effective, counterbattery operations must

*Director, Department of Combined Arms, Field Artillery School.

receive great attention. If the enemy is engaged in rushing up reinforcements and supplies in great quantity, isolation of the battlefield becomes of primary importance. If the enemy infantry is strong, well-armed, well-disposed, and well-led, most attention must be given to close supporting fires.

Handling of Missions

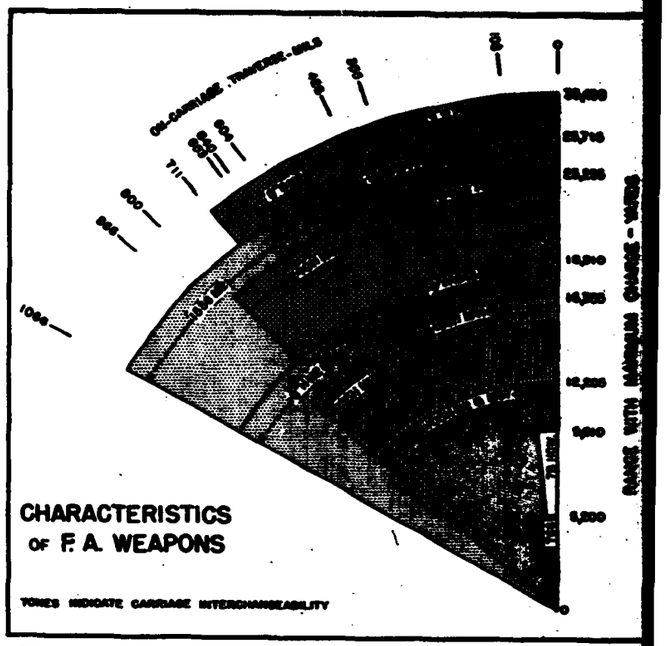
Fortunately, this problem is not as difficult as it might seem at first glance, and for two reasons. One is that the artillery cannon is a powerful and versatile weapon, and can handle any or all of these missions in rapid succession. If we consider the battery or larger unit, it can handle them all simultaneously. Certainly, a two-howitzer battery of 240s cannot fire as many rounds on a counterattack in as short a time as a six-howitzer battery of 105s, nor can a 105 howitzer knock out an important bridge at 22,000 yards. However, it may be stated that all types of artillery weapons can and do undertake all types of missions with good results. The second reason is that the field artillery is organized and equipped for the purpose of handling all of these missions at the same time. The bulk of the close supporting fires will normally be furnished by the division artillery. The corps artillery has the medium range and long-range howitzers, as well as guns which are particularly well adapted for the counterbattery rôle and for the isolation of the battlefield.

Employment

The two charts show the characteristics of the principal field artillery weapons. Let us review briefly their usual employment. The horse-drawn artillery is out. It was a lot of fun in peacetime, but has no place on the modern battlefield. Some pack artillery will remain. It is expensive in manpower, space, and labor, and is not needed very often. When it is needed, it is needed *urgently, and nothing else can do the same job.* Airborne units are equipped with the same weapon, but it is deficient in range and hitting power for this mission. All other types of artillery are now both towed and self-propelled. There is a tendency toward the self-propelled mount in the future, for ease and speed of going into and out of action, and, in the heavier types, for decreased shipping and road space and economy in manufacture. Limiting factors on this trend are: the requirements for economy in use of motor fuel, for heavier bridging equipment, and for air transportability.

The 105mm howitzer is the standard, light, direct support weapon. We now have both four- and six-piece batteries, with consideration being given to standardization on the six-piece formation. There are three battalions in each infantry and armored division. The 155mm howitzer is a tremendously versatile weapon. Its characteristics are similar to the 105 but it has a greater range, and a greater weight of metal and explosive in its projectiles. It has been considered for the rôle of direct support, and is accurate and effective on all types of missions at ranges up to 16,000 yards. It is a fine corps artillery weapon for all missions, especially that of reinforcing the division artillery. One battalion is organic to the infantry division; and one is being considered for inclusion in the armored division.

In addition to the above, we find in the corps artillery the 155mm gun, the 8-inch howitzer, the 240mm howitzer, and the 8-inch gun. The guns are high velocity weapons, and are not economical on close support work except for destruction of vertical targets of small size, but are good for counterbattery fire and isolation of the



		75mm HOW M8	105mm HOW M2A2(T) M37(SP)	155mm HOW M1(T) M44(SP)	8" HOW M2(T) M43(SP)	240mm HOW M1(T) T92(SP)	155mm GUN M2(T) M40(SP)	8" GUN M2(T) T93(SP)	ROCKET LAUNCHER T66
WT OF PIECE & CARRIAGE IN TRAVELING POS. (TONS)	T	72	2.49	6.35	14	HOW 23.95 CARR 25.95	15.05	GUN 28.34 CARR 29.94	.84
	SP	—	19.75	21.5	41.5	64.5	41.5	67.0	—
TIME TO EMPLACE (MINS)	T	3	3	5	30 to 360	60 to 360	30 to 360	60 to 360	2
	SP	—	1	1	1	5	1	5	—
WEIGHT OF PROJECTILE (LBS)		14.7	33	96.1	200	360	95.1	240	42
RATE OF FIRE (RDS/MIN)	MAX	6	4	3	1	1	1	1	16
	NORM	3	2	1	1/2	1/2	1/2	1/2	16
EFFECTIVE AREA OF BURST (YDS)	LATERAL	30	50	60	60	100	60	60	80
	RANGE	10	15	16	20	25	16	20	16

References: TM 9-2300, 7 FEB 44 and appropriate TM's

(Effective area of burst FM 6-40, 1 JUNE 45.)

battlefield. The 8-inch howitzer is a remarkably accurate piece, and is a prime favorite with all who have used it.

Old Concept Ridiculous

The old concept of heavy corps artillery was that of a weapon which was cumbrous and slow-moving, which took days to emplace, and was brought into action days after the battle was joined, when the divisions had met organized resistance that had to be destroyed by "siege guns." Two incidents from the past war will illustrate the distance we have advanced from such a concept. One May morning an infantry battalion commander was ordered to capture a certain hill. He issued his orders, deployed his battalion, and advanced to the assault. Several hours later his troops, hot, dusty, and tired, reached the far side of the hill—where they found an 8-inch howitzer battalion in position, firing merrily at the enemy. At another time, the commanding general of a certain armored division registered a very heated protest. The reason was that a heavy artillery unit, in going into position, had been so atrociously bad-mannered as to cross his route of march, and in the process had cut the advance party off from the point of his advance guard!

In the corps artillery, the field artillery observation battalion is organic. Its heaviest weapon is the Bazooka, but it is the eyes and ears of the corps artillery, and the corps can't do business efficiently without it. With its flash-ranging, sound-ranging, and radar-ranging equipment, it can produce locations of enemy artillery when no other agency can. Its meteorological and survey sections furnish data which permit accurate fire when observation is impossible.

The Past

It appears that the outstanding progress in the artillery during the past war has been in the development of the tactics of the reinforcing corps artillery, and in the process of pulling such units into that "close-knit fighting team." Twenty years ago there were many good batteries, but few battalion commanders had the opportunity to train their battalions as such. In the 1930s the development of the battalion fire-direction center began to pull battalions together as units. Soon thereafter division artilleries began to take shape, and in the immediate prewar and early war years, and especially in the large-scale maneuvers of that period, the battalions of the division artilleries and their supported units began to develop their teamwork. However, the great mass of corps artillery battalions and their higher headquarters had no opportunity to learn their combined team play until they reached the battlefield. This is a serious, hard-learned, and costly lesson which must be kept in mind by commanders of all arms at all levels during the postwar training years.

The Future

What the future may hold, no man can foretell with assurance. The merger of the seacoast, antiaircraft, and field artillery into one artillery arm is already being planned. It should result in a broadening of knowledge and vision on the part of all artillerymen. It must not result in any decrease in technical skill on the part of any artilleryman. As to weapons, rockets are still in their infancy and already have proven their worth in battle. Jet propulsion, atomic warheads, atomic propellants, new fuels, new power plants for vehicles, guided missiles, all, with many others, known and unknown, will materially affect the artillery. But whatever its nature, cannon will always be essential on the battlefield, and its missions will continue to be to gain supremacy over the enemy's weapons, to isolate the battlefield, and to assist the assault forces in the destruction of the enemy.

New Regular Cavalry Officers

Seventeen Cavalry officers were among the additional 900 officers appointed in the Regular Army on August 28, 1946. These are in addition to those that were appointed in June.

The permanent rank to which they were appointed in the Regular Army appears before their names while their temporary ranks appear after.

2d Lt. James C. Vaughn (1st Lt.)
2d Lt. Kenneth W. Ramussen (2d Lt.)
1st Lt. J. R. Abernathy, Jr. (Capt.)
1st Lt. William S. Miller (Lt. Col.)
1st Lt. Harry G. Sanders (Major)
Capt. John J. Prokop, Jr. (Capt.)
1st Lt. Donald C. Felton (Lt. Col.)
Capt. Charles R. Keasey (Lt. Col.)
2d Lt. Richard E. Stanley (2d Lt.)
Capt. Charles H. Hayhuff (Lt. Col.)
Capt. Donald F. Gibbons (Major)
1st Lt. Harold D. Woodruff (1st Lt.)
1st Lt. Edward J. Vincent (Capt.)
1st Lt. Robert J. MacDonald (Major)
1st Lt. Paul A. Baltes (Capt.)
1st Lt. Henry R. Howell, Jr. (Major)
1st Lt. Alfred Yorston, Jr. (Capt.)

INFANTRY

Cooperative Training

*Infantry and Armor**

PRIOR to and during World War II, much was written about the need for coöperative training among the various types of combat arms. It was a generally accepted principle that Infantry, Artillery, Armor, and Air Corps should all know how to work together. In spite of this accepted principle, however, units that were insufficiently trained in working with other units frequently entered combat. Practically all reports from the fighting fronts emphasized the necessity for coöperative training of all types of units. In some instances, these reports were specific with regard to the points to be covered; in other instances, the reports were merely general statements which cited the need for coöperative training.

In the paragraphs which follow, the sentences in italics have been extracted from WD Pamphlet 20-17, "Lessons Learned and Expedients Used in Combat," and bear either directly or indirectly on the subject of coöperative training of infantry and armor. By closely examining these statements from combat veterans, it is possible to draw certain definite conclusions as to the value and scope of coöperative training.

"*Leadership is based on knowledge. First, every officer and enlisted man must know his job; . . .*" (This) "*is obtained in training; . . .*"

Whereas most military men readily accept the truth of this quotation, the fact is often overlooked that the knowledge itself must necessarily include a great deal of familiarity with the tactics and technique of supporting units, or of units that are acting in a supporting rôle. This knowledge can be obtained in many ways, but, primarily, it is acquired by practical work and training with the different types of units. Every officer and enlisted man is expected to study War Department field manuals and other publications in order to acquire the basic elements of knowledge. "*Remember the little things make or break you in battle. Don't pass over your Field Manuals and Army Regulations lightly; all the materials you need in battle is included in them. It is up to you to dig it out.*" By thorough study, the military man learns through the experiences of others, but this study can become of value only by practical application of the principles learned. As the leader studies, he puts his knowledge to a practical test by working in the field, first with his own unit, then with his own unit as part of a larger unit, and finally with his own unit combined with units of other arms. Because of the importance of armor in present day warfare, it is essential that infantry and armor take part in coöperative training. They thus will learn to work together. This training is so much a part of practical knowledge, that, if leadership is based on knowledge, axiomatically, leadership is based on coöperative training.

"*False alerts tend to make gun crews skeptical. Some units regard any tracked vehicle as a tank, and promptly report it as such. This destroys the efficiency of the warning system. Front-line troops should be thoroughly familiar with identification of enemy armor.*"

Although this quotation applies primarily to enemy armor, is is necessary for pefsonnel to learn to identify vehicles of our own units, as well as those of the enemy. The best way to teach troops the difference between a tank and an ordinary tracked vehicle is to show them the actual vehicles. Such a demonstration should be one of the first steps in coöperative training. The armored unit should furnish vehicles and personnel to train the infantryman, and the subject should be covered in such a way that the infantryman will be able to recognize by sight, sound, or silhouette, all of the common types of friendly armor. He should also be able to tell at a glance the difference between a tank and a half-track, or a light tank and a medium or heavy tank. By thus becoming familiar with the armored vehicles of his own Army, the infantryman, to a certain extent, automatically learns to identify enemy armor, and at the same time, he learns how to differentiate between the common types of enemy armor. Although it is true that he may not be able to differentiate between a German Mark IV or a Mark V, he at least will be able to tell whether the vehicle in question is an enemy light or heavy tank or an enemy half track.

While the infantryman is learning to identify armor, the tanker should be given an opportunity to examine infantry weapons and other important items of equipment. He should hear the various infantry weapons fired while he is near the location of the gun, and later

*From The Infantry School.

while he is near the point of impact of the weapon being fired. In this way the tanker will learn to recognize infantry weapons by sound. He should also be given training in identifying friendly infantrymen at a distance. Some of this training should be conducted with the tanks buttoned up and in motion so that the tanker will learn to identify friendly troops and weapons in spite of the noise and restricted vision.

"Every soldier should be given a ride in a buttoned-up tank to show him the limited vision and field of fire, and the closed-off feeling of the tankers. It will do much to counteract the dread of a tank attack, and will increase faith in his own ability to resist one."

Although this quotation is specific as to one small point of training, it bears on a subject which is an important part of training—the capabilities and limitations of different weapons and units. Infantry should understand the capabilities and limitations of armor—and armor should understand the capabilities and limitations of infantry. This is a training subject which can be easily arranged and which can be both interesting and highly instructive to the participants. Armored personnel, when used to instruct infantry, have an opportunity to do worthwhile boasting about the strongpoints of their equipment; also they have an opportunity to inform the infantryman of their weak points and thus seek from him the coöperation and protection which is often necessary to make an armored attack successful. This instruction should cover the ability of tanks to cross various types of terrain, the ability of the tank crew to see and hear, and to aim and fire their armament while at a halt and while moving. It should also cover the difficulties involved in the resupply and maintenance of tracked vehicles, and the capabilities and limitations of tanks in the daytime and at night. Another point which should be emphasized is the invulnerability of armor to small-arms and time fire. All the points mentioned above should first be explained to the infantryman. He should then be allowed to examine all of the equipment closely. He should be permitted to fire the weapons and to ride in a tank, and possibly even drive one for a short distance. He should ride in a tank through a dug-in infantry position so that he will see how safe an infantryman is against tank attack when he stays in his hole and refuses to run. This phase of the training should be followed by actual demonstrations of all of the points mentioned, so that the infantryman can see with his own eyes the exact capabilities and limitations of these steel monsters.

The Doughboy should be used in the same manner to train the tanker in the capabilities and limitations of infantry. During this period, the infantryman has his opportunity to boast about the many things that he can do well. At the same time, he has an opportunity to explain to the tanker the things which the infantryman cannot do, and for the accomplishment of which he needs armor to help him. In this training the tanker is shown the characteristics of the principal infantry weapons. He learns the types of location from which they are fired, the ranges at which they usually fire, and the effect of the various weapons on armor plate. He becomes familiar with the methods which infantry uses to combat armor, and the best ways in which to guard against these methods.

As a final phase of the training in capabilities and limitations, the infantry and armor should give short demonstrations for each other which will show the usual tactics employed by their respective units. These preliminary demonstrations should not be in the nature of combined problems, but rather in the nature of a starting point for the more advanced study of tactics to follow later. The demonstrations should be comparatively short, and cover only the more elementary tactical principles. In these first problems the infantry might demonstrate a rifle platoon and company in the attack and in the defense. Similar demonstrations should be given by armor.

"Infantry should be 'married' to the tanks to an extent that one tank company and one infantry company are blended as a unit. . . . The infantry platoons sleep and work with the tank platoons."

This quotation emphasizes the most important part of any coöperative training. In this phase the infantry and armored units should be employed together in the field as definite teams. If possible, the units should be blended together no higher than the company level. Their problems and exercises should be planned to cover all possible phases of technique. To teach technique, squad problems should be planned which involve the use of a rifle squad and a single tank section for clearing a woods, eliminating a strongpoint, or reducing a roadblock. These problems should be followed by platoon problems involving the use of a rifle platoon and a section or platoon of tanks. Infantry and tanks should practice different formations, and should learn when to use each formation. The primary point emphasized in all problems should be coöperation between the two arms. Such training will bring to light many points which must be worked out before the units can function satisfactorily as a team in combat. The Doughboy will learn to point out to the tanker the obstacles to be avoided and the targets on which to fire. This means that the infantryman and the tanker must work out a reliable method of communications. The tanks should have a telephone on the outside so that an infantryman can talk to the tank commander. An AN/VRC3 (300 series) radio with the tanks will make it possible for the infantry company commander to talk to the tanks by means of his 300 radio. Also, a liaison radio car at battalion headquarters will enable the infantry battalion commander to exercise control over the tanks.

The infantryman will learn that when he has tanks supporting him he must protect those tanks. Likewise, the tanker will learn that he cannot advance too rapidly without sacrificing the protection furnished him by the slower Doughboy against Bazookas and antitank guns.

There will be times when the infantrymen can ride on tanks. There will be other times when infantrymen cannot be too close to the tanks without suffering heavy casualties from artillery and mortar fire. The infantryman will learn to be observant for antitank mines, and at the same time he will learn to walk in tank tracks in order to pass safely through an antipersonnel mine field. *"Regardless of the initial formation, it is not essential that tanks and infantry keep their respective positions throughout an assault. A tank must stop to fire effectively, and that is the time for the infantry to press on. Both arms must realize the fact that if one stops, that is not a reason for the other to stop. When tanks are canalized by difficult terrain or are held up by mine fields, it is necessary for the infantry to precede the tanks. The tanks, however, must continue to give the infantry fire support, backing up to high ground, if necessary, to keep the infantry in view."*

Coöperative training, in order to be successful, requires work, planning, and a spirit of coöperation on the part of both infantry and armor; however, the training is vital and must be done in order to attain success in combat.

Only by real coöperative training will units be able to render reports such as the following one from the European Theater of Operations: *"We rode eight men on a medium tank and six on a light tank, all on the rear deck. We first sent out a wave of tanks buttoned up, put time fire from the artillery on them, and followed with the tanks carrying the men. The artillery observer rode with the leading wave and controlled the fire, setting his fuzes a little high. To insure control by the infantry CO and the tank CO, I put them both in the same tank. The infantry CO hung his SCR-300 on the outside of the tank, and worked directly with that part of his battalion which followed. Infantry company commanders could talk to tank platoon commanders by telephones hung on the back of the tanks. We fought this way for eight days and nights, and the foot soldiers loved the scheme. A disadvantage: It fails to use most of the crew-served weapons. We are going to try to utilize the heavy weapons company by riding it on tanks."*

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There are more than 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. . . .

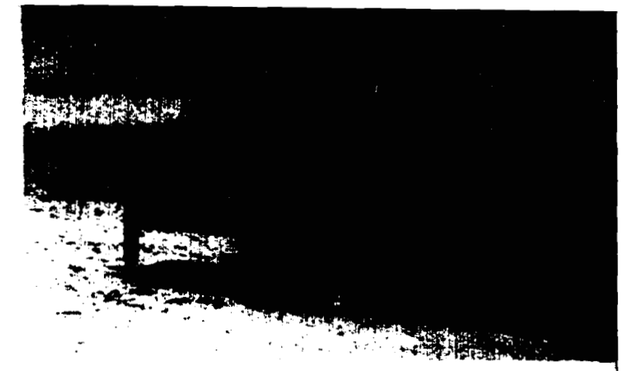
. . . One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. . . .

. . . The process of developing a new weapon and how it is standardized, which is outlined in this article is not widely known, and should prove illuminating. . . .

ORDNANCE DEPARTMENT

DEVELOPMENT OF THE AIRBORNE 40mm AA GUN

*by Major Thomas G. Gentel**



A NEW weapon does not spring full-blown from the mind of some harried inventor. One man may have an idea, but it is the work of many men and organizations that finally produces a weapon which meets the needs of the arm that uses it. Ideas come from many varied sources: the soldier in the field, tactical requirements, scientific organizations such as the National Defense Research Council, manufacturers, and the Ordnance Department, to name a few. Comparatively few new ideas come from amateur inventors. During the war, ideas from this class of inventors were screened by the National Inventors Council, and any that seemed promising were forwarded to the Ordnance Department.

Examination of Inventions

The National Inventors Council did a magnificent job. An idea of its magnitude can be gained from the following figures. From its inception in August, 1940 until December 31, 1945, there were 202,625 inventions submitted to the Council. Of these inventions 67,541 pertained to Ordnance subjects. After careful review, 2,471 were submitted to the Ordance Department for action, since the Council was not familiar with all the latest developments, many of which were highly classified. About 90 per cent were rejected for various reasons such as duplication or impracticability. The remaining 241 were tested, or received special treatment. As a result, 37 were adopted by the Ordnance Department for use. None of the 37 was a new weapon —all were improvements on weapons in use. This does not mitigate their importance, since these improvements —such as a new sight for the Bazooka or a feed mechanism for a gun—cannot arbitrarily be measured.

As may be seen, every avenue for new or improved weapons was explored. The majority of useful ideas, however, came from the Army, which was natural.

Ideas From Field Encouraged

During the war, the Ordnance Department sent three publications directly to the men in the field to glean any ideas they might have, and to inform them of improvements, or of improvisations that were used by others.

These magazines answered their questions, and the Ordnance Department adopted many suggestions that were made for improvements. "Army Motors" dealt with tanks, combat vehicles and trucks. It informed Ordnancemen of new tricks of which they could take advantage, and published letters and articles from men in the field.

"The Ordnance Sergeant" was slanted principally toward all equipment other than automotive.

Firepower the Ordnanceman's Journal, was a magazine of general interest.

On the masthead of each of these magazines was a statement that all Ordnance personnel was encouraged by the Chief of Ordnance to contribute articles and materiel of interest to other Ordnancemen. These articles were sent directly to the magazine and not through "channels." Thus they allowed the greatest freedom of expression, with the assurance that the suggestions or ideas contained would go directly to the appropriate development division for consideration.

1,800 Weapons

There are over 1,800 different weapons and pieces of equipment supplied by the Ordnance Department to the Army. Of these more than 1,600 were new, or received major improvements during the war. The process of developing a new weapon and how it is standardized is not widely known and should be illuminating.

Airborne Infantry was one of the new tactical developments of the war, and necessitated the use of weapons especially designed for carrying in planes and gliders. These troops needed weapons for both offense and defense. One weapon of defense was the 40mm antiaircraft gun which was used against low-flying planes or ground troops.

The Airborne Command did not specify the exact weapons it needed—with dimensions and weights—it merely stated that it had to have an automatic antiaircraft gun similar to the 40mm M2A1 (Bofors). This is an automatic weapon that fires 40mm shells in clips of four at the rate of 120 per minute. Principal dimensions of this gun in traveling position are: length, 225 inches; width, 72 inches; height 79½ inches. Weight is 5,549 pounds. This gun travels on a four-wheel carriage and was much too big to enter any of the cargo planes then in use, in 1942.

Specifications called for a gun that could be transported by a C46, C46A, C47 or C54 plane. A major job of redesigning was called for . . . and it was accomplished.

Steps In Redesigning A Weapon

In the Ordnance Department there is a little known committee, but it is one of the most important in the entire Army. It is the Ordnance Technical Committee, and its members are responsible for the weapons used by the Army. They approve or disapprove all new developments, and standardize those weapons that they feel should replace a weapon in use, or should be included as a new weapon. The committee is composed of representatives of all the using arms, including the Navy and Marine Corps, and of the different Ordnance services. During the war, representatives of the British and Canadian Army and Air Forces participated in all the meetings. It was this complete coördination that insured only the best weapons for issuance to our troops. Once each week the committee meets. Each item to be presented is called an OCM (Ordnance Committee Minute), and is prepared by the development division that is responsible for that particular weapon. In the Ordnance Department the Research and Development service has seven development divisions: Tank and Motor Transport, Artillery, Rocket, Ammunition, Small Arms, Aircraft Armament, and Research and Materials. The latter division covers fuels, lubricants, ballistics, various materials, and specifications. The Ordnance Department is divided into four services: Research and Development, Industrial, Field, and Military Plans and Training. Each of these also have representatives on the committee. Every OCM is signed by the representative of the using arm interested in that particular weapon, as well as by those divisions and services of the Ordnance Department that are responsible for the production of the weapon or its components. For instance, when a new gun is developed by the Artillery Development Division the Ammunition Development Division must develop new rounds for it, and since new ballistics must be calculated the Research and Materials Develop[illegible] Division also enters the picture. Further, the [illegible] interested in determining whether or not the gun can be readily serviced and repaired in the field. Thus the development of any new weapon is not a one-man show.

On August 28, 1942, an OCM was read before the Committee that recommended the development of an airborne automatic 40mm gun, utilizing as many as possible of the features of the standard 40mm antiaircraft gun. This OCM was approved by the Committee and signed by representatives of the Coast Artillery Board (antiaircraft defense is assigned to them), Air Corps, Air Ordnance and the Ordnance Department.

Preliminary sketches had been made prior to the meeting and work was started as soon as the OCM was approved. Drawings were made, and a contract let to an industrial firm. The firm was manufacturing 40mm mounts, and so was familiar with the problems to be solved. Two pilot models were built so that simultaneous tests could be made both at Aberdeen Proving Ground and the Airborne Command at Fort Bragg.

Pilot Models Exhaustively Tested

The first pilot model was shipped for testing to the Aberdeen Proving Ground late in November 1942. In January 1943 the other pilot was shipped to Fort Bragg for tests and from there to Camp Davis, Headquarters, for the Antiaircraft Testing Board. As a result of the tests, certain modifications were recommended and were incorporated in the manufacture of two slightly different models. Eight of one model and 10 of the other were manufactured and shipped to the North Africa and the Southwest Pacific Theaters of Operation for combat use in the spring of 1943.

The mount bore very little resemblance to the original 40mm Gun Carriage M2A1 after the various changes had been made. The top carriage of the M5 Carriage is similar to that of the 40mm Gun Carriage, M2A1, except for minor modifications to the platform and foot rests, which reduce the width of the mount sufficiently to permit its passage through the doorway of a plane.

The chassis consists of a center base with one permanently attached outrigger, and three removable outriggers which may be fastened to the mount by brackets and tapered wedges. Each outrigger has a leveling jack. In traveling position, the side outriggers are removed and hung by steel straps to the rear outrigger, or

*Ordnance Department.

are carried separately. Individual right and left wheel assemblies for maneuvering the mount are attached to each side of the base in place of the outriggers.

The New Weapon

The wheels are of the airplane type with 7.25 x 11.50 plain tread airplane tires inflated to 50 pounds pressure. No system of spring suspension is used. Airplane-type mechanical brakes, operated by a lever and cable, are fitted to each wheel.

Before loading the carriage into a plane, it is necessary to remove the gun barrel and the detachable outriggers. The carriage can be unloaded from the plane and moved for short distances by manpower, or be towed behind any prime mover. Three men can emplace the carriage in approximately five minutes, and can raise it from firing position to traveling position in approximately eight minutes.

Principal characteristics are weight in traveling position, of 3,480 pounds (detachable outriggers and barrel removed). Over-all dimensions in traveling position are: length, 118 inches; width, 56 inches; height, 76 inches. Total weight is 4,495 pounds. Compare these characteristics with those for the standard M2A1 carriage and it is apparent that a major redesigning job was done. Rates of fire are the same as for the M2A1; traverse, 360°, and elevation, from −5° to 90°, are also the same.

On August 2, 1943, the experimental models were standardized as the 40mm Gun Mount, M5, and immediate procurement of 200 was authorized. In a little less than a year a new weapon was designed, tested and standardized.

The development of this weapon is relatively uncomplicated when compared with the steps required to build a new tank. Tanks and other vehicles used by many arms require a much wider coördination. For instance, the Corps of Engineers prescribes definite limitations on the characteristics of vehicles, such as weight and size, which are dictated by the bridges they erect.

Also to be taken into consideration are the facilities for loading and unloading at ports in this country and in the theaters, the capacity of the winches on board ships and their hatches and holds. Railroad and highway bridges and tunnels are also restrictive factors.

The final weapon is a masterpiece of compromise when one considers the various physical limitations imposed on its design and the varied requirements of the different using arms.

Mission of the Ordnance Department

The mission of the Ordnance Department is to develop, design, procure, store, maintain for and supply to the Army such equipment and supplies as are assigned to the Ordnance Department for procurement, in such quantities and at such times as are required; and to train and to furnish specialized Ordnance troops as authorized to Zone of the Interior installations and units of the field forces.

The major types of items procured by the Ordnance Department are tanks, self-propelled mounts, motor combat and transport vehicles, artillery and its ammunition, fire control equipment, small arms and their ammunition, bombs, grenades, pyrotechnics, land and submarine mines and their equipment, rocket launchers, and spare parts therefor. In addition, the Ordnance Department will procure other matériel, raw materials, ingredients and facilities, including machine tools and other tools and equipment, necessary for their production and maintenance.

". . . Misunderstanding of cavalry's value and function might, perhaps, be traced to one of the early tragedies in the First War. The English had not yet learned the new rules of the game and, as is customary with democracies, they were terribly short of men. In one of the desperate attempts to hold back the German army a cavalry regiment was ordered to charge. It was the futile and heroic and impossible effort of the Six Hundred brought up to date. . . . The immediate deduction was: 'Cavalry has no place in modern war.' The truth is, of course, that the cavalry had been misused. In the American Army there have been generals who maintained that fact, in season and out of season, with all the energy that 'Billy' Mitchell gave to his crusade for the flying arm. They have asserted that in modern war the cavalry has as definite a place as the dive-bomber or the tank."—Herbert Corey in *The Army Means Business*.

ARMY AIR FORCES

The Gallant Little "L" Plane Had Versatile Uses in World War II

by Charles Villency

THEY were nicknamed "the little planes with the BIG PUNCH" by the Army Air Forces men who knew what these planes could do. These were the "L" planes, the liaison aircraft that were light enough to make maneuverability a minor problem but capable of performing functions which were never found on any activation chart in World War II. Officially their mission was liaison work; actually they were cargo carriers, ambulance planes and even bombers.

Usefulness of the liaison plane was proved during the war in all theaters of operation. Today it maintains its place in the Army Air Forces as a versatile aircraft. A number of new models have been developed since the war, but their function remains generally the same.

For instance, one of the new liaison aircraft, the L-13, has been designed primarily as a liaison and utility plane that will take off or land in a short area with heavy loads. It is an all-metal job of 2,900 pounds gross weight, powered by one 245-horsepower geared Franklin Model XO-425-5 air-cooled engine, and has radio equipment excelling that of any communications and navigational apparatus heretofore put into liaison aircraft.

Normal crew and passenger provisions are for one pilot, one observer and one litter patient. An alternate arrangement will accommodate two litter patients, and a special seating arrangement will allow an overload of one pilot and five passengers.

The cold statistical facts about the "L" plane's construction cannot convey the drama that so often was coupled with their use in World War II. There is many an Air Forces veteran who can truthfully say he owes his life to this small plane.

Back in the days when the Japs were holding on tenaciously to their gains in Burma, the little liaison planes had more than their hour of glory. There's the story of one liaison pilot whose outfit had been operating right under the noses of the Japs for six months, evacuating wounded, carrying supplies, doing reconnaissance and performing a variety of other functions in support of the ground troops who were fighting deep in the jungle country. Assuming that the ground forces could have marched safely to the nearest medical aid station, it would have taken them at least two weeks to batter their way through the jungle. But the liaison planes made the trip in a couple of hours.

It wasn't until the spring of 1943 that the first liaison squadrons went into combat, but that was not their official mission. Actually they were to provide theater and task force headquarters and ground force units with general liaison, messenger and courier service in areas behind the front lines of the enemy troops. They performed these functions and a host of others besides, as AAF historical records show.

The liaison planes performed along lines that were considered impossible. For instance, two 14th Air Force officers actually flew the Hump in liaison planes, a procedure that originally had been frowned on when the question came up as to the best method of moving these planes from India to China. Although they had been told of the difficulties of hopping over the towering Himalayas, Major Fred Welsh and Captain Edward Maher undertook the flight in a pair of L-5s.

They took off from a base in Assam and landed at an advanced field in China. The men reported they got as high as they could—9,000 feet—and made most of the mountain passes. They were forced to drop to 300 feet some of the time, just skimming treetops. And though they had to fly single file through the main pass of the Hump, they got through.

Liaison planes played several rôles in the China-Burma-India Theater of Operations. In Burma, back in 1944, there were two separate light plane operations. One squadron, attached to the 10th Air Force, supported Merrill's Marauders and Chinese-American units in India. Another light plane force operated with the Air Commandos, directed by Colonel Philip Cochran and Colonel John Alison. Activities of this commando unit were in conjunction with operations directed by the late Major General O. C. Wingate of the British Armed Services.

General Wingate attested to the usefulness of the "L" planes with warm words of praise after an operation which saved the lives of many British troops. Surrounded and trapped in the Arakan section in southern Burma, the British troops faced annihilation by the Japs. Many were wounded and had no way of getting out of the jungle fastnesses. Liaison planes received a call for aid. Seven light planes and nine sergeant pilots were dispatched, and in 15 days they evacuated 700 casualties. That mission was considered so important by the British that they provided Spitfire cover for the light planes. However, the liaison planes never had any fighter protection in later operations. General Wingate

later told the Americans that "without your men and your aircraft, this campaign could not have hoped to be a success."

The light planes flew into places where larger aircraft feared to operate. A problem otherwise unsurmountable lay in keeping supplies flowing in to the ground troops who were completely isolated in the jungles. Teaming up with C-47 Skytrains, liaison planes accomplished the job. The larger transports flew to the large back bases with a full load of supplies while the light planes distributed this matériel to the small advanced outposts interspersed through the jungle.

Liaison pilots had no snap job, because the Japs knew the value of the small aircraft and did everything to stop them. One pilot got away with 21 holes in his plane. Many times the enemy occupied both ends of the same landing field so as to cut off the liaison planes. Frequently the liaison pilots had to fight the Japs for possession of their planes. On one occasion, the Japs captured some of the liaison planes, so the pilots became ground troops, joined the British and recaptured the aircraft.

Colonel Cochran, hero of the African and Burma campaigns, declared the liaison planes "did one of the finest jobs I have ever seen."

"Our light planes did everything," he said. "They evacuated wounded, served as cargo carriers, transporting everything from barbed wire and bedding rolls to mortars and mortar shells. We used them to help direct our ground activities, to observe enemy movements. A couple of times we made bombers out of them and got excellent results. If we needed to round up the ranking officers from various points in the jungle for important conferences, the light planes did the job."

Three types of planes—the L-1, L-4 and L-5—were used for these operations. Each liaison squadron had seven officer pilots and 32 noncom pilots. In the operations in the CBI and elsewhere, the AAF light plane activities were separate from the use of liaison aircraft by the artillery. AAF liaison squadrons were attached to the various Air Forces where they could be assigned to the ground force units for over-all liaison functions. Their planes were piloted by Air Forces personnel, while artillery liaison planes were flown by artillery personnel and were used only in connection with artillery operations.

If skepticism meets the statement that liaison planes could even serve as bombers, here is how it was done: The Commandos in the CBI attached 100-pound bombs to the wings of the L-5 and a 250-pound bomb to the belly of the L-1 (in late 1944 this plane was no longer in production), and bombed the enemy from low altitudes. On one occasion, a force of Japs took cover under a bridge and fought a strong delaying action from their protected position. Two men took off in an L-5, equipped themselves with hand grenades, swept down on the top of the bridge and tossed their grenades out of the doors at the enemy under the bridge.

The liaison planes did yeoman work in reconnaissance. They worked in close coördination with advancing ground forces by reconnoitering the terrain and dropping notes to the advancing columns with information concerning the Japs' strength and position. Light planes kept a close and constant watch on all trails leading into the landing strips to detect existence of any enemy patrols. Light planes also were used to spot targets for bombers. One man sat in back of an L-5 with smoke bombs which he tossed overboard when the plane flew in at zero altitude. The heavy aircraft then bombed on the smoke.

Evacuation of wounded forms part of the proud record of the light aircraft. While the L-1 and L-5 normally carried only two men each, in response to an emergency situation it was not unusual for the L-5 to carry three and the L-1, four passengers. Sometimes the L-1 even carried five men. There was no other way to bring out the wounded from the jungle, Colonel Alison reported at the time.

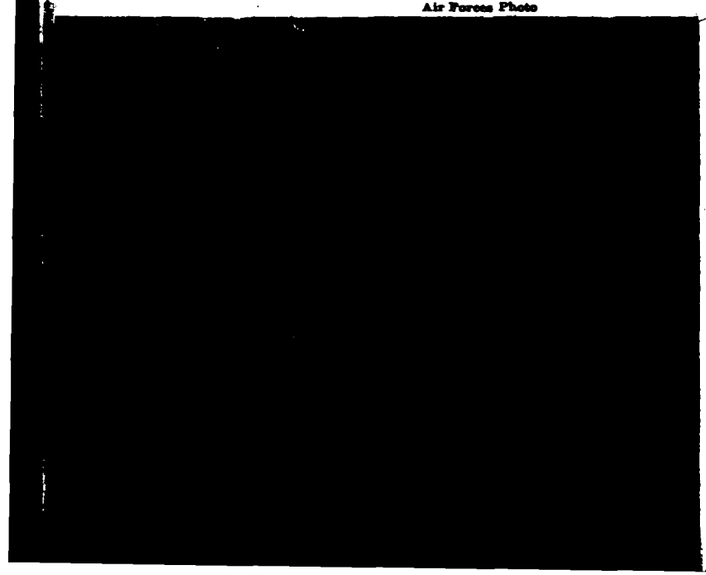
"The men were very glad to sacrifice comfort for safety," he said. "A wounded man behind enemy territory is a worried man. The knowledge that the light planes were evacuating the casualties was a great help to general morale."

Although the official specifications of the L-5 indicated it was built to carry about 250 pounds of cargo, actually the normal load was often twice that. The liaison planes carried supplies attached to each wing and, when no landing fields were available, dropped the matériel to the troops below by parachute.

The "little planes with the BIG PUNCH" accomplished their missions and more. The pilots who flew them are proud to have taken part in such gallant performances.

An L-5 hugs the mountains in China as it goes out on a mission over the Salween front. It faces dangers from the enemy as well as uncharted mountains.

Air Forces Photo



MEDICAL DEPARTMENT

Medical Care in Combat*

THE Army Medical Department watches over the health of the soldier from the time he is inducted until he is discharged. An outstanding example of this care is the treatment the wounded soldier receives during combat. Here treatment and evacuation combine into a near-perfect medical service organization and may best be understood by following an injured soldier through the "normal" chain of evacuation.

Medical treatment begins as soon as the soldier becomes a casualty. Many a soldier has stated that he received medical care within minutes after he was wounded. From that point on, his evacuation may be compared to a medical conveyor belt.

Every soldier is trained in the principles of first aid and carries with him in battle the things he may need in such emergency. If his injury is too serious for him to help himself, medical aid men are there to give him first aid where he falls and litter bearers carry him to the battalion aid station located a few hundred yards from the front lines for emergency surgery and medical care. These aid stations are usually located so that they can be reached by following the "lines of drift," by some means of markers either natural or improvised and move to new positions each time fighters advance.

Here the first real medical attention is given by the Battalion Aid Surgeons and their assistants. Supplementing the first aid given by the medical aid man, any bleeding is stopped, dressings and splints are applied, pain is relieved by morphine, and shock is counteracted by plasma and whole blood, as well as opiate. Plasma is used in the treatment of shock to render the casualty transportable and help preserve life until a hospital can be reached; whole blood is given to prepare the man to withstand life-saving surgical procedures. At the battalion aid station the decision is made whether the wounded man should be returned to combat or moved on along the chain of evacuation by ambulance, jeep or litter to the collecting station which may be a few hundred to several thousand yards from the front. This also is only a stopping point where the wounded are sorted into groups that will return to combat and those who will be sent on for more care. Since collecting stations are close to the zone of battle, they take care of both walking and transported wounded. They maintain contact with all division battalion aid stations; their primary objective being to prepare the wounded for transportation to more permanent Medical Department units.

The next stop for the wounded requiring further medical care is the clearing station. These are well-equipped but temporary installations under tentage, serving one division and beyond the immediate fighting area. They have complete surgical equipment, electricity, and full kitchen facilities. Here emergency surgery and treatment is given and the wounded are classified according to type of injury. The wounded soldier remains here for several days, if necessary, until he can be moved again—either back to combat or prepared for transportation to the evacuation hospital. Clearing stations usually are operated in pairs so they can leapfrog to keep up with advancing troops. Each is staffed by 12 doctors and 96 enlisted men and generally consists of 12 tents in a unit.

Set up as near the front as practicable is the evacuation hospital. It is generally found some 12 to 15 miles to the rear and in some cases as far as 50 miles. These are semi-fixed installations usually set up in a school or some other suitable building accessible to auto roads and

A medical aid man tapes up a wounded soldier. Four aid men carried this soldier more than a mile through thick jungle before he could be put aboard a Jeep.

Signal Corps Photo

*From Surgeon General's Office.

airfields. They provide facilities for major medical and surgical treatment of all casualties. In terrain where no buildings are available, these evacuation hospitals also may be under canvas. In this event they are large tents housing from 40 to 60 cots each, and are provided with all the equipment of a modern hospital. A 750-bed hospital of this type is generally staffed by 47 medical officers, one warrant officer, 52 nurses, and 308 enlisted men.

Evacuation hospitals are outstanding examples of the efficiency of organization. So minutely planned are the logistics involved that, upon occasion, these fully equipped, modern medical installations have risen upon barren fields within a matter of minutes. Several instances were reported in ETO of hospitals set up ahead of their Division so that the first men hit by enemy fire found ready and waiting the best medical and surgical skill available anywhere with X-ray and other equipment permitting the most delicate of surgery to be performed immediately.

At the evacuation hospital initial wound surgery is performed. In this stage of treatment the main objective is to prevent infection. The operation termed "debridement" is performed which removes all tissues devitalized and prepares the way for the prompt and successful institution of the secondary or reparative phase of surgery which follows at the base hospital to which the man is removed.

From the evacuation hospital the man may be sent to one of several hospitals, depending upon his condition —convalescent or general hospitals within the theater or the general hospital in the United States.

General hospitals, both overseas and in this country, are fixed installations providing general medical and surgical care. Here the wounded man receives reconstructive surgery, the third and final phase of his surgical care. The commanding general of each theater of operations decides the maximum length of time a man can remain in hospitals in his zone; it may be 30 to 90 days, or more. Men requiring longer care, and those declared unable to perform further duties are evacuated to the United States.

A wounded soldier who continues in this chain of evacuation from the battle front goes from the general or base hospital overseas to an embarkation hospital, and from there is moved by hospital ship or hospital plane to the United States. The hospital ships with an average capacity of 500 patients are complete floating hospitals staffed by about 12 medical officers, 35 nurses, and about 100 enlisted personnel. The planes carried about 24 litter patients, and shuttled back and forth between overseas theaters and this country.

The wounded are landed at debarkation hospitals where they remain only long enough to be routed by plane or hospital train to the appropriate general hospital which specializes in the treatment the individual case requires; the secondary effort being to send each man as far as possible to the hospital nearest his home so that he may be visited by his relatives and friends. Here the wounded man remains until he has received the maximum of medical and surgical treatment going on to the convalescent hospital for that phase of his care. From here the man is eventually recovered sufficiently to be returned to duty or discharged to civilian life.

Signal Corps Photo

Ninth Army aid men give assistance to German prisoner shot in the stomach.

All along the line of this medical conveyor belt the soldier has received treatment. His spirit has been developed and he has put his dependence on the doctors and nurses. He has seen others with possibly more serious wounds get well. He learns to take the loss of an arm, leg, eye or disfigurement in his stride. He believes he will soon be well to do a job and has complete confidence in the doctors and nurses and that he is given the best care that medical science can provide. That this confidence is not misplaced is shown by the fact that almost ninety-six out of every 100 wounded who reached hospitals survived. This record has been accomplished by a vigilant, aggressive medical policy which has resulted in the advancement of medical science by many years. Many of these new methods of medical and surgical treatment have already been passed on to the public.

MARINE CORPS

Marine Tank Lessons Learned at Guadalcanal, Bougainville and Tarawa

by John L. Zimmerman and Joel D. Thacker*

Early in the war against the Japs the U.S. Marines learned the importance of mutual support by infantry and tanks. But, they had to learn this important fact the hard way at Guadalcanal.

TANKS were an organic part of the first United States Marine Corps unit to go overseas after the outbreak of war with Japan. The First Marine Division, which landed in New Zealand in the midsummer of 1942, was equipped with five companies of light tanks —the M-3. These tanks actually saw action the second day of the Guadalcanal campaign.

The Marines' first lesson in the use of tanks in the Pacific was learned in the bitter initial fighting of the Guadalcanal campaign on the small islands of Gavutu and Tanambogo, twin islets joined by sort of a causeway, just off the shore of Tulagi. Here, well emplaced, competent enemy troops offered determined resistance to the attacking Marines of the First Parachute Battalion and the Second Marines. Two tanks were assigned to help out the assault.

It was at this point that the importance of close mutual support by infantry and tanks was learned. One of the two tanks had allowed itself to get too far ahead of the troops. It was attacked and burned with ease by the Japs. The other tank operated with its supporting infantry, delivered valuable support in its turn and withdrew successfully.

Ilu, first known as the Battle of the Tenaru, was the next action in which Marine tanks took an important part. It was here that the first great Jap assault on the American perimeter was launched. After a momentary success the Jap attack was stopped and hurled back. The attack had been launched across the sand bar at the mouth of the Ilu River. After being repulsed the enemy had returned to the right bank of the river. The Japs were concentrated in a small area, triangular in shape, bound on one side by the lagoon-like river and on the other by the sea. The area was also heavily overgrown with brush and cocoanut palms. Reports indicated that this force was well equipped with artillery and modern weapons capable of inflicting heavy damage on a light tank.

A platoon of tanks was sent across the sand bar into the enemy concentration to increase the confusion among the Japs, which presumptively had come upon them when they were thrown back with heavy casualties. Two of the tanks were disabled, one by means of a mine, but the crews were rescued. No statement was made in the Final Action Report, whence these details come, as to the effectiveness of the sortie.

The second big attack upon the American perimeter was launched from inland against the southern sector, along a ridge. Coincidentally with the main attack a smaller action was fought on the right flank of the American positions in which both forces faced each other across an open plain, a flat stretch of land had been burned clear by the defenders for the sake of better observation. Each force occupied woodland bordering upon the field. Estimates of the enemy force were about one battalion with artillery. Official account of tank participation in this action follows:

"Tanks were employed against the position, at first with some success. However, the mistake was made in attempting repeated sorties along the same route. Enemy anti-tank weapons were soon put into position and a subsequent sortie was met with close-range fire which destroyed three tanks."

Two things were realized at this point in the operation. First, there was the explicit realization that the

*Historian, USMC

light tank was an inadequate weapon, that its fire power and its protective armor were insufficient for the tasks normally assigned to tanks. Secondly, there was a growing idea that in terrain of the type in which the actions were taking place, the usefulness of the tank was, and would continue to be, severely limited.

These two ideas were made explicit in the recommendations submitted at the close of the campaign, and which follow:

"Tanks were employed with some success on two occasions. An analysis of these actions indicated:

1. That the jungle is generally unfavorable for tank action.

2. That tanks in small numbers can operate effectively in areas occupied by cocoanut plantations.

3. That the tanks must operate at slow speed and with extremely close infantry support.

4. That wherever possible medium tanks should be employed because of the extreme vulnerability of the light models."

The second large operation of the Marine Corps was that of Bougainville, and here, as in Guadalcanal, a type of terrain was encountered that proved to be the worst possible for the employment of tanks. The participation in action by tanks was limited almost entirely to the task of perimeter defense. Here also, as in Guadalcanal, only light tanks were employed, although the Third Marine Division tank unit—the Third Tank Battalion—included one company of medium tanks, model M4A2. There is no record that this company ever went ashore.

The first action in which it might be said that tanks played an important part and operated in accordance with tank doctrine was the short and violent Betio assault by the Second Marine Division. By this time the division had been equipped with one company of medium tanks from the First Marine Amphibious Corps, who send Company C of the Corps Tank Battalion to New Zealand in October, 1943, for attachment to the Second Division.

The details of the assault on the small, low island are well known. The terrain was more suitable to tank participation than had been that of the Solomon Islands, and the type of defenses which the enemy employed was that against which it was hoped that tanks would be effective.

The two terrain features which caused great difficulties to the infantry likewise proved to be an impediment in bringing tanks into action. The reef which extended roughly parallel to the shore along the landing beaches precluded the possibility of getting the LCD's near the beach proper. It was necessary for crew men to disembark at the reef, wade ashore over the partly submerged coral shelf, and pick out a path that could be followed by the tanks. During this stage of the operation one tank was lost as a result of falling into a hole in the coral.

It will be remembered that along almost the entire beach there had been built a sea wall several feet high, strongly constructed of cocoanut logs. The distance between this wall and the water's edge was only a few feet, and the infantry was, for a time, pinned down in the narrow strip by fire from enemy emplacements inland. There was, at all times, congestion on the beach.

The tanks, once ashore, could not immediately get inland, since the sea wall extended without a break along the beaches where they landed. A means of ingress was provided when a demolition charge blasted out an opening in the wall beyond a point of land on the extreme right of the positions.

Here a difficult decision had to be made by the commanding officer of the company. In order to approach the opening the tanks would have to use one of two paths. The more desirable route lay along the beach under the sea wall, but practically the entire length of the beach was crowded with combat troops, some of whom were wounded. The less desirable route lay through the water and along the uneven partially submerged coral shelf parallel to the beach line, and it was this route that he finally selected. In making the trip, three tanks fell into submerged shell holes, and of the three, only one was salvaged.

Two medium tanks got onto the island and began working inland with the infantry who stayed in close support some fifty yards to the rear. After making some progress, both these tanks became casualties, although only one was totally destroyed. An anti-boat gun damaged the traversing mechanism of one tank, which thereupon made its way back to the beach and set up as a beach defense weapon. Fire from an enemy tank burned the second one completely. One tank of the original group of six was salvaged during the first night and went into action again on the second day.

In the meanwhile, another group of eight tanks landed on the opposite end of the landing beaches, and here again one tank was lost in a submerged shell hole on the coral shelf. The remaining seven found a break in the sea wall and succeeded in getting onto the island, where they supported the advance of the infantry and worked against enemy strongpoints.

The fact that the entire battle took place within a severely limited area and that it was a bitterly contested fight wherein at times the lines were poorly defined makes it understandable that two tanks at least were damaged by friendly fire. A medium tank, in its first advance after getting onto the island, was disabled by friendly mortar fire while later in the fight a second tank was damaged by friendly dive bombers.

Recommendations made at the close of the operation confirmed those made nearly a year earlier at the end of the Guadalcanal campaign. The light tank was once more found to be inadequate both as to armor and armament, and the necessity for even closer coöperation between the tank and the infantry was stressed. It was recommended that one light tank per platoon be equipped as a flamethrower.

TRANSPORTATION CORPS

Army Transportation Corps

*by Lieutenant Colonel Russell G. Oakes**

THE Chief of Transportation is the head of the Transportation Corps and as such is chief transportation officer of the Army and Traffic Manager for the War Department and is responsible for directing, coordinating and supervising all transportation functions for the War Department and for operating such field activities pertaining to these functions as may be assigned to his command by the War Department. The Chief of Transportation is a technical staff officer of the War Department. . . ."

Following the prosaic pattern so characteristic of its official documents, the Army thus capsules its description of the Office of its Chief of Transportation. There is no hint of the toil and trouble, the blood and sweat, the pioneering, ingenuity and resourcefulness, the imagination and determination, the breadth and scope of activities and operations that entered into the discharge of his responsibilities and the accomplishment of his mission during World War II. Nor is there more than a hint, and that imperceptible to all but the initiate, of intricacies and complexities inherent in peacetime responsibilities and activities.

The Transportation Corps is, of course, the Service arm commanded by the Chief of Transportation, and the agency with which and through which he accomplishes his many-faceted mission and his myriad responsibilities. Its peak wartime strength was 403,000, of which nearly 300,000 were military and slightly more than 100,000 civilian men and women. Its current strength, less non-Table of Organization personnel assigned to installations, and to staffs of Armies and Theaters outside the jurisdiction of the Chief of Transportation, is 65,238 military and 44,493 civilian for a total of 109,731.

The Chief of Transportation is coördinator for the War Department with the Office of Commissioner of Customs on all matters of War Department interest, and he is the delegated agent of the Secretary of War for the administration and supervision of all marine personnel affairs of the War Department.

This youngest of the Army Corps was born on July 31, 1942, out of a General Staff decision that full and complete coördination and integration within the Army of all highway, marine and rail transportation activities was fundamental to the successful prosecution of the war. That this decision, translated into policy out of which the Transportation Corps was set up as an "emergency agency," was soundly conceived is illustrated by Paragraph X of War Department Circular No. 227, dated July 30, 1946:

"TRANSPORTATION CORPS. For information of all concerned, it is announced that on February 6, 1946, the Chief of Staff approved the continuance of the Transportation Corps as a part of the permanent Military Establishment. At the appropriate time the War Department will seek the implementing authority necessary to accomplish the establishment of a permanent Transportation Corps."

Illustrative of the continuing efforts of the Army to better coördinate and integrate its highway, marine and rail transportation activities is the transfer, announced as recently as August 9, of functions encompassing administration and operation of all general purpose automotive equipment from the Quartermaster Corps to the Transportation Corps.

Among the types of units affected by the transfer are:

Transportation Corps Truck Company (Heavy), formerly the Quartermaster Truck Company (Heavy). This type of unit operates large truck-tractor and trailer combinations capable of hauling all classes of Army supplies.

Transportation Corps Truck Company (Troop), formerly known as Quartermaster Truck Company (Light) or Quartermaster Troop Transport Company. Equipment employed by this unit consists of trucks commonly known as two-and-one-half-ton, capable of moving supplies, equipment and personnel in smaller quantities and numbers than the tractor-trailer combinations.

Transportation Corps Car Company, formerly known as Quartermaster Car Company, equipped to provide passenger transportation for military personnel.

Specialized automotive equipment peculiar to its own responsibilities and functions, among them mobile bakery, shoe repair, textile repair, fumigating-and-bath, laundry and refrigerator units, remains with the Quartermaster Corps.

The War Department General Order establishing the Transportation Corps came eight months after Pearl Harbor. To the Chief of Transportation it presented the seemingly insuperable task of creating, training and managing an organization destined to embrace more than 400,000 personnel while actually designing, building, increasing and speeding all types of military transportation under his jurisdiction and utilizing to the fullest extent all commercial transportation in his field to bring to bear upon the enemy on distant battlefields

*Transportation Corps.

the full force of America's military might. Out of this congerie of responsibilities and challenges, and aided by few, if any, fortuitous circumstances, sprang the largest integrated transportation system in the world.

To delineate the accomplishments of the Transportation Corps would require volumes. But presentation of at least a few highlights is necessary to comprehension of its place in and importance to Allied victory and future security. They are:

TROOP MOVEMENTS (Zone of Interior)

a. 40,541,261 troops moved by rail and 1,144,399 by bus in organized groups of 40 or more. (December 1941 through July 1946.)

FREIGHT SHIPMENTS (Zone of Interior)

a. 349,071,700 short tons of Army freight shipped via rail, highway and water carrier. (December 1941 through July 1946.)

EMERGENCY CONTROL OF UNITED STATES RAILROADS

a. Assumed control, under the direction of the Secretary of War and the Commanding General, Army Service Forces, of all the railroads of the country at the time of the railroad labor crisis of December 1943 and turned them back to private management in January 1944 without any interruption of operations having occurred and without any financial involvement of the United States.

OCEAN TRANSPORTATION:

a. 8,420,197 troops and other passengers embarked from American ports. (December 1941 through July 1946.)

b. 7,417,001 troops and other passengers returned to the United States. (December 1941 through July 1946.)

THEATERS OF OPERATION:

1. Successfully met all intra-theater transportation requirements of theater commanders.

2. Operated 65 overseas ports of embarkation and debarkation.

3. Military Railway Service (TC) operated 30,000 miles of military railroads, a large part of which (especially in Europe) had to be completely rebuilt and rehabilitated.

4. Operated 46,500 trucks in Motor Transport Service.

5. Operated the famed Red Ball, ABC and XYZ highway express routes to deliver to the front 1,924,006 long tons of supplies.

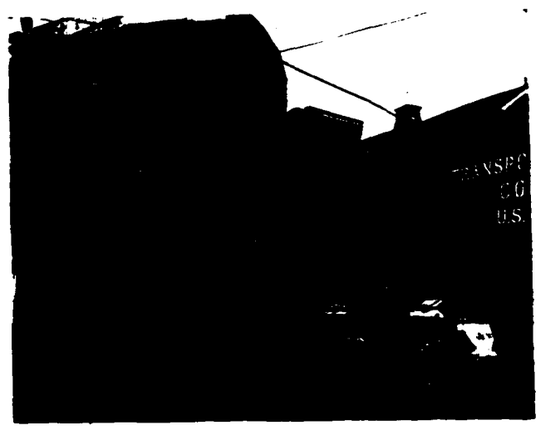
While these statistics point up the record and provide a clear conception of the Transportation Corps' complex and varied activities and responsibilities; while they explain in a way the fierce pride TC men take in their organization and in their accomplishments, they give little indication of the valor and the heroism that entered into their achievements. They fail to tell of the Port Battalions, the Military Railway Service and other TC troops who left their engines, their cranes, their slings, their hatches and their hoists to pick up rifles or carbines and join Ground Force troops in standing off enemy attacks; they tell nothing of the Negro DUKW operators at Iwo Jima who amazed even the doughty Marines by ignoring withering bombardment in order to maintain a flow of supplies to hard-pressed Leathernecks ashore; nor do they tell of the operation of ports under "buzzbomb" attacks, and of Harbor Craft troops in snub-nosed tugs showing the way to the invasion of the Continent over Omaha and Utah beaches. That glory—and much more—belongs to the men of the Transportation Corps.

But it is the transition from war to peace, and peacetime planning, which now engage the Transportation Corps. Naturally, it is employing means proved wise in war to shape its peacetime ends. The evolution of events already has resulted in the streamlining of both organization and procedures. Installations, among them four Ports of Embarkation which were of major importance during the war; nine Transportation Zones; Holding and Reconsignment Points and other installations superfluous to peacetime needs, have been closed out. The Zones have merged with the Army's field organizations, with each Army commander having on his staff a group of Transportation Officers. Economy consistent with efficient operations, and with progress, has become a "must."

Two major goals constitute the objective toward which this new Corps strives: 1. Provision of efficient transportation service to the peacetime Army and, 2. Creation of superior efficiency in its fields and readiness to meet any emergency of peace or of war. The second of these, of course, embraces the first, but it encompasses much more—"preparedness."

Preparedness in military transportation means creation through aggressive study, research, experiment, education, ingenuity, industry and training of new and better means and methods of moving men and material. It means close coöperation and coördination

Freight cars of the Army Transoprtation Corps pour from the open bow of an LST onto a rail track in France.



between the Transportation Corps and the industries engaged in transportation and the production of transportation equipment; close coördination and coöperation between the Corps and all other Government Agencies, and agencies of Allied Nations, dealing with transportation. It calls for the addition of courses in transportation to the curricula of many schools and colleges, and the provision of extension courses for the Transportation Corps Reserve. And it demands perpetuation of the alertness to responsibility that was so characteristic of TC forces during the war.

It is to the accomplishment of these ends that the Transportation Corps has dedicated itself. Already, through its Research and Development Division, its Transportation Corps Board and the Transportation Corps Technical Advisory Board, which is a hand-picked, representative group of leaders in the nation's transportation industries, it is busy examining every last detail of all captured enemy transportation equipment, and delving into records of enemy transportation methods and procedures. It has sponsored and is very actively assisting experiments with new applications of cycloidal propulsion. In another direction, it is working in coöperation with leading shipbuilders toward perfection of marine electro-coatings developed by one of its officers during the war to 90 per cent effectiveness in protecting a ship's hull from rust and other corrosives; and toward perfection of an electrolytic cleaning process, developed by the same officer, which is expected to outmode "chipping." Perfection of these methods would be of vast economic significance to commercial as well as to military shipping.

The Transportation Corps has developed a far-sighted and long-reaching program of education and training, which includes establishment of the Transportation Center at Fort Eustis, Virginia. Here it will provide comprehensive training for enlisted men in more than 90 different skills, ranging from Diesel mechanic to marine engineer, from boatswain to locomotive engineer, from electric locomotive repairman to marine diver, and from armorer to amphibian truck driver. In addition, Fort Eustis, which will have complete facilities for the thorough training of all TC personnel, will offer a course for camp, post and station transportation officers.

The education and training program for regular officers envisions within their first year of service, a three-month basic course at Fort Benning, Ga., and a basic branch course of five months at Fort Eustis. An associate branch course of three months also will be offered at Eustis for graduates of Officer Candidate School, Reserve and National Guard officers, officers from other services and foreign nationals. There will be a Regular Advanced Technical Course of 10 months for officers with from three to 10 years service, with an associate course of three months for Reserve, National Guard and Transportation officers, and for officers from other services. The over-all program continues for eligible officers through the Command and General Staff School, the Armed Forces College, the Industrial College and the National War College. A transportation course also is to be offered at the Air College. At this writing, eight leading American colleges and universities have agreed to take eligible officers for graduate and/or post-graduate work in transportation subjects.

The Corps' ROTC program contemplates the activation of from 30 to 35 units of 250 men each. Of these, perhaps seven will be activated this fall. Under War Department policies presently in vogue, the ROTC units would study the transportation course, of 160 hours per year, in their junior and senior years.

Nearing completion in the educational and training program are arrangements for extension-course instruction to Transportation Corps Reserve personnel. One out of every two officers in the A.U.S. who served with the Transportation Corps in World War II and who is now being relieved from active duty, is applying for a commission in the newly organized Transportation Corps Reserve. A surprisingly large number of these officers already are displaying eagerness to enroll in the proposed extension-course instruction.

The Transportation Corps has accepted the challenges to its ingenuity and determination implicit in its peacetime mission and responsibilities as eagerly as it accepted those imposed by war. It faces them with the same fresh vigor and vitality that carried it over many an "insurmountable" obstacle placed in its path by desperate and deadly enemy nations; with the same flaming faith in its abilities that made its troops certain during the war that if called upon to do so they could move mountains. It is determined that, military-wise, its superiority shall be unquestioned, and that its developments and progress shall be devoted to the common peacetime interests of the nation rather than exclusively to preparedness for war.

The Chief of Transportation is a technical staff officer of the War Department and commands the Transportation Corps. In these capacities he:

1. Renders technical and administrative advice and recommendations to the Secretary of War, Chief of Staff and the War Department General and Special Staffs.

2. Prepares plans, estimates, and orders affecting transportation matters or the Transportation Corps, in order to relieve the War Department General and Special Staffs of such routine duties.

3. Coördinates with the War Department General and Special Staffs with regard to their operational, administrative and technical plans and activities.

4. Exercises such Army-wide technical supervision of transportation activities and inspections in connection therewith as the Chief of Staff may prescribe.

5. Commands all troops and activities or services assigned to his command by the War Department and exercises the usual functions of command over such troops and activities and services.

6. Prepares plans for the transportation requirements of the War Department and advices the Director, Services, Supply and Procurement, WDSS, with respect to transportation problems.

7. Represents the War Department in obtaining allocations of shipping from the War Shipping Administration and from the Combined Shipping Adjustment Board, or such other similar organizations as may exist.

8. Directs the application of shipping available to the War Department to meet the requirements of the Army and the United States Military missions aboard.

9. Prepares and disseminates information regarding the status of troop and freight movements, location of ships, ship movements, and ship and cargo losses pertaining to the Army.

10. Maintains liaison for the War Department and negotiates with surface commercial carriers, including the railway industry, the commercial motor transportation industry, the commercial shipping industry, including inland waterways and the Great Lakes shipping industries, the Office of Defense Transportation, and other U. S. Government agencies on all matters of surface transportation, including rates, classifications, agreements, and conditions of handling all movements of War Department personnel, freight and cargo.

11. Prepares the budgetary requirements for the movement of War Department freight and exercises staff supervision over the expenditure of these funds to insure the most efficient and economical use thereof.

12. Establishes the policies and procedures for the operation of the Army ports of embarkation to include those pertaining to direction and coördination of shipping procedures and warehousing and storage functions.

13. Exercises staff supervision and control over the assignment and maintenance of all War Department floating equipment, except stream-crossing equipment and that required for river, harbor, and fortification work under the Chief of Engineers, and rescue boats under the control of the Commanding General, Army Air Forces.

14. Designs, procures, and purchases (including inspection) floating equipment for the War Department, except: stream-crossing equipment, and vessels and floating equipment required for river, harbor, and fortification work under the Chief of Engineers, and the design of rescue boats of the Army Air Forces.

15. Designs, procures, and purchases rail equipment for the War Department.

16. Procures specialized pier and ship cargo-handling equipment for the Transportation Corps.

17. Exercises technical staff supervision over the operation of all utility railroads and over the allocation, maintenance, repair, and economical use of all railroad equipment of the War Department.

18. Exercises staff coördination and control over movements of troops and other War Department passengers and all War Department-owned and controlled freight and cargo within the Zone of the Interior by commercial motor, rail, water, and air (non-contractual) and to and from overseas theaters by water and by civil air (non-contractual).

19. Issues releases under a block system to regulate the movement to ports of Army cargo for export.

20. Routes all War Department freight of one or more cars and/or the equivalent of one carload or more (as usually loaded) if moved by truck, and all inland movements of troops in groups of fifteen (15) or more.

21. Computes freight rates for procurement officers in the field.

22. Operates the War Department fleet of railroad tank cars.

23. Exercises staff control over the operation of Army Reservation Bureaus.

24. Makes basic determinations of requirements for administrative and L of C (Line of Communication) cargo and personnel vehicles, Transportation Corps truck units and related equipment to meet the needs of the War Department.

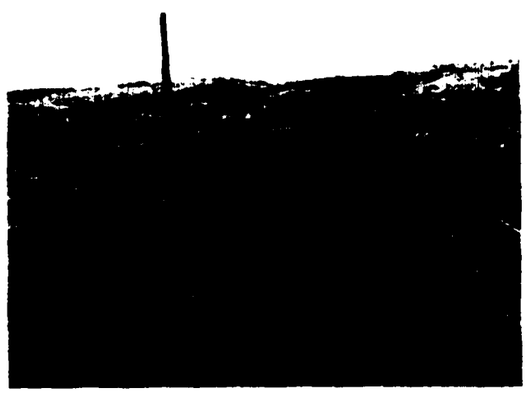
25. Exercises staff control over the allocation and utilization of administrative vehicles (as defined in WD Circular 139, 1945) and first and second echelon maintenance thereof, except for the Army Air Forces.

26. Provides the War Department with traffic and transportation engineering service (except air), including the determination of foreign and domestic transportation capabilities and requirements.

27. Formulates plans, policies, and technical methods governing the training of personnel engaged in transportation activities, except air, and except those assigned by the War Department to other commands for supervision.

28. Commands and operates ports of embarkation, the Transportation Corps Board, Transportation Corps Supply Depot, Transportation Corps Railroad Repair Shops, and the Transportation Training Center.

Transportation Corps trucks are taking supplies from freight cars operated by TC Military Railway Service units in a town near Frankfurt, Germany.



TANK AND ANTITANK*

by Brigadier R. M. P. Carver

"In the battle of El Alamein, in 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. . . . Rommel employed about 300 German tanks, almost all Mark IIIs and IVs, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant, and the 6-pounder. . . . This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with."

THE present seems to be an appropriate time at which to review the development of tanks, Allied and Axis, during the war and of the antitank weapons produced by either side. It is an interesting story, the truth of which has been distorted by controversy and ignorance. One major cause of misunderstanding has been the claim to have produced a weapon which to the soldier is useless until not only has he received it in the field in sufficient numbers to replace its predecessor, but has also been trained in its use, and has with it the accessories and behind it the spares necessary to maintain it. It was, I think, Mr. Duff Cooper, then Secretary of State for War, who in 1935 said that we had the best antitank gun in the world. He was alluding to the two-pounder. If there were any fit to fire at that time, they were not outside the experimental ranges. In the Middle East, then the threatened theater of war, they were not in service until the end of 1940. Misleading statements of that kind are the cause of controversy which has confused the issue on countless occasions.

FRANCE, 1940. In 1940 when Germany attacked the Low Countries, we had the following tanks in service:

Matilda, Mark I. A three-man I tank mounting a 2-pounder and co-axial .303 Vickers machine gun. Well armored for its day with 75mm but very slow, underpowered, unreliable and with a very short range. Not more than about 60 of these. No spares.

Cruiser, A.9. Forerunner of the Valentine: originally designed by the late Sir John Carden before his death in 1936. Crew of six. Armor about 14mm. One 2-pounder gun and three .303 Vickers machine guns. Range about 100 miles. Speed 20-25 m.p.h. Unreliable on account of track defects. No spares and often not the full complement of weapons. Nevertheless the best tank in the service of either the British or the French. About 100 of these.

Light Tank, Mark VI, VI-B or VI-C. Crew of three. Armament one .5-inch and one .303-inch Vickers machine gun. Armor 14mm. Very poor cross-country capacity. 35-40 m.p.h. on roads. Reliable, having been in service since 1935. Range about 100 miles. Purely a

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reconnaissance vehicle, but provided in fact the equipment of the vast majority of tank units.

In the same campaign the Germans used the following types of tank:

Pz-kw, Mark I. A light tank inferior to our own in armament, having only two 7.92mm machine guns. Armor 14mm, equal to our own. Cross-country capacity slightly better. Crew of three.

Pz-kw, Mark II. An improved light tank, carrying one 20mm and one 7.92mm machine gun. Armor 15mm. Better cross-country capacity. Still really only a reconnaissance vehicle. Crew of three.

Pz-kw, Mark III. Cruiser-type tank. Originally carried one 37mm gun, equivalent to our 2-pounder and two machine guns. In the spring of 1941 it certainly had a 50mm gun. I do not know whether in 1940 any were equipped with 50mm guns. Armor 30mm. Crew of four. Good cross-country capacity and reliable.

As far as quality went, therefore, we would appear to have been pretty well on a level with the Germans, though our Cruiser was thinner than their Mark III. In quantity we were hopelessly at a disadvantage. Light tanks were the only ones available in any quantity. The Matildas were handicapped by their reliance on transporters for any major move. The only transporters available were railway flats, which were immobilized by the German Air Force. Wherever they fought German tanks they were successful, until overcome by weight of numbers and outmaneuvered as a result of their slow speed, short range and unreliability.

As far as weapons to deal with German tanks were concerned, quantity and inferior armor-piercing ammunition were the main disadvantages. The 2-pounder, whether in the tank or on a ground mounting, would knock out the German Mark I or Mark II at ranges up to 1,000 yards, and the Mark III up to 500 yards, if not slightly more. The Boyes antitank rifle and the Vickers .5-inch machine gun would penetrate the Mark I or Mark II at a range of about 400 yards, but were useless against the Mark III. The German 37mm antitank gun was equivalent to our 2-pounder and could knock out the Cruiser at about 500 yards, the Light Tank at 1,000, but made no impression on the Matilda. The 50mm antitank gun would knock out the Cruiser at 2,000 and the Matilda at about 800 yards.

Generally speaking, therefore, in this campaign it was quantity rather than quality in both tanks and antitank guns which was our chief disadvantage, though in the 50mm antitank gun the Germans were a considerable step ahead. I am not certain that they did in fact have them in this campaign; if they did, it was not in very great numbers, the 37mm being still their standard tank and antitank gun. In armor the Mark III was twice as thick as the A-9, but less than half as thick as the Matilda.

LIBYA, 1940-1941. At the beginning of the campaign against Italy in June, 1940, we had in Egypt approximately the following numbers and types of tank:

Cruisers, A-9 and A-10. About 60. Many of these, however, were without their 2-pounder and at least one machine gun. Much other necessary equipment, such as sighting telescopes and wireless sets, was also "to follow." There was a complete lack of spares. They were not subject in the desert to the track trouble experienced in France and were generally fairly reliable, after original cooling and air-cleaning troubles had been solved. The A-10 was substantially the same as the A-9 with two instead of three machine guns, and armor of 30mm instead of 14mm.

Lights, Mark VI, VI-B or VI-C. About 200, of which not more than 160 were in the field. Reliable apart from track trouble, which depended for its solution on a vast reserve of locally-made track pins.

The only Italian tanks up to February, 1941, were the Mark XI, a poorly armored unreliable Cruiser mounting a 37mm gun, of which there were very few, and the C.V-3 which could hardly be called a tank at all, a miniature machine-gun carrier which was little more than a death trap. As far as both quantity and quality went, therefore, we were definitely superior. For antitank guns we had two batteries of 37mm Bofors; their chief disadvantage lay in the fact that the ammunition for them was made in Poland and, therefore, once we had fired off what we had, the guns were useless. There were also some 2-pounders in the support company of the 1st Royal Northumberland Fusiliers at Mersa Matruh. In reserve were the old prewar medium tanks of 6th Royal Tanks, some dug in in the defenses of Matruh and some manned by the Egyptian Frontier Force in Siwa!

In October, 1940, the scale was turned even further in our favor by the arrival of the 7th Royal Tanks with some 50 Matilda Mark IIs, a great improvement on the Mark I, though with the same gun and armor; the 2d Royal tanks with 50 to 60 Cruiser A-13s and the 3d Hussars with 60 Light Tanks. The A-13 was the first Cruiser with Christie-type suspension, the pilot models of which had been made by Nuffields in 1936. In speed it was a great improvement on the A-9 and A-10, but had only 14mm armor and the same armament.

At the start of the offensive on December 8, 1940, we had in the field the following tanks:

Matilda Mark II, 50; Cruisers A-9, A-10 and A-13, about 170; Lights, about 160.

The Italians never produced more than about 100 M-11s, and always in such scattered groups that they were never a problem at all. For antitank guns we had more 2-pounders, which had replaced the 37mm.

The Matilda was "Queen" of the battlefield. The only things which could stop it were a mine or a direct hit by a field gun at short range. The real problem of the campaign was maintenance. By the time we reached Tobruk, tank strength had fallen to 16 Matildas, 50 Cruisers and 50 Lights. Only a small proportion of the losses were battle casualties. For the final battle of Beda

Fomm on February 8, 1941, the enemy produced about 40 new M-13s, a much improved Diesel-engined Cruiser with a 37mm gun. As, however, he only had scratch crews, who had snatched the tanks straight from the dockside in Benghazi, and as they were Italians, they proved little trouble to us. After the battle of Beda Fomm it was found that only 12 Cruisers and 40 Light Tanks fit for a farther 100 miles could be produced. By that time the 2d Armored Division had arrived, bringing, apart from what went to Greece, some 60 A-13 Cruisers and 60 Lights, the latter being kept at the base for reinforcements.

When Rommel attacked from Agheila in April, 1941, with his 5th Light Panzer Division, made up of Mark IIs and Mark IIIs, he was faced by the 3d Hussars with about 40 Lights and the 6th Royal Tanks with about 40 Italian M-13s. The 5th Royal Tanks with about 50 Cruisers, which had not been new when they left England, were in GHQ reserve at Tobruk. They were ordered up in a great hurry, too late. Many broke down and more ran out of petrol, with the result that they hardly affected the battle at all. Meanwhile mixed Light and Cruiser tanks and about 15 Matildas were rushed up to Tobruk, where they became part of the encircle garrison.

GREECE AND CRETE, 1940. The 1st Armored Brigade which went to Greece had some 60 Cruisers (3d Royal Tanks) and the same number of Lights (4th Hussars). In addition, the Divisional Cavalry regiments of the 2d New Zealand Division and the 6th Australian Division had a number of light tanks. Our Cruisers were mostly A-9 and A-10, which suffered very badly from the track trouble they had experienced in France, but not in the desert. For antitank guns we had 2-pounders, but not in profusion. The Germans produced many Mark IIs and a higher proportion of Mark IIIs, all now with the 50mm gun. They may have produced some Mark IVs: I am not certain. If they did, there were not many. The Mark III with the 50mm was definitely superior to anything we had, and we were hopelessly outnumbered. The few Cruisers we had were kept moving from one threatened place to another, and mechanical breakdowns were responsible for the majority of losses, becoming total losses as the withdrawal began.

To Crete went four Matildas, which were landed at the opposite end of the island to which they were most needed. Before the eastern Mediterranean route was closed, a mixed party of Matildas and Light tanks, amounting to about 30 in all, were sent to Malta. Known as "Malta Tanks," they were chiefly used for clearing wrecked aircraft off the aerodrome runways.

LIBYA: JUNE, 1941. One of the most significant battles of the war, as far as tank and antitank development was concerned, was fought on the Egyptian frontier in June, 1941. It was called "Battleaxe" and was a full-scale attempt to relieve Tobruk. It ended in complete and utter failure. As a result, hardly anyone outside the Middle East was allowed to know about it, which was a pity as there was much to be learned from it. For the first time against the Germans we had a full-scale tank versus tank battle, in which we were superior in numbers. The German tanks were almost all Mark III equipped with 50mms. We had about 100 Matildas and about 150 Cruisers. The 50mm was much superior to our best armament, the 2-pounder. The armor of the Mark III was about equivalent to that of the A-10, but thicker than that of the A-13. The armor of the Matilda was double the thickness of the German.

The main cause of our defeat was the German use of the 88mm antiaircraft gun as an antitank gun. The slow, unreliable Matildas were slaughtered by them. The Cruisers were outgunned by the Mark IIIs and also blown to pieces by the 88s. In addition, the Mark III with its 50mm could knock out our 2-pounder antitank guns, impossible to conceal in the desert, from ranges at which it was itself invulnerable to them. Our only effective antitank weapons were now the 25-pounders of the Royal Horse Artillery diverted from their field rôle.

The lessons to be learned from this battle were:

1. That the only limit to the range at which the 88 could knock out our tanks was visibility—up to 3,000 yards. Therefore only artillery could deal with them. Artillery support of tanks was therefore necessary at all times.

2. Our tanks, with the exception of the Matilda, could not fight a tank versus tank battle on equal terms with the German Mark III.

3. The Matilda was too slow and unreliable to be used as a cruiser tank in the desert.

4. The 25-pounder was the only effective antitank weapon we had.

The result, therefore, was an immediate need for an increase in supporting artillery, partly for the support of tanks, partly for use as antitank weapons. This need was not met.

SYRIA: JULY, 1941. No tanks took part in the Syrian campaign other than Light tanks of the 6th Australian Divisional Cavalry. The French produced some Renault tanks equipped with 37mm, which could be dealt with adequately by 2-pounders. Their presence came as a surprise and they caused considerable casualties when they first appeared, the British troops opposing them having only antitank rifles—those useless weapons, which were for so long an unnecessary burden to the PBI.

LIBYA: WINTER, 1941-1942. At the opening of the "Crusader" operation in November, 1941, we had approximately the following numbers and types of tanks actually in the field:

Matildas, Mark II, 100; Valentines, 50; Cruisers, A-10 and A-13, 150; Crusaders, A-15, 170; General Stuarts (American), 170; total, about 650.

Inside Tobruk we had the 1st Royal Tanks with a mixed collection of 50-odd tanks, varying in type from Matilda to Mark VI Light, and the 4th Royal Tanks with 50 Matildas, brought in by landing craft during the preceding month.

This operation, therefore, saw the arrival of three new types, the Valentine, the Crusader and the Stuart, the Stuart being the first American tank with which we were equipped. Details of these tanks were as follows:

Valentine. Development from the A-10, but with much increased armor. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 60-65mm, about double the thickness of the A-10. The engine being the same, the Valentine was considerably slower. It was fortunately very reliable. Crew of four.

Crusader. Development from the A-13. Armament still 2-pounder and two Besa 7.92mm machine guns. Armor 40mm. Fast, well-sprung, but hopelessly unreliable, involving constant attention by drivers and fitters. Crew of five.

Stuart. A small light tank, with a badly designed fighting chamber. Armament 37mm, almost exactly equivalent to the 2-pounder, and two .3-in. Browning machine guns. Armor 40-45mm. Its great advantage was its extreme reliablity. Its great disadvantage was its very inadequate petrol tank capacity, giving an endurance of only 40 miles. Crew of four, very cramped. Although its only advantage over the Crusader was reliability, it was much preferred by many.

For antitank guns we had 2-pounders in rather greater numbers than before. The only better antitank gun was in the 1st South African Division. Their antitank batteries each had a troop of 18-pounders, old field guns converted.

Rommel had three armored divisions, two German—the 15th and 21st (the old 5th Light)—and one Italian, the Ariete. Each had about 150 tanks. The majority of the German were Mark III, about equal in armor to the Crusader and Stuart, but better armed with 50mm. A new arrival was the Mark IV. This had slightly thicker armor than the Mark III, but not as thick as the Valentine. It was equipped with a short-barrelled low velocity 75mm, designed as a close support HE weapon, but also very effective as an armor-piercing weapon. These made up less than a quarter of the total. There were also a small number of Mark II light tanks. The Italian were all M-13s, equivalent to the Stuart, but with weaker armor. For antitank guns the Germans were liberally equipped with 50mms and 88mms, the Italians with 37mms and 47mms—neither very effective guns.

We therefore outnumbered the enemy by about three to two in tanks. The Germans had a slight superiority in armor and a definite superiority in tank guns and antitank guns. The proportion of supporting artillery to tanks was still inadequate on our side. Only one armored brigade—the 4th Armored Brigade, equipped with Stuarts—had its own regiment of Royal Horse Artillery.

From the beginning of the series of tank battles which dominated the "Crusader" operation, it was obvious that we were at a great disadvantage, our tanks being vulnerable to the enemy's tank and antitank guns at ranges at which we could not penetrate their tanks. At the end of the first week the three armored brigades of the 7th Armored Division were reduced from a strength of about 450 to a total of 50 tanks. By remarkable efforts of recovery, repair and reorganization, this number was quickly reinforced; but after the relief of Tobruk there were only enough tanks and crews to man one brigade. In spite of our inferiority in the quality of tanks and in quality and proportion of antitank guns to others arms, Tobruk was relieved, and Rommel chased back to Agheila. He was reduced to a strength of 8 tanks at one time before reinforcements reached him at Benghazi. It was a remarkable feat, achieved by courage, determination and skill, helped not a little by Rommel's mad and ineffective dash to the frontier at the crucial period of the battle. The outstanding lessons of the operation were the need for a better gun in our tanks and the need for ample and intimate artillery support for tanks.

LIBYA: SUMMER OF 1942. Our tank strength in the desert in May, 1942, when Rommel attacked, was roughly as follows:

Matilda, Mark II, 150; Valentines, 150; Crusaders, 200; Stuarts, 100; Grants, 150; total, 750.

In addition there was a brigade in GHQ reserve which was brought up in the middle of the battle with a further 50 Grants and 100 Stuarts. The General Grant was an American tank, originally designed as a heavy tank for the close support of infantry. For armor it had 75mm on the turret and 45-50mm on the hull. Its armament consisted of one 37mm in the turret and one 75mm in a sponson in the hull with limited traverse, and two .3-inch Browning machine guns. Its advantages over previous tanks were its slightly thicker armor, its 75mm gun, its reliability and the ample room for the crew. Its disadvantages were the fact that its main armament was low down in the tank, with the result that almost all the tank had to be exposed before the 75mm could be fired, and that it only had limited traverse; in addition it was very bulky, making a big target, and had an endurance of only about 70 miles. Of the three brigades equipped with a proportion of these tanks, two had only received them just before the battle started. Their gunnery mechanism was quite different to any we had had before and entailed considerable training.

For antitank guns a few of the new 6-pounders had arrived just before the battle and had been issued to the armored divisions, but many gunners had not had an opportunity of firing them.

The enemy had about 300 German and 150 Italian tanks. The German were Mark III and Mark IV, with a greater proportion than previously of the latter. Both had reinforced their armor, but the armament remained the same, though in many cases the 50mm of the Mark IIIs was of an improved type with a higher muzzle velocity. The Grant was the equal of the Mark IV, though a more difficult tank to fight, and the superior of the Mark III. The Italian tanks were still M-13s. In antitank guns we now had a few 6-pounders, which were most effective against all enemy tanks in spite of their very bad sights; but the Germans now had 88mms and the improved 50mm on a much more lavish scale. At one period in the battle round Knightsbridge we did use heavy antiaircraft guns as antitank guns with great effect. The advent of the Grant and the 6-pounder was extremely valuable, but the great majority of tank and antitank guns were still 2-pounders and at an even greater disadvantage *vis à vis* the Germans than in the winter. For the first three weeks of the battle the enemy's losses in tanks were generally in the same proportion to his total strength as our own. On June 16, however, we lost almost all our remaining strength of Grants to his antitank guns, while he lost practically no tanks; from then on the balance of superiority in tanks was heavily loaded in his favor.

In the fighting in July, which ended in the stabilization of the line south of El Alamein, we had a definite superiority in numbers of tanks, a complete new brigade of Valentines having arrived, but only a small proportion were Grants. We were still relying mainly on Matildas, Valentines, Crusaders and Stuarts. More 6-pounders were available, in spite of the heavy losses round Tobruk, but the 2-pounder was still predominant.

EL ALAMEIN. In the battle on August 31, 1942, on which Rommel pinned his hopes of reaching Alexandria, we had available approximately 200 Grants, 100 Crusaders, 100 Stuarts and 100 Valentines. A few of the Crusaders were equipped with 6-pounders, otherwise there was no new type of tank on our side. Six-pounder antitank guns were by now fairly plentiful and had almost entirely superseded the 2-pounder. A new high velocity shell had been produced for the 2-pounder, but it was still hopelessly inadequate as an antitank gun. Rommel employed about 300 German tanks, almost all Mark III and Mark IV, mostly the latter. The latest improvement on his side was the Mark IV Special, equipped with the long 75mm (Kwk-40), designed as an antitank gun and superior to the 75mm in the Grant and the 6-pounder. All the Mark IIIs now had the long improved 50mm. Both were carrying extra armor and were considerably heavier than the original design, a fact which caused them increasing mechanical trouble. This time there was no surprise; he had little space to maneuver and we were well ensconced in an excellent battle position. He ran his head right into it and our 75mms and 6-pounders took heavy toll, though we realized that the Mark IV Special was a tank to be reckoned with.

The Battle of Alamein itself was a great milestone in tank development from our point of view, as it saw the advent of the Sherman tank. This was a great improvement on anything that had gone before. Its armor was 65-75mm. Its gun was a 75mm of what was then considered high muzzle velocity, mounted in the turret. Firing armor-piercing shell, it was superior to the Mark IV Special. The guns of each were just about equal in performance, but the Sherman was better armored. Firing HE shell it could compete with the 88mm antitank gun. It was reliable, roomy and excellently designed for fighting.

By now the 6-pounder antitank gun had almost entirely superseded the 2-pounder, and the proportion of antitank guns to other arms was liberal. In addition, a small proportion of Crusaders were equipped with 6-pounders. The Matilda had at last disappeared except for 32 mine-clearing flail tanks, the first ever to be used. Our approximate tank strength at the beginning of the Battle of Alamein was 400 Shermans, 130 Grants, 200 Crusaders, 120 Stuarts and 200 Valentines. Of these 1,050 tanks, 538 carried 75mm guns and 650 were American. The Germans had about 400 tanks and, in addition, a number of self-propelled antitank guns. About half of these carried the long 75mm Kwk-40, the rest 50mm. For antitank guns they had a large number of 88mms and 50mms. The 75mm towed antitank gun had not yet appeared. With the Sherman we had at last not only a vast superiority in numbers, but also a superiority in armor and armament. The 88mm remained the greatest menace; it was defeated by artillery support and by HE fire from Grants and Shermans. There is little doubt that the Sherman was one, probably the main, deciding factor in our victory.

TUNISIA. The British First Army introduced the Churchill to battle for the first time, except for four tanks tried out at Alamein. With armor of 87-100mm and a 6-pounder gun it was a considerable improvement on the Valentine, which it succeeded as the British tank designed primarily for the support of infantry. It was, however, unreliable at that time. Its armor was no real protection against the 88 and it was vulnerable at 500 yards to the new 75mm antitank gun, which the Germans first produced in Africa in January, 1943. Its 6-pounder gun was able to compete with the Mark IV Special, but was useless as an HE weapon.

When it first landed, the British 6th Armored Division was equipped with Crusaders, which it thankfully exchanged for Shermans in February.

At the Battle of the Mareth Line in March, 1943, the Eighth Army had three armored brigades equipped with about two-thirds Grants and Shermans, and one-third Stuarts and Crusaders, an increased proportion of the latter carrying 6-pounders. In addition there was a brigade of Valentines, a small proportion of which were now also equipped with the 6-pounder. For the Battle of Medenine, which preceded it, we had a few of the

new 17-pounder antitank guns, but they did not come into action. In his disastrous attack on this occasion Rommel used three Panzer divisions, mostly equipped with Mark IV Specials. By now he also had a number of self-propelled guns, mostly 75mm, on a variety of chassis—Czech, French and German. He was defeated mostly by 6-pounder antitank gun fire and concentrated artillery fire, our own tanks hardly being engaged at all. Where they were engaged, the 75mms of the Shermans and the 6-pounders of the Crusaders did great damage. The Americans with the First Army were equipped with Shermans and Stuarts.

It was not until after crossing the Wadi Akarit in April that the Eighth Army met its first Tiger. This formidable tank had 82-110mm of armor and carried an 88mm gun. It was, therefore, more heavily armored than the Churchill, which appeared in the field about the same time, and very much better armed. The only antitank gun we had which could deal with it was the 17-pounder, of which there were very few at that time. Luckily there were also few Tigers. They were not, we believed, reliable. By the time we in the Eighth Army met them, the Germans had already lost the campaign except for the final stand round Tunis, and they were chary of risking the loss of precious Tigers. They therefore inclined to withdraw when heavily shelled and did not prove the nuisance they might and could have been. At the end of the campaign in Tunisia we had an overwhelming superiority in numbers of tanks, an increasing number of which were Shermans, which had proved the superiors of all German tanks we had met except the Tiger. We had evolved tactics, employing the intimate coöperation of HE fire from artillery and tanks, directly or indirectly fired, which defeated the normal ground antitank gun, 50, 75 or 88mm, in open country. The PIAT in the British Army and the Bazooka with the Americans had begun to replace the obsolete antitank rifle as the light short-range personal antitank weapon of the infantry, both firing hollow-charge HE projectiles. The 17-pounder had just begun to appear and was for a short time the best antitank gun on either side in the field. At any rate it had proved capable of dealing with the Tiger at over 1,000 yards.

SICILY AND ITALY, 1943. The end of the North African campaign saw the end of the Grant, the Crusader and the Valentine. The Stuart remained on the scene, in small numbers in the British Army, in greater quantity in the American, purely as a reconnaissance vehicle. It was definitely now a light tank. All the British, Canadian and American tank units which took part in the campaign in Sicily and in Italy up to the end of 1943 were equipped with Shermans throughout. The Churchills remained in North Africa and did not come over to Italy until 1944. The Germans produced few tanks in Sicily and not many were seen in 1943 in Italy, except in the counterattacks at Salerno and on the River Sangro. The country and the fact that the Germans were permanently on the defensive gave an added importance to their antitank guns. The most notable changes were the great increase in self-propelled antitank guns of all calibers up to 105mm. Inconspicuous, mobile and armored all-round and overhead against shell fragments, they could not be defeated by the tactics of HE fire used in North Africa. In addition, the thick country and the introduction of flashless powder made it very difficult to locate guns when they fired. The ranges at which most tanks were knocked out were now about 100 yards instead of 1,500, which had been the average in Africa.

The other main advance in German antitank weapons was the first appearance of the 88mm designed purely as an antitank gun, no longer dual purpose antiaircraft and antitank. It was lower, more mobile, had an armored shield, improved sights and a considerably improved performance. The Germans also produced in larger numbers different types of light taper-bore antitank guns. These fired a small projectile which had a considerable power of penetration. On our side more 17-pounders were available and we had also a number of American self-propelled 76mm antitank guns, called by the Americans "Tank destroyers" or M-10s. These had a better armor-piercing performance than the 75mm in the Sherman, but not as good as the 17-pounder, and were not really effective against the Tiger except at very short ranges. The Germans did not produce their version of the Bazooka in Italy until 1944, although they had long used hollow-charge shells fired from field guns.

NORTHWEST EUROPE, 1944-1945. The main features in the development of tanks and antitank guns by the time that the invasion of Normandy took place were the following:

British

1. Introduction of 17-pounder in Sherman. (Ratio of one 17-pounder to three 75mm in fighting troops.)
2. Appearance of Cromwell, armed with 75mm.
3. Introduction of 75mm in Churchill (ratio initially one 75mm to two 6-pounders in fighting troops and subsequently two 75mm to one 6-pounder).
4. Introduction of flame-throwing Churchill (Crocodile).
5. Use of amphibious tanks (Shermans).
6. Increase of armor on Churchill.
7. Improvement of mine-clearing tanks and increase in numbers. Sherman Crab.
8. Disappearance of 2-pounder antitank gun. The 17-pounder now standard, with the 6-pounder replacing the 2-pounder in infantry battalions.
9. Increased number of self-propelled antitank guns. Conversion of proportion of M-10s from 76mm to 17-pounder.
10. Introduction of rocket-firing aircraft.

American

Nil, except that some Shermans were equipped with 76mm in place of 75mm and that the Stuart was relegated to reconnaissance only, though still used in larger numbers than in the British Army.

German

1. Appearance of Panther.
2. Increased proportion of Tigers and Panthers.
3. Vast increase in numbers of Bazooka-type weapons.
4. Increase in number, type and effectiveness of self-propelled antitank guns.

When the 21st Army Group was completely ashore at full strength its British, Canadian and Polish forces had approximately the following numbers of tanks in the field, excluding reserves outside units:

Sherman 17-pounders, 320; Sherman 75mm, 1,400; Cromwell, 390; Churchill 75mm, 50; Churchill 6-pounder, 400; Churchill Crocodile, 60; Sherman Crab, 120.

Of this total of about 2,740 tanks, two-thirds were American. All the self-propelled antitank guns were American, although about a third had British 17-pounder guns in them. Not counted in this total were about 150 AVREs (Armored Vehicles Royal Engineers), all Churchills. Equipping Shermans with 17-pounder guns was a British idea, the conversion being carried out in England. Only British, Canadian and Polish tank units were equipped with them—no American.

As the campaign proceeded, the total number of tanks in the field declined, as the size of the British armies dwindled also. The main changes were an increase in the proportion of 17-pounder to 75mm Shermans, the proportion doubling by the end of 1944; the conversion of all Churchills to 75mm and an increase in the number with thicker armor; an increase in the number of Crocodiles and the conversion of all self-propelled antitank guns to 17-pounder, including the appearance late in the year of a British self-propelled 17-pounder antitank gun on a Valentine chassis, replacing a proportion of towed 17-pounders. Later still, in the spring of 1944, one armored division, which had been equipped with Shermans, was re-equipped with British Comets. There were also important developments in armor-piercing ammunition. These, however, did not become effective until after the end of fighting in Normandy. The Cromwell had the same armament and approximately the same armor as the Sherman. It was smaller, faster and, unlike its prototype the Crusader, reliable. An attempt to produce a modified Cromwell, called a Challenger, with a 17-pounder in it, was initially not a success because the tank was mechanically unreliable. The unreliability was eventually overcome. The Comet, developed from the Cromwell, appeared first in the field after we had crossed the Rhine: it had improved armor and armament, as well as better cross-country capacity.

On the German side the outstanding success was the Panther. Its main armament was a long 75mm (Kwk-43) of performance equivalent to our 17-pounder. Although the sides of both turret and hull were considerably thinner than those of the Tiger, the front of the turret was 110mm and the front of the hull formed by two plates, the main glacis plate being of 80mm sloped at an angle of 55° from the vertical. This combination of thickness and angle made it immune from 17-pounder fire at over 800 yards. The Panther was lighter, more maneuverable and apparently more reliable than the Tiger. The final development in German tanks was the Royal Tiger. Very few of these were ever met, only one or two before Falaise. It carried the latest type of 88mm, with a performance considerably superior to the 17-pounder. The armor was a considerable improvement on the original Tiger, thicker and with sloping instead of vertical plates. Thicknesses and angle from vertical were: Turret front 180mm at 10°, turret sides 80mm at 20° Hull front: top plate 150mm at 50°, bottom plate 100mm at 50°. Hull sides and rear 80mm at 25°. It was a very formidable tank, but one which in view of its weight, petrol consumption and size must have presented to the German staff many problems in its movement.

In addition to Panthers and Tigers, the Germans had a large number and variety of self-propelled antitank guns, chief of which were the Jagdpanther and Jagdtiger. These carried the latest types of 75mm and 88mm guns, had very thick front plates and were armored overhead against shell splinters. They were less conspicuous than tanks, but had only a very limited traverse. For towed antitank guns, 88mms were plentiful, but the 75mm Kwk-40 provided the great majority. In the later stages of the campaign, particularly beyond the Rhine, the 50mm and even the 37mm reappeared in greater quantities, but in Normandy the 75mm and 88mm were the standard antitank guns.

The development which caused us greatest trouble and which forced a revolution in tank tactics was the introduction on a lavish scale of the Bazooka and its smaller equivalents, the Panzerfaust and Faustpatrone. These were all different forms of hollow-charge projectiles varying in range from 50 to 200 yards, cheaply and easily produced. Right up to the very end every detachment of German Infantry was liberally supplied with them; they were capable of knocking out all our tanks, even the heavier Churchills. They were especially effective in the thick *bocage* country of Normandy and in villages and woods.

On our side probably the most significant development as far as this campaign was concerned was the Crocodile flame-thrower, though without the 17-pounder Sherman we should not have got far. On the German side the Bazooka and its lesser brethren, and the Panther and its self-propelled antitank gun equivalents were the most notable. In addition we had the added advantage of the rocket-firing fighter, which was particularly effective against armored fighting vehicles on the move on approach marches or in withdrawal.

THE RUSSO-GERMAN BATTLES—1941-45*

by Captain F. N. Fitzgerald

PARNE

(Although the battles outlined in this story have been covered in thorough detail in previous issues of the JOURNAL, *we feel that this report gives such an over-all and comprehensive view of the Russo-German campaign that it warrants publication. The second installment will be carried in the next issue of the* JOURNAL.—EDITOR'S NOTE.)

DURING the six years of war in Europe the needs of security prevented the publication of many facts concerning the campaigns, but now that hostilities have ceased the true story of the major operations is rapidly being made known. In Britain and America, in addition to the official documents that are being placed before the public, commanders who held important positions are putting into print the details of the great actions which occurred under their control, and the errors as well as the successes are being disclosed. But from Russia comes little information. The Soviet government evidently intends to keep for its own use the war lessons learned by the Red Army.

Bearing this in mind—and bearing in mind also that Russia is the newest and now one of the two greatest military or land powers in the world and therefore a subject of great military interest, anyone wishing to study the late war in Russia, either for its general lessons or for their possible application to the future, must look far and wide and learn to apply the smallest details of scrappy information to the general principles which govern them.

Since the middle of the nineteenth century the Russian Army (Tzarist and Red) had few successes to weld into a tradition. In the 1914-17 war the "Russian hordes" found that strategy was of greater value than numbers, but the lesson was learned too late to be applied. The operations of the new Red Army (1918-21) against the White Russians and later against the Poles showed the same weaknesses as under the Tzar. In 1939-40, the war with Finland appeared to be equally badly conducted. Here, however, the would-be omniscient observers "missed the bus," for it was not through Soviet mismanagement that the Finns remained so long undefeated. Nor was the Finnish war (as some said later) "a great bluff." The Russians fought well, but the terrain and the Mannerheim defenses, the short front and the hard winter, made greater speed of advance impossible.

The Russian soldier is as good as any other, obedient if rather undisciplined, earnest if often illiterate.[1] His commanders are good, the staffs generally competent. Russian generals are inclined to independence of action and occasional unorthodoxy in method, but in so large a country every army commander must, after all, be his own commander in chief. In the field of tactics and strategy a certain weakness is, however, very noticeable.

The greatest Russian want, not alone in 1941, but all through the hardest war years, was good up-to-date equipment. Lack of equipment, especially of transport and signal equipment, made strategic operations slow and cumbersome, and the Russians had to make up for surprise by an overwhelming superiority in man power. In "*Our Armored Forces*,"[2] Lieut.-General Martel points out how the Russians never attempted an offensive unless they had a three- or four-to-one superiority. They were amazed at the intrepidity of the British in Libya, who dared to attack when they were actually weaker than the Germans and Italians opposing them.

The organization of the Red forces was, in the main, similar to that of other nations. But a rigid "war establishment" was something unknown to the Soviet commanders, and they were willing to fight with any combination of units. Each army commander developed his own organizational system within his own command.

The air forces were mainly divided into three types. The most important was Army Coöperation Command, whose units acted directly under army control. Next came Long-Range Bomber Command, and finally Defense Command. An Air Army was normally attached to each Army Group or Front. A Front comprised two to five armies. The air army was made up of air divisions, each of three or four air regiments. The air regiment contained two to four squadrons of 15 aircraft per squadron.

In addition to their bombers, fighters and reconnaissance aircraft, the Russians employed *Stormoviks*—heavily armored planes used for strafing ground troops from a low level. Many of these aircraft carried cannon for attacking hostile tanks.

The armored unit was the Corps. An Armored Corps contained a tank brigade (about 180 tanks), three lorry-borne brigades, and the usual complement of auxiliary arms. It was therefore, the approximate equivalent of a German, U. S. or British Armored Division.

The tanks used were the T.34 cruiser tank for exploitation rôles, and the K.V.[3] tank (and in 1944 the Stalin tank) for infantry-supporting action. Captured German tanks, and vehicles supplied by the Allies (especially the British Churchills), made up a very great part of Russian armor.

If one disregards the initial gains made by the Germans in the Summer and Autumn of 1941, when the Red Army was still raw and inexperienced, one must recognize that the chief feature of the Russian forces was an ability for dogged defense in the face of overwhelming odds. The loss of Kiev was not to be repeated, and in 1942 Voronezh and Stalingrad held out heroically until the Soviet reserves were ready to launch their counteroffensive. In this way the German principle of victory through strategic break-through failed to be realized.

On their part, the Russians concentrated on the tactical employment of armored formations. Local break-throughs were exploited to turn German strongpoints. At Stalingrad, Orsha and Bobruisk, Russian tank columns (with accompanying mechanized infantry and artillery) forced their way through the defenses and then pushed the assault from the rear, while the less mobile elements exerted pressure on the front and contained the German troops. Tactical envelopment by mechanized forces became the main use of Russian armored units in attack.

In defense both sides employed tanks as improvised pillboxes and to augment the artillery. Tank formations were also widely used as operational reserves, to counter-attack wherever a hostile break-through appeared likely. According to Soviet sources, the German High Command issued several instructions dealing with the use of operational reserves. In particular, the High Command insisted that such reserves should not be split, but should be used together in the main counter-effort. This doctrine is self-evident, but it is not an easy one to put into practice. The enemy does not disclose his plan in the initial stages, and a number of factors may cause the commission of parts of the operational reserve on minor tasks. In January, 1944, General Tolbukhin was exerting strong pressure on Kirovograd and Krivoi Rog. The operational reserves of the Sixth German Army which held this area comprised two panzer divisions. Since a break-through at either of these points would threaten the entire German salient, a panzer division was dispatched to each of the locations menaced. When the attack on Nikopol, at the apex of the salient, took place in February, there were no general reserves available to meet it. With difficulty the panzer formation at Krivoi Rog was disengaged and sent toward Nikopol, but Tolbukhin's army had already defeated the German infantry and the reserve division was unable to stem the hostile advance.

In their counteroffensives, the Germans generally employed panzer units against the flanks of the enemy salients. The panzers were supported by infantry whose task it was to consolidate the gains won by the armor.

One of the major difficulties in the employment of large tank formations, particularly over long distances, is the control of sub-units. In the open steppes of southern Russia geometric formations were adopted by the Red Army and maneuvers were carried out with precision, even on the battlefield. This greatly simplified the commander's task, as he could observe progress and maintain direction without continually resorting to the radio—an instrument exceedingly scarce in the Soviet armies. Most frequently employed formations were the arrowhead, inverted arrowhead and echelon. Their use was similar to that of the equivalent infantry formations; arrowhead gave ample protection to the flanks, inverted arrowhead was used in enveloping maneuvers, and the echelon was employed when one flank only had to be covered.

It was learned that a single line of tanks, although it had great striking power and was often able to secure an initial penetration, lacked drive and was easily held. Tank attacks were therefore made in waves, the leading wave halting on the first objective and permitting the supporting waves to pass through under its covering fire.

**An Cosantoir*, The Irish Defense Journal.

[1]Despite Soviet statements to the contrary, the standard of illiteracy in the U.S.S.R. is still extremely high.

[2]Reviewed in the April issue of *An Cosantoir* by the author of this article.

[3]The T.34 cruiser tank weighed 27 tons and carried a 76mm gun and three M.G.s. The K.V. was 47 tons, with a 76mm gun and three M.G.s. The Stalin tank, used in the later battles, was an improved version of the K.V. type. Compares with German Tiger, 54 to 60 tons; U.S. General Sherman, 30 tons; British Churchill, 37 tons. Russian light tanks were the B.T. (13 tons) and the T.26 (9 tons); both were armed with a 45mm gun and two M.G.s.

If tank units led the attack, the infantry followed under the shelter of the vehicles, each wave being supported by a separate infantry force. An essential in all advances was a tank reserve, held in rear and ready to deploy as required.

The German units employed in Russia after 1941 were organized altogether differently from those used in the western and desert campaigns. In general, the divisional formation was only 60 per cent of what it was at home or in Libya. As far as possible the number of automatic weapons was kept at a high level, but the man power and the tanks were reduced considerably. The panzer divisions in the Soviet war contained only 250 to 300 tanks, instead of the normal complement of 350 to 400. In panzer corps and armies, the proportion of infantry was in an exceeding high ratio to the number of tanks.

Kiev Operation—September, 1941

The German invasion of Russia opened on June 22, 1941. By the beginning of August two German army groups stood northwest and southwest of Kiev. Von Bock's northern Group had taken Smolensk on August 7 and was now halting a moment in its "march on Moscow." This group contained Von Weich's Second Army and Guderian's Second Panzer Army. To the south Von Rundstedt's Group (Von Reichenau's Sixth Army and Von Kleist's Panzer Army) was near Katazin. Between Von Bock and Von Rundstedt lay the Pripet Marshes.

Early in August Von Rundstedt's armies converged on Uman where a strong Russian force was concentrating. The battle lasted until August 12, when Von Kleist's divisions broke through towards the Black Sea, and then swung northwards again towards Kirovograd on the Dnieper. Von Reichenau similarly advanced to the Dnieper near Belaya Tserkov and Cherkassy. Here both armies halted, for the advance to Kharkov—the next objective—could not be undertaken while the Kiev salient remained, and Von Rundstedt was unable to reduce it unaided.

The German plan was to execute a "double-double-envelopment" about Kiev in the manner of the Warsaw campaign of 1939. There was, however, this difference: in Poland the inner arms of the pincers had been by far the stronger, but in the Kiev operation it was the outer arms that would be the more powerful.

Von Rundstedt concentrated his two armies on the Dnieper, while Von Bock diverted Von Weich's force to the Mogilev area and Guderian's Panzer Army to Roslavl. Almost 300 miles separated the two army groups.

On September 1 the outer arms of the two army groups commenced their drives north and south. Von Kleist gained a bridgehead over the Dnieper at Kremenchug and moved towards Lochvitza. At the same time Von Reichenau's units crossed at Cherkassy and Kanev and marched westward toward Kiev.

But the decisive blow was to be struck by Von Bock from the north. When the decision was taken to encircle Kiev from both flanks, his army group had moved southward and by August 20 had taken Gomel, Guderian's tanks attacking the town from the rear while Von Weich assaulted frontally. By the end of August Guderian had forced the Desna at Novgorod Seversk and Von Weich had crossed at Chernigov. The bank of the Desna was Von Bock's line of departure, as the Dnieper Von Rundstedt's.

While Von Rundstedt drove northward across the Dnieper, Von Bock launched his offensive toward the south. By September 10 the break-through had been made in both sections and the panzers of Guderian and Von Kleist raced toward each other almost unopposed. Four days later the leading columns met at Lochvitza and Priluki. With the severing of Marshal Budenny's communications the main task of the panzers was completed. They now endeavored to prevent the escape of the Russian forces trapped in the Kiev region, while Von Weich and Von Reichenau closed in on the city with their infantry armies.

On September 10 Marshal Budenny started to evacuate the salient, but the movement came too late. On September 20 Kiev fell to the Germans. It is probable that 600,000 Russian troops were taken at Kiev, apart from the casualties in the fighting on the flanks of the salient. Only one of Budenny's five armies escaped the German encirclement.

Budenny can hardly have been surprised by the operation. The German preparations were carried out quite openly. But the speed of the panzer attack in the later stages of the battle undoubtedly achieved local surprise in many places. The Soviet Command showed a lack of decision in this operation, neither defending Kiev to the last nor yet ordering its evacuation while there was still time. The conquest of 25,000 square miles of territory in any Western European state would have spelt disaster; in the U.S.S.R. the loss was severe, but not final.

German Offensive at Stalingrad—1942

The most famous defense of World War II is that of Stalingrad. The Volga city itself was not the objective of the German offensive; it was by accident rather than by design that the Wehrmacht's forces were concentrated against it.

In 1942 the German General Staff abandoned the attempt to take Moscow by frontal assault. Instead they planned to seize the Caucasus with the threefold objective of cutting the Allied southern supply route to Russia, capturing the oil wells of Maikop and Baku, and turning the strategic flank of the defenses before Moscow and the west-Russian industrial centers. Had this plan been applied in 1941, instead of the dual offensives on Moscow and South Russia, the Soviet Union might have been defeated. As it was, by 1942 the Russian positions had been stabilized and the Russian

armies tried in battle. During the winter of 1941-42 they had even taken the offensive and had proved that under favorable circumstances they could drive back the Germans.

The German units in 1942 were greatly reduced in strength from the 1941 models. Furthermore, the High Command was obliged to depend to a considerable extent on auxiliary forces from Rumania, Hungary, Italy and Finland. There were 65 auxiliary divisions in Russia at this time, and it is a universal military truth that auxiliaries are of little value. The Russians soon learned to appreciate this fact when Marshal Zhukov's counteroffensive began.

By May 1942 the Germans had three army groups ready to open the attack in southern Russia. About Kursk stood Von Weich's Group—the Second Army and the Second Panzer Army, which had played so vital a part in the Kiev campaign during the previous year. Von Hoth commanded the Fourth Panzer Army and Sixth Army north of Kharkov. The First Panzer Army and Seventeenth Army, under Von Kleist, were between Kharkov and Stalino. Farther to the south, Manstein's forces were operating in the Crimea.

It will be observed that each army group comprised an infantry and a panzer army. The three groups, under the command of Von Bock, amounted to some 16 panzer divisions, six motorized divisions, 40 infantry divisions and between 15 and 20 Italian, Hungarian and Rumanian divisions.

On June 22 the initial "mopping up" of Russian forces along the proposed line of departure had been completed and the great offensive opened with the advance of the southern army group from its bridgehead over the Donetz at Kupiansk. On June 28 the second offensive blow was struck by Von Weich in the north; by July 1 the Second Panzer Army had broken through toward Voronezh. The next day Von Hoth's central group advanced eastward.

The front upon which Von Bock's offensive opened was little more than 250 miles long. It was not surprising, therefore, that the Russian defenses were rapidly pierced. On July 6 elements of the Second Panzer Army crossed the Don and entered Voronezh. This exploit savored strongly of a similar dash to Warsaw, three years earlier. As on the previous occasion, the tanks were insufficient to take the city, and when the Second (Infantry) Army arrived before Voronezh on July 10 the Russians had concentrated large forces—including armor—and a furious 10-day tank battle ensued.

The River Don forms a salient, pointing eastward, with one of its cornerstones at Voronezh, the other at the Black Sea, and its apex at Kalach, some 50 miles short of Stalingrad. The Germans intended to occupy this salient with two army groups while the third took the cornerstone, or haunch, Voronezh. The River Volga forms a second salient pointing eastward, this time with Stalingrad as the cornerstone on the north, the Black Sea again on the South, and Grozny the apex. One of the two remaining army groups would enter this salient and drive toward the apex, while the other took the cornerstone, Stalingrad. It was a simple geometric advance in echelon-from-the-right. It was, however, essential that the cornerstones, Voronezh and Stalingrad, should be captured, for if they were not, then the Russians would be left with pivots from which to launch a counteroffensive against the long German lines of communication. When, therefore, it became clear that Voronezh was not to be taken easily, Von Bock determined that the second cornerstone—Stalingrad—should not remain to menace the drive into the Caucasus.

On the southern wing of the attacking armies Von Kleist's tanks reached Millerovo on July 13. Manstein had now cleared the Crimean Peninsula and was free to join in the assault eastward. The Germans turned toward Rostov. But on July 27 the Russians abandoned the famous Don city, falling back before the converging attacks of Von Kleist and Manstein. By August 1 the First Panzer and Seventeenth Armies were south of the Don, heading for Elista and Maikop in the Caucasus region. Von Hoth's two armies were making for Stalingrad, via Kalach.

The Russian Supreme Command also appreciated the importance of Stalingrad (as they had the importance of Voronezh) and determined to hold it, even at the temporary sacrifice of the Caucasus. The proximity of the Don and Volga bends made strategic defense impossible, and the Soviet Command was forced to rely, therefore, on tactical defense near the city and even within the built-up area itself.

By August 15 the Germans had forced the Don at Kalach and 10 days later made another crossing at Kletskaya. To the southwest Manstein's troops from Rostov, reinforced with panzers from the now stabilized Voronezh front, neared Kotelnikovo. The Red Army threw in tank formations to oppose the Germans on the Askai River and large-scale tank battles resulted. By September 3 the Germans had the upper hand, although their tank losses reached a new height in this struggle. There were now some 750,000 men and 2,500 tanks closing in on Stalingrad.

At this stage the maneuver period was over. Sheer weight of numbers could alone bring the campaign to a close, for the strongly defended Volga line rendered an outflanking maneuver impossible.

To hold Stalingrad until a counteroffensive could be prepared, the Russians had left the northern Caucasus weakly held. Von Kleist's panzer and motorized units took Voroshilovsk on August 4 and on the next day reached the Kuban. On August 8 the Russians evacuated Maikop and by the 25th Von Kleist had reached Mozhdok on the Terek River. Here at last the Russians made a stand. A huge area had been conquered by the Germans—in the manner of Poland, France and Yugoslavia—with a comparatively small army composed mainly of panzer and motorized units. But unlike

those earlier campaigns, a final defense was put up, strong enough to delay if not to hold Von Kleist's forces.

In the mountain areas the German panzers found rapid advance and exploitation more difficult, and during September and October the struggle was slow and costly. Novorossisk was captured on September 10, but before Tuapse, as well as at Mozhdok, the offensive was held. On November 2 the Germans turned the Terek line, but on the 15th their tanks were routed near Ordzhonikidze.

Back on the Volga the close fighting continued. From September 15 to October 15 the German assaults were at their heaviest. Tanks, infantry and artillery were flung into the streets of the city, and at many points the attacking troops reached the Volga—only to be driven off again in fierce counter-charges. One surprising feature of the Stalingrad battle—which continued with less intensity on the part of the Germans until November 18—was the fact that no sizable reinforcements were ever sent to the commander of the Soviet garrison, General Chuykov. The Russian High Command was holding all its reserves for the great counteroffensive. Three armies were in the process of creation; two on the northern bank of the Don, northwest of Stalingrad, under Generals Vatutin and Rokossovsky, and the third, led by General Yeremenko, in the Ergeni Hills south of the besieged city.

Russian Offensive at Stalingrad—1942-43

By the middle of November the Fourth Panzer and Sixth Armies, now commanded by General Von Paulus, consisted of four panzer, three motorized and 15 infantry divisions. The bulk of this force was committed on the Krasnormeisk-Orlovka line, running through the factory districts of Stalingrad. Back across the 50-mile wide plain to the Don were German defenses, covering the supply bases and airfield that Von Paulus had constructed in order to relieve the long lines of communication and make him partially independent of the strategic depots west of the Donetz.

On Von Paulus' northern flank, reaching back along the River Don, were Rumanian and Italian formations. South of the Sixth Army, 13 Rumanian divisions, with some tanks and cavalry, held the railway line. The right flank of these Rumanian units was "in the air," only cavalry patrols maintaining contact with Von Kleist's armies in the Elista area. While the Stalingrad front was extremely strongly held, therefore, the northwestern sector was weak and the southern sector open. Farther back still, only minor forces of Von Weich's reduced army group opposed the Russian General Golikov at Voronezh. No sizable strategic reserve had been held out by the Germans.

It is hard to understand how the German High Command could have so blindly concentrated almost their entire striking force in the Stalingrad region or how the Wehrmacht commanders failed to observe the Russian preparations for a counteroffensive along the Don front. Von Paulus must have known that the Red Army defenders of Stalingrad did not represent the major portion of the enemy reserves. Yet when the Soviet counteroffensive opened on November 19, 1942 the Germans had made no preparations to meet it.

On November 19 Rokossovsky struck out across the Don at Serafimovich. By the next day a 20-mile gap had been made in the Rumanian defenses and Russian armor poured through. While one column made for Chernyshev another turned westward on Kletskaya and Kalach. The break-through was totally unexpected and the armored troops recrossed the Don at Kalach on November 21, taking Von Paulus' Sixth Army in the rear. The counteroffensive was only two days old.

On Rokossovsky's right General Vatutin also broke through the Don defenses. Together with part of Rokossovsky's armor, Vatutin defeated a Rumanian force north of Chernyshev and by the 21st he had crossed the Chir River and his armor was deploying over the steppes toward Millerovo and Likhaya. On the 22d three panzer divisions were met and defeated south of Chernyshev. A strategic break-through had been accomplished.

South of Stalingrad the Rumanian line lay along the railway. The troops were not, therefore, in a position to overlook General Yeremenko's approach from the Volga to the Ergeni Hills. On November 19, while Rokossovsky and Vatutin crossed the Don, Yeremenko descended the slopes to fall on the Rumanians. On the 20th he pierced their line at Abganerovo, near the junction of the Rumanian and German forces. By the 25th Yeremenko was approaching the Don, his right wing only 20 miles from Rokossovsky at Kalach. Von Paulus was almost surrounded.

Marshal Zhukov, the commander of the counteroffensive operations, did not make the error of exploiting too rapidly. The temptation to do so must have been great, for the undefended steppes presented an invitingly open region to the Russian tankmen. But the Russians had begun the attack with barely half the transport required for such a move, and rashness at this stage might have been disastrous. During the last days of November Zhukov consolidated what he had won.

It was obvious that to escape the ring which was closing about him, Von Paulus must fall back at once, preferably along the Stalingrad-Rostov railway line. His depots and airfields in the Don-Volga area must be abandoned, together with most of his heavy equipment. There was still some hope, if he could hold the Chir and the Askai river lines, of covering Von Kleist's withdrawal from the Caucasus.

A relief force was being assembled under Manstein about Kotelnikovo, but there were no reserves of sufficient strength to throw back the Russian attack. Russian moves on the central front about Orel and Bryansk were holding down the German units in those areas. Von Paulus could expect little assistance from outside his command. Yet he was forbidden to attempt withdrawal. The reason for this may, indeed, have been partly a fear for Von Kleist, still many miles to the east of the Sixth Army. But Von Kleist's forces were neither as strong nor as well-equipped as those before Stalingrad, and their loss could not therefore be as serious. A second reason existed for holding the Sixth German Army within the grip of the closing Russian pincers. Hitler feared the result to German prestige of abandoning the city which had been so greatly publicized in the world's press.

On December 10 Manstein's relief force—some 150,000 men, and four divisions of panzers—set out northeastward from Kotelnikovo. On both sides of the Don, at Gremyachev and Nizhnechirsk, violent tank battles took place with Yeremenko's armored flank-guards on December 16. Had Von Paulus made a coördinated attack at the same time from the north of Yeremenko's corridor instead of an abortive effort to retake Kalach a week earlier, something might have been achieved. But by December 18th Manstein's assaults petered out and he was compelled to withdraw toward Rostov.

In the meantime on the Voronezh front, Golikov, supported by Vatutin's right wing, launched an offensive across the Don at Boguchar, cutting General Gariboldi's Eighth Italian Army in two. By December 24 this new advance, combined with the other blows they were receiving, obliged the Axis troops in this region to fall back towards Millerovo. General Malinovsky's Armored Corps were in action against Manstein in the Kotelnikovo area and on December 27 this German strongpoint fell to the Russian Commander.

By December 31 Von Paulus was surrounded, Manstein was in retreat, the whole Don salient was collapsing, and Von Kleist's Caucasian front was in imminent danger of being cut off from Rostov. Von Kleist had already been weakened by the transfer of some of his panzers to Manstein early in December. Now it was clear that he must fall back on Rostov. To do this his rearguards would have to be sacrificed.

By the end of December the Seventeenth and First Panzer Armies had abandoned the Terek line and General Maslennikov was in pursuit. After a sharp fight the right wing of the Russian Trans-Caucasian Army entered Elista on January 1, 1943. The Russian general had hoped to cut off Von Kleist by turning southward from Elista, but the German main body was already far to the west. On January 23 the Soviet troops re-entered Armavir, but Von Kleist had passed through the gap between Malinovsky's forces at Konstantinovsk and the Sea of Azov. Another large group withdrew to Novorossisk, where they held a considerable beachhead against repeated Russian attacks until the Summer of 1943.

At Stalingrad the New Year saw the liquidation of Von Paulus' Armies by Rokossovsky and Chuykov. After an ultimatum sent to the German commander on January 7, which the newly promoted Field Marshal rejected, the Russian attack commenced on the 10th. Some 80,000 men remained inside the Russian "steel-ring"—the rest (once 250,000) had been killed or captured. A fortnight later only one quarter of these were still fighting. On February 2 Field Marshal Von Paulus surrendered and the Sixth Army was finally eliminated.

Thus ended one of the most dramatic episodes of the entire war. It occurred shortly after the British victory at El Alamein and formed the second decisive battle of World War II. The campaign had peculiar features which are not easy to explain. The Germans, who started out so successfully, made glaring blunders of the most elementary kind. Did they really believe that the Red Army had no reserves, or that the reserves would not be in a position to counterattack as soon as they did?

In his article, *Strategic Objective*, which appeared in the Moscow bulletin *Voks* in 1945, Major-General Galaktionov quoted Marshal Stalin's speech of November 6, 1942: "What then, was the main objective of the German offensive? It was to outflank Moscow from the east; to cut it off from its Volga and Urals rear and then to strike at the city. The German advance southward, toward the oil districts, had an auxiliary purpose; not only, and not so much, to capture the oil districts as to divert our main reserves to the south and to weaken the Moscow front, and thereby facilitate the success of the blow at Moscow. . . . In short, the main objective of the German summer offensive was to surround Moscow and end the war this year."

The Russian leader—and with him Major-General Galaktionov—wishes to show that the Caucasian drive was merely a subsidiary effort on the part of the Germans. This is not unlikely, but the fact remains that to outflank Moscow by pushing east of Stalingrad necessitated the capture at the same time of the entire oil region up to the Caspian Sea. It is noteworthy also that neither the Marshal nor Galaktionov mentioned another German objective—the severing of the Allied supply route through Iran.

The Russian handling of the counteroffensive was far from perfect. After the first assault the energy of the Red forces appears to have died down. Not all the reserves were engaged in mopping up Von Paulus' Sixth Army, and ample time was given to seal the Rostov gap and prevent the extrication of Von Kleist's armies in the Caucasus, yet this was not done. However, the German losses were so great, and the blow to their prestige so powerful, that they never fully recovered in Russia.

(To be continued)

In the next issue of the* Journal *Captain Fitzgerald continues his examination of the major battles of the Russian war. He deals with the German offensive against Kursk in 1943, Tolbukhin's conquest of the southern steppes, the Russian assaults on Orsha and Bobruisk in 1944 (where they broke through the defenses of the "Panther Line"), Malinovsky's advance across the plains of Hungarian Transylvania, and finally the battle of Berlin.

Japanese Preparations for Philippine Conquest*

by Captain T. W. Davison, U. S. Navy

THE following remarks reflect my personal observations of Japanese activities in the Philippine Islands during my tour of duty there from December, 1939, to May, 1942, two days before Corregidor fell. They in no way reflect any official opinion of any department of the United States Government.

For convenience, I shall group these Japanese preparations for conquest under two headings—Strategic Preparations, and Tactical Preparations. The former can be dismissed briefly, as they follow the German and Japanese pattern so common the world over.

Long-term, or strategic, preparation for conquest consisted in establishing a "Little Japan" colony in many key localities. One of the most publicized of these before the war was at Davao on the Island of Mindanao in the Southern Philippines. The inhabitants enjoyed local government to a large degree, wore native Japanese dress a considerable part of the time, had their man power mobilized into a closely organized, well-disciplined corps of "athletes," and conducted schools of their own where Japanese language was used and the Samurai code extolled.

Manila and other cities in the Philippines had similar Japanese colonies, the only outward difference being that the inmates followed city customs and were therefore less noticeable than their country cousins because of wider use of the conventional business suit, higher attendance at American-Philippine public schools, and greater use of English as the commercial language of the Far East.

There were two bluejackets in my crew who spoke Japanese, presumably having learned it from association with Japanese during some years of duty with the Yangtze River Patrol. One lived with a Japanese woman in Manila in the Japanese section of the city. The other had been married for some years to a Japanese. These men used to tell me "off the record" of some of the parties they attended in Nipponville. At suki-yaki dinners served over cozy little charcoal fires, their hosts would grow mellow and boastful, and drink toasts in warm saki to the Japanese equivalent of the old Prussian "Der Tag." There seemed little doubt in anyone's mind that "the Day" meant Japanese conquest of the Philippines—and, of course, much more.

These bluejackets showed every outward indication of being entirely loyal to the United States. As I look back now I wonder if they did not have a very good hunch as to when war was coming, for each managed to wangle a swap with a man on another ship. Their new ships departed on the outbreak of war; ours remained for the hopeless task of defending Manila Bay.

The strategic preparation for conquest was nothing more than having a part of Japan functioning in many localities of the Philippines before war in a social, economic, political, and secretly military sense. On the other hand, several tactical preparations for conquest were noticeable.

The first of these case histories deals with the destruction on the ground of all but a few of the U. S. Flying Fortresses stationed on the Island of Luzon the first day of war. The story was that a Japanese beer and fruit stand close to the big army air base at Clark Field, north of Manila, kept a watchful eye on activities there. Early Monday morning, Manila time, several hours after word had been received of the Pearl Harbor attack, the Forts took off on a warming-up run. They were awaiting permission from Manila to conduct an offensive bombing mission against the Japanese airfields on Formosa to the north. Permission apparently was not received.

When the planes took off, a radio transmission left this Japanese fruit stand. Another message followed a short time later when the planes returned. Then, with bombs in racks and crews standing by our planes on the ground, enemy bombs fell on the airfield. Clark Field was knocked out of the war without delivering a single offensive stroke!

Had this Jap fruit stand radio said, in effect, to bombers already on their way from Formosa: First, "Hold it, no planes here now," and later, "Okay, gang, come and get 'em"? If so, it performed a great service to the honorable Empire builders, and at little cost to them. This radio set and its operator were discovered and destroyed—but too late.

A few planes managed to get clear of the field by taking off on the first excited cries of warning that preceded the blast of bombs by seconds. Among these few planes was a P-40 piloted by my friend, Lieutenant

*United States Naval Institute Proceedings.

Church, of the Army. Later, *Time Magazine* featured a story of his daring and aggressiveness. With another plane he re-visited Clark Field after it had been occupied by the Japs and strafed a line of parked bombers. He crashed his blazing plane into these as his last heroic and defiant act of life.

The second case history deals with Nichols Field in Manila, where many of the Army medium bombers were based. Most of these were destroyed on the ground Monday night in a full moon bombing attack. An Army aviator we fished out of Manila Bay subsequently told me that just as the bombs started to fall on Nichols Field a couple of MPs ran into the radio house and shot a man at the transmitter key who had been sending dashes on the radio. Presumably the enemy planes came in on this beam. The radioman was in uniform. Whether he was a saboteur spy, or a traitor well paid by the enemy, our friend did not say. The point is that the enemy had made careful plans for this tactical use of radio. It indicates thorough and extensive staff work between the sabotage units in Manila and the Japanese military command. Their plans to make these tricks work were apparently better laid and more skillfully executed than our counterplans to prevent such possibilities. From our ship we watched this spectacular and gruesome sight. First we heard the drone of engines, then we saw the planes pass under the moon a few seconds before bomb flashes came from Nichols Field.

Captain Colin Kelly's subsequent hit on the *Haruna* was the more remarkable because it was made from a survivor plane. How much more costly in Japanese shipping might the Luzon landings have been with attacking American air power measured in squadrons instead of a few lone planes?

The enemy now had complete mastery of the air, with all its advantages, which seemed to superimpose themselves one upon another in algebraic progression.

One case history deals with the destruction of the Cavite Navy Yard by air attack the first Wednesday after war. In this case we credit the Japanese with sabotage organization and military intelligence. Toward the end of the noon hour, Wednesday, December 10, 1941 (Manila date), squadrons of Japanese large two-engined Navy bombers winged their way over Manila Bay and plastered the Cavite Navy Yard unopposed from the air. From the ground they were fired at by obsolete 3-inch guns with no modern fire control. From ships in and near the yard they were fired at by more of the same old 3-inch guns with no fire control at all; and by all stations they were barked at harmlessly by 50-caliber machine guns. It was a beautiful clear tropical noon hour, with blazing sun and not a cloud in the sky. The planes were silver color. When one caught the reflection of sun now and then in a dip or turn, it flashed like a minnow. We counted in each of the first two waves an arrowhead-shaped spear made up of three sections of nine planes each. The third wave seemed to have about 18 planes. One plane from each wave seemed to be a little lower than the rest and trailing somewhat. Subsequently we got to recognize this bird as photo-Charlie.

When the first crash of bombs fell into the Cavite Navy Yard, our fire-fighting parties responded bravely. They rushed into the burning torpedo shop and other dangerous and important buildings still standing. No water came from their hoses to reward their heroic gesture.

Later investigation disclosed that control mechanisms on the water pressure pumps in the pump house had been smashed with sledge hammers. These hammers had been left on the deck near the pumps in mute evidence. No personnel were in attendance when the first trouble-shooter party ran in to see why there was no fire-main pressure. Sabotage squads had done their timely work well. The yard burned on, the flames as unopposed as the bombers had been a few minutes earlier.

The ammunition depot was not hit that day. As this fact became evident with the withdrawal of the enemy bombers, a dozen local Japanese rushed the depot with fire arms and dynamite. Some were shot down by guards who had valiantly stood their ground. The remaining Japs fled. One of the bodies was later identified as that of a barber who had a little shop just outside the navy yard gate. He and his friends apparently had their battle stations and were apparently well drilled in their duties.

No doubt the leading citizens of the local Japanese colony in the barrio of Cavite turned over the evacuation navy yard to the military with full honors incident to the occupation of Manila. We blew up the ammunition depot ourselves before evacuating the area.

This case is representative of Japanese intelligence and sabotage planning in all phases of conquest in the Far East. Similar cases transpired on a grand scale. Our

Captured Japanese photograph showing interned American civilians at the Santo Tomas internment camp near Manila. This camp was liberated by the 1st Cavalry Division.

Official U. S. Navy Photo

British and Dutch allies were victims of equally thorough sabotage organization. The pattern did not differ from the German model used so effectively in the conquest of Europe.

The Japs made certain definite preparations for the Bataan Peninsula Campaign which they knew would be forthcoming. There were caves on the seaward shore of the Bataan Peninsula, beautiful caves which we, aboard passing Navy ships, used to admire through binoculars as we steamed up the coast or anchored in a cove sometimes between target practice exercises. I have passed within a hundred yards of some of these caves in a boat on the way ashore with swimming parties before the war.

Apparently the Japanese had buried mortars, machine guns, and ammunition in these caves at some time before the war. Stores of food, carefully preserved against time and moisture, were apparently buried in this locality also. Some small ravines led up into the jungle from a group of these caves, and in these ravines wells were dug. They had been covered over, and their very existence was a secret.

Some weeks after the Japanese had started their push into the Bataan Peninsula from Manila, they were stopped by the excellent United States Field Artillery units holding positions on high ground covering the flat-land approach from Manila. A battle of fixed positions resulted. To harass our positions from the rear and to create a diversion, the Japanese had landed an estimated 600 specially trained Commando jungle troops on beaches near these caves.

These landings were made secretly at night. The enemy troops dug themselves in, established defensive artillery and machine-gun positions, and set up housekeeping around their wells as the social center of the community. They sent out snipers nightly with food and water rations to last a few days. These snipers went unopposed to positions on trails leading between our various jungle centers of activity. The snipers would take concealment and pick off the end man from behind after a column had passed his position. At the time it was believed that these snipers infiltrated through the front lines at night from enemy positions. Undoubtedly many did; but others were already in our rear, as it turned out later.

The first time this became known was when a naval officer was taking a hike in the country one day from our naval section base at Mariveles Bay, at the seaward tip of the Bataan Peninsula, opposite Corregidor. As he was sauntering along a jungle trail, thinking perhaps of some nice fresh roast monkey, or of the carabao stew he might expect for supper, he was startled by some Japanese soldiers in the trail ahead of him, in uniform and of course fully armed. These soldiers tried to capture our young hero alive, but he made a full power run back along the trail toward Mariveles, with the Japs in pursuit. Failing to capture him, they fired, and missed. He made the best possible time back to the section base and reported the incident. This bit of interesting intelligence was broadcast by voice radio to various Army and Navy units. I heard it on the bridge of my ship in Manila Bay.

A task force was organized consisting of a 12-inch mortar group on Corregidor, an Army officer atop some tall jungle tree on a hill overlooking the ravines as spotter, with walkie-talkie radio; an infantry company of Philippine Scouts; and a U. S. Navy vessel of the inshore patrol. The mortar group lobbed some big ones into the ravines. The Navy vessel poured some 3-inch stuff into the mouths of the caves from seaward, and the infantry closed in to finish off such game as might be flushed from hiding by the above fire. This infantry detachment ran into some pretty stiff fire. So, more artillery pounding was requested. The remaining Japs retreated to the tops of the cliffs and dived to their deaths below. Three hundred Jap bodies were buried when the fighting stopped after several days of stiff resistance from this enemy detachment.

So far as I know the time that these enemy troops landed in our rear was never determined. But the incident brings to mind a conversation I heard one night on the bridge radio. As the Japs were undoubtedly listening in at the time, they must have been aware of how much we knew of the adventure.

One night toward the end of December we were poking around Manila Bay slowly in the pitch dark looking for anything out of the ordinary, when the bridge radio loudspeaker proclaimed in a startled voice that three ships were lying just to seaward of Mariveles Point. Were they friendly, the voice wanted to know? The senior naval officer afloat in Manila Bay said he had no information of three ships that might be there, but that there was so much Allied shipping coming and going, and so many Philippine coastal vessels turning up unexpectedly, that he could not assume them to be enemy without further information. Further information was soon forthcoming from the same voice on the small patrol yacht to the effect that the vessels appeared to be painted with striped camouflage. One of our ships was directed to verify the whole thing at dawn. There was nothing in sight in this area at dawn, of course, so the whole matter was dropped. Looking back on this conversation, I believe that the Japanese troops may have been landed that night.

The uniform of these enemy troops showed forethought, planning, imagination, and good practical common sense. One of these jungle sniper uniforms was on display at Mariveles later. It was of jungle green, with streaks and blotches of different shades. The shoes had a superimposed undersole shaped like the hoof of the wild carabao, indigenous to the Philippines. Such marks in a sandy brook bed were not of themselves cause for alarm. After the sniper had climbed his tree, he would pull a green mosquito netting over his body and

most of the rifle. This increased the camouflage and afforded mosquito protection.

Our most successful defense against these Japanese jungle snipers was found to come from Moro warriors from the southern Philippines. These wild men of the jungle wore a G string and a long knife for their uniform. One of these invaluable allies would stalk a Jap sniper. It might take half the day to locate him even after arrival in the area of the last sniper attack. Then the Moro would noiselessly glide to a tree near the one holding the Jap, would climb it barefoot to near the top, climb out on a limb and drop to a branch of the desired tree. He would then adjust his position noiselessly until he was on a limb over the prone Jap, and would then fall on him with his knife. A few Jap prisoners taken on Bataan professed great distaste and fear of these Moro tactics.

Japanese tourists, geographers, fishermen, farmers, and photographers were legion out there. They were everywhere, sticking their noses into everything. They must have had access to about every picture (except military) taken in the Far West in general and the Philippines in particular. Photo-information ran the gamut from the large Rising Studio (why leave out the "sun"?) in the resort town of Baguio in Luzon, where everything was Japanese from ownership on down, to the usual run of Manila photo shops. These latter usually had either a chemist, or clerk, or bookkeeper, or messenger boy from the Japanese colony—at least, somebody in the organization somewhere to snag off an extra print of a strategic picture of whatever might come up from time to time.

The Japanese military staff work in preparation for the invasion of Luzon must have been thorough, accurate, and realistic. No obvious flaws were apparent. They did exactly what we expected them to try to do, and in the conventional sequence:

(1) Destroyed local American air power the first day of war.

(2) Continuous bombing of shipping in Manila Bay from the second day on.

(3) Established beachheads at Legaspi, Southern Luzon, and at Linguayan to the north, with the greatest early show of strength south in an attempt to divert and confuse our ground forces (dates not certain).

(4) Destruction of Cavite Navy Yard third day of war.

(5) Support of beach positions by the arrival of eighty transports at Linguayan and forty at Legaspi. The invasion was now on.

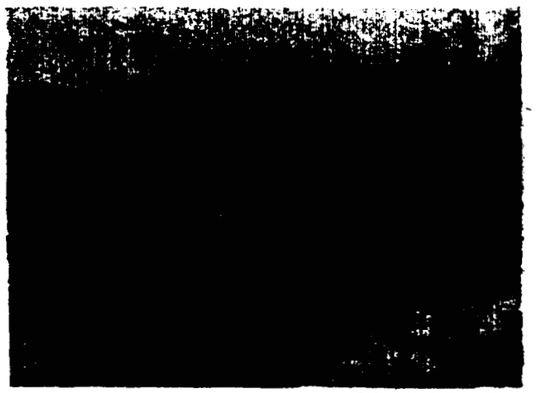
These scenes of Japanese landings were exactly where we had thought them most probable, and where *Time Magazine* some months before war had predicted they would be because of the flat low country between these sites and Manila.

The first hostile action against the Philippines was many hours after we had got word out there of the treacherous attack on Pearl Harbor. What, then, is the answer? Supposedly when two commanders appraise each other, they make plans which will checkmate any foreseen attacks of the adversary. Unforeseen attacks, then, become the ambition of a military commander. This is reflected in the adjective of the expression to achieve surprise.

Since there was no surprise in the opening phases of the Philippine campaign, and no unforeseen attacks developed, what explains the tragic blunders we made out there, resulting in a plight where the heroic last stand of Bataan and Corregidor became necessary? One answer might be that the Japanese achieved surprise in the Philippines by destroying the air and sea forces of our great advance base at Pearl Harbor. That answer stands up only if you believe that had Pearl Harbor *not* happened, the air force and ships there destroyed could and would have relieved the garrison on Luzon. But how? The Marshall and Caroline Islands were fortified, and American amphibian power was still in the planning stage at the time.

Are we to judge that Japanese preparations for the Philippine campaign included a more accurate and realistic appraisal of the situation than ours? Did the Japanese arrive at a correct estimate of the situation when they planned on being able to destroy American air power on the ground the first day at the Luzon bases, instead of figuring on our air power destroying them on the ground at their Formosa bases? We have discussed a few of the Japanese material preparations, realizing that there were many more that we have not mentioned. It is obvious that their mental preparations were equally realistic. Were ours?

Wreckage at Cavite Naval Station near Manila. Japanese saboteurs ashore gave all possible aid to the bombing compatriots. This is a scene after the first Jap blows in December, 1941.



Official U. S. Navy Photo

Return of the National Pistol and Small-Bore Matches

by Leonard J. Grassman

BACK on the sports stage after a wartime of more businesslike shooting, the nation's marksmen finished their first postwar National Pistol and Small-Bore Matches at Camp Perry, Ohio, early in September. About 1,000 keen-eyed contestants lined up along the two-mile Perry firing line and burned up over a million rounds of small-caliber ammunition and perforated target bull's-eyes all the day long from August 31, through September 8, firing the multiple shot which heralded the return of a greatly expanded and invigorated American sport.

Purpose of these matches is not to dispose of surplus ammunition but to provide a national benefit in addition to supporting a great sport and a nerve straining test of individual skill. The benefit, rarely apparent in peacetime, is obviously present when our nation is threatened by war. Our national marksmen became the teachers of our adaptable but rusty citizenry at the outset of the emergency which preceded the late war, and the National Rifle Association provided training films and expert gunnery instructors who taught the expert use of small arms to the officers and men who later became the small-arms instructors for our armed forces

Early in the century, when the rifle and pistol ceased to be essential tools of daily life and their possession became a matter of law, the marksmanship of Americans had declined greatly from the standards of the famed frontier shooting. The War Department, always aware of any threat to National Security, decided some precaution should be taken to preserve at least a nucleus group of skilled marksmen to train our fighting forces in the event of future emergencies. To accomplish this, the National Board for the Promotion of Rifle Practice was formed. The Board, composed of twenty-one members appointed by the Secretary of War from representatives of the War and Navy Departments, the Army, Navy, Marine Corps, National Guard, Organized Reserves, National Rifle Association, and the country at large, has for its president the Under Secretary of War. The present board, in addition to its president, the Honorable Kenneth C. Royall, is composed of General Courtney H. Hodges, Commanding General of the First Army, War Department representative; Captain Clifford H. Duerfeldt, Navy Department representative; Major General B. B. Miltonberger, Chief of the National Guard Bureau; Major General E. S. Bres, Executive for Reserve and ROTC; Major General Milton A. Reckord, Adjutant General of the State of Maryland and Executive Vice President of the National Rifle Association; Colonel Emerald F. Sloan, USA (Ret), Director of Civilian Marksmanship, Executive Officer of the National Board; Colonel Christian H. Clarke, Jr., representing the Director of Organization and Training, War Department General Staff, and Colonel Joseph K. Bush, Army Ground Forces.

Interest in such skill had originated in Europe but as an organized sport it is primarily American. In 1871, the National Rifle Association of America was chartered in New York. A great part of its membership was composed of members of the civilian National Guard Units of a number of States. In 1903, the Office of the Director of Civilian Marksmanship was set up in the War Department with appropriations and authorization to provide certain War Department equipment to civilian rifle clubs which had been organized in accordance with regulations approved by the National Board for the Promotion of Rifle Practice. The Director issues Army Qualifications Badges to civilians, also. Because of his close association with the activities of the National Board, the Director of Civilian Marksmanship is normally appointed as Executive Officer of the National Board. Present Director is Colonel Emerald F. Sloan, USA. He and the Assistant Director, Lieutenant Colonel Paul F. Roberts, Inf., have had a great deal of experience in working with the National Guard, Reserves, and civilian riflemen, and are always available for information on organization of rifle clubs and procurement of government materials for such organizations. Three classes of applicants which may receive such assistance are schools and junior and senior rifle clubs organized for target practice.

Schools, in order to receive the benefits, must maintain during the entire school year a uniformed corps of cadets, at least 40 in number, above the age of 14 years. They must have an adequate course in military training and must conduct target practice in accordance with the regulations prescribed by the Board. Targets, rifles and ammunition in certain specified amounts are authorized for issuance. Senior rifle clubs may receive similar benefits by enrolling with the Office of the Director with a

membership of at least 10 physically fit male citizens above the age of 18. They must not be eligible to receive federal aid for such activity from any other source and must maintain affiliation with the National Rifle Association and must carry out target practice as prescribed.

Junior rifle clubs have pretty much the same stipulations but must be under the sponsorship of an adult, responsible, male citizen, and have proportionate marksmanship qualifications and courses. In order to receive the issue of nonexpendable equipment all such organizations must furnish a surety bond, provide for secure storage of equipment, pay all transportation charges and have suitable range facilities. They must also submit at the close of each calendar year an annual inventory of U. S. property and an annual report of firing.

Contemporary interest in the use of small arms has been stimulated by personal experiences in the armed forces during the war, by enlarged gunnery and sporting clubs, by preparedness-minded organizations, schools and other such units. It is anticipated by the small-arms enthusiasts that the sport will be greatly enlarged and more popularly received in the future.

The first of the National Matches was held at Sea Girt, New Jersey, in 1903. The Matches of 1905 and 1906 at the same location. The 1904 Matches were held at Fort Riley, Kansas, and in 1915 and 1916, they were conducted at Jacksonville, Florida; in 1919, again in New Jersey, at Caldwell. All other matches have been held at Camp Perry, Ohio; the first in 1907 and the last in 1941.

In the first matches, participation was limited to teams from the regular services and the State National Guard organizations. The National Individual Rifle and Pistol Matches were inaugurated in 1904 with 187 entries in the rifle and 38 in the pistol. With the passage of the National Defense Act in 1916, participation of civilian teams from each state was authorized and a Small-Arms Firing School became an important part of the National Match Program. The National Pistol Team Match was inaugurated in 1920 with 36 teams firing. In 1939, there were 128 entries in the rifle team match, 33 in the pistol team competition and 2,037 in the National Individual Rifle Match and 622 in the National Individual Pistol Match.

The National Championships of the National Rifle Association have been an important part of the National Match program from the beginning. In 1940, there were 91 NRA matches.

The National Matches sponsored by the War Department consist of the National Trophy Rifle Team, the National Trophy Individual Rifle, the National Trophy Infantry Team, the National Trophy Pistol Team, and the National Trophy Individual Pistol Match. Many new matches have been created for this year's and subsequent matches. During the 42 years since the adoption of the National Matches, numerous Trophies have been accumulated and these trophies are presented to the winning teams or individuals who usually retain possession of the original trophy for one year and are given a miniature replica thereof for their permanent possession. The contestants also fire for small money prizes.

Marksmanship as a sport is comparatively low cost after the initial outlay for equipment, which, in itself, isn't great. It is a family sport in which all members of the family regardless of sex may indulge. It is an ideal week-end sport, and bows neither to weather conditions nor season since there are ample facilities practically everywhere in the nation for indoor and outdoor shooting. It is a sport of skill and a test of temperament, granting great satisfaction.

Through the years it has swept a long way from the career soldier's bivouac but still remains the most engaging sport for regular and reserve officers who maintain a man isn't a soldier unless he can shoot, and military men have long and successfully competed on the range, individually and in civilian or military teams.

Now, as the interim Army is more settled and officers are becoming accustomed to their newest assignments, military teams are springing up on a large number of camps and posts, and military activity in the field of marksmanship contests promises to be greater than ever.

The same picture is true for the civilian side of the picture. Veterans, loath to set aside the skill in shooting attained in service, are either joining or forming marksmanship organizations. Although this year's match was the greatest in the history of the National Matches, shortage of housing facilities and difficulties in transportation, and costs have prevented it from being as great as it might have been. In the next few years, when such limitations are removed, the National Matches are expected to claim numbers as great as other national sports.

This year's match produced some remarkable scores despite the rust collected through lack of target practice during the busy war years. Arthur Cook, 18-year-old youth from the District of Columbia, won the junior small-bore rifle championship at Camp Perry with a 1,582 score. One of two 18-year-olds to make the Dewar international team (teams competing from the English speaking countries) this year, Cook beat out John Kelley of Fort Worth, Texas, who had a score of 1,580. The national small-bore title went to G. Wayne Moore of Washington, Pa., who used a borrowed rifle to post 3,184. The pistol championship title went to Harry Reeves, a Detroit policeman who attained the highest score ever posted at Camp Perry. He scored 2,588.

Such shooting as this places the famed marksmanship of our Daniel Boones and Dead-eye Dicks of our more romantic pioneer days in a rather amateurish light by contrast, and as the fever for the small arm spreads from our present 500,000 marksmen into the millions, our nation will have no fear about a shortage of teachers in expert marksmanship in the event of a future emergency.

AGF Outlines Organized Reserve Training Program

ARMY Ground Forces has outlined a two-year training program for the Organized Reserve Corps, which makes the AGF not only responsible for the training of the Infantry, Armored Cavalry and Artillery, but also for the training of units of the technical services which would ordinarily be attached to a field army.

The program provides for the training of Signal, Infantry, Airborne Infantry, Armored Infantry, Field Artillery, Tank Destroyer, Armored Cavalry, Antiaircraft Artillery, Seacoast Artillery, Military Police, Engineer, Chemical, Medical, Ordnance and Quartermaster units, for ORC bands and for Order of Battle and Photo Interpreter teams.

They are based on a minimum of 50 home or "armory" training periods annually, of two hours each. Field training will consist of a 15-day period annually, but since such training is not planned until 1948, a field training program will be issued at a later date.

The programs are outlined to provide refresher training, initially, in basic subjects, followed by progressive training in tactical and technical subjects. All units will receive instruction in such basic subjects as administration and mess management, first aid, chemical warfare, customs of the service, dismounted drill and ceremonies, domestic disturbances and martial law, intelligence, signal communication, map and aerial photograph reading, methods of instruction, military law, organization of the Regular Army and Organized Reserve Corps, protection of military information, censorship, psychology of leadership and utilization of training aids.

This training will be followed by technical and tactical subjects of the particular arm or branch, including logistics, motor vehicle operation and maintenance, air-ground liaison, the artillery-infantry-tank-engineer team, military history, map exercises and maneuvers, staff procedure, supply, terrain appreciation, weapons, tactics, amphibious operations and specialist training. Advanced training for a limited number of specialists will be conducted by means of special courses at service schools.

Tables of allowances of equipment for home training of the Organized Reserve Corps have been approved by the War Department, and units will be able to begin drawing their equipment as soon as adequate facilities for its maintenance and storage are procured, General Devers stated.

The tables of allowances published thus far cover equipment for home training of ORC Chemical, Antiaircraft, Engineer, Field Artillery, Infantry, Medical, Ordnance, Quartermaster, Signal, Finance, Special Services, Counter Intelligence, Order of Battle, Photo Interpreter, Transportation Corps and Airborne Infantry units. Virtually all organic equipment of each arm, branch and specialty is made available, plus necessary Air Forces, Chemical, Engineer, Medical, Ordnance, Quartermaster, Signal and Transportation equipment.

The amounts of equipment authorized vary with the class of unit, whether A, B or C. Class A units are organized at full strength of officers and enlisted men, and will be as fully equipped as possible. Only essential individual and training equipment will be furnished Class B units, organized with full officer strength and enlisted cadres, and Class C units, with full officer strength only.

To alleviate problems of maintenance and storage, only 25 per cent of authorized vehicles will be issued, and 25 per cent of specialized equipment such as artillery pieces, heavy engineer equipment and tanks. Such heavy equipment will be issued to Class A units only, except in the case of Class B Field Artillery battalions, which will be issued one appropriate artillery piece. Normal engineer, ordnance, chemical and quartermaster equipment which accompanies vehicles will be issued on a one-per-vehicle basis.

In addition to individual arms and equipment, which will be issued to all members of Class A and B units, and uniforms, which will be issued to all enlisted members of the ORC, many specialized items of equipment available from World War II stocks will be furnished for home training purposes.

Senior ORC instructor's offices in each state are allocated training aids and motion picture projectors, and are a source of combat and training films for ORC units. The Signal Corps has already produced one film especially for ORC use, "United," Miscellaneous Film No. 1267, an 11-minute subject designed to stimulate enlistments in the Organized Reserve Corps.

TOUR OF DUTY. By John Dos Passos. Houghton Mifflin Company. $3.00.

John Dos Passos, one of America's most sensitive and talented reporters, tells an engrossing and important story of Americans in action against a background of the whole wide world. His book, told in terms of incident and human anecdote, poses the life-and-death problem America faces today: How to carry over into the postwar world the miracle of our wartime effort and virtue.

In *Tour of Duty* you will travel by plane, battleship, foot and jeep from Pearl Harbor to the Philippines, from Paris to Berlin. You meet the matter-of-fact courage of the guerrillas and learn details of their incredible lives.

Dos Passos is not presenting a personal point of view in *Tour of Duty*. He preaches no sermon. He is observing and reporting. Those on the spot do the talking. Their dialogue emerges with a seeming stenographic quality. Their talk emphasizes with mule-kick force the momentum we have lost in peace, but enjoyed in war.

BEHIND THE IRON CURTAIN. By William Van Narvig. Ziff-Davis Publishing Company. $3.00.

In this book, in more than 50 chapters, the author covers every phase of Russian life, intimately and in detail. First he talks of the Russian family group, the party, the secret police, the farms, industry, labor unions, the press, black markets, the democratic concept and its meaning to Russia.

The second half of the book is presented as though written by an average Russian and tells his outlook on Russia and the rest of the world—how he feels; what he knows; what he has been taught; and, consequently, his reaction to everything from his belief that Russia alone won the war to the atomic bomb, the veto, and the United Nations. This is a book neither sympathetic to, nor critical of, the Russian people. It is completely realistic and it is vitally important, because it will help the people of the Western world understand the reasons for the average Russian's views.

William Van Narvig was born in Russia, and more than 25 years of his life have been spent inside Russia—as a student, as a soldier, as a government employee, as a businessman. He is a citizen of this country and served in the U. S. Army Intelligence as a Lieutenant Colonel during World War II.

OPERATION LIFELINE. By James Lee with photographs by Joe Rosenthal. Ziff-Davis Publishing Company. $5.00.

This is a non-fiction book that tells the story of NATS—the Naval Air Transport Service—one of the Navy's most vital arms both during and after the war.

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James Lee, Washington correspondent for International News Service, gathered the text material for this book on the scene by invitation of the Navy. Joe Rosenthal is famous as the Associated Press combat photographer who photographed the Marines raising the American flag on Iwo Jima.

THE BATTLE OF GERMANY. By Lieutenant Theodore Draper with maps and drawings by Sergeant Walter H. Chapman and a Foreword by Major General A. R. Bolling. The Viking Press. $5.00.

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As Private First Class Clarence Krebs, Jan Valtin was a member of the Public Relations Office of the 24th Infantry Division during the division's action in the Philippines. He and Captain Lloyd Price, *Dallas* (Texas) *News* reporter and Public Relations Officer of the 24th Division, conceived the idea of writing a history of their division's combat action. Out of this came the now popular seller *Children of Yesterday*. Entitled "Japs Die Hard" at first, the entire royalties of the book are to go to the 24th Infantry Division Association.

This book is the story of the men of the 24th Division who fought the war in the Philippines. Hundreds of them are mentioned by name.

Vivid descriptions of the combat actions on Leyte, Mindanao, and Corregidor are to be found in the book's pages. It is a book worth reading.

* * *

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War, the author points out, is also hurling ideas at the enemy, prospective or real. War is also in the minds of men as much as it is on the battlefield. In fact, Mr. Margolin, a veteran newspaperman turned propaganda expert, proves that psychological warfare (the fancy word for propaganda) has won and lost wars before a single shot had been fired.

Mr. Margolin vividly relates the propaganda moves leading to World War II. Quite obviously America was as unprepared for war mentally as it was militarily. The chapter "Germany In America" is exciting reading, as is most of the book, but it is a shameful chapter in American history. How a "savvy" America could have allowed the Germans, their Bunds, their propagandists and their spies, to have literally stepped all over America, is not something most Americans would like to remember. But read it we must and its lesson must be taken to heart.

Mr. Margolin served with the Psychological Warfare Branch of Allied Force Headquarters in the Mediterranean for sixteen months. He views the workings of propaganda from the watchtower of a man who has seen this deadly weapon work before, during and after hostilities. In writing *Paper Bullets* he has done a great service to the professional soldier and the civilian.

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CAVALRY'S FIRST TEAM IN JAPAN

*by Colonel Charles A. Sheldon, GSC**

An area three times the size of New Jersey on Japan's Honshu Island is occupied by the First Cavalry Division. In this informative article Colonel Charles A. Sheldon, Chief of Staff of the division, explains the unit's occupational methods and policies.

1st Cav. Div. Photo

A First Cavalry Division armored car passes a reviewing stand in Tokyo. This highly mobile vehicle is effective in breaking up riots and demonstrations.

1st Cav. Div. Photo

First Cavalry Division troopers keep in shape by undergoing a regular training program. Here a group of cavalrymen are working out a tactical problem.

WHEN occupation forces in Europe and the Philippines began to realize that the post-hostilities rush for the home fires would not be soon as they anticipated, they gave vent to their feelings in bawdy "we wanna go home" meetings which bordered on mutiny and did little, except menace the good impression laid by American troops during the early phase of the occupation. To combat this feeling of depression and to further security measures, the War Department created a new Armed Force—the Constabulary, in Germany—a mobile group of 32,000 hand-picked officers and men known for their levelheadedness and physical impressiveness.

The occupation force in Japan needed no such disciplinary force for there had been no flagrant exhibitions or mass disorder. Instead, the Eighth Army came to Japan already prepared for the job of disarming and impressing the defeated Japanese. Spearheading the way into Japan minutes after the surrender document was signed, sealed and delivered aboard the U.S.S. *Missouri* in Tokyo Bay, 12,800 crack troopers of the First Cavalry Division quickly entrenched themselves under the scales of a still potentially powerful but writhing dragon. After adding "First in Tokyo" to its long list of firsts (Manila, Tacloban, etc.), the First Cavalry Division settled down to the long, arduous task of pulling the dragon's teeth.

Securing a firm grip on Japan's nerve centers (Tokyo-Yokohama) the First Cavalry Control spread out until its scattered units now sprawl over one-third of vital Honshu Island like a giant octopus. When other units deactivated, the First Cavalry carried on the job, and today it controls ten Prefectures, an area of approximately 23,600 square miles (three times the size of New Jersey), having a population of more than 12 million. Everywhere in Tokyo, the once-proud metropolis, one sees the yellow and black of the Norman Shield shoulder patch with its bar sinister, and horse's head. All roads no matter how small lead to a Cavalry installation sooner or later.

Major General William C. Chase, renowned leader of the "Flying Column," which made the daring dash to Santo Tomas to free 3,700 internees, is the Commanding General of this Division. Two of the Division's four Regiments, the Seventh and the Eighth, are stationed in downtown Tokyo. The Second Brigade's headquarters is located at the Imperial Guard Barracks. One squadron of the Fifth Regiment is stationed in Camp Drake, Asaka, 12 miles from Tokyo—formerly a formidable Japanese Military Academy, but now the site of the Division Command Post. Special troops (Quartermaster, Signal, Reconnaissance, Tank, Ordnance, etc.) comprise the rest of the post. The Division's four Field Artillery battalions are concentrated near Ojima, on the southern tip of Gumma Prefecture approximately eighty miles from Camp Drake. However these battalions have outposts in neighboring prefectural towns: The 61st at Ota, the 82nd at Miizugahara, the 99th and 271st at Koizumi.

After months of tedious work amidst the humid throngs of Japan's cities, Allied personnel are privileged to visit rest hotels (former Japanese resorts, mountain and seaside, famous for their hot springs, beauty, and above all, tranquillity). Scenic Nikko, beautiful, rich in culture and center of Japan's shrines, is foremost among these resorts. Men of the First Cavalry's Field Artillery battalions patrol this area and do Military Police work with the least amount of friction. Additional troops can be called for similar work here if necessary.

Military Government units are stationed in distant, but strategic towns. Other "line troops" are posted in the near-by Yokohama area. Each regiment consists of two squadrons, having a headquarters, weapons and three line troops. In addition to these two squadrons, each regiment has a separate Regimental Headquarters Troop plus a Service and Cannon Troop.

Tokyo is divided tactically, rather than by the old Japanese method of "Kus and Wards." The Second Brigade is in charge of Tokyo City which is divided into four squadron sectors. These sectors are then divided for the unit's convenience. Following certain Ku boundaries is inevitable because it facilitates close contact with the Japanese Police.

But perhaps the most outward sign showing the presence of the Cavalry in Tokyo is the massive parades and display of armed might. The ever-colorful Cavalry parades emphasize mass formations of foot troops, followed by endless columns of rumbling tanks, recon-cars and Artillery. This makes a sound impression on the Japanese people whose lives have been based on respect and admiration of power. Besides impressing the Nipponese, the parades have dual purposes—increase "esprit de corps" and general morale among the troops and to honor visiting dignitaries. Parades including more than 3,000 men were staged in honor of former President Hoover, General Dwight D. Eisenhower and more recently for the six-man Congressional party. The site of the parades—the sprawling Plaza of the Imperial Palace Grounds—adds a touch of "we-mean-business" to the whole affair.

The First Brigade is composed of the Fifth and the Twelfth Cavalry Regiments with headquarters at Otawa. The first squadron of the Fifth Regiment is at Camp Drake, while the second is at Fuchinobe. The Twelfth Cavalry headquarters is at Otawa too. Their first squadron is at Haratsuka and the second is at brigade headquarters.

In Kanagawa and Shizuoka Prefectures there are a number of beach resorts and this area is also patrolled by alert troopers of the First Brigade. Foot patrols and lifeguards are present at every authorized swimming beach for safety and also to keep the Japanese G-string mermaids and men out of our area, and vice versa. Kamakura beach (the French Riviera of Japan) is probably the most extensively visited. Paramount duty of the guards and patrols in this area is to enforce existing restrictions and insure the safety of our men.

The First Cavalry Division operates independently of CIC and CID units but is always in close liaison with them. Either party notifies the other in case of disorder, or when certain "leads" come in. It was "The First Team" that helped locate the gold, silver, and platinum hoard that was hidden in Tokyo Bay by the Japanese before surrendering. The Cavalry to date has destroyed 30,895 tons of Jap ammunition, 3,500 artillery pieces, 100,000 rifles, thousands of swords, etc. Hidden treasures are still being recovered from Japanese installations—especially precious industrial metals. Tips about these hidden stores come from many and varied sources, but the most reliable are from Japanese informers who are closely investigated.

The returning Japanese soldier is a constant source of danger because they were fed an overdose of propaganda and indoctrinated to a certain code of life characterized by their method of suicidal warfare. However, they have caused no alarming problem. Instead, they seem to mingle with the common mass and be lost in its surging tide.

With the revival of its population from near-serfdom to free men, the Japanese labor parties are gaining momentum. Frequently, marches and massive demonstrations are held by thousands of irate groups.

These gatherings, no matter how large, are surprisingly orderly.

The duties of the Cavalry Division do not interfere with the work of the Japanese Police unless the offense involves Allied Personnel. Japanese Police are now armed. They have no powers over GIs but there have been no reports of tension between GIs and the Japanese Police Force. Their primary duty is traffic in so far as the occupational force is concerned. Though the Japanese Police do not hold the position of Demigods which the "Kempei-Tai" (thought police) held, the people respect them.

*Chief of Staff, First Cavalry Division.

The "Korean Problem" is becoming less and less a real issue because most of them are being repatriated. The mutual hatred between the Koreans and Japanese has at times broken into full scale riots but the Cavalry patrols have quelled such disorders. Whenever these demonstrations of feelings are in large scale, strategically placed, highly mobile armored cars appear on the scene —(thanks to the two-way radio sets in all patrol vehicles). The "Hot Spot" of these demonstrations was Tokyo's notorious Shimbashi area—the scene of a bustling black market ring, predominantly headed by Koreans.

The food situation may aptly be described as critical in Tokyo but it is not a source of many law violations. Hunger contributes to many petty thefts from occupational forces. There have been several (peaceful) food demonstrations just after the crucial period following the first winter. There was never once a food riot. SCAP has done a fine job in releasing foodstuff to the hungry, thus saving thousands, much to the appreciation and humble gratitude of the people. Statistics show that more people moved into the country, rather than from the country into the city. This trend was probably instigated by the knowledge that more food was to be had in the outlying farm districts.

Housing is a minor problem for the millions in Tokyo. They can throw together a few pieces of lumber, mud-plaster and remnants of bombed out buildings to have a home acceptable to the low living standards of the Oriental.

First Division Cavalrymen are getting regular training as combat troops, and also attend classes in basic Japanese language. Each unit of squadron level maintains its own noncommissioned officer school with classes in relations with civilians and MP work. Modern firing ranges and fields for working tactical problems are available to every regiment.

The population was "deloused" with DDT, and to this is attributed the small percentage of sickness or epidemic among the conquerors and the conquered.

Since the beginning of this occupation each regiment has been required to designate one troop as MPs and they work through the Division Provost Marshal. Their chief job is to regulate traffic on the crowded thoroughfares of Tokyo, enforce speed regulations, prevent black market, help the Division Surgeon in the control of venereal disease and provide escorts for visiting dignitaries.

The occupation is extraordinary in that no disorders are encountered, and it seems assured that the success of this occupation is a surety now. Today, more than a full year after storming the beaches, they are vigorously enforcing "law and order," looking for potential "leads" and at the same time teaching the defeated people through actions the ways of Democracy and Peace—a much more enlighting way of life.

AGF SETS UP TWO GROUPS IN G-3 SECTION

Two major groups—one for training and the other for operations—have been created in a reorganization of the G-3 Section, Headquarters, Army Ground Forces, General Jacob L. Devers, Commanding General, announced recently.

The work of the G-3 Section has been materially increased in recent weeks by the inactivation of the Replacement and School Command, the assumption by AGF of responsibility for the recruit training of all Army enlisted personnel except those going to Air Forces and increasing responsibility by AGF for the organization and Training Group. This group will handle Schools, Replacement Training, Troop Training and Civilian Components.

The Operations Group will handle Operations, Organization and Equipment, and Training Publications and Aids.

First Cavalry Division

by Major Hal D. Steward

A FIRST CAVALRY DIVISION trooper once remarked, "After all, everybody knows that 'First' means 'Number One'."

Being first was the keynote of this famous Cavalry division all during World War II. It stacked up an unsurpassed number of "firsts" in its battles against the Japanese in the Southwest Pacific.

Some of the First Cavalry Division's most outstanding "firsts" include capturing the first island capital city on the return of the American forces to the Philippines—Tacloban of Leyte; capture of the capital city of the Island of Samar—Catbalogan; first American unit to enter Manila, capital of the Philippines; and first military unit to enter Tokyo, Japan, to get the occupation under way.

Although the First Cavalry Division has only been organized as a division since 1921, many of its units date as far back as 1855.

On March 3, 1855, Congress authorized the formation of the Fifth Cavalry Regiment. The Seventh Cavalry was formed at Fort Riley, Kansas, in 1866, under Lieutenant Colonel George Armstrong Custer. The Eighth Cavalry also organized in 1866 lost no time in establishing itself as one of the outstanding regiments in the American Army. The Indian Wars were over when the First Cavalry Division's youngest regiment, the Twelfth, was formed on February 2, 1901.

But it was an entirely different First Cavalry Division of 1921, the year the division was organized, from the regiments of the olden days. To be sure the morale and élan of the old cavalry troopers who fought the Indians was passed down through the generations to the soldiers who fought the Japs. But the tactics and armament had changed.

Gone were the covered escort wagons. In their places were huge, modern cargo trucks. The well-groomed horses were gone from the division when it embarked for overseas in 1943. Instead of blacksmiths paring hooves, motor mechanics cleaned and tested vehicles. Gone were the Gatling guns with their rotary guns of bygone days. In their place were .30 caliber machine guns. Gone were the old single-action rifles. Instead there were trim repeating carbines, Tommyguns and Browning automatic rifles.

Even though the division had trained for years with horses as its means of transportation it was still capable of becoming successful infantrymen overnight. In early 1943, the division was still mounted. By early 1944, the division had, as a dismounted unit, invaded and defeated the tough Japs on the Admiralty Islands.

The First Cavalry Division was successful as a dismounted unit; however, many of its leaders felt that it would have been even more successful as a horse-mounted unit. It was realized by First Cavalrymen that horses were a means of transportation rather than attack. Horses were capable of going where vehicles couldn't pass. Especially in mountain and wooded terrain a horse-mounted unit could have been used to an advantage.

A modern, well-equipped cavalry division, be it dismounted or mounted on vehicles or horses, is a highly desirable unit in any army. The First Cavalry Division proved this in three major Pacific campaigns. Its now famous "flying column" established the fact that a mechanized and motor-mounted cavalry unit can be successful. The "flying column" crashed through 100 miles of enemy territory in 66 hours to capture Santo Tomas University Internment Camp in Manila and liberate allied civilian internees.

When the First Cavalry Division was alerted for overseas and combat, horses and horse equipment were hastily turned over to other units. By June 18, 1943, the last unit of the division had left Fort Bliss, Texas, which had been the division's headquarters for 22 years.

Arriving in Australia in July, 1943, the division underwent special jungle and amphibious training for five months. After Australia they had a short stay in New Guinea.

Then, the Admiralties, the division's first combat action in World War II. A reconnaissance force under the command of Brigadier General William C. Chase, present division commander, hit the beach of Los Negros on the morning of February 29, 1944, with the mission of securing and holding Momote Air Strip.

A tough assignment had been handed the Cavalrymen in their first test of battle, but they had undergone months of strenuous training and were ready for it.

For the first 24 hours it was 1,000 First Cavalrymen against 5,000 combat veteran Japs. The battle was on.

Six hours after the original landing, General Douglas MacArthur came ashore to discuss the situation with General Chase. The Commander in Chief told him, "You have all performed marvelously. Hold what you have taken, no matter against what odds. You have your teeth in him now—don't let go." General MacArthur then turned and decorated Lieutenant Marvin J. Henshaw, first soldier ashore, with the Distinguished Service Cross.

The original reconnaissance force to land on the

Admiralties consisted of the Second Squadron of the Fifth Cavalry Regiment, a section from the 99th Field Artillery Battalion, a platoon from Troop A of the Eighth Engineer Squadron and attached units.

Four thousand five hundred Japanese soldiers were killed in this campaign.

Many feats of heroism were performed by American Cavalrymen in this Pacific action. One of the greatest acts of outstanding personal bravery was performed by Sergeant Troy A. McGill, Troop G, Fifth Cavalry, who was awarded the Congressional Medal of Honor posthumously. He fired his weapons until all his ammunition was gone and then singlehandedly charged the Japs with a gun using it as a club until he was overcome and killed. He was credited with killing more than 60 enemy.

Major General Innis P. Swift was in command of the First Cavalry Division during the Admiralties campaign. General Chase commanded the First Brigade while Brigadier General Verne D. Mudge commanded the Second Brigade.

Following the fierce fighting in the Admiralties the First Cavalry Division troopers settled down to a few months rest. Then came an assignment that was to turn out to be even bigger and tougher than the Admiralties. The First Cavalry Division had been selected as one of the four initial divisions to storm the beaches of Leyte Island in the Philippines.

At 10 A.M. on the morning of October 20, 1944, the first wave of Cavalry troopers hit the beach at Leyte.

The Seventh Cavalry Regiment under the command of Colonel Walter E. Finnegan started off the Philippines campaign by taking Tacloban, capital of Leyte Province, a full day ahead of schedule.

They continued to push on until they were approximately four days ahead of the original schedule when they captured the town of Babatngon after moving across the entire northwestern end of the island. In making this rapid movement the First Cavalry Division's assigned mission of securing San Juanico Straits also was accomplished ahead of time.

Two other regiments, the Fifth and Twelfth Cavalry, spent more than 50 days in the rugged, mud-soaked mountains of Western Leyte, which was the Japs' last stronghold. The Twelfth Cavalry was the unit that fought through to deliver the final blows to the stubborn Jap forces on Leyte.

During these actions the Fifth Cavalry was commanded by Lieutenant Colonel Charles E. Brady, the Twelfth by Colonel John H. Stadler, Jr.

The division came in as a reserve unit after the island of Luzon had been invaded on January 9, 1945. It landed on the Luzon beaches January 27, 1945. Three days later it was scheduled to begin a maneuver that would overshadow everything it had done in the past.

One minute after midnight on February 1, 1945, the division started its dash for Manila, capital city of the Philippines, to liberate 3,700 civilian allies interned at Santo Tomas University and also to capture and secure Malacañan Palace, capitol building of the Philippines.

When the First Cavalry Division left Guimba, where the push to Manila began, the column was spearheaded by tanks from the 44th Tank Battalion and squadrons from both the Fifth and Eighth Cavalry Regiments. The force was under the command of General Chase.

Supporting the leading column was the remainder of the Fifth and Eighth Cavalry, and the other two Cavalry regiments in the division—the Seventh and Twelfth.

Twenty miles from Manila at the Angat river the First Cavalry and the 37th Infantry Divisions made contact. They had been operating parallel to each other. Until the divisions reached Manila the 37th Division had been meeting the most enemy opposition.

A few minutes after 6 P.M., February 3, a Cavalry tank entered the city limits of Manila. The First Cavalry Division had added another "first" to its credit.

On the outskirts of the city the Cavalry column split. One unit sped on to capture and occupy the Malacañan Palace—the other rushed through Manila's streets, crashed through thick walls to capture Santo Tomas University and liberate more than 3,700 allied civilians who had been interned by the Japs for three years and a month.

This event was to climax everything the First Cavalry Division had done in the past. Today it is still the highlight in the division's outstanding history.

During the Leyte campaign and the Luzon campaign until February 28, when he was wounded by a Jap grenade, Major General Verne D. Mudge commanded the First Cavalry Division. Brigadier General Hugh F. T. Hoffman replaced General Mudge and commanded the division until August of 1945. At that time General Chase, by then a major general, returned to the division from the 38th Infantry Division, which he had been commanding for several months, to assume command. General Chase is today commanding the First Cavalry Division in Japan.

No division in the American Army today can boast of a prouder record than that of the First Cavalry Division.

Yes, the horses are gone from the division, but the traditions are still there as they have always been. The First Cavalry Division has established a lasting place for all Cavalrymen in American military history.

Today "First" still means "Number One" to every member of the First Cavalry Division.

What's Wrong With Armor?

"Mechanized War" by Sergeant George Baker. Reprinted with permission of *Yank* Magazine from the November 3, 1944, issue.

*by Captain Stephen M. Barber**

Holder of the DSC, Captain Barker served a great deal of his time with armored units in combat in World War II. Herein the author shows the necessity for an armored force with its own mechanical mine sweepers and bridges. His suggestions are timely and worthy of consideration.

TAKE a look at the miles of "tanks" crawling slowly forward while "Sad Sack" clears the way. We smile now, but incidents like that were once routine. Can't you hear an angry general . . . roaring for action . . . and a bristling colonel blaming the engineers? The engineer commander rushes to the defense of his "Sad Sacks," but still the column creeps slowly on.

Smile now while you can. Then look at the picture again. Doesn't the artist hit the nail on the head? There is mechanized might, hell on tracks, or whatever you wish to call our fastest moving, hardest hitting ground force. A half dozen mines, a crater in the road and a handful of snipers can easily delay a large armored force. It has happened uncounted times. TNT to stop the tanks . . . snipers or mortars to stop "Sad Sack" with his gadgets and tools . . . and our most mobile arm is the least mobile of them all.

A paradox? Yes. Armor is designed to crush the enemy with exceptionally mobile, hard-hitting weapons, its personnel protected with armor plate. The defense against it is logical. Stop the tanks with obstacles that force dismounted men and vulnerable equipment to prepare a new crossing or route. Now stop the unprotected men and machines with mortars or other weapons which are poor targets for the tanks. The weak link is the dismounted men, the engineers. Our armor depends upon relatively unarmored engineers.

In spite of all this they have done a stupendous job by previous standards. That they could do one hundred times better with special equipment is seldom considered. We must consider it, now more than ever, for other nations have watched us. They may have learned lessons from our experience that we have failed to grasp.

The basic principle of armor . . . high mobility combined with heavy fire power and relative invulnerability . . . has barely been tested, for armor has been mobile only in the most favorable circumstances. Modern armor relies upon terrain free from artificial and natural barriers or else upon a previous penetration of the enemy defense to a depth that provides intact bridges and unmined country.

Armor, to be fully exploited, should be able to advance as fast as it can overcome the enemy. Enemy strength in men and weapons should be the criterion. Inert obstacles such as mines and streams should not be. Powerful as armor is, it can never deliver its Sunday Punch until it can roll over obstacles.

It is true, we have excellent obstacle crossing equipment . . . by the old standards. The bulldozer, the treadway bridge, the bailey bridge and others are now recognized essentials in an armored offensive. They

*Former 1st Armored Division Engineer Officer.

nevertheless are insufficient. They are too slow to permit the proper use of armor. An enemy sniper or mortar crew can stop a bulldozer or a bridge building job. Work jobs must have outposts or some semblance of a bridgehead. Bridgeheads take time. This is the fallacy, the paradox of armor, the missing equation in the theory of tanks.

Armor will be delayed as long as we adhere to the ancient bridgehead theory. It will be delayed at each demolition as long as it takes, first, to establish the outposts or bridgeheads, second, to overcome the obstacle, third, to get the tanks over the new crossing and once again into contact with the enemy. And, each delay permits the enemy time to prepare a new obstacle.

These delays during obstacle crossing are in direct opposition to the theory of tanks. Armor should be insensitive to small-arms fire. The fault lies in our so-called armored engineers, our dismounted mine detectors. Dump truck and dismounted engineers have no place at the head of an armored column. Yet we depend upon them.

Yes, the trouble with armor is its unarmored engineers. Rather, it is with our concept of the armored engineer's role. Insufficient stress has been laid upon speed. Armor must *smash* its obstacles, or hurdle them without pause. A dump truck engineer organization is not capable of the required high-speed mission. Armor should rely upon special engineer equipment to gain the necessary speed. The special equipment must be at least as invulnerable to enemy fire as the tanks themselves. We must therefore consider armored engineer methods, organization, and equipment in an entirely new light, for upon these depend the future of the tank, the blitzkrieg and maybe even greater issues.

The Doggone Gadgets

Important beginnings have already been made with special obstacle reducing equipment. I vividly recall the astonishment and interest of a truckload of high-ranking German prisoners on one of those glorious last days of the war. They saw in our column of monstrous bridge-carrying tanks of the "ark" type and in our many other "gadgets" things which many of us have failed to appreciate. Again, I have seen the surprise in an enemy doughfoot's eyes as he looked at an American tank dozer and slowly realized its purpose. Even more awed were the Germans guarding Anzio's mine fields when they saw a "snake" explode a clear lane before their eyes releasing the trapped armor from the countless thousands of enemy and allied mines.

Yes, steps have been taken to replace "Sad Sack" and his mine detector. Many were field expedients demanded by the situation. For, war with the Wehrmacht, which developed mining and demolition to a fine degree, has proven their need and started their development.

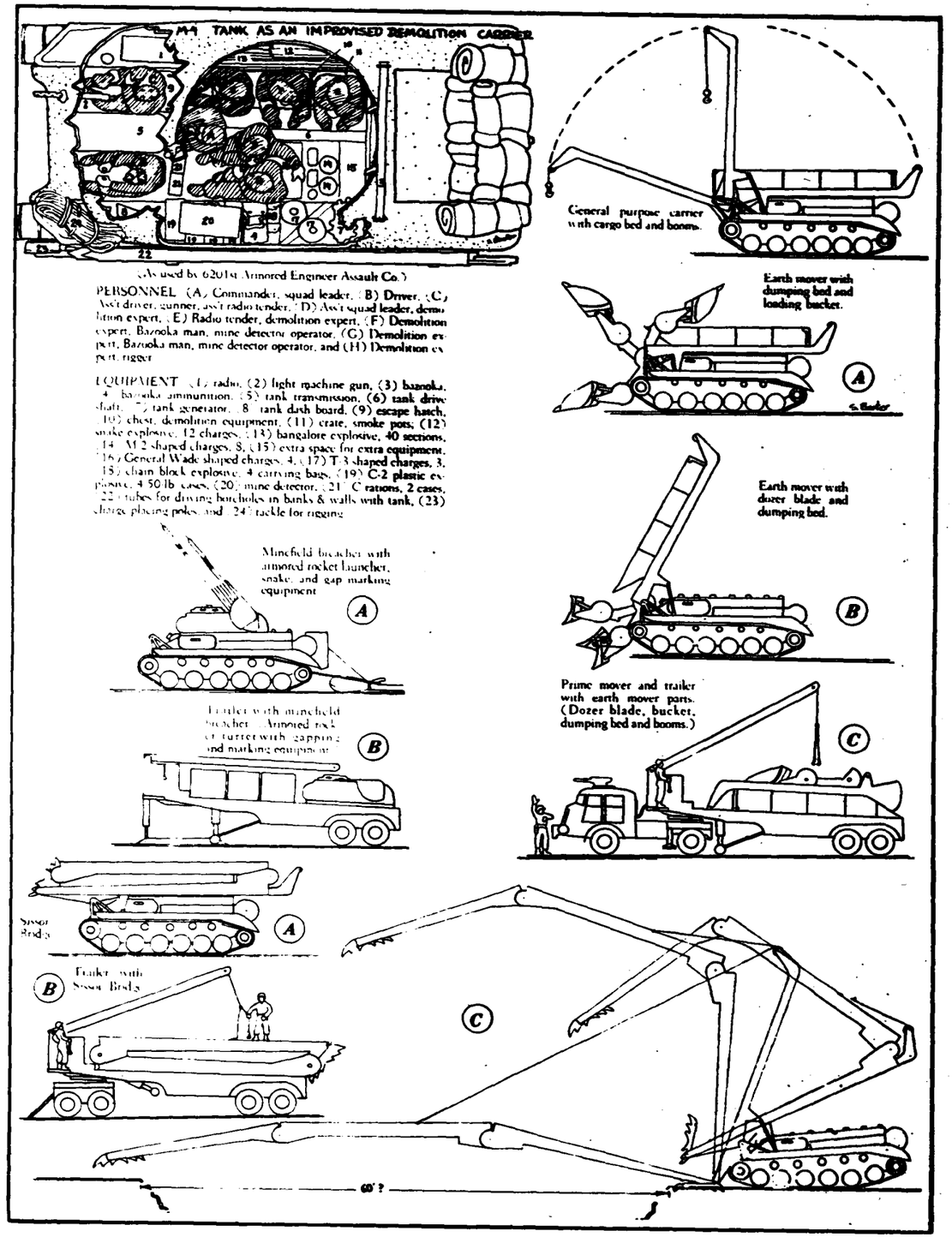
For instance, the British at Alamein, faced with hundreds of thousands of mines, improvised two flails or "scorpions." Chains fastened to a rotor on the front of a tank and powered with a Ford engine lashed the ground to detonate mines. The machines were new and makeshift. It is not surprising, therefore, that one wore itself out in the main attack, even before it reached the mine field. It was, nevertheless, a step in the right direction, and the British Eighth Army at once made a large number of better "scorpions." Soon an improved model was produced in the United States. Then, in 1943 in the American Fifth Army, a provisional mine clearance company was organized and equipped with "scorpions." Later, an improved flail, the British "crab," was manufactured and put in combat, but even that had minor faults that made it impractical. At least it could cross the bailey and treadway bridges, which the "scorpions" could not due to their bulky, sideheavy, outboard auxiliary engines.

The tank dozer is another example of an armored obstacle remover. In a muddy Italian field in 1943 engineer officers and ordnance men of the U. S. First Armored Division mounted a D-7 angledozer blade on a T-2 tank retriever and controlled it with a Quickway crane winch. This tank dozer proved better than a previous model, and although it was far from perfect, it possibly contributed as much as any other single factor to the saving of Anzio beachhead during the four long months of siege for this vehicle extinguished from one to a dozen major fires nightly in ammunition dumps by covering exploding ammunition with soil while the dumps were being strafed, shelled and bombed in an enemy effort to destroy our fire power. This is not a typical case of armored engineering, but it shows what tank-mounted machinery can do in the face of furious enemy opposition.

A still better tank dozer, made from an M-4 medium tank, a D-8 dozer blade, and a bridge truck hydraulic system, ignored shelling and small-arms fire to fill craters and gorges in the mountains of Italy which is poor tank country at best. It was "knocked out" on many occasions like many a good tank has been, but it nevertheless remained in almost daily combat. On one occasion this vehicle and another tank dozer spent three days during active combat working two miles ahead of all other troops to prepare a ford and several by-passes. That is an almost absurd example of true armored engineering.

The widely distributed "GI tank dozer" has proven many advantages of armored obstacle reduction. Yet, it was relatively undeveloped and in most cases poorly exploited. Its maintenance problems were so great that three tank dozers were required so that one might be in operative condition when needed. Bogies, clutches and engines wore out at a terrific rate, yet these dozers did many "impossible" jobs.

Its greatest fault was usually its crew, as is often the case with special equipment. Just as the blade had been hung on the tank, as an afterthought, so had tank dozers been distributed and manned . . . as after-



thoughts. Provision for manning and maintaining such special equipment must be reflected in tables of organization or amendments thereto.

Other "working tanks" that have already been produced or improvised are rollers of various types for detonating mines, folding bridges such as the British scissors, the Churchill Self-launching Bridge, the LVT "doodlebug" ramp for mounting coral banks, ark bridges, fascine carriers for filling ditches, demolition carriers and personnel carriers. Tank retrievers belong in the same class for they have proven themselves vehicles capable of removing obstacles and even carrying and placing bridges under fire. Likewise, such accessories and means used by tanks as "snakes" and rocket trailers for detonating mines, mortar grapnels for pulling trip wires, direct armor-piercing cannon fire for producing bangalore-boreholes, petards and demolition rockets for breaching walls, the Davis treadway dolly bridge, the various tank launched bailey bridges, the tank pallet or sled for hauling assault supplies . . . these, and numerous other armored and semi-armored obstacle reducers have been improvised and used in battle. Necessity has mothered their invention. One can plainly see the direction in which the armored units have been groping.

The next logical step was to design a special machine plus a special organization with a special mission. This was far more difficult.

Armor's Unarmored Engineers

One of the most notable "working tanks" was the British Avre (armored vehicle, royal engineers). This Churchill tank, stripped of its gun, was equipped to carry engineer troops, tools and explosives. It mounted a petard or spigot-type mortar capable of throwing a 40-pound demolition bomb. The crew was a special engineer squad with a very particular mission.

The American version or AVE (armored vehicle engineer) was an M-4 tank with tank dozer blade, room for engineer soldiers, explosives, and a rack of demolition rockets atop the turret in lieu of cannon or petard. It was a noteworthy vehicle in many ways. Even so it had its faults, for it possessed the mechanical failures of the tank dozer. Theoretically it was sound, but in action neither it nor any other tank formed the basic item of equipment around which the standard U. S. armored engineer battalion was designed. If anything held that unique position it was the two and a half ton GMC dump truck.

Useful as the dump truck was, it still depended upon hand loading, for no quick mechanical means was furnished the armored engineer battalion normally. Once loaded with gravel it provided the squad it carried with no room for their tools, their explosives, or themselves. The men had to stand atop the load, or as I have seen them do, attempt to dig foxholes in it. Miserable vehicles they were to accompany the point of a column, yet it is the point that needs the immediate engineer support to get ahead. The only other alternative for the assault engineers was to ride the top of a fighting tank, carrying only those tools and explosives that they could hold in their hands. Naturally their support was feeble and slow, for they could do little more than call back for bridging or whatever else was needed and ask for the establishment of outposts or security that the bridge or by-pass might be completed. Thus, in crisis after crisis, armor was relying upon unarmored and unequipped troops.

Consequently, just prior to the 1945 Po Valley Offensive, the First Armored Division did considerable experimentation in armored assault of such obstacles it expected to encounter as fortified ditches, dykes, canals, etc. The entire division was trained in special techniques and a provisional company of 260 men and 44 special purpose tanks was formed. Included were arks (tanks with bridging welded on top), fascine carriers (tanks adapted to place log and culvert crossings in deep but narrow streams), personnel and demolition carriers (modified tanks affording maximum dismounted support for the head of a column), tank retrievers (for removing obstacles, placing bridges and withdrawing arks, etc.), crabs (for clearing mines), dolly treadway bridges (short wheeled bridges pushed by tanks), tank dozers and a Churchill self-launching bridge tank.

Actually the equipment was used in very few instances, for the enemy ran short of explosives and abandoned demolition almost entirely. Nevertheless, it proved its ability to do speedy construction while under fire. Furthermore, the bulky equipment had a grueling test of its ability to march. The organization likewise was tested in its capacity to function administratively and otherwise during a campaign. Many important lessons were obvious to those who heeded them. One lesson was that that particular type of unit is not the best answer to the assault clearance of obstacles even though it does have many advantages over conventional engineer methods and equipment.

Most obvious was the fact that new ways of getting our armor forward in spite of natural and enemy obstacles are quite possible. There is no doubt that with new techniques of obstacle assault armor can fulfill the smashing mission expected of it, but without engineer support that is truly armored our tanks will often be the least mobile of all our fighting forces.

Armor Needs A "Working Tank"

Let us now consider the problem from its logical beginning. First we must ask, "What are the fundamental requirements of obstacle assault equipment?" A likely answer is that such machinery must possess speed, relative invulnerability, mobility, dependability and versatility. These at least are the most obvious requirements.

We can gain speed in overcoming obstacles, first, by replacing manpower methods with modern mechanical means such as a contractor employs whenever possible. Second, we must provide both crews and machines with armor, thus decreasing the necessity for establishing the small but time-consuming bridgeheads around them. In other words, the machines must be just as invulnerable as the tanks, if not more so. Third, and this is important, the required men and machines must be available in sufficient quantity to handle all of the work expected, and handle it simultaneously at numerous places.

The assault vehicles must obviously be mobile. They must go wherever tanks go. Most of today's "gadgets" cannot. Assault vehicles must therefore closely approximate fighting tanks in height, width, length, weight, turning radius, fording ability, flotation, etc. It is a sad mistake to try to increase the mobility of armor with vehicles that are more clumsy than armor, yet that has often been attempted.

Dependability is of vital importance. Skeptics point to the continual bogie trouble of the tank dozer as their chief argument against it. An armored dozer designed specifically for its job and thoroughly tested should be just as dependable as an ordinary tractor type bulldozer or an ordinary fighting tank.

Versatility is probably the most important requirement of all. Terrain and natural obstacles change from one mile to the next. Furthermore, a clever enemy can make obstacles in a multitude of forms. The methods and equipment for overcoming such obstacles must therefore be extremely adaptable. A minimum number of types of unusually versatile equipment must be developed. These machines, moreover, must be incorporated in the TOs and TEs of the armored engineers in such a way that their numbers can be varied . . . some types dropped . . . others added . . . according to the particular campaign requirements. Provisions for modifying maintenance facilities and crews accordingly are also necessary.

Allowance for experimentation and modification of methods and machinery in the field, close to the front, is also a necessity if rapid adaptability is to be gained. Experimentation in the field by U. S. Army units in the recent war was done under considerable handicap. Here necessity not only fosters invention but demands practical results. It is here, therefore, that research and development should be carefully encouraged as a useful adjunct to the experimental programs carried on at the forts and factories within the U. S.

The Versatile Vehicle

It is quite possible that a single heavy duty tanklike chassis equipped with certain standard accessories can replace all, or almost all, of the many types of gadgets needed. This chassis should be armored but not armed heavily. Its sole purpose is to do a job of work, not to fight. Fighting is the task of the fighting tank. This vehicle should have a power take-off, a hydraulic pump and a fast but powerful winch, all for operating the various accessory parts. The chassis should have cargo space, plenty of it. It is needed for carrying explosive equipment, construction tools, building materials, or men, as the case requires.

The addition of various accessories would convert the chassis to any one of several types of assault machine. These essential types of assault machinery are: 1. earth-movers, 2. mine-removers, 3. bridges, 4. carriers. Let me explain them.

By an "earth-mover" I mean something along the lines of one or more of the following pieces of equipment: bulldozers, scrapers, carryalls, loaders, dump trucks, demolition rockets, petards, and bulk explosives. All are used to move dirt, or other obstacles. The answer may be a tank chassis with a dozer or loader type blade and a dumping truck type bed. A flail, snake, or rocket launching attachment may solve the problem of the mine remover. The bridge should probably be a scissors type class 40 span of 60 feet or so although the tank should also be able to launch, by pushing, a standard military bridge like the bailey of 100 feet or more.

By "carrier" I mean a truck-like vehicle. It should be part of the "earth-mover" just mentioned. It should also be easily adapted for carrying ponton type bridging, storm and assault boats, bulk explosives, mines, culverts, fascines, prefabricated road mat and all the other paraphernalia of the engineer's trade. Like the present Brockway bridge truck, it should have booms or a derrick to place its load accurately as well as to load itself. The bed should dump, not rearward like a truck, but forward over the tank's bow. As a carrier it should also be able to transport an armored heavy duty air compressor for inflating pontons and powering hand tools.

The army's truck-mounted Quickway Crane towed a special accessories trailer with pile driver, crane boom, bucket and shovel attachments mounted upon it. In a similar fashion, the proposed vehicle should have its accessory parts easily transportable on special trucks or trailers. These accessories should be mounted on wheels in the division rear until needed. Spares should be in Corps and Army dumps likewise on wheels and ready to roll. When needed they would have to travel forward, meet the tank chassis near the front, and without the aid of other equipment these two should exchange loads in a matter of minutes.

Of course the division's obstacle removers would all be equipped with one accessory or another according to the needs of the battle. They would travel with the division's points ready for instant work. But, when one equipped as a bridge layer for instance, expends its load, it must be quickly fitted with a replacement bridge. It must travel but a very short way to the rear to obtain this replacement bridge. We must therefore carry extra loads and accessories. We must keep these loaded "on wheels" ready for instant marching. They must be ready to roll at all times.

These accessories should not overtax the trains and

dumps. I do not propose, for instance, that a normal quota of bridge be carried in a desert campaign. Nevertheless, the replacement loads must be available in quantity, for they are the ammunition of the working tank.

The Avre was World War II's nearest approach to the all-round working tank. It was considered adaptable to every assault need. If it was, it was at least too time consuming to adapt it in combat. Its turret had to be removed and the tank had to be rebuilt with a special cupola before converting it to a self-launching bridge. It was an excellent vehicle, but armor's engineers need more than a made-over tank. They need a new and special piece of equipment.

The answer is a better vehicle than the Avre, the bulldozer or any present machine. Its construction is far from impossible, for we need only to consolidate upon one chassis various types of existing equipment. This is well within the scope of American industrial knowledge and American military ability.

The "gadgets" have proven that special armored vehicles can quickly and effectively fill craters, place bridges, clear mines, etc. In the future they will replace the dump truck engineers. Of course it would be foolish to attempt to replace skilled, courageous hand labor completely, but we must not depend upon it as we have, nor should we carry it exposed and without adequate equipment on the top of a fighting tank.

Let us look ahead. A war in the future may use innumerable nasty devices. Blown bridges may be contaminated with persistent chemicals, virus or bacteria, mines with proximity fuses and radioactive debris. These would seriously delay most manual labor. Airtight tanks protected from radioactive soil with special armor may be essential for fighting, for carrying troops and even supplies, and most certainly for clearing obstacles and bridging streams.

Yes, the "Rube Goldbergs" are here to stay. Careful thought must be given their development, for armor's wallop depends upon them.

★ ★ ★ ★

ACTIVATED ORC CAVALRY AND TANK UNITS

Here are the names and location of the Cavalry and Tank units that have been activated to date in the Organized Reserve Corps:

FIRST ARMY AREA

Boston, Mass.—Headquarters and Headquarters Troop, 304th Cavalry Group.
New York, N. Y.—Headquarters and Headquarters Troop, 303d Cavalry Group.
Brooklyn, N. Y.—Headquarters and Headquarters Troop, 302d Cavalry Group

SECOND ARMY AREA

Washington, D. C.—782d Tank Battalion (Armored-Drawn Type).
Cleveland, Ohio—83d Reconnaissance Troop.

THIRD ARMY AREA

Atlanta, Ga.—Headquarters and Headquarters Troop, 301st Cavalry Group.
Athens, Ga.—314th Cavalry Reconnaissance Squadron.

FOURTH ARMY AREA

None to date

FIFTH ARMY AREA

St. Paul, Minn.—315th Mechanized Cavalry Reconnaissance Squadron.

SIXTH ARMY AREA

Phoenix, Ariz.—Headquarters and Headquarters Company, 19th Armored Division.
Seattle, Wash.—75th Amphibious Tank Battalion.

The Capture of Muhlhausen*

by Brigadier General R. W. Grow, United States Army

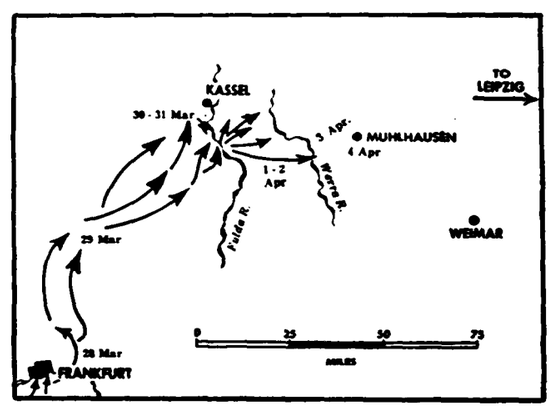
THE operation described here was typical of many during the great exploitation east of the Rhine in March-April 1945. There are several important tactical principles involved and the action was so successful that it warrants study.

BACKGROUND

After crossing the Main River from south to north, a few miles east of Frankfurt late on 28 March, the 6th Armored Division came under XX Corps and was given the mission: "Seize Kassel," (about 100 miles air-line). By dark on the second day (30 March) a line some five miles south of Kassel had been reached. Resistance which had been scattered then suddenly stiffened to the extent that a coordinated attack by at least the whole division would be required. In the meantime the 80th Division was closing up, so on corps order the latter took over the mission of capturing Kassel to the north while the 6th Armored turned east initially with an objective of Leipzig (125 miles), changed late on 31 March to Weimar (80 miles a little south of east). To reach either objective the general route lay through Muhlhausen.

As can be seen from Sketch 1, the division operated in multiple columns, four to six (not all of which are shown); but was forced to cross both the Fulda and Werra Rivers in a single column. The reasons for this constitute an interesting study in themselves. It was SOP in the 6th Armored Division to hit any river on as broad a front as possible with four or more columns if routes were available; to seize initially existing crossings, if any, and establish small bridgeheads. Then depending upon how many crossings were secured we poured everything over the most suitable ones. If no bridge was captured one had to be built after the site was seized. There was always the question: Should we build more than one bridge in order to cross faster? The answer depended on whether material was available to build two or more simultaneously, or could we build one and get everything across it before material for a second could be spotted.

*Military Review.



Sketch 1.

All bridges over the Fulda south of Kassel had been destroyed except one railroad bridge which was partially gone (one track of the double track was left). The best bridging site appeared to be opposite the 69th Combat Team, which fought its way across dismounted against machine-gun fire on 31 March. A bridge was built that night. The Cavalry Reconnaissance Squadron picked its way precariously across the railroad bridge a few miles to the north, and the balance of the division crossed the engineer bridge on 1 April, immediately developing into six columns on the east bank.

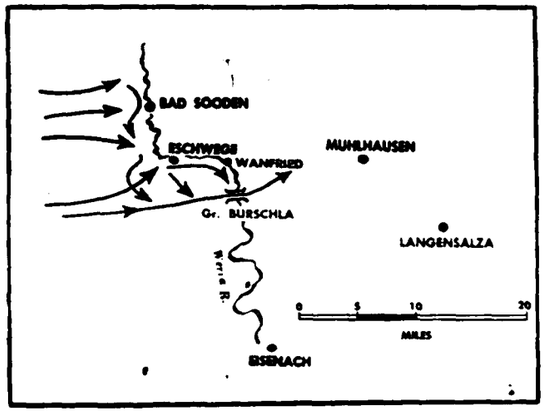
The Werra River presented a slightly different problem. Each column had encountered considerable opposition and enemy air had been particularly active on 1 and 2 April. Of the six columns the one on the extreme right captured a bridge intact. The one on the extreme left had an intact bridge in its front strongly defended. Therefore the three right columns (CCB) were all diverted over the captured bridge at once while the attack on the left (north) bridge defenses continued throughout 3 April. The enemy finally destroyed the bridge before it could be seized so during the night of 3-4 April, the three left columns (CCA) were pulled to the south and again the whole division crossed a single bridge, fanning out on the east bank and continuing on 4 April.

Had we given the enemy more time by advancing on a narrow front, the bridge which we seized would have been blown, as it was prepared except for the placing of explosives which had not arrived.

CAPTURE OF THE CITY

The picture as it appeared to us on the morning of 4 April is shown on Sketch 2.

Muhlhausen was known to be a city of about 50,000 and to contain certain important German government officers and officials. It was probably defended but it was important to prevent the escape of the government officials. German resistance in the Bad Sooden area had been strong and the enemy was known to be in strength in the hills north of Eschwege. There had been no resistance at Gross Burschla, but Wanfried was held by the enemy. There were no friendly troops east of the river to the north of Bad Sooden, and to the



Sketch 2.

south we were out of contact with the 4th Armored Division which we knew was fighting for Eisenach about fifteen miles up the Werra River. Therefore the division was shooting into the open with neither flank covered and the north flank known to be threatened by rather strong forces.

(Parenthetically it is interesting to note that several days later, 7 April, before the First Army troops on the left came up, the division was struck on the left rear by a strong counterattack northwest of Muhlhausen and was forced to throw all reserve troops into action to clear the pocket north of Eschwege and east of Bad Sooden, destroying a force of 1,500 Germans.)

For a few miles east of the Werra River the country is hilly and wooded, then just west of Muhlhausen it breaks into the great Thuringian plain, as fine a maneuver ground as one can imagine.

The plan for 4 April was simple and is shown on Sketch 3.

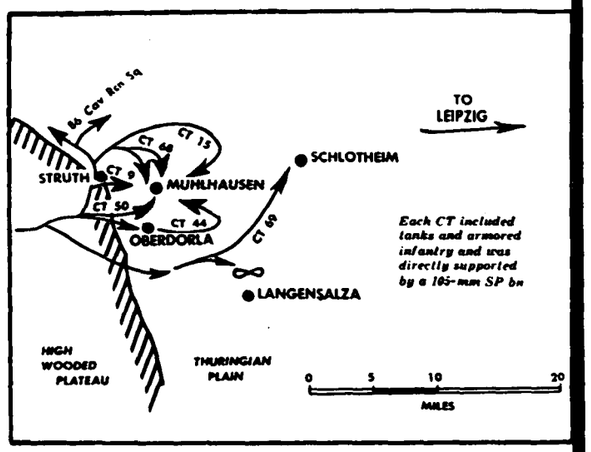
While the 86th Cavalry Reconnaissance Squadron protected the exposed left rear, six combat teams poured out of the hills, deployed across the plain, swiftly knocked out all opposition and completely surrounded the objective. Combat Team 69, in the lead, had no opposition until it neared the airfield northwest of Langensalza. Here tanks laid direct fire at 2,000 yards on German planes frantically trying to take off amid April showers, an amazing sight. (Although the airport was by-passed at this time in order to continue the mission, it was secured the following day together with a number of practically undamaged planes.) The enemy was driven east of Schlothheim and the "back door" closed.

Combat Team 44 had stiff rifle and bazooka resistance in Oberdorla, south of Muhlhausen, and destroyed the town. The other four combat teams each encountered road block and light resistance, but all completed the investment of the city by dark with all exits blocked and patrols working into the suburbs.

At daylight 5 April Combat Teams 9, 50, and 44 quickly entered the city while Combat Teams 68 and 15 blocked and the 86th Cavalry Reconnaissance Squadron stretched east to extend a protective screen along the whole north flank. Prisoners totalled only about 2,000 which accounted for the lack of resistance in the city but some 285 members of the German Foreign Ministry with their records were taken.

Although the resistance actually encountered was not serious, the enemy strength had been unknown and therefore the plan was designed to bring the full power of the division into action against a concentrated objective and at the same time provide ample security against the most dangerous outside threat, from the north (known, 20mm and mortar fire north of Struth) and east (unknown). The problem was not only to capture Muhlhausen but to prevent the escape of important Nazis. Few, if any, escaped. Due to the fact that the division crossed the Werra River in one column, the development had to be successive. Therefore, CT 50 which was leading, initially blocked in the hills southwest and out of sight of the city, CT 69 next in column was given the long mission to Schlothheim, followed by CT 44. Units of CCA crossed the river in the order CT 15, CT 68 and CT 9 so that all closed in on the city simultaneously. The Reconnaissance Squadron crossed ahead of CCA to cover the flank.

After Langensalza was cleared on 5 April, the division established a line from south of that city, north through Schlothheim thence northwest and west which eventually extended forty miles before First Army troops came up on the north flank on 9-10 April.



Sketch 3.

Planning U. S. Industrial Mobilization

by Leonard J. Grassman

The "Prep Agency" of the United States is the Army-Navy Munitions Board, one of the most important and least publicized mediums of our national readiness against possible future aggression. In this article Leonard J. Grassman gives the first complete picture of just what the ANMB is and what it does.

THE United States must be ready to meet any threat of war. It cannot entrust its security to the conjectures of successful and lasting peace until there is concrete assurance that such a peace is an actuality, not just a possibility. In the meantime, it must remain strong enough to maintain that security. "The price of Liberty is eternal vigilance."

General of the Army Dwight Eisenhower lent the weight of his military genius and leadership to this belief in stating: "National security is a state of organized readiness to meet external aggression by a quick and effective mobilization of public opinion, trained men, proved weapons, and essential industries, integrated into the most efficient instrument of armed defense, and reinforced by the support of every citizen. The security establishment comprises *all* the people, *all* our enterprises, *all* our government."

The government has created an agency to aid in providing us with lasting preparation until we reach that age of peace when such preparedness is no longer necessary.

The "Prep Agency" of the United States is the Army-Navy Munitions Board, one of the most important and least publicized mediums of our national readiness against possible future aggression. It is a board devoted to research in preparation for national emergency and an over-all liaison between our national material might, our industry, and our combat elements.

Although this agency was originally constituted in 1922, it is doubtful that many Americans knew even of its existence—certainly not its functions.

In its 25 years of existence, the ANMB has passed through many periods of change and evolution—from a token body without much significance to its extremely important stature at present. Today, most of its work is concerned with four major responsibilities: the development, during peacetime, of an industrial mobilization plan which will when effectuated develop the national economy and harness industry effectively to the military need in any future emergency: the responsibility for the administration and operation of the statutes covering the stock-piling of strategic and critical materials against the need of a future emergency; the development and expediting of joint procurement between the War and Navy Departments and is assigned policy control of all joint agencies lying between the services wherein they concern themselves with matters of this nature; and is also concerned and responsible for developing and expressing military interest of the services in all matters pertaining to our national import and export.

The Board, at present, is composed of its civilian chairman, Mr. Richard R. Deupree, prominent industrial head, the Under Secretary of War, Mr. Kenneth C. Royall, and the Assistant Secretary of the Navy, Mr. W. John Kenney. The routine of the Board and its operational functions are administered by an Executive Committee consisting of the civilian chairman of

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the Board, assisted by two deputy executive chairmen, one a general officer of the Army Major General Sidney P. Spalding, USA, and one a flag officer of the Navy, Rear Admiral Roger W. Paine, USN. The executive committee is assisted by a staff of about fifty Army and Navy officers and Civil Service employees drawn from the two departments. In policy matters, the Board is advised by a committee made up of the Chief of Staff of the Army, the Chief of the Army Air Forces, the Director of Service, Supply and Procurement of the War Department General Staff, the Chief of Naval Operations, the Deputy Chief of Naval Operations for Air, and the Chief of the Material Division, Office of the Assistant Secretary of the Navy.

Two Special Assistants Brigadier General Edgar P. Sorrensen and Rear Admiral Thomas B. Combs, aid the Executive Committee by reflecting the views of the Army and Navy Air Forces.

Assisting the Executive Committee in carrying out the responsibilities of the Board, supervising and coordinating the work of all subordinate elements to insure close liaison with appropriate agencies of the War and Navy Department and preventing unnecessary delays in the prosecution of the work of the Board is the Secretariat. Comprised of the Army-Navy alternates, Colonel Nathaniel M. Martin, C.E., and Captain G. M. Prevost, U.S.N.R., the Secretariat also insures the plans for the procurement of new items are integrated with the development of such items, maintains close liaison with the agencies responsible for research and development and keeps the Board currently informed on all such matters, along with making special and detailed studies or plans as directed by the Executive Committee or the Board.

One of the foremost of the ANMB projects is the Industrial Mobilization Plan, an instrument of progressive planning designed to evolve with the development of our industrial strength and scientific progress so that in the event of a national emergency, our industrial might and knowledge can be harnessed quickly.

Strong belief that the War Production Board, properly constituted, is to be the inevitable cornerstone of an effective industrial harness in any forthcoming emergency, the ANMB has authorized the creation of a group of distinguished civilians, selected from those with War Production Board experience in the late war, to develop a manual which will embody the organizational changes in the WPB structure considered necessary as the result of actual experience with the one which was developed in the midst of the war. This group will also make recommendations on a complete pattern for the war agencies which they feel will be necessary to be brought into being with the outbreak of war.

Planning of this nature will prevent a repetition of the confusion and frustration experienced by those representatives of industry who hurried to the capital early in the emergency to offer their wares for the defense of our nation only to run into the lack of proper agencies to utilize their efforts or to assign proper priority, etc.

Currently, and since the end of the war, the Army-Navy Munitions Board is aiding in a sensible disposal program for the disposition of war plants acquired by the government during the war, and is also aiding in the retention program—a project to create sufficient "stand-by" plants and other facilities to aid in "to war" conversion and wartime production. It has also completed and will promulgate shortly its pattern of all the inter-agency, service, and civilian industrial advisory committees it considers will be necessary to cover its industrial mobilization responsibilities. The pattern comprises about 75 committees covering the complete industrial field and under them will be created numerous sub-committees to handle specific detail and technical assignments.

Under the Executive Committee are four planning divisions, Materials, Products, Services, and Procurement, from which spring the numerous special committees and sub-committees which encompass all the problems involved.

Materials Division, which collates the military, naval, civilian, and allied requirements of materials, such as steel, copper, aluminum, etc., in an emergency, devises plans for production and supply of such materials, and is responsible for the development of stock piles. It is also concerned with the current study of underground sites, which have proven militarily expedient in modern warfare.

In the recent inspection of representative types of underground sites throughout the nation, conducted by the Corps of Engineers for the Army-Navy Munitions Board, the results of which have not been published, it has become evident to observers that, contrary to common conception, caves do not make the best underground sites for factory or storage use. The natural twists, variations of level, make for a great amount of reconstruction. Another detrimental factor existent in caves is high humidity, which is harmful to stored materials. It appears that mines and quarries are much more easily adaptable to industrial purposes desired in underground utilization. One observer, technically qualified, has noted that soft stone areas, of which there are plenty in the United States, rather than soil, make for better underground sites.

The importance of underground sites in modern warfare need not be amplified. In an atomic war, should the bomb not be outlawed in future warfare, utilization of below-surface facilities is a must. The effects of strategic bombing in Europe and Japan during the war have already proven that even in the use of the lesser weapons, underground factories and facilities are an absolute necessity. The good condition of such facilities in Germany after bombing which obliterated whole cities proves the greater impregnability of Mother Earth and, even now, as our Prep Agency prepares plans for such utilization, it is rumored that

another government, using war prisoner labor, has built the biggest underground airfield in the world in a highly dominating and commanding area, which has a great, semi-global, air striking potential. Great Britain's enormous, mile-long, underground factory, which withstood the rigors of the Battle of Britain, is a monument of the strength of below-surface spaces.

In the study of underground sites, one Corps of Engineers colonel put forth a plan substituting American machinery for hand labor in the Japanese "cut-and-cover" techniques for building concrete shelters, miniature hangars, and sub-terrain storage facilities. The Jap technique allows for rapid construction with a maximum use of natural formation and permits concrete construction without forms.

In the stock-piling planning, when the President approved Public Law 520, which authorized $100,000,000 to ANMB to begin stock-piling of materials essential to our national security, it is estimated that around $300,000,000 will be needed for this purpose during the fiscal year. The hundred million dollars was granted during the wind-up of the last session of the 79th Congress under the stock-piling act which contemplates the accrual of scarce but essential items at a cost of around $2,100,000,000, to be spent over a five-year period.

To date, the Board has formalized the stock-pile objectives, year by year, as to composition and requirements, and has determined and directed the purchase of the first year's increment after clearance by State, Commerce and Agriculture Departments and CPA. The Board is developing a supplemental list of items for additional purchase in fiscal 1947 for presentation to Congress for approval, and has also contacted many industrial associations which concern themselves with metals, minerals, and materials, and plans continued consultation with qualified industrial groups in carrying forward its stock-piling programs.

In the initial stock-piling stage, ANMB is concerning itself primarily in drawing from the nation's vast surplus supply of war materials. From this stock are being drawn essential materials necessary to national security, but even in this early stage, the ANMB must keep its eye on our piles of other essential materials, an element which must cause them and the industrialists of the nation great concern because many of these items essential to the stock pile are desired by industry for civilian manufacture. Relative to this dilemma, Mr. Deupree, head of ANMB, stressing that every precaution is being taken not to cripple civilian economy, said nevertheless that an industrial mobilization and stock-piling program is definitely in the making, indicating that certain materials, although critical in civilian production, must be maintained in the stock pile against an emergency.

In stock-piling, the ANMB, by transfer from war surplus and purchase, assembles huge stocks of critical and essential items and materials. Of these, some are lasting and remain a stable stock, some become obsolete and must be replaced, while those with a tendency to become stale, lose strength, or perish are rotated—turned back into market and replaced with fresh and vital material. When purchasing or selling for the pile, the Board conducts its market activities in a quiet manner in order to frustrate attempts to speculate on these activities and also to prevent a physical effect on either the national or world market.

Other national resources, although not assembled in the stock pile, actually are earmarked in "paper consideration" so that, if needed, their source and manner of procurement will be but a simple manner of reference and execution.

The Products Division, which collates the military, naval, civilian and allied requirements for manufactured products in an emergency, devising plans for the production of such products, makes recommendations to the Board concerning the modification or abandonment of existing facilities, the development or construction of new facilities and the allocation of existing industrial capacities in an emergency. One of the causes responsible for the creation of this committee is the entangled problem of producing for more than one service and one nation.

The Procurement Coordination Division supervises and coordinates all phases of procurement by the services wherever joint requirement exists, preventing duplication of effort, eliminating competitive bidding between the War and Navy Departments, insuring equitable distribution of production and further standardizes design, contract procedures and procurement specifications.

In joint-procurement for the services, standardization of items between the services is a major problem, and the standardization of any item or class of items is given careful attention. For example, in a radar set of similar operating characteristics, the Army must have dust protection, while the Navy sets must be of comparatively small size and resistant to gunfire shock. Differences such as these must, if they possibly can, be reconciled.

However, despite the difficulties, a considerable amount of progress has been made. The volume purchase of food and lumber is already integrated, and, in textiles and clothing, footwear and petroleum products, there is close collaboration between the services in the buying operation. The most notable progress is in the field of medical and surgical supplies. The services have not only established a joint buying office in New York, but have succeeded in standardizing about 85 per cent of the items each of them use.

On October 15 of this year, President Truman approved an amendment to the authority of the Army-Navy Munitions Board, the principal effect giving the Chairman of the Board authority to assign to either the War or Navy Department or to a joint agency the procurement of any item purchased for the use of either or both services.

In connection with this approval, the President stated that concentrating in one agency the procurement of each type of common or substantially similar items by the armed services will mean an undoubted savings in money and personnel for the government and will simplify the furnishing of supplies and munitions by industry to the armed services. This authority also includes the power of final decision in the event of disputes between the two departments arising out of the determinations made by the Chairman of the ANMB. Such decisions will be binding on both the War and Navy Departments.

The fourth major division of ANMB, "Services," is charged with formulating plans for the development and control of manpower, transportation, electrical energy and other services required for the mobilization of industry in an emergency; to act as a liaison between the Board and government agencies dealing with finance, price or manpower control, transportation, public relations, or economic warfare, and to supervise and coordinate the preparation of plans for the establishment or activation of such agencies as would be required in an emergency.

"Decentralization of industrial facilities," a much discussed subject by contemporary strategists, either industrial or military, is another subject of interest to the Board.

Modern warfare, which places the whole of the United States within striking distance from many foreign points emphasizes the importance of such decentralization. The Board, in recognizing the importance of decentralization, is making a study of the extent to which Industry is centralized and is doing everything possible to foster dispersal of new and/or future additional plants and facilities to strategically decentralized locations.

Recently the ANMB was given another great responsibility when it was charged with the responsibility for determination of the military interest in national import and export. Because of this, the Board holds membership on inter-agency State Department committees which concern themselves with different phases of economic foreign policy and its members have been active in steps being taken to conserve our national resources.

As evident from the foregoing definition and analysis of the Army-Navy Munitions Board and its activities, the ANMB is a great network of committees whose studies reach into every possible phase of our national structure to bring forth elements for the protection of our national security and to construct the machinery which will make our nation capable of a quick swing to prepared strength in the event of a national emergency. The Board, in acceptance of all these duties, is acutely alive to the great responsibilities it has assumed. It realizes that there must be evolved, in peacetime, practical and well-understood mechanisms whereby in a minimum period of time the nation can effectively get into high gear at the beginning of an emergency to produce the requirements of war. These essential mechanisms cannot be evolved or executed with dispatch without the complete cooperation, support and understanding of government, industry, and labor.

The Army-Navy Munitions Board, now, as it goes into full-grown action, is indicative that our nation has reached the end of that indifference of thought and action which has heretofore left our nation inadequately prepared to defend itself. The "Prep Agency," of the United States, with its "gathering" activities, will meet any future emergency just as the squirrel meets the winter—PREPARED.

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Tuberculosis is a deadly killer. Nearly 55,000 Americans die of it each year . . . six every hour. In Washington, in every 16 hours some one dies of tuberculosis and during each day five new cases are reported. Your Tuberculosis Association, supported by Christmas Seals, fights to stop this useless waste of life. Stand behind it in this fight. Buy and use Christmas Seals . . . as many as you can.

Strength Report On

Armies of the World

by Major Hal D. Steward

PEAK strength of the Russian Army at the height of World War II was reported to be 20,000,000 persons. Today that is no longer true because Russia, like other Allied armies, has been demobilizing her military forces since the end of the war.

No army in the world today stands anywhere near the top of its wartime strength.

Just prior to V-E Day the United States had 8,300,000 men. Today it has just over a million.

This report on the Armies of the World does not pretend to be completely accurate in its figures. The information included in this article was gathered from numerous sources. Some were highly accurate and others were probably greatly in error. This must be taken into consideration when trying to compile a report on the strength of all the major powers in the world today.

It is widely known that Russia maintains extreme secrecy about the strength of the Russian Army. Any figures on Russian forces can be grossly inaccurate. However, from information available a rough idea of the size of the Russian Army can be given.

Of the five big world powers Russia has the largest army, which is reported to be around 3,000,000 persons. China comes next with about 2,700,000 regulars in the National Army; Britain is third with about 1,500,000 men; United States fourth with 1,100,000 men and France fifth with about 150,000 men.

Both Britain and the United States are following the same policy of trying to build a volunteer army of approximately 1,000,000 men by July 1, 1947. China, of course, is maintaining an army of large strength because of internal trouble. France is still in the process of reorganizing her army, and Russia is reported to be increasing her military strength, but so far that is hearsay.

Military training begins in Russia at the age of 12 when elementary courses are given for two hours each week. Compulsory training begins at 16 and continues to 50.

Estimated population of Russia including the Baltic Republics, occupied Poland and lands returned by Rumania to the U.S.S.R. was about 195,000,000 in 1940. Besides Russia Proper, which has a population of approximately 110,000,000 there are 16 Union Republics that go to make up Greater Russia and bring its total population near 200,000,000 persons.

Russia is said to have a potential military strength of some 40,000,000 persons. This means that Russia would muster into service all physically fit male and female persons between the ages of 14 and 50.

No information is available on the Russian Air Force although they were reported to have had 4,000 planes at the beginning of the war. The Russian Navy consists of only three battleships and smaller craft.

France's army, which today is still being reorganized, will have 55,000 men for the United Nations Force, 50,000 for the Army, 80,000 for the Air Force, and 60,000 for the Navy. France has also 1,000 planes all of which were given her by the United States.

China during the war had about 6,000,000 men in service. Today she has nearly half that number still under arms. Communist China is reported to have nearly a million men in service. It is hard, however, to obtain any accurate figures on Chinese forces as each Warlord has his own army of undetermined size.

One of the large armies of today is maintained by Yugoslavia, who is reported to have nearly 800,000 persons in her army, of which 10 per cent are women. This army is an outgrowth of the guerrilla army that was organized during the war. The Air Force is in the process of being rebuilt. The Navy was completely destroyed in the war.

Spain has been out of the military limelight since the Spanish Civil War, but today she has an army of 10 Corps numbering about 300,000 men.

Brazil, only South American country to send a large expeditionary force overseas to fight in World War II on the side of the Allies, had about 1,000,000 men under arms during the war. Brazil subjects all males between 18 and 45 to military duty under a selective service system. Permanent peacetime strength of the Brazilian Army is reported to be around 100,000 men.

Service in the Argentina Army is compulsory from 20 to 45 years of age. The men belong to the First Line Army for the first 10 years, then pass to the National Guard for 10 years and close their service with five years in the Territorial Guard, mobilized only in the event of war. Argentina maintains a peacetime trained reserve of 300,000 men.

Regular Army strength of Argentina is supposed to be around 45,000 men; however, it is reported that she had nearly half a million men in active service during World War II.

Here is the reported strength of all the American countries: Argentina, 45,000; Brazil, 100,000; Chile, 40,000; Colombia, 10,000; Costa Rica, 500; Cuba, 15,000; Dominican Republic, 4,000; Ecuador, 6,000; Guatemala, 6,000; Haiti, 5,000; Honduras, 2,500; Mexico, 50,000; Nicaragua, 3,500; Panama, no information; Paraguay, 3,000; Peru, 35,000; El Salvador, 3,000; Uruguay, 8,000; Venezuela, 10,000; Bolivia, 15,000.

THE RUSSO-GERMAN BATTLES — 1941-1945*

by Captain F. N. Fitzgerald

PARWO

(EDITOR'S NOTE: *In the September-October issue Captain Fitzgerald surveyed briefly the organization and background of the Red Army, proceeding then to discuss the German campaign against Kiev in the early autumn of 1941, the advance to Stalingrad in the following summer, and the Russian counteroffensive during the winter of 1942-43. He now goes on to outline the major operations on the Eastern Front from 1943 until the summer of 1944.*)

THE BATTLE OF KURSK—JULY, 1943

THE pattern of the Russo-German war during the first three years had a seasonal appearance. Each summer the Germans advanced, each winter the Soviet armies took the initiative. After the Russian winter offensive of 1942-43 the German front was straightened and considerably shortened, and in March a German attack recaptured Kharkov. By early summer the Red Army held a salient between the Valdai Hills and Bielgorod. Orel and Kharkov, north and south of the salient, were still in German hands. Kursk and the territory to a distance of fifty miles west of it was Russian.

In 1941 and 1942 German strategy had been directed towards the total defeat of the Soviet Army. The Wehrmacht's offensive of 1943 was more modest, initially aiming only at the elimination of the Kursk salient. The immense losses in men and material which the Germans had suffered in the Stalingrad campaign in the previous year compelled the High Command to modify its ambitions.

The terrain of the Kursk salient was elevated but not close. A number of rivers have their headwaters in the hills near Orel and on the plateau north of Kharkov, and the stream beds tend to limit maneuverability to a certain extent. Woods are few.

North of the salient were the Armies of General Popov, at that time building up for the first Russian summer attack, which was to be launched against Orel in July. The Kursk sector was defended by General Rokossovsky, with General Vatutin's forces on the left about Oboyan. General Konev stood on the eastern bank of the Donetz opposite Kharkov (*see map of Kursk area*).

The Germans concentrated picked units north and south of the salient with the intention of driving behind and isolating Kursk. In the north was the Third Panzer Army, comprising four panzer divisions (equipped with some of the new *Tiger** tanks) and six motorized and infantry divisions. In the south another Panzer Army, commanded by Von Hoth, contained seven panzer divisions and six motorized and infantry divisions. Strategic reserves totalling six panzer and seven infantry divisions were held at Orel and Sumi. Thus over 500,000 men and a considerable quantity of heavy material was available to Field Marshal Von Kluge for the 1943 operation. The numbers could not be compared with those employed in the Stalingrad campaign, but the mission was very much more limited in scope than that given to Von Bock in the previous summer.

The offensive opened on both flanks on July 5, 1943. Massed tanks, supported by artillery (much of it on self-propelled mounts) drove through the fortified zones to a depth of ten miles in the first three days of the battle. In the north panzers took Malo Archangelsk after a stiff fight, but the Red troops defended the flanks of the German corridor and prevented the panzers from deploying to left and right of the town. After a pause for reorganization another attempt was made to enlarge the Malo Archangelsk wedge in the direction of Poniri. This was also held. A new assault was opened along the Kromi-Fatezh road, but the Russian network of trenches and fortifications obliged the attackers to abandon the attempt. The Russians held their positions in great depth and did not retire from the flanks of the German wedges. Holding the "haunches" of the penetrations, the Red troops threatened the communications of the German spearheads and thus contained large infantry formations which would otherwise have been available to support the leading elements of the attack. This was the *tactical* application of what the Russians had done *strategically* at Voronezh and Stalingrad. The theory is obvious, but it requires courage and tenacity on the part of the defending troops and good judgment on the part of their leaders to apply it on the battlefield.

On July 11th the direction of the German effort was changed and two fresh panzer divisions (probably drawn from the operational reserve at Orel) advanced eastward through Zmievka against General Popov's left wing. Here the attacking troops met with even less success than previously. During the following three days the battle in the northern sector continued, but signs of German exhaustion soon became apparent. The panzers in particular had suffered heavily in their efforts to open the narrow gaps they had forced through the defenses; about 1,000 tanks and a large number of men were presumably lost in the struggle.

In the south the pivot of the first attack was Bielgorod. Some success was gained along the Bielgorod-Kursk railway line but all movements towards the strongpoint of Oboyan were held. By July 10th both Von Hoth and Vatutin had suffered heavy casualties.

Between July 10th and 15th, Von Hoth's panzers penetrated to the heights near Rzhava where a large-scale tank battle developed. As at Malo Archangelsk the Germans retained their narrow corridor but were unable to enlarge it. Von Hoth now turned his attention to the Kotocha area where he succeeded in making an initial advance but was held on the high ground near Shebekino. By July 21st the Germans realized their defeat—the offensive in the north had ended almost a week earlier—and began to withdraw from the advanced positions at Rzhava and Shebekino.

On July 12th, General Popov launched an attack on the Orel area. In the first three days his Army penetrated thirty miles, but the German panzers which were committed north of Kursk succeeded in disengaging, and, battered though they were, four tank divisions reached the Orel approaches on July 20th in time to cover the city. From that date the advances by Popov's troops were achieved by hard fighting.

Rokossovsky similarly regained the initiative and by July 18th had retaken Malo Archangelsk. Farther south General Vatutin rapidly cleared the German corridors into his position and by July 24th the Kursk salient was firmly re-established. The German summer offensive, which lasted less than three weeks, was followed by a Russian offensive north and south of Kursk. On August 3rd Bielgorod was captured by General Vatutin's columns. On 23rd, Kharkov was taken after a bitter struggle. In the north Popov entered Orel on August 5th. The Soviet armies had the line of the Dnieper River as their objective and by late autumn they had achieved it.

The Russians claimed to have inflicted about 100,000 casualties on the Germans and to have knocked out over 2,000 tanks. Even allowing for Soviet exaggeration, the injury to the German attacking forces in the Kursk operation must have been enormous. At least eight panzer divisions were so badly mauled that they were hardly recognizable as divisions, and they had to be withdrawn from the front for reorganization.

The Kursk battle showed the same characteristics as Von Arnim's campaign in Tunisia some months earlier, and as Von Rundstedt's Ardennes offensive in December, 1944. The German commanders were no longer seeking a decision, they were fighting a delaying action by means of local attacks.

There was no surprise about the Kursk operations. Both sides were fully aware of the movements and concentrations of the enemy. The Germans hoped to effect a breakthrough by weight of metal alone, but the Russian defenses were too strong and the Red Army commanders had learned the importance of unyielding defense, even when the flanks of the position are gone.

The selection of the corners of the salient as the points for their dual attacks was not novel to the Germans. The maneuver, often wrongly described as the "*Cannae manoeuvre*," is a common one in war and a traditional one to the Germans. Strategically, it was used in Poland, Yugoslavia, and Kiev (to mention only the major examples of World War II); tactically, Rommel attempted something similar at El Alamein (his was, in fact the true *Cannae* plan, although through the action of Alexander and Montgomery it did not succeed).

The Russians timed their counteroffensives well, but as before Stalingrad, the Soviet commanders appeared to lose their grip of the situation once their armies had jumped off in attack. Certainly, they gained great successes during the remainder of the summer and autumn of 1943, but at the start of the advances there was every likelihood of even greater achievement. Time and time again they permitted whole German pockets to slip through their hands, through lack of coördination and an inability to alter the direction of the advance at will.

TANK-CAVALRY COÖPERATION ACROSS THE MIUS—1943

In the Amiens offensive of 1918 the Allies experimented with the use of horse cavalry supported by tanks. The experiment was a failure and observers promptly concluded that mechanization and horseflesh could not be blended. Events in Poland in 1939 appeared—at any rate superficially—to confirm this view. But in the campaigns of 1942 and subsequently the Soviet armies showed the fallacy of this belief.

A notable example of tank-cavalry coöperation occurred during the Russian summer offensive of 1943. While the battles for Orel, Kursk and Kharkov drew the attention of both Russian and German commanders northward there was little activity in the Stalino-Rostov area. As a result when the Soviet armies in the north advanced westwards a re-entrant was left in the Russian front south of the Donetz. On August 22nd the Russian Supreme Command decided to advance Tolbukhin's Army which formed the Soviet left wing. The main struggle farther north had engaged the greater part of the opposing forces and neither Tolbukhin nor the Germans facing him could concentrate large numbers of troops for the operation.

*An Cosantóir, Irish Defense Journal.

*The *Tiger* tank was first used in Tunisia in February, 1943. The early models of this German "Infantry" tank weighed 54 tons and were armed with a long-range 88-mm. gun. The later *Royal Tiger* weighed over 60 tons. See also footnote in Part I of this article, in last issue.

Tolbukhin already held a small bridgehead across the River Mius. On August 22nd the Russian general launched an attack from this bridgehead and cut the Stalino-Tagenrog railway near Amvrosievska. Tolbukhin's tank-cavalry teams now headed southwestward toward the seacoast and Mariupol. By 27th the Germans were in full retreat and the southern bastion of the defense, Tagenrog, was isolated. Three days later it was taken by storm.

The normal employment of the combined tank and cavalry units was, naturally, in open country where large areas could be traversed with little opposition. The capture of the railway at Amvrosievska, which placed Tolbukhin's troops in the rear of the Tagenrog lines, permitted their employment in this manner. Crossing the flat plain the tanks were usually given the task of covering the flanks of the mounted troops. When opposition halted the cavalry, tanks from the reserve went into action, acting as mobile artillery and clearing the hostile strongpoints. When, in the latter stages of the operation, the German counterattacks were coördinated and heavy weapons were brought into action, the cavalrymen dismounted and fought as infantry—or, more accurately, as *dragoons*. The tanks dug in and served as pillboxes in support of the dragoon-manned trenches. Tank-groups were also held in rear to serve as mobile reserves. When the Russian advance was held by the defenses on the Gruzskoy River, the Red commander concentrated all the armor at one point and made a heavy tank attack. As the tanks broke through the German lines the cavalry followed up and exploited the gap.

It will be noted that four separate missions were given to the armor of the tank-cavalry teams. In an advance over open undefended country the tanks served as flank-guards. Tanks were used as supports and reserves for the lightly armed horsemen. Tanks and dismounted cavalry fought in defense. When stiff opposition was met the tanks forced a breach which the cavalry then exploited. In so far as the Cossack horsemen acted as infantry when the need arose they could be styled *dragoons*, but their normal mission was a cavalry one of exploitation; they were not equipped to hold terrain against serious assaults or to attack major defenses.

Tolbukhin's campaign was not the first attempt by the Russians to combine armored and cavalry tactics, but the large scale of the operations attracted widespread attention. Tank-cavalry coöperation was not always as successful, and in 1944 Marshal Malinovsky suffered a serious setback in Hungarian Transylvania through over-dependence on these teams.

Orsha and Bobruisk—1944

By the summer of 1944 the Russian southern front was far in advance of the northern. An immense salient had been formed south of the Pripet Marshes, its apex reaching to Lwow and Kovel (in pre-1939 Poland) and its left flank resting on the Dniester and the eastern slopes of Carpathian Mountains. The Pripet Marshes effectively cut the southern fighting zone from the northern sector so that in fact the two areas were independent of one another, but it was not possible for the Red forces to extend the salient in South Poland and farther west until their comrades had advanced over the Upper Dnieper and thus straightened the front once more.

Through the months of May and June the preparations for the northern offensive were made. On June 22nd the attack was launched along the entire front from Vitebsk to Zhlobin. The Soviet drive followed the route taken by Kutusov and Tschitschagov as they pursued Napoleon in the winter of 1812; the ultimate objective of the 1944 advance being—as Kutusov's had been—to seize Minsk and cut off the hostile armies north of the River Niemen. The initial tasks were therefore the seizure of Vitebsk, Orsha, Mogilev and Bobruisk.

The Soviet Army Groups (or *Fronts**) were given objectives as follows: General Bagramian's *1st Baltic Front* and General Chernyakovsky's *3rd White Russian Front* were to attack Vitebsk; Chernyakovsky's left wing was responsible for the offensive against Orsha; Mogilev was to be assaulted by Colonel-General Zakharov's *2nd White Russian Front*, and General Rokossovsky's *1st White Russian Front* was to move against Zhlobin and Bobruisk.

The German *"Panther Line,"* which had been prepared and fortified during the spring, ran northward along the Dnieper from Zhlobin to Orsha and thence along the Orsha-Vitebsk railway to the River Dvina. The defenses consisted of a series of fortified trench systems, covered by minefields and wire obstacles. They were repeated at intervals, to give depth to the defense, and at some places the belts of trenches extended for seventy miles in depth. The trenches were continuous, and one German humorist stated that it was possible to walk from Leningrad to the Black Sea without appearing above ground level.

The German *Central Russian Group*, commanded by Field-Marshall Busch, consisted of four Armies. In the north the Third Panzer Army was held near the River Dvina; the Orsha-Mogilev sector was defended by the Fourth Army; the Ninth Army covered Bobruisk, and the Second Army watched the northern flank of the Russian salient into Poland from the neighborhood of Pinsk.

Orsha was defended by the XXVIIth Corps of the Fourth German Army. One motorized and three infantry divisions were disposed along the *"Panther Line"*

*These *Fronts* or *Army Groups* are misleading, if one attempts to compare them with the *Army Groups* of the Western Allies. The Soviet *Fronts* were in actual fact only comparable to a British or U.S. *Army*.

For the purpose of the record, the Russian *Fronts* about this time were (from north to south): Leningrad Front, Volhovo Front, 2nd Baltic Front, 1st Baltic Front, 3rd White Russian Front, 2nd White Russian Front, 1st White Russian Front, 1st Ukrainian Front, 4th Ukrainian Front, 2nd Ukrainian Front, 3rd Ukrainian Front.

where it left the course of the Dnieper, and eight brigades were in reserve before Orsha. The right wing of the Corps rested on the river, the left ran across marshy ground and woods (*see map of Orsha and Bobruisk*).

On June 23rd the Soviet attack was mounted. The main effort was made north of the Dnieper, against the left of the XXVIIth Corps. The first line of trenches and part of the second were taken by the Russian infantry-artillery teams in concentrated attacks. Although the defenders committed some tanks and self-propelled artillery, their counter-efforts failed to close the gaps driven by the Red troops.

On the next day the Russians resumed their advance across the marshy ground, driving a salient ten miles deep and ten miles wide. Having room now to maneuver and being on firmer and more open terrain, Soviet tanks and self-propelled guns were sent into action. These finally broke through the defenses and turned the flank of the German division. German reserves were thrown in, supported by a number of tanks, but the Soviet infantry had moved in close support of their armor and had consolidated the ground won. On this day, too, events farther north were favorable to the Russians; between Orsha and Vitebsk another breakthrough had been achieved which further jeopardized the German position.

June 25th saw the heaviest fighting about Orsha. A series of German counterattacks resulted in large-scale battles in which the armor of both sides played an important part. But by evening the Russians retained the initiative and the final breakthrough was accomplished; advances of up to fourteen miles were made and on the 26th Soviet armored and motorized units were well to the west of Orsha, where they cut the German communications with Borisov. The city was now isolated. East of Orsha Soviet forces crossed the Dnieper below the river-bend and on the following day the city was taken by the converging attacks of Red Army troops from east and west.

On June 24th, the day after Chernyakovsky's assault on the Orsha position opened, the 1st White Russian Front commenced the attack on Bobruisk. The line here ran from the south of Gomza to the Dnieper near Zhlobin and thence to Rogachev. The first line consisted of five or six continuous trenches protected by mines and tank barriers. The defenses were manned by elements of the Ninth German Army and comprised two panzer and eleven infantry divisions, supported by other arms. Bobruisk itself was prepared for defense.

As the Russians already held Rogachev it was probably expected that the main effort would come from the Druth line. On the night of June 23-24th Russian troops bridged the Druth north of Rogachev, under heavy German artillery fire, but at the same time the main attack was launched in the south, near Shatsilki. By evening of 24th these southern columns had captured the first line of German trenches and had actually broken through south of Parichi on a front of eighteen miles and to a depth of six miles. As soon as the gap was secured Soviet tanks were sent through and entered Gomza on the same day. The Germans counterattacked from Parichi, committing panzers against the flank of the Russian wedge, but the Red troops held their ground.

On the next day one Russian mobile column moved from Gomza toward Glutsk while another advanced northward along the Gomza-Bobruisk railway. The Germans continued to counterattack west and south of Parichi but the Russian troops had consolidated their position and suffered no serious loss of ground.

During June 25th the Soviet infantry had been following the armor, but the tank formations were moving so rapidly that they were soon more than ten miles ahead of the supporting troops. On 26th, while the infantry approached Brobruisk from the south, Russian armor was already north of the city on the west bank of the Beresina. Bobruisk was surrounded.

Soviet tanks also penetrated to Glutsk, which was captured on the evening of 26th.

On the west bank of the Druth, near Rogachev, the fighting was more severe, and it was not until June 26th that the Russians reached and crossed the River Dobysna. Then tanks were thrown in on a narrow front and swinging northwards, succeeded in cutting the road to Mogilev. This move toward the north turned the flank of the defenses and Startzy was rapidly captured. By evening the tank columns were on the east bank of the Beresina, only two miles from Bobruisk. On the following morning the infantry joined the armored units here.

By June 27th the Ninth German Army was cut in two. The portion west of the Beresina was trapped in Bobruisk while the troops on the east bank were forced southward from the neighborhood of the city. A large-scale counterattack by the latter group (the XXXVth Corps, containing one infantry and two panzer divisions) sought to break through the encircling Russians towards the north, but the Soviet forces defended stubbornly, using their armor as improvised pillboxes. On the next day the Russians closed in from north, south and east and by afternoon the entire pocket was liquidated.

On the night of 28-29th the German units in Bobruisk made an attempt to escape from the city. Infantry and panzers attacked in a northerly direction, at the point where the investing forces were weakest. Some tanks succeeded in passing through the Russian cordon, but most of these were rounded up during the subsequent "mopping-up" operations. The remainder of the Germans were held in the city despite their numerous efforts to escape, and on June 29th—two days after the fall of Orsha—Bobruisk was taken.

The similarity between the Orsha and Bobruisk operations is striking. In both cases the defenses were partly along a river and partly across open country. In both cases the Soviet main effort was made so as to

avoid a river crossing. In both cases the armor of the main effort broke through to the rear of the town, so that the defenders were taken from behind by tanks and in front by infantry. Tactical encircling moves of this type were carried out again and again as the Russians approached defended cities and strongpoints.

The Russian use of dug-in tanks as pivots for the defense was not original, for the Germans had long since learned to appreciate the value of panzers used in this manner. As the war progressed all the belligerents tended more and more frequently to use their armor thus, for as the caliber of the weapons mounted on the tanks grew larger the value of tanks as artillery pieces became increasingly apparent.

Undoubtedly Soviet air superiority was an important aid in this offensive. The casualties inflicted on the ground forces by aerial attack were negligible, but the Germans were prevented from maneuvering in the open (where there would have been heavy casualties) and were thus pinned down and easily dealt with. Air support was concentrated against the German XXXVth Corps pocket east of the Beresina and both disorganized the German efforts to break out of the encircling ring and made the final task of mopping up by the Soviet troops much simpler.*

The terrain on the upper reaches of the Dnieper was less favorable to armored movement than the southern steppes, being broken with marshes, woods, small streams and occasional ravines. Soviet tank commanders learned that even where there was little or no opposition it was more economical to avoid these obstacles which would delay the advance. In the attack on Bobruisk some of the columns which by-passed the city to the west increased their journey by as much as one-third the distance in order to escape broken ground of this nature.

*Russian *Stormovik* armored aircraft were employed for tasks of this nature.

The June offensive brought rich results to the Red Armies. Vitebsk, at the northern end of the *"Panther Line,"* fell two days before Orsha. Slutsk, the next important communications center after Bobruisk, fell on June 30th. Converging columns took Minsk on July 3rd. Brest-Litovsk was finally captured on July 28th and the northern and southern fronts, now in line, made contact west of the Pripet Marshes.

The fact that the four key points of the *"Panther Line,"* Vitebsk, Orsha, Mogilev and Bobruisk, could be taken in so short a time may appear strange in view of the German efforts at defense. Physically the defenses were undoubtedly very powerful. But two factors played against the Germans. The first was the knowledge that the *"Panther Line"* represented in fact the apex of an immense German salient, whose right rear, over three hundred and fifty miles to the southwest, was already threatened by the Soviet advances in Poland. With the Red Army knocking at Germany's front door, the troops holding a defense line miles away in Russia could not help but feel that they were wasting their time. Furthermore, although the lines of trenches were prepared and the obstacles erected, the manpower of the defenders was sadly deficient. To speak of "divisions" is misleading, for the German division was a unit much understrength in 1944.

The second factor in the rapid penetration of the *"Panther Line"* is a corollary of the first. As the German forces grew weaker the Russian grew so much stronger. Battle-trained men and fresh recruits were pressed forward in hundreds to fill the Russian establishments. Also the situation with regard to equipment was easing rapidly, as more and more material was delivered to the Army commanders from the three sources of supply—the Russian factories, the Western Allies and the captured German depots.

(To be concluded)

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. . . The Field Marshal (von Schlieffen) . . . always endeavored . . . to keep alive in the General Staff and thus in the army at large, the idea of a war of annihilation. . . . Hence in his writings he often attributes his own ideas to the leaders of the past—among them Moltke—when he wishes to prove that to achieve a decisive victory of annihilation, *outflanking*—preferably from two or three sides—must be resorted to as Hannibal did at Cannae. Modern battles, Count Schlieffen characterizes even more than earlier battles as a "struggle" for the "flanks." . . . Except for Tannenberg, a real Cannae did not occur in the World War. That one did not occur in the West at the beginning of the war is the fault, in the first instance, of the Supreme Command. Indeed, it was the Schlieffen Plan on which our operations were based, yet in their actual execution it was departed from. His constant exhortation to make the right flank as strong as possible was not heeded.—BARON VON FREYTAG-LORINGHAVEN, General of Infantry, German Army, 1925.

Armored Task Forces*

*by Lieutenant Colonel Patrick H. Tansey, Jr.***

THIS article is not an attempt to justify the use, formations and tactics of armor as employed in the European Theater of Operations, but to present in general a clear idea of one way the armored divisions actually fought through France, Belgium, and Germany. Before we start, let us first of all understand the meaning of the term "Armored Task Forces."

Normally the combat commands of the armored divisions were divided into two or three small forces of combined arms—these were called task forces. The combat elements of an armored division consisted of three tank battalions, three armored infantry battalions, three armored field artillery battalions, one armored reconnaissance squadron, one armored engineer battalion, plus the normal attachments of one tank destroyer battalion, and one antiaircraft automatic weapons battalion self propelled, plus attached field artillery varying from one battalion to a group.

The armored divisions were normally subdivided into three equal combat commands. The average combat command was composed of a headquarters and headquarters company, combat command; one tank battalion; one armored infantry battalion; one armored field artillery battalion, either attached or in direct support; one armored engineer company; one tank destroyer company; and one battery, antiaircraft artillery automatic weapons, self-propelled.

Most of the thirteen light armored divisions in the European Theater of Operations (2d and 3d Armored Divisions under T/O&E 17, 1 March 1942 are considered heavy armored divisions) normally used the following type of task force organization at one time or another. The combat command (CC) was divided into two task forces (TF). The remainder of the tank destroyer and armored engineer companies, and the entire antiaircraft automatic weapons battery composed the combat command reserve. The armored field artillery battalion was placed in direct support of both task forces. We see that TF 1 was heavy in tanks, having two medium tank companies to one armored infantry company. TF 2, on the other hand, was heavy in infantry, having two armored infantry companies to only one medium tank company.

TF1[1]	*TF2*[2]
TK Bn (-1 Med Tk Co)	Armd Inf Bn (-1 Armd Inf Co)
1 Co Armd Inf	1 Med Tk Co
1 TD Plat	1 TD Plat
1 Armd Engr Plat	1 Armd Engr Plat

[1]This TF is commanded by the CO of the Tank Battalion.
[2]This TF is commanded by the CO of the Armored Infantry Battalion.

The fact that these task forces were unbalanced was a disadvantage since the CC commander seldom knew what type of resistance he would encounter in his zone of action before he committed his TFs to specific routes. Often he discovered that it would have been better to have had these TFs switched, but by the time that information was known it was too late to make the change. An equal proportion of tank platoons to infantry platoons would have been more desirable, but could not be obtained without splitting front-line companies, which proved unfeasible due to administrative difficulties. The big advantage that this task force possessed was the fact that it contained all the combat arms in sufficient proportion under a definite commander, a battalion commander who had the necessary staff, communication, supply and administrative facilities from his own battalion headquarters to assist him in maintaining control.

The organization of the armored division into task forces proved itself to be especially adapted for pursuit when the terrain and roadnet permitted. Armored divisions with two combat commands abreast—each having two task forces abreast—can cover wide fronts, the distance between the task forces being limited to the range of the artillery in support. This means that the division, marching on four routes, is provided great flexibility in being able to bypass strong resistance encountered on any one route.

The march formations of armored task forces were organized as follows:

TF 1		*TF 2*	
Advance Guard	*1 Med Tk Co 1 Armd Inf Plat Assault Gun Plat (Tk Bn) 1 Armd Engr Plat	Advance Guard	*1 Armd Inf Co 1 Med Tk Plat Assault Gun Plat (Armd Inf Bn) 1 Armd Engr Plat
Flank Guard	1 L Tk Co	Flank Guard	MG Plat (Armd Inf Bn) Rcn Plat (Armd Inf Bn)
Main Body	*Hq & Hq Co (-) Tk Bn *Med Tk Co Armd Inf Co (-) TD Plat Medical Det Maint	Main Body	*Hq & Hq Co (-) (Armd Inf Bn) *Armd Inf Co Med Tk Co (-) TD Plat Medical Det Maint

*Artillery Forward Observers Accompanied.

*Military Review.
**Instructor, Command and Staff College.

Now let us look at the advance guards since most of the fighting was done by them. We see that it is commanded by a company commander whose company is the main fighting force—either tank or armored infantry. There is a platoon of tanks or infantry to work with this company. The point usually is a platoon of tanks and a platoon of armored infantry. The advance guard commander has an artillery forward observer with him. The 105mm assault gun platoon is with the advance guard to assist in eliminating road blocks by direct fire. An engineer platoon is with the advance guard for the same purpose—to eliminate road blocks by direct action, that is, to clear minefields and booby-trapped road blocks as rapidly as possible, and to assist in bypassing small blown bridges by selecting, improving, and maintaining fords. Having these attachments well forward with the advance guards saves a great deal of time, and enables the armored columns to keep hot on the enemy's heels. As in all advance guard action, these task force advance guards were committed rapidly and aggressively. Usually when the main body was committed it too was employed with speed—many times directly from march column.

As far as can be determined by the author from after action reports of the armored divisions operating in the ETO, the assistance which the task forces gave one another was indirect rather than direct in most cases. By this I mean that if TF 1 of a combat command was stopped by strong enemy resistance and TF 2 managed to get through, then it kept driving forward, usually causing the resistance in front of TF 1 to withdraw by the mere threat of TF 2's location. There was another reason for indirect rather than direct support—this was the air support provided for the armored columns by the Tactical Air Command. If a TF was stopped by strong resistance, an air strike or two on the enemy position would jolt him sufficiently to enable the TF to continue forward. It is difficult enough to coördinate an air strike without having to worry about a friendly column coming into the target area from the enemy's rear or flank. Besides, it is faster to get a strike than to have a column change direction and get set for a coordinated attack.

Let me quote an historical account of a fine example of efficient task force operation by the 6th Armored Division in pursuit operations.

"During the drive into Central Germany the 6th Armored Division was directed to seize Mühlhausen, a city of thirty thousand inhabitants.

"On the night of 3-4 April 1945 one bridge over the Werra River was captured intact. The division crossed on this bridge, Combat Command 'B' leading, followed without distance by Combat Command 'A.' Vehicles were crossed without distance as enemy air was not active and speed was necessary. The flow of traffic over the bridge was never halted.

"CC 'A' was ordered to close in on the city from the north and northwest, CC 'B' ordered to close on the city from the south and southwest. A hasty reconnaissance was made by combat commanders and their task force commanders. Each of the combat commands had three task forces. Under CC 'A' were Task Forces 15, 68 and 9; under CC 'B' were Task Forces 50, 69 and 44. The tables below show the composition of these Task Forces.

"CC 'B' assembled near Heverode, CC 'A' southwest of Eigenrieden. (See Sketch) Both commands started the encirclement of Mühlhausen simultaneously.

"Opposition was light. Small forces of enemy infantry were cleared up from the small towns adjacent to Mühlhausen. Antitank fire was encountered by TF 15 in Bickenriede and in Dachrieden and was quickly overcome. TF 15 and TF 69 both bypassed Mühlhausen as if to continue east, then TF 15 turned south, then west, and blocked all eastern exits of the city. Meanwhile TF 69 drove past the city and blocked from the north and east. By dusk all task forces were in position as shown on sketch, and held Mühlhausen in a vise-like grip. The division commander decided that the attack to clear the city would be launched at 0700, 5 April 1945. All artillery was emplaced so as to give support if heavy resistance was encountered. All task forces held in place except TF 9 and TF 50, which drove into the city. Sporadic street fighting was encountered. Some three or four hundred prisoners were taken in the town, whereas some twelve hundred were gathered in by TF 15 as they tried to flee eastward.

CC "A"

TF 15	*TF 68*	*TF 9*
15 Tk Bn (-1 Med Co)	68 Tk Bn (-1 Med Co & 1 Lt Co)	9 Armd Inf Bn (-1 Co)
Armd Inf Co	Armd Inf Co	Med Tk Co
TD Plat	TD Plat	TD Plat
Armd Engr Plat	Armd Engr Plat	Armd Engr Plat
212 Armd FA Bn		274 Armd FA Bn

CC "B"

TF 50	*TF 69*	*TF 44*
50th Armd Inf Bn (-1 Co)	69th Tk Bn (-1 Med Co)	44th Armd Inf Bn (-1 Co)
Med Tk Co	Armd Inf Co	Med Tk Co
TD Plat	TD Plat	TD Plat
Armd Engr Plat	Armd Engr Plat	Armd Engr Plat
231 Armd FA Bn	128 Armd FA Bn	

"The city was cleared by 0930, 5 April 1945, with a minimum of losses. The enemy troops were well equipped and had excellent morale. It was learned upon questioning the German officers that the rapid encirclement had completely disrupted their plan of defense; thus the quick capitulation of the entire garrison."

Amphibious Reconnaissance

by First Lieutenant Robert R. Nelson, Jr.*

Information gained by a patrol—even though the mission cannot be completed—is many times of great importance to its own as well as to other units.

FINAL preparations had been made by XX Corps to cross the Rhine River in the vicinity of Mainz on the night of March 27-28, 1945. The XX Corps had been assigned a sector of the Rhine from Eltville to the confluence of the Rhine and Main Rivers.

The initial crossing of the Rhine by Third Army troops had been made on the night of March 22-23, in the vicinity of Oppeheim by XII Corps. On March 25, the VIII Corps crossed the Rhine at Boppard and then on March 26, the same Corps crossed again at Oberwesel.

Because of these crossings, as well as the crossings that had been made at Remagen by the First U.S. Army and at Wesel by the 21st Army Group, the Rhine River no longer possessed any strategic importance to the Germans.

Nevertheless, to the infantrymen of the XX Corps, who were to cross in the vicinity of Mainz, the river still constituted a formidable tactical barrier. Where the crossing was to be made, the Rhine reaches one of its widest points, with a water gap of nearly 2,000 feet. The current in this sector averages 2.39 miles per hour and attains a speed of 5.80 miles per hour at highest navigable levels. Cover on the German side of the Rhine was fairly good, so the chief obstacle was the river's width.

Intelligence reports indicated that one regular German divisional unit (about 7,000 troops) was located on the immediate front of the Corps.

Although the VIII and XII Corps had already established bridgeheads across the Rhine on both flanks of the XX Corps, an additional crossing was necessary to gain possession of the Mainz-Wiesbaden-Frankfurt roadnet. The Third U.S. Army at the time enjoyed a considerable numerical superiority over the enemy, and it could thus continue its rapid advance beyond the Rhine.

The 80th Infantry Division, with the 16th Cavalry Reconnaissance Group attached was ordered to make the Rhine crossing. The Division planned to send the 317th Infantry across the Rhine at Mainz, passing just south of St. Peter's Island. The main assault forces were to land at the northwest outskirts of Kastel.

On March 26, 1945, each reconnaissance troop of the 16th Cavalry Reconnaissance Squadron, Mechanized, was ordered to send one patrol across the Rhine that night on the following missions, for the 80th Division.

1. Send patrol across the river for bridge crossing information. Patrols to return at 0300, March 27.
2. Essential elements of the information desired:
   a. Can patrols cross the river and land undetected.
   b. Is there enemy within a 500-yard semicircle of the patrol's landing site.
   c. What is the location or direction of movement, strength, disposition, and composition of enemy encountered.

Plans of the patrol called for the use of a reconnaissance platoon's regular rubber boat, which will hold three men and a little additional equipment. It was decided that each of the three men would carry a pistol and a submachine gun. One SCR Radio, netted with troop headquarters, was also taken along.

Because little time was available, the patrol moved into the 3d Platoon's OP on the river for a hurried view of the opposite shore. The OP was in a three-story railroad bridge tower, the height of which gave the patrol good observation of the opposite shore, the town of Biebrich, and the two islands in Troop C's zone.

The writer, who led this three-man patrol from Troop C, decided to let the rubber boat drift downstream be-

*Cavalry School Student.

tween the two islands and land in a wooded area at the west end of the town. No enemy activity had been observed on St. Peter's Island, but foxholes were visible. Rettberg Island, however, was alive with enemy activity.

The patrol planned to leave from a point about 50 yards up the river from the railroad tower OP, on the right flank of Troop C's zone. A church overlooking the river from the center of Biebrich was selected as the patrol's objective. The patrol was to move around through the town, stop at the church, and then move back to the rubber boat in the woods.

Arrangements were made with Troop A for the patrol to land in the 2d Platoon's area at Budenheim upon the patrol's return at about 0300 hours on the morning of March 27, 1945.

Much enemy activity was observed on the German side of the Rhine, and it was assumed that if a landing was successful it would soon become too hot for the patrol to stay. Machine-gun nests were spotted along the banks at 50-yard intervals, and many enemy were seen moving about. Because of American crossings on both flanks in the XX Corps Zone, artillery fire could not be requested. However, the 1st and 3d Platoons of Troop C were in position to support the patrol with .30 and .50 caliber machine guns, 37s, and 60 and 81mm mortars.

Members of the patrol wore wool knit caps and sweaters and each man carried an extra magazine of SMG ammunition, which was taped to the magazine loaded in the gun, and also two extra pistol clips. In addition each soldier had three hand grenades, hung from belts—one each of fragmentation, white phosphorus, and concussion types. After study of the ground, maps, and aerial photos in which dangerous localities were noted and orientation check points selected, the patrol checked equipment and made final preparations for the departure.

At 2000 hours the patrol was ready to "jump-off." After waiting an hour for darkness and seeing that a bright moon was rising, it was decided to make the crossing early before the moon rose too high. The patrol wanted also to take advantage of the evening mist which was settling over the river and masking some of the moon's brightness.

The patrol pushed off at 2100 hours. Each patrol member had a boat paddle which was used for slowing speed and steering. Paddling was too noisy.

Reconnaissance boats are oval in shape and flat-bottomed, which make them difficult to handle because of their spinning. The patrol made its way to a point between the two islands where it stopped and listened. The current was less strong here. Activity was heard in Biebrich and also in the wooded area west of the town, which had been chosen as the original landing point. A new landing point directly in front of the patrol's present position between the two islands was selected, where all was quiet.

When the patrol was within 20 feet of the new landing site it spotted a sentry walking on the road just above the river bank. This changed plans, and the boat was allowed to drift downstream.

When the patrol reached a point opposite to the church in Biebrich, two or three boats anchored off shore were found. It was decided to drift in to the three boats, tie up the patrol's boat to the German boats, and swim ashore. But, when the patrol was within an arm's reach of the newly discovered boats a German sentry appeared and called out to the patrol. The patrol froze into position and let its boat continue to drift downstream. The German sentry failed to take any action.

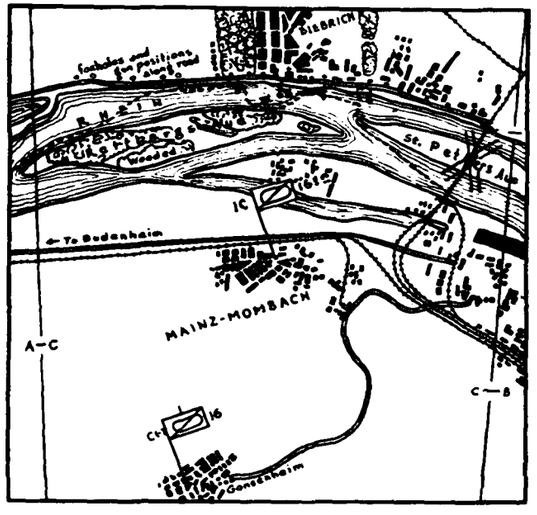
Just after this a German boat was observed being paddled down the river. It came to within 30 feet of the patrol's boat but the river mist was heavy at the time and the Germans failed to see the patrol.

It apparently was impossible to land on the German side of the river, and so the patrol returned, landing on its own shore at 0030, March 27, 1945.

The patrol in three hours and 30 minutes had located several machine-gun positions, enemy positions on the two islands, and enemy positions on the German side of the Rhine.

One difficulty the patrol experienced was due to its lack of experience with rubber reconnaissance boats. It therefore had trouble maintaining a straight course and keeping the boat from spinning. The boat itself is clumsy and hard to paddle, and it rides so low in the water under a load that it ships water. However, the boat is easy to inflate and deflate and is light though cumbersome.

Although the patrol did not make a landing, the information it obtained proved to be of great value to the 16th Cavalry Reconnaissance Squadron and the 80th Division, when they crossed the Rhine the following night.



Armored School Extension Courses

*by 1st Lieutenant Olin C. Harrison**

ARMY extension courses are slated to play an important part in the postwar education of reserve officers. The Armored School at Fort Knox, Kentucky, has announced that it is already accepting applications for enrollment in its courses.

These courses are of particular interest to reserve officers in the Armored and Cavalry branches, since satisfactory completion of a prescribed series of extension sub-courses will be a requisite for their promotion.

Carefully selected officers at The Armored School are being assigned to write, edit and grade the various extension courses. These courses will cover everything from basic military instruction in the 10-series course, to combat command operations and staff functions in the 50-series course.

The courses will be available to all ranks up to and including majors. However, only the first five of the 50-series course, for majors, will be administered by The Armored School. All sub-courses after the first five are the responsibility of the Command and Staff College at Fort Leavenworth, Kansas.

Established by army regulations, the Extension Course Department of The Armored School has been in operation since July 30, 1946. The department is composed of four divisions: an editorial division, which works with other School departments in preparing sub-courses; an operations division, which processes applications and disseminates sub-courses to students; an instructor division, which grades students' solutions; and an administrative division, which maintains the necessary records.

The regular instructional departments of the School —Tactics, Weapons, Automotive, Communications, and General Instruction—do the actual compiling and writing of the courses.

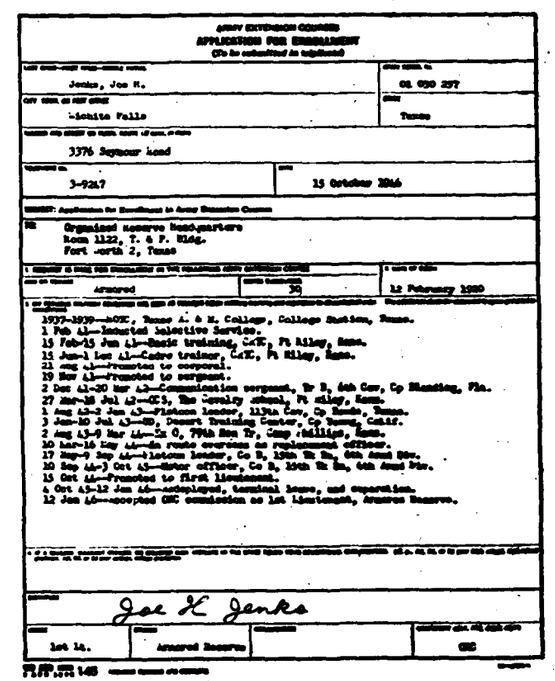
Every officer who works on extension courses at The Armored School must have combat experience. The School commandant and all department directors concerned exercise close supervision over all courses.

Following is a typical case in the preparation of a 30-series subject: Tactics of the Tank Company.

The Director of the Tactics Department first selects an officer to write the course who commanded a tank company in combat for several months and later was a battalion S-3 in action.

First, the officer selected studies all the field manuals, technical manuals, and other publications relating to his subject. Then he prepares a detailed outline of the entire sub-course, including the scope of each lesson and the tactical principles involved. This outline is presented at a conference attended by his division chief and department director. By the end of the conference the outline is thoroughly formulated and ready for expansion into a sub-course.

The officer then writes the course, including the lesson being considered in this article. He stresses practical work based on the text assignments available, putting hypothetical situations and requiring students to work out the solutions to those problems. He will probably include an overprinted map to be used by the student in working out the solutions.


ARMY EXTENSION COURSES
APPLICATION FOR ENROLLMENT
(To be submitted in triplicate)

Jenks, Joe H. — 01 030 297
Wichita Falls — Texas
3376 Seymour Road
3-9247 — 15 October 1946
Subject: Application for Enrollment in Army Extension Courses
To: Organized Reserve Headquarters, Room 1122, T. & P. Bldg., Fort Worth 2, Texas
Armored — 30 — 12 February 1920

1937-1939—ROTC, Texas A. & M. College, College Station, Texas.
1 Feb 41—Inducted Selective Service.
15 Feb-15 Jun 41—Basic training, CAC, Ft Riley, Kans.
15 Jun-1 Nov 41—Cadre trainer, CAC, Ft Riley, Kans.
21 Aug 41—Promoted to corporal.
19 Nov 41—Promoted to sergeant.
2 Dec 41-20 Mar 42—Communication sergeant, Hr B, 6th Cav, Cp Blanding, Fla.
27 Mar-18 Jul 42—OCS, The Cavalry School, Ft Riley, Kans.
1 Aug 42-2 Jan 43—Platoon leader, 113th Cav, Cp Hulen, Texas.
3 Jan-10 Jul 43—RD, Desert Training Center, Cp Young, Calif.
2 Aug 43-9 Mar 44—Co C, 79th Rcn Tr, Camp Phillips, Kans.
10 Mar-16 May 44—En route overseas as replacement officer.
17 May-9 Sep 44—Platoon leader, Co B, 15th Tk Bn, 6th Armd Div.
10 Sep 44-3 Oct 45—Motor officer, Co B, 15th Tk Bn, 6th Armd Div.
15 Oct 44—Promoted to first lieutenant.
4 Oct 45-12 Jan 46—Redeployed, terminal leave, and separation.
12 Jan 46—Accepted ORC commission as 1st Lieutenant, Armored Reserve.

Joe H. Jenks
1st Lt. — Armored Reserve — 030

*Armored School Extension Course Editor.

The next step in the preparation of the lesson is to test it out. The officer, who is preparing the course, arranges for several lieutenants from other departments to be detailed to him for this phase, and the lesson is submitted to them. The lieutenants endeavor to solve the lesson and their solutions are carefully studied. If several miss a requirement, the author of the course assumes that the requirement is either too difficult or else it is not clearly presented to the student.

The necessary changes are made and the lesson is then ready for presentation to a board of officers who will make the final decision. This board (sometimes called the "Murder Board") takes the lesson apart word by word. The board may approve the lesson with or without changes, or direct that it be rewritten.

An editing officer is available to the author of each course for consultation at any time on questions of format and syntax. Then the course is written up in its final form and turned over to an editing officer for a final check.

The lesson is then forwarded to Headquarters Army Ground Forces for final approval. When AGF gives its final O.K. it is ready for distribution to students.

To enroll for extension courses the student is required to fill out WD AGO Form 145, which can be secured from the local Reserve Headquarters.

When the enrollment blank has been submitted and approved, the student receives the first lesson of the sub-course he is enrolled for. The lesson material includes a lesson assignment sheet, which gives the text assignments; materials required, and any other information necessary to prepare the student for solving the lesson requirements. It also includes an answer sheet, which gives the requirements and provides space for the student to write his answers.

When the solution sheets are returned, they are given to an officer who grades them. His job is relatively easy if the requirements are true-false, multiple-choice, or word-completion type. A map problem, or a requirement which necessitates a detailed explanation, is a different matter.

The grading officer does not guess how much to cut if an answer is either wholly or partly wrong. At the time the lesson is prepared, a cut sheet is also made which tells the grading officer just how many points to deduct for each error or omission.

When the lesson is returned to the student a comment sheet is attached. For example, let us assume that the student made an error in the route of advance to an objective. The comment sheet would state that the route of advance was too long, or too exposed, or whatever else was wrong. The solution would show the route which should have been chosen.

The school solutions are not considered to be ironclad. The grading officer has instructions to consider all solutions carefully. If the student hits on a satisfactory solution, or if he follows sound reasoning and proves it by his answer, the student will receive partial credit regardless of the school solution. If the school solution is deemed to be the best of the several possible answers, the solution sheet will include a discussion of the problem, with reasons why the school solution is considered the best. Furthermore, each item of the school solution includes a text reference supporting the answer given.

The extension courses offered by The Armored School are:

The 10-series of sub-courses designed for warrant officers, enlisted men, and qualified civilians. It includes sub-courses pertaining to general military instruction on such subjects as organization of the armed forces, drill and physical training, interior guard duty, first aid, military law, individual weapons, and basic administration.

The 20-series is designed for second lieutenants, and includes such subjects as methods of instruction, tank gunnery, mines and booby traps, mess management, and tank platoon in combat.

The 30-series, for first lieutenants, includes tank company combat supply, tank company in combat, armored infantry company in combat, troop movement and bivouac, terrain evaluation, and training management.

The 40-series, for captains, teaches such subjects as military government, tank battalion in combat, staff functions in the tank battalion, armored infantry battalion in combat, the armored engineer battalion, and the mechanized cavalry reconnaissance squadron.

The 50-series, for majors, is administered only in part by The Armored School, all sub-courses after the first five being the responsibility of the Command and Staff College. The sub-courses administered by The Armored School cover combat command operations, staff functions, and armored amphibious operations.

EXTENSION COURSE OF THE ARMORED SCHOOL

LESSON ASSIGNMENT SHEET

SUBCOURSE 30-2 ..... Training management
LESSON 3 ..... Preparation of applications tactical exercises
CREDIT 2
TEXT ASSIGNMENT ..... FM 21 5 pars 104 121
FM 17 30 pars 31-37 appendix 1
MATERIALS REQUIRED ..... Sketch map training area X
LESSON OBJECTIVE ..... This lesson is designed to illustrate principles involved in developing a tactical exercise

SUGGESTIONS

Study FM 17 30 pars 31 37 for principles of the attack Use the attached sketch map for your terrain study

EXERCISES

1. Situation. a. This lesson is a continuation of the situation in Lessons 1 and 2.

b. Your company entered the unit training phase today 5 July You have just received a training memorandum from battalion headquarters, directing you to prepare a tactical exercise on the tank platoon operating with an infantry company in the attack, illustrating the following principles

(1) Battle reconnaissance
(2) Initial orders and dispositions
(3) Fire and maneuver
(4) Assault of the position including reorganization

The exercise is to be conducted in Training Area "X" (see sketch map)

2. FIRST REQUIREMENT See answer sheet

3. SECOND REQUIREMENT See answer sheet

Christmas Greeting from General Devers

To All Members of the Army Ground Forces:

On the eve of this Christmas season I extend my sincere and hearty greetings to you all.

We regard the New Year with cheer and confidence; dedicating ourselves to the high resolve of preserving our priceless liberty, that "Peace on Earth; Good Will to Men" may become a reality for all time.

JACOB L. DEVERS,
General, USA,
Commanding.

New Ground General School

THE Cavalry School, as a name, passed into history on October 31. In keeping with the announced War Department plans the Army school at Fort Riley becomes The Ground General School Center, teaching several different courses. The new school center will receive its initial impetus from the assets passed on to it by The Cavalry School. These assets are: a complete instructional plant, a going concern of proven efficiency, the spirit and cooperation that made an outstanding record possible. The success of the new school is assured for it begins operations with all of the "know how" The Cavalry School has assembled over the years.

The first beginnings of The Cavalry School, The Cavalry and Light Artillery School, was established in 1887. This was replaced in 1907 by the Mounted Service School. The Cavalry School, as it is known today, succeeded the combined school on September 19, 1919. Many of our Nation's great soldiers have either studied or taught at this famous school. To mention a few: Pershing, MacArthur, Wood, Lear, Patton, Wainwright and Craig.

The old school has performed its mission well. In World War II, five and six-tenths per cent of all General officers had Cavalry backgrounds. This fact is remarkable for of the total officer corps of the United States Army, only one and two-tenths per cent were Cavalry officers.

The Armored Cavalry subjects taught by The Cavalry School will be transferred to Fort Knox, Kentucky, where they will be incorporated into the Armored School. This is in line with the announcement revealed at the Dedication of Patton Hall at Fort Riley on April 4, this year, by Secretary of War Robert P. Patterson, that the historic Cavalry and the comparatively new Armored Force will be merged into a single arm to be known as the "Armored-Cavalry" in recognition of the new developments during World War II.

It is the desire of the War Department to keep alive the art of horsemanship. Gen. Jacob L. Devers, in the press conference held at Fort Riley last April, declared, "Certainly the horse won't be what it was before the war. It will be used as a training instrument for officers. I feel that we have to train officers along those lines—if for no other reason than to keep our hand in. Pack transportation has demonstrated its necessity many times. If we are going on missions where we may not be able to choose the terrain, the art of horsemanship may be extremely important again. This was proven in the late war."

To implement this policy, the new Ground General School will maintain a Department of Horsemanship. This department will continue to teach a very small number of selected officers advanced and intermediate horsemanship and packing. These courses will give the Army a small core of trained horsemen that may in some future time be the key to a critical situation in difficult terrain. In addition to the horsemanship courses there will be taught two enlisted courses—one, the Horseshoers Pack and the other, the Saddlers Pack; thus keeping for the Army two highly skilled arts on which animal transport is vitally dependent.

The new Ground General School will be charged with the task of training, each year, the entire graduating class of West Point. The graduates will be trained in the specific duties from a lieutenant in the Army to a battalion commander. This will be in addition to their general education at the U.S.M.A. and their indoctrination with the traditional officer philosophy of "Duty, Honor, and Country."

In addition to the Military Academy graduates, Reserve and National Guard Officers and graduates of the Army Officer Candidate Course, who have been integrated into the Regular Army, will be assembled at Fort Riley for further instruction and indoctrination before being assigned to duty. These functions of the new school are known as the "Basic Course."

The Army Officer Candidate Course, presently located at Fort Benning, will be transferred to the Ground General School which will qualify or reject all of the officer candidates for the entire Army. The course will be branch immaterial; the candidates who successfully complete the course will receive their basic branch training at their respective schools. It is planned to graduate two classes a year.

The present Intelligence School will become the Intelligence Department of the Ground General School and will be considerably enlarged. There is no contemplated change in the courses as presently taught by the Intelligence School, which are: Officers' Intelligence Course, for the officer students; the Photo Interpreters and the Order of Battle-Interrogators Courses which are for enlisted specialists. The department will be charged with the instruction of all Intelligence Subjects taught by the Ground General School.

After World War I Cavalry was a relatively obscure arm and received little public notice. Because American Cavalry failed to participate as Cavalry to any extent in World War I, the public paid little heed to the magnificent accomplishments of the Cavalry of the other Allies as well as that of our enemy, Germany. American Cavalry after World War I was led by an aggressive group of leaders with vision and foresight. They incorporated into the Cavalry weapons which tended to greatly increase the fire power of the arm and also incorporated motor vehicles to increase the mobility of the arm. Gradually the Cavalry developed an entirely mechanized force which was the forerunner of our Armored Force. It was composed of lightly armored vehicles which were fast and had great cross-country mobility and by the gradual incorporation of other arms, such as Field Artillery and Engineers, produced a balanced mechanized striking force whose missions were the same as those performed by horse cavalry throughout the history of warfare; but the technique of performance of these missions was greatly changed due to the cavalry trooper being carried in a fast armored vehicle instead of on a horse.

It was the vision and foresight of the Cavalry which gave the U. S. Army the basis for the magnificent armored units, which did so much in World War II to accomplish the defeat of the Axis powers. Much of the tactics and technique of the Armored Force stemmed from the basic and advanced indoctrinations given the leaders of these armored units when they received instruction at The Cavalry School.

The transfer of activities of The Cavalry School to Fort Knox is not an act indicative of the abolition of the Cavalry function, but merely a transition and a combination entirely in line with the policy of the U. S. Army to encourage and accept changes which will keep our Army the most modern and effective for peace in the world.

Cavalry Day Dedications

FOUR cavalrymen, three of whom won the Congressional Medal of Honor and one the Distinguished Service Cross with a Cluster, for conspicuous bravery in World War II, were remembered on October 30, Cavalry Day, at Fort Riley, Kansas, when each had a Cavalry School barracks dedicated in his memory.

The barracks were named: Praeger Hall, in memory of Major Ralph B. Praeger of Claflin, Kansas; Waybur Hall, in memory of First Lieutenant David C. Waybur of Piedmont, California; McGill Hall in honor of Sergeant Troy A. McGill of Ada, Oklahoma, and Thorne Hall in memory of Corporal Horace M. Thorne of Desoto, Missouri.

Cavalry Day, selected as the anniversary of the organization of cavalry in the Continental Army on October 30, 1776, was decided upon as the most fitting time to make the dedication to these four cavalry heroes.

Major Praeger was awarded the DSC with an Oak Leaf Cluster for his command and distinguished service as a Guerrilla leader in the Philippines after the fall of Corregidor. When the Japs invaded the Philippines he was in command of Troop C, 26th Cavalry, Philippine Scouts.

Lieutenant Waybur on July 17, 1943, volunteered to lead a patrol into enemy territory in Sicily to locate an isolated Ranger unit. When trapped by four light Italian tanks he ordered his patrol, armed with one .30 caliber and two .50 caliber machine guns, to engage the enemy. With ammunition exhausted, three of his men wounded, and himself seriously hit, Lieutenant Waybur stood with his .45 caliber Thompson submachine gun in bright moonlight directly in line of the leading tank's fire and succeeded in killing the two enemy crew members with point-blank fire at 40 yards.

Sergeant McGill was awarded the Medal of Honor for heroism in action on Los Negros Island in the Admiralties, for singlehandedly standing off an attack by drink-crazed Japs on a critical key position.

Corporal Thorne won his Medal of Honor for valor during the German counterattack late in 1944. He neutralized an enemy tank by killing the occupants and forcing the supporting machine guns and bazooka team to withdraw in confusion.

Annual Meeting

The annual meeting of the United States Armored Cavalry Association will be held at the Army and Navy Club, Washington, D. C., at 8 P.M., Monday, January 27, 1947.

This meeting is held for the purpose of electing officers and for the transaction of such other business as may properly come before the meeting.

2d Armored Division Association

FORMATION of the Second Armored Division Association has been announced by Captain George M. Warren, Acting G-1 of the Division, who is handling the drive for members. The Association, which will function as a social, informative and historical agency, will have its temporary home at Camp Hood, Texas.

At the present time, pending the adoption of a constitution and by-laws, a promotion committee, whose duties are to handle everything pertaining to the Association, has been appointed.

Major General Isaac D. White, Commandant of The Cavalry School, called a meeting at Fort Riley, Kansas, for all former members of the Second Armored Division and sent to the committee the various ideas of this group as pertains to the formation of the Association.

Colonel Reddin F. Perry, a former Chief of Staff of the Division, held a similar meeting of "Hell on Wheelers" at Fort Knox, Kentucky. This group also forwarded plans and suggestions to the committee.

Names and addresses of the committee are: Lt. Col. Louis W. Correll, Hqs. 2d Armored Division; Lt. Col. Marcel F. J. Brunow, Historical Division, War Department; Major Louis M. Nawrocky, Sixth Tank Bn.; Capt. George M. Warren, Hqs. 2d Armored Division; and 1st Lt. William W. Barnett, Jr., 78th Armored Field Artillery Bn.

Mr. W. M. Kabler, former adjutant of the 17th Engineer Battalion and now a lawyer in civilian life, has been contacted and has consented to draw up a constitution and by-laws to be submitted to the promotion committee for approval.

The officers of the Association will be civilians, with their headquarters tentatively at Camp Hood, Texas. Membership will be open to anyone who has served in the Division, either overseas or in the United States.

Captain Warren is anxious to contact all former members of the Division so as to bring the address file up to date. "We do not have the present addresses of a large number of men who served overseas with the Division," Warren stated, "and the only way to insure these men of getting information on the progress of the Association and a copy of the Division History is by contacting us."

All copies of the Division History will be mailed direct from the publisher.

5th Armored Division Association

On September 11, 1946, the Fifth Armored Division Association was formally activated with appropriate ceremony in Washington, D. C. Major General Lunsford E. Oliver, wartime Division Commander, presided and the affair was attended by a dozen former members of the Division, as well as by General Devers and General Haislip. The date of September 11th was set since this commemorated the first entry of Division troops into Germany in 1944.

At the initial meeting General Oliver was elected President of the Association and Lieutenant Colonel Ressegieu appointed Acting Secretary. Former members of the Division are urged to supply home addresses and information about themselves to the following address:

Lt. Colonel F. E. Ressegieu
Research & Development Division, WDGS
The Pentagon, Washington 25, D. C.

At present the main function of the Association is to compile a roster of home addresses of as many former members of the Division as possible. At sometime in the future it is hoped to hold a meeting of representatives from different geographical areas, at which time a more permanent and elaborate organization can be created.

General Oliver recently received word that Combat Command R of the Division had been cited by the French Republic for its operations from the 14th to the 20th of September 1944 in the Wallendorf Area, Germany.

General Oliver also recently received a letter from Prince Felix of Luxembourg, who was escorted into his home city by the Fifth Armored Division. Prince Felix expressed considerable interest in the activation of the Division Association and expressed a desire to become an honorary member.

9th Armored Division Association

ACTING SECRETARY, Captain Louis Gelling, of the Ninth Armored Division Association requests that former company and battalion commanders of units in the division contact him. He is particularly anxious to obtain all available rosters of former division units. All correspondence should be addressed to Captain Gelling at: Headquarters The Armored School, Fort Knox, Kentucky.

Former members of the Ninth Armored Division should also contact Captain Gelling if they are interested in joining the association.

11th Armored Division Association

THE Eleventh Armored Division Association will hold its first National Convention next summer in Chicago. The date of the meeting has been set for August 14, 15 and 16 so that members will reunite on the fifth Anniversary of the activation of the Division in Camp Polk, La. William Lipp, former Division QM, is making an extensive search in Chicago to find the hotel best equipped to handle the Convention.

Interest in the Association is growing throughout the country, according to letters now reaching the National headquarters at 1719 K Street, N.W., Washington 6, D. C. Many of our members have expressed a keen interest and willingness to organize local chapters of the Association in towns where Division membership is strong.

Charles D. Starrett, 490 AFA Bn. of Euclid, Ohio, has offered to help form a chapter in his area. We know we can count on Bernard Schwarts of New York City and Isaac Kramer of the MPs is lining up Thunderbolt men in Boston. John Janecek of Lincoln, Neb., sent up a list of all Band members and he states that members of the Division Band are keeping in close touch with each other. In a roundup of Thunderbolt men in the town of Irwin, Pa., 12 men's names were found, who served with the Eleventh.

From such groups as these, the Association is seeking to accomplish the purpose set forth in the Constitution drawn up in Gmunden, Austria, just before the Division was disbanded. This Constitution states that the Association was formed to "foster fellowship and good will amongst members of the Division . . . to provide mutual aid and assistance and to promote the general welfare of its members."

Details of how this can be accomplished will be discussed at business meetings to be held next summer. At the same time, the agenda will include the election of officers and the submission of a permanent constitution and by-laws for the Association.

In the meantime, news of the Division will continue to appear in this column. Here are some of the latest news items:

Albert H. Buschmann, Div. HQ. of New York, just became the father of a baby girl. Don Casanova, of the Band, is singing his "Rum and Coca-Colas" in New York. He has plans that may take him on tour as far as Puerto Rico. Major Michael J. L. Greene, 41 Cav. Rcn. Sq., writes from Germany that he has met the following 11th A.D. officers, all in the U. S. Constabulary, now policing Germany—Col. Charles H. Reed, Capt. Harold Mullins, Lt. Col. Joe Ahee, Major Ralph Gray, Col. Leo B. Conner, Lt. Col. Ernest Brooch and Lt. Col. Palmer McGrew. He also saw Major Hill Blaloch and Lt. Col. George Pickett of the 1st Inf. Div.

Lt. Col. Joy R. Bogue, who G-2'd the 11th through Louisiana maneuvers, and was also Chief of Staff of amphibious operations in the Pacific, is now instructing in the Intelligence Course at Command and Staff College.

Roy Stringfellow and John Whitaker of the Division Infantry and Robert F. Jenkins of the Division Signal Company are now working in Shreveport, La.

Mrs. Elizabeth McWilliams of Darlington, Wisconsin, has asked to be put in touch with any of the buddies of her son, Kenneth P. McWilliams, who was killed in the Ardennes campaign.

The rapid growth of the Association has been especially marked during the last month. Yet membership from some of the units of the Division is noticeably lacking. This is due largely to the inability of the Association to obtain rosters of their veterans. Information is being sought especially of the names and whereabouts of former members of the 492 AFA Bn. and all companies except "A" of the 133d Ord. Maintenance Bn. We would like to have rosters of both.

We want to thank those of you who sent in your names in response to our request in the newspapers. We received over one hundred and fifty replies and we wish we could thank all of you by name in this column, but space does not permit it.

* * *

12th Armored Division Association

PROOFS of the 12th Armored Division Combat History, priced at $5.00, are expected off the presses in the near future. The book can be ordered from: 12th Armored Division Association, P.O. Box 950, Baton Rouge, Louisiana.

Temporary address of all communications pertaining to the Division Association is: J. Edward Obey, 419 West 38th Street, New York 18, New York.

Pat Harness, formerly of the 56th AI Battalion, is publishing a monthly edition of the *Hellcat News*, subscription to which is $1.00 a year. Subscriptions can be sent to Mr. Harness at: 2737 South Veitch Street, Arlington, Virginia.

The Executive Council of the Association made tentative plans at a meeting in June at Harrisburg, Pennsylvania, to hold the first convention of the Association somewhere in the East in September, 1947, which will be the fifth anniversary date of the activation of the division.

Those men who joined the Association in Heidenheim, Germany, have a valid membership until the end of 1946. Those who joined overseas and who have also purchased a membership recently are members in good standing until December 31, 1947. Those who have not renewed their membership are urged to send $1.00 to the Association at: P.O. Box 950, Baton Rouge, Louisiana.

14th Armored Division Association

FORMER members of the 14th Armored (Liberator) Division are requested to write Lieutenant Colonel J. C. Lambert, Adjutant General's School, Fort Oglethorpe, Georgia, for information about the formation of a 14th Armored Division Association.

Innumerable inquiries concerning such an organization have been received, according to Colonel Lambert. The organization has the backing of both Brigadier General Albert C. Smith, ex-major general and wartime division commander, and General Jacob L. Devers, former Sixth Army Group commander and present commander of the Army Ground Forces.

The association, according to Colonel Lambert, will be a nonprofit one and will not pledge support to any political party, religious group, or other organization of veterans. Its purpose will be to foster and preserve the comradeship and *esprit* that existed among its members during the training and combat life of the division.

The 14th Armored Division trained at Camp Chaffee, Arkansas, and Camp Campbell, Kentucky. It is credited with liberating 200,000 allied prisoners of war and 250,000 displaced persons. More than 500 of its members were killed in action and 3,000 wounded. The division was inactivated at Camp Patrick Henry, Virginia, during September, 1945.

* * *

Letters to the Editor

VETERANS' ASSOCIATION 6TH U. S. CAVALRY

Detroit 13, Michigan

October 31, 1946.

Colonel Edwin M. Sumner, Editor,

ARMORED CAVALRY JOURNAL,
1719 K Street, N. W.,
Washington 6, D. C.

Dear Sir:

Received your letter of October 25th.**

***Regarding the Veterans' Association 6th U.S. Cavalry, early in September 1946 a letter was received from Colonel T. J. Marnane in reference to the policy of the Commanding General, Fifth Army, to assist us in forming a 6th Cavalry Division Association. Needless to say, we appreciate his attitude and offer of assistance very much and we may make use of his offer.

One correction on his letter, however—we are not, and do not intend to become a division organization as that would be a misnomer. The 6th Cavalry was a regiment until January 1, 1944, at which time it was reorganized on the Group setup, therefore we will maintain our present name and title of the 6th U. S. Cavalry Veterans' Association.

One matter the ARMORED CAVALRY JOURNAL may be able to help us on, is the absorption of the 6th Cavalry Group Association, which was organized shortly after the termination of the war. It is the opinion of our Commandant that, that organization was set up because the fellows did not realize that the Veterans' Association—6th U. S. Cavalry was in existence, and had been for many years.

At present we are planning a Cavalry Round-up, or reunion for the association in Chattanooga, Tennessee, which we would like to hold early next summer, therefore if the JOURNAL can lend any assistance in the matter it will be appreciated, at least in boosting our membership.

W. R. WAGNER,
Adjutant.

FIFTH UNITED STATES CAVALRY
VETERANS' ASSOCIATION

Newcastle, Pa.

Colonel Edwin M. Sumner, Editor,

ARMORED CAVALRY JOURNAL,
1719 K Street, N. W.,
Washington 6, D. C.

Dear Colonel Sumner:

Your letter of October 29, received and its contents noted with pleasure. You request a short history of our association, but as all the historical records are in the custody of our Historian, Comrade John H. Hackett, in Savannah, Georgia, I am unable to give you any data about the regiment. But, I will try and explain our aims and objectives in a few brief remarks.

First, to inculcate the true principles of patriotism and loyalty to the United States Flag and Constitution, to cherish the true traditions of the regiment in which we had the honor to serve, to show our appreciation of the service of the officers and men who have served in time of peace or war of yesteryear. Our aim is to cultivate the true principles of fraternal comradeship, to maintain open hearts and sympathy to all within our circle and to render aid and comfort to those who are in need of assistance and to promote a feeling of true comradeship to any member of the grand old Fifth U. S. Cavalry, wherever he may be.

This preamble is very prominent at our annual meeting. Every year we who attend meet some of the boys who served in the regiment in Puerto Rico and the Philippines, and it surely brings back memories. I have met any number of comrades whom I had not seen for 44 years at these annual meetings.

Our annual meetings in the past have been well attended. Members have come from every state in the union, Cuba, Puerto Rico, and other places too numerous to mention.

I send very best wishes to you and your association, and I am in,

Comradeship,

A. B. HAID,
Commander.

What Would You Do?

*by Colonel Hamilton H. Howze**

SITUATION (See Sketch)

You are commanding a cavalry troop (proposed organization)* of a Corps Cavalry Squadron. Your troop is engaged in a pursuit, and during this day has been delayed by successive small enemy detachments. In your evaluation of the terrain, you estimate that the strongest defensive position along your entire route is the ridge ABC.

Your leading platoon split at the road fork at Y and continued forward. When the leading elements were at K and N, the left column received AT fire from Hill A and lost an armored car which is now burning briskly, as may be seen from the sketch. The remaining elements on the left fell back hastily to L, while the right took cover in the woods at M, where they could see the terrain fairly well, but no sign of enemy.

The head of the troop column is now at Q. An artillery round has just landed 200 yards left of Q. A patrol dispatched by you to P received a near miss from a shell that came in flat and hard and exploded—seeming to come from either Hill B or Hill C.

The Squadron Commander now appears at Q and accompanies you to F where you both agree that Hills E, F, and B are traversable by tanks, but A and C are tank-proof.

The Squadron Commander now says to you, "I have brought a platoon of light tanks along; they are at the tail of your column, and attached to you. You must get past this ridge and proceed along your route with the minimum delay. Your forward observer here can get the fire of all six assault guns. It is now noon. Now tell me what you are going to do."

REQUIREMENT:

Tell him. What is your plan?

***PROPOSED TROOP (Corps Cavalry)**

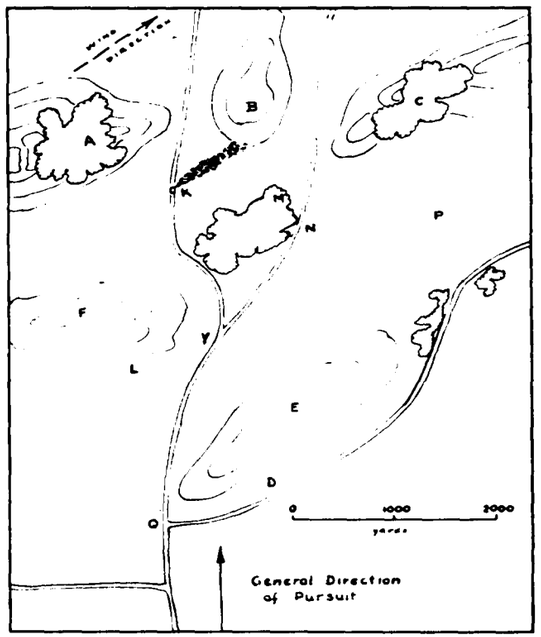
Troop Hq and Three Platoons

PROPOSED PLATOON

Two Scout cars, each of two one-quarter tons and one light tank.

Rifle Section. Two personnel carriers carrying a total of one officer and 21 riflemen besides drivers.

Support Weapon Squad. Two one-quarter tons carrying one 81mm mortar, ammunition and crew.



SOLUTION

My plan as the Troop Commander. (See sketch.)

1. I know now about as much of the enemy situation as I can reasonably expect to get without using up an inordinately great amount of additional time. I know that the enemy intends to defend both passes (on either side of B). Which he holds the strongest, or where his specific positions are, I do not know. I decide then to attack the pass where the terrain will best facilitate attack.

2. The remainder of the troop plus the attached tanks will assemble under cover just short of F, and I assemble the platoon leaders somewhere on F where I can issue them their orders. The leading platoon at this time will remain in its original position.

*Director of Instruction at Cavalry School.

3. I will instruct the forward observer as follows: "Arrange to have your guns register in on concentrations 1, 2, 3, 4, and 5, as I indicate here on your map. Report back to me within one-half hour"—and send him on his job.

4. I will instruct the platoon leaders: "We will attack to gain passage through the pass between A and B. We will not bother to reduce the pass between B and C. This plan will require us to reduce the enemy positions on A and B. The second and third platoons will attack abreast, as indicated, to take the First Objective, supported by fire by the tank platoon on F. After it is taken, the second platoon will remain in position and support the attack on the Second Objective. That attack will be made by the third platoon attacking as indicated from A, while the light tank platoon will attack directly from F to B following the general route shown. On taking the Second Objective, that area will be consolidated by the troops on it and further orders will be issued at that time.

5. "Now as to details. My plan for the progress of the attack I have divided into phases.

"*Phase 1.* Second and third platoons cross line of departure, attack First Objective. Light tanks from F shell entire area of First Objective, with particular attention to suspected enemy positions. Artillery, fire concentrations 1 and 2 for ten minutes, simultaneously; then shift to slow fire on 3 and 4, prepared to return to 1 and 2 on my order.

"*Phase 2.* When attacking troops reach line R-R, tanks will fire on First Objective above and beyond the line S-S, until ordered to stop.

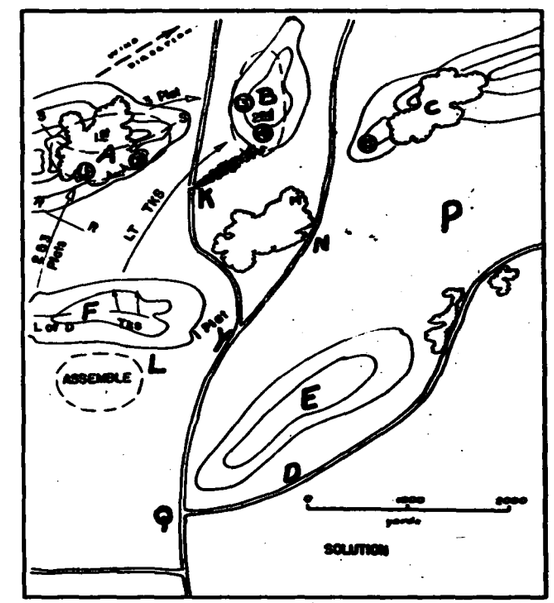
"*Phase 3.* Second platoon on First Objective occupies that position and places fire on Second Objective. It will lift that fire when endangering our own attacking elements or upon my order, whichever occurs sooner. Third platoon from First Objective as indicated, will attack Second Objective in conjunction with light tank platoon. Artillery will fire concentrations 3 and 4 until ordered lifted by me or by the F. O. Tanks will attack from hill at F along route as indicated and in conjunction with third platoon will occupy Second Objective.

"*Phase 4.* Troops on Second Objective will prepare to resist counterattack which, however, I do not expect. Do not dig in but be prepared for further movement in the general direction of pursuit. In this phase, the artillery will fire slow fire on concentration 5 unless called for for more pressing missions. The first platoon, when Second Objective is taken, will form on the road prepared for immediate pursuit to the north.

"Each of the above phases will be ordered by me.

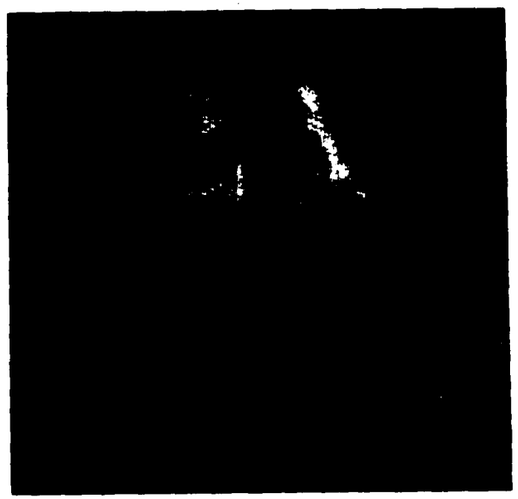
6. "I will accompany the attack of the second and third platoons. The second platoon will be on the right. Platoons will dismount their riflemen prior to crossing the line of departure. Put your quarter-ton crews right with your rifles. Have one light tank follow each rifle squad, attached to it, to be called up to render close fire support as necessary. Put your mortars under cover behind F and register in on the reverse slope of hill A. Let them fire at a slow rate throughout our attack. Be sure you are capable of stopping their fire.

7. "It is now 1300 hours. Your platoons are assembled. Issue your orders carefully. We will attack at 1400 hours."



At the same time that the African wings wheeled inward on the disorganized Roman center, Hastrubbal appeared on the Roman rear flank thus closing off all hope of retreat or escape. Thus, with this third element, Cannae became the perfect battle, a battle of annihilation. The Romans fought with the utmost bravery and acquitted themselves with honor. Their lines grew shorter. They faced outward to meet the attacks of the enemy, but the pincers closed in on them pitilessly and they were crushed. The maniples fought independently and were cut off and destroyed piecemeal. Some groups managed to cut their way out. When the Carthaginians were themselves exhausted with the massacre, they took the remaining 3,000 Romans prisoners.—EDWARD BARKLEY WILCOX, *Cannae, the Perfect Battle.*

OTHER BRANCHES



Major General Robert T. Frederick

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Merry Christmas and a Happy New Year to Other Branches from the ARMORED CAVALRY JOURNAL

"Never before in the history of arms have the requirements of warfare demanded the cooperation, coordination and mutual understanding that today's weapons and methods make necessary. The increased tempo of warfare and the greater power of weapons impose upon all soldiers the obligation to seriously endeavor to know the capabilities, limitations and problems of all branches of the armed forces. The complex organization, the intricate equipment and the high degree of specialization of a modern army preclude any man becoming an expert in all its fields. But if each in his own field is to give the greatest service, and to receive the maximum support and assistance, he must know what is expected of him and what he may expect from others. The closer we can come to thinking in terms of the whole team rather than the elements of it, the more smoothly and efficiently will the team perform when the occasion to use it arises.

"If the Armored Cavalry Journal, through its 'Other Branches' Section, stimulates a desire for knowledge and understanding of the branches other than one's own, it will perform a real and commendable service."

Robert T. Frederick

Major General, U. S. Army,
Assistant Commandant, The Artillery School,
Officer In Charge of Seacoast Branch

COAST ARTILLERY CORPS

Seacoast Artillery

*by Captain Richard P. Fullmer**

SEACOAST ARTILLERY is an effective defense of the coast. That coastal defenses are not everywhere begs the question. It has been clearly proven that wherever seacoast armament is emplaced, it is a strong deterrent to assault, even after the most intensive preparation.

Fortunately during the last conflict the seacoast defenses of the continental United States were not called on to actively engage the enemy, but in no way does this render these defenses outmoded or unnecessary. On the contrary, since these defenses represent the final barrier to any enemy water-borne landing, their importance and vitality must never be underestimated nor allowed to deteriorate.

The following examples effectively illustrate the contributions made by seacoast defenses in the destruction, detention or withdrawal of attacking naval forces.

In 1915 a combined Anglo-French Fleet tried to force the Dardanelles; Turkish seacoast defenses frustrated this effort and the Allied Armada suffered a decisive defeat. Naval forces generally regarded fortified areas with extreme caution subsequently, and in 1941, the mere existence of the harbor defenses of Manila and Pearl Harbor dissuaded the Japanese from direct assault. In 1942, Corregidor and its attached forts alone denied to the Japanese the use of captured Manila harbor facilities for five months.

The Japanese were surprised by the resistance offered at Wake Island, too. The meager Marine seacoast defenses there, consisting of six 5-inch guns, sank seven Japanese warships, including one cruiser, and damaged two more before being finally reduced and overwhelmed. Dieppe's seacoast defenses beat off a heavy Commando raid that had lost the element of surprise, and in six hours the Allied forces lost more than two-thirds of their ships and men.

The seacoast defenses of Tarawa, manned by Imperial Japanese Marines, ravaged and almost beaten flat by a murderous naval and aerial bombardment, took a cruel toll of our attacking forces. The Soviet seacoast defense of Sevastopol, besieged by land and denied all help, fought off frequent fierce, determined German assaults, and successfully repulsed the enemy for two months. The French coast artillerymen in Oran, Algeria, survived aerial and heavy naval attack. During the naval engagement, the British reported that the shore batteries were active and accurate up to 24,000 yards. In fact the major battery at Oran was never silenced. The stubborn defenses at Lorient, Saint Nazaire, Calais and Dunkirk, interfered seriously with Allied supply and sharply reduced the speed and security of the Allied advances. As these examples demonstrate, assault operations against fortified areas have always been costly.

Consider, especially, the role and value of Corregidor. In an effort to speed up the Bataan campaign, the Japanese began a series of amphibious operations at the southern tip of the Bataan peninsula. The intention was to place Japanese troops behind the embattled Americans on the peninsula, cut off their retreat, and so force a quick end to the campaign. The first Japanese landing was attempted within the range of the seacoast armament on Corregidor. The old, obsolete 12-inch mortars of the seacoast artillery smashed that amphibious attack completely. No attacks were ever launched within seacoast armament range again. From January 2, when the Japanese took Cavite just across the bay, until May 5, 1942, Corregidor was under constant aerial and artillery bombardment. One by one the smaller, unprotected, rapid-fire batteries were knocked out but the turreted and casemated large-caliber guns continued firing to the very end. It is a source of endless pride to the Coast Artillery Corps that Fort Drum's 14-inch turret battery fired its last defiant round at the Japanese only five minutes before the final surrender by General Jonathan Wainwright. This heroic resistance of Corregidor was an inspiration to the Nation.

Clearly, then, the first protection of Manila and the last resort of American troops against Japanese aggression was the seacoast artillery of the Harbor Defenses of Manila and Subic Bay.

At home, alerted seacoast defenses protected our harbors and anchorages from attack. A German submarine slipped into the harbor at Scapa Flow and torpedoed a British cruiser early in the war. Seacoast defenses on both coasts prevented this from happening to us.

Troops performed the usual seacoast mission—to deny important harbor or island facilities to the enemy. This mission, by itself, necessitates a technical and tactical organization that is highly specialized and extremely flexible. It requires personnel thoroughly indoctrinated with the tactical concepts of several combat arms, highly skilled in technical artillery services, and expediently adaptable to all eventualities. In almost every instance of determined seacoast resistance to landing assault, the artilleryman has had to be a gunner,

*Coast Artillery Corps

a combat engineer, a demolitions expert, an infantryman, and in many instances an expert in electrical, and highly intricate mechanical equipment.

A modern seacoast artillery battery is a complex unit. The combined efforts of many men are required to fire one salvo from a modern coast artillery 16-inch battery at a naval target. Some men operate or serve the pieces; others are assigned many different important duties—operation of the radar, computation of firing data, maintenance of communications, running the power plants, observation of the target and of firing, and technical maintenance of delicate equipment. Well trained crews can deliver two accurately aimed one-ton projectiles every sixty seconds; at this rate, a 16-inch battery can fire with pin-point precision twelve tons of high explosive projectiles every five minutes. Behind this firing, the complex fire control structure contains a highly skilled radar section which locates and tracks targets under any conditions of visibility and furnishes information on target location constantly to the computing section. The computing section operates an electrical data computer which converts the radar information on the present location of the target into future azimuth and elevation settings, *i.e.*, the direction and distance of the target, for the guns. These settings are electrically transmitted to the gun pointer and the elevation setter of each gun. In the majority of cases, this equipment and personnel are well protected in deep, strong, reinforced concrete emplacements.

In this impregnable self-sufficiency is rooted the tough fiber of seacoast artillery resistance to assault. All mobile seacoast batteries attempt to approximate the indomitable indestructibility of these fixed installations by digging in and preparing for the contingency of final assault.

Seacoast troops man artillery that includes 16-inch rifles, 8-inch and 6-inch guns (most of which are at present casemated), 155mm Long Toms and 90mm dual purpose guns, as well as 40mm automatic weapons. In the 90mm and 40mm classes, the seacoast troops fire antiaircraft missions in addition to their normal seaward mission.

In this respect it may be noted that, contrary to public opinion, our present seacoast matériel is not obsolete but is perfectly capable of destroying any of the present water-borne vessels of modern warfare. However, it is visualized that in the not too distant future practically all of this matériel will be replaced by guided missiles.

Coast Artillery troops also operate underwater mine defenses, including the Army Mine Planters. The submarine mines planted by the Coast Artillery are the largest and most intricate mines used by the armed forces. All of these mines are controlled electrically from shore and are a threat only to enemy vessels. When hostile vessels, surface or undersea craft, are detected in the mined areas, individual mines closest to the enemy may be set off deliberately by the shore control station, or the entire mine field may be energized so that the approach of a vessel to a mine detonates the mine.

All these normal operations of the seacoast troops, including the operation of seacoast searchlights, require long and intensive training. Added to them, however, is training for individual combat, for infantry combat, for light field engineering and field fortification, for field orientation and survey work, for demolition work, and for basic field artillery firing. In the latest war, seacoast artillerymen were hurriedly transferred into other services and arms and rapidly trained to perform the duties of their new assignments with a minimum of difficulty. Whole units were converted overnight into field artillery units, infantry replacement units, port battalions, and quartermaster units without extensive instruction. The speed with which this transformation was accomplished proved the adaptability of the seacoast soldier and the validity of this hard-won fundamental training. Coast Artillery units participated in landing operations as shore parties, infantry troops, artillery troops, military police and performed a host of other duties, sometimes with only a briefing on board the assault vessels before disembarking.

The knowledges and skills of the seacoast artillery troops were used in this latest war in so many diverse ways that the identification of seacoast troops was almost lost in the constant turmoil and stress of the struggle.

In the near future, the advent of radically new weapons will provide the attacker with means for swifter, more diversified and powerful thrusts as well as improving the accuracy and strength of the defender. Therefore the coast defender of tomorrow must be capable of rapid movement and concentration of power against any threatened point on American coasts. The Coast Artilleryman's background of proven adaptability, versatility and fundamental understanding of combat principles has prepared him well for solving the ever changing problems of coastal defense. The tested flexibility of seacoast organization and the demonstrated resilience of the seacoast soldier are good foundations on which to build now a force capable of quickly meeting and absorbing the enemy's hardest blows and so helping win the needed time for our national mobilization and organization for the counterblow. Intensive training, constant drill, endless repetition of defense exercises, minute scrutiny of methods and procedures, target practices, field maneuvers, and continuous research for the development of new and better weapons, all these will drive home to each seacoast artilleryman his ultimate purpose, to move, stand and fight.

For the present he will man the conventional seacoast artillery but with the development of new weapons, rest assured that new defenses will replace the old and the seacoast artilleryman will be ever vigilant to insure that at all times he is prepared to do his part in the defense of our country at home and on our island outposts.

VETERINARY CORPS

Veterinary Activities in World War II

*by Lieutenant Colonel William E. Jennings, V. C.**

When World War II ended in August, 1945, there were 41,600 horses and mules in the Army, of which more than 17,000 were in overseas theaters. The peak animal strength of 60,170 during the war was reached, however, on December 31, 1943. Colonel Jennings gives a thorough picture of what these animals did and how they were cared for during the war.

ARMY VETERINARIANS so closely guarded the health of animals in World War II that there was not a single epizootic among the thousands of horses, mules, war dogs and pigeons engaged in military operations. That accomplishment, through the application of modern Veterinary Medicine, including an effective program of immunization, stands unparalleled in the history of war.

And to that may be added the fact that, even if there had been a serious outbreak of disease in military animals, the veterinary service of the United States Army was effectively organized to handle it. Due in large part to the experience gained in the first world war and to research and development in the years that followed, the United States Army had organized and developed one of the best systems of veterinary service for animal care in military history, prior to the beginning of World War II.

By act of Congress, the Veterinary Corps of the United States Army was organized on June 3, 1916.

*Chief, Animal Branch, Veterinary Division, Surgeon General's Office.

In connection with the care of public animals, the veterinary service has a fourfold responsibility. First, it is charged with inspecting all animals offered for sale to the Army, to determine their physical fitness and freedom from communicable diseases. Secondly, it functions to protect the health and preserve the efficiency of those in service. Thirdly, it is also charged with the veterinary technical supervision of the Quartermaster Remount Breeding Program. Finally, when animals become unfit for military duty, yet are still serviceable for agricultural or commercial purposes, they are sold to civilians but provided only that they are certified by a veterinary officer to be free from communicable disease.

This is an important responsibility in connection with the prevention of the spread of communicable diseases among civilian-owned animals. Previous to World War I, excess Army animals were sold without regard to their state of health. As a result, such diseases as glanders, which was rare in the United States prior to that time, was spread to every county and city east of the Mississippi. It was not until the close of the

century that this highly contagious disease of equines was brought under control. In the meantime, glanders took a toll from farmers and owners of horses calculated in the hundreds of millions of dollars.

To that costly lesson in animal management, and animal disease control, were added a number of other lessons, all learned in an equally costly and in an equally unforgettable way—all prologuizing the eventual organization of a competent veterinary service. In the Spanish-American War, for example, the purchase of unfit animals was so notorious and the loss of animals at the volunteer and regular army camps was so appalling that newspapers blazoned those facts alongside shocking reports of the death of troops from filth-borne disease.

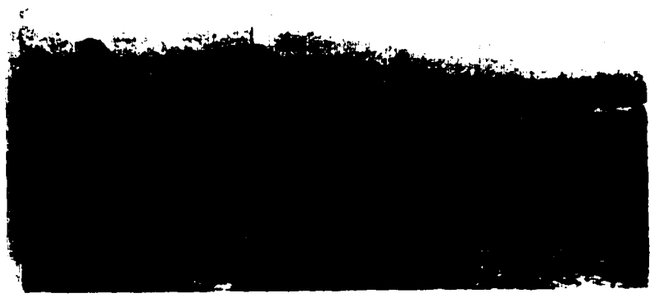
During the first world war the United States Army utilized approximately 572,000 horses and mules, of which over 191,000 were overseas. It is estimated that the combined animal strength of the Allies in that war was 750,000.

At the beginning of the period of limited emergency (September 8, 1939), the animal strength of the Army was 23,283. From that date until July 1, 1940, the animal strength remained at about the same level. On July 1, 1940, the Army embarked on a program of rapid expansion and The Quartermaster General began to procure, immediately, relatively large numbers of horses and mules. During the recent war, on December 31, 1943, the animal strength reached its peak—60,170 animals. With cessation of hostilities in August 1945, the horse and mule strength of the entire Army was 41,600, of which more than 17,000 were in overseas theaters. The above figures are for the United States Army only, and do not include many thousands belonging to Allied Armies, under American control and for which the United States Army Veterinary Corps rendered service.

On July 1, 1940, when The Quartermaster General began to procure relatively large numbers of horses and mules, construction of new veterinary hospitals and additions to existing hospitals at posts, camps, and stations in the United States, was initiated at once. The Veterinary Division, Surgeon General's Office, had anticipated that need and already had detailed plans for a group of hospital units from which complete hospitals could be constructed to accommodate the number of sick and injured animals at posts, camps, and stations. The individual units consisted of medical clinics, surgical clinics, 30-stall ward buildings, 20-stall contagious ward buildings, dispensaries, administration buildings, barracks, dipping vats and corrals. These plans proved of great value, particularly in view of the indefinite premise upon which the wartime animal strength was projected.

Pack animals were indispensable to troops fighting in Burma. A pack train is shown here carrying food, ammunition, weapons and other supplies.

Signal Corps Photo



Hospital facilities were established on a basis of 3.5 per cent of the animal strength of a command, that being the rate which experience had indicated was proper for the zone of the interior as compared with a rate for theaters of operation of from five to 12 per cent, or even higher, depending upon the extent and type of combat activities.

With the advent of motorization and mechanization, methods of evacuating animal casualties changed. The animal-drawn ambulance of World War I was discarded and the leadline, another development of that war, was used less and less for leading casualties back to treatment stations. Mobile units and detachments serving with tactical commands were not charged with care of unserviceable animals. Temporarily incapacitated animals were evacuated through a chain of specially equipped units for further treatment and hospitalization. Permanently unserviceable animals and those which were uneconomical to salvage were destroyed immediately. Provisions were also made for the quarantine and disposition of all captured and stray animals. To insure that diseases would not be spread by such animals, all were placed in quarantine for 21 days, immediately upon receipt.

In this diagrammatic chain of evacuation, veterinary detachments, attached to each regiment and to smaller independent mounted organizations, operated dispensaries or aid stations where disabled animals were collected, treated, sorted, and their disposition determined. To the rear, still in divisional area, were veterinary companies or veterinary troops which served as connecting links between the front-line installations and the Veterinary Evacuation and Veterinary Convalescent Hospitals located in the rear of the combat zone. In the zone of communications and the zone of the interior, veterinary station hospitals of 25- to 150-stall capacity provided the necessary hospitalization facilities.

In the equipment initially provided for the Veterinary Company (Separate), the motorized evacuation elements consisted of 2½-ton, 6 x 6 trucks with stock-rack bodies. Later, when cavalry porté units were organized and equipped with prime-movers and semi-trailers for transporting horses, the Veterinary Company's 6 x 6 trucks were exchanged for the cavalry's type of transportation in the interest of uniformity. Under the simulated combat conditions of the Louisiana Maneuvers, in 1940, the evacuation trailers were found to be inferior to the 6 x 6 trucks, formerly used by the veterinary companies, for cross-country use. World War II experiences further proved the worth of the 2½-ton truck with stock-rack body in getting over rough ground to evacuate sick and injured animals.

Added war experience proved and projected plans for the global war clearly indicated that animals were never to be used in large numbers for combat operations. Therefore, two large Veterinary Station Hospitals (23d and 24th), and one Veterinary General Hospital (30th), which had been organized and trained in the United States, would not be needed or utilized overseas. Accordingly, all three were inactivated and their personnel assigned to veterinary evacuation hospitals and veterinary teams which proved to be of inestimable value in rendering the necessary veterinary care for sick and injured animals. These veterinary teams were organized by War Department approved Tables of Organization, as follows: a motorized evacuation detachment of 1 officer and 10 enlisted men; one of 3 enlisted men only; a hospital detachment of 1 officer and 19 men, capable of hospitalizing 30 animals; a hospital detachment of 2 officers and 35 men, capable of hospitalizing 75 animals; an animal service detachment of 1 officer and 4 men for attachment to small mounted units, such as pack troops; and a headquarters animal service detachment of 1 officer and 2 men, to supervise three or more animal service detachments. These units performed the same functions as their larger counterparts and all of them were self-contained to render veterinary service.

In addition to the valuable service rendered by veterinary units in the care and treatment of the sick and injured animals, the United States Army Veterinary Service performed many other outstanding services in connection with animals not only for the United States Army but also for the Allies. In January 1944 the British Army sent a mission to the United States for the purpose of purchasing 2,200 mules for use by British forces. The United States Army was responsible for the care and movement of these animals to the New York Port of Embarkation. Further, as British Army veterinary personnel were not available to accompany these animals onward from New York Port of Embarkation, United States Army veterinary officers and enlisted men were assigned to each ship and charged with the professional care of the animals while en route to their destination. Only one of the 2,200 mules was lost en route to their destination—Calcutta, India. In recognition of the efficient manner in which this group of animals was assembled, cared for and shipped to their destination and the splendid condition of these animals on arrival in India, the Director of the British Army Remount Service dispatched an official communication to the Chief of Staff, U. S. Army, expressing his high regard for the invaluable assistance rendered in connection with this project.

Signal Corps Photo

With a mule safely strapped on an operating table at the 23d Veterinary Station Hospital at Fort Bliss, the table is then lowered to a horizontal position.

As a result of the long war with Japan, the Chinese Army had suffered many reverses and defeats. The veterinary service, too, had suffered severely and the animals were in a deplorable condition. To assist the veterinary service of the Chinese Army in caring for the many thousands of animals so vitally needed for the transportation of supplies to units of the Chinese Army, over 400 United States Army veterinary officers and enlisted men were assigned, in a liaison capacity, to the various units of the Chinese Army. This liaison veterinary personnel worked side-by-side with their Chinese colleagues, establishing veterinary schools, horseshoeing schools, and schools for instruction in animal management and packing. In addition to this liaison veterinary personnel, the following United States Army veterinary units were attached to the Chinese Army to assist the Chinese veterinary service in rendering veterinary care, evacuation, and treatment for all sick and injured animals: four veterinary companies (Separate), two veterinary evacuation hospitals, 28 veterinary animal service detachments. As a result, countless numbers of animals were saved which would otherwise have been lost; sick and injured animals were returned to duty, promptly; and the veterinary service of that Army was revitalized to a point not expected by even the most optimistic.

Many other equally outstanding services rendered by the United States Army veterinary service during the recent war could be mentioned. The work done by U. S. Army Veterinary Corps in Iceland in the control of diseases which were devastating the animal population in that country was of the very highest order. In the Military Governments established in Germany and Japan, and the governments established in countries which had been occupied by the enemy,

United States Army veterinary officers did outstanding work in the preventing and controlling of animal diseases which were depleting very rapidly the food supply in these countries, where acute shortage of foods of animal origin already existed. Vigorous effort against such devastating diseases as foot and mouth disease, rinderpest, surra, hog cholera, and others, through vaccination, quarantine and isolation, placed these diseases under control and prevented their further spread.

As a parallel of the service rendered by the United States Army Veterinary Service to the Chinese Army may be mentioned that furnished to the Italian Army after its defeat. The veterinary service of that army was completely disorganized when the Italians surrendered. There were thousands of valuable animals, all well-seasoned by combat, which were absolutely essential to our operations against the German Army in the rugged, mountainous terrain of Northern Italy. The Italian veterinary units were reorganized and equipped and, under United States Army veterinary supervision and direction, proved to be of most vital importance in the successful completion of that campaign.

In the transportation of animals by rail, water and air, the United States Army veterinary service played an important role and, oftttimes, the leading part. During the recent war, several thousands of United States Army animals were transported from the United States to overseas commands without a single outbreak of communicable disease occurring and with the exceedingly low mortality rate of less than 1 per cent as a result of disease and injury. Further, all animals landed at ports of debarkation in such excellent condition that theater commanders praised the splendid manner in which animals were handled while being transported overseas. Indeed, the exclusion of disease, the maintenance of a low mortality rate, and the delivery of animals at their destination in such excellent condition are all remarkable accomplishments when it is considered that animals were transported great distances, frequently being aboard ships for periods ranging from 45 to 60 or more days with much of the time spent in tropical climates.

Over 9,000 animals were moved by air from Burma to China to stem the advance of the Japanese forces on our vital air bases in China. From these bases, the U. S. Army 14th Air Force (Flying Tigers), late in the war assisted by the U. S. Army 10th Air Force which had done so superbly in assisting the ground forces in retaking Burma, sent almost daily missions to disrupt and destroy the Japanese communications, depots and transportation of supplies in that part of China occupied by the enemy and in the China Sea and those islands adjacent thereto. In the movement of these 9,000 animals, and such a movement is without precedent, not one animal was lost or incapacitated. Planes of the C-47 type were used exclusively—four animals and their equipment to each plane. Altitudes from 14,000 to 18,000 feet and in some instances 20,000 feet were necessary to clear the jagged, snow-covered peaks of the Himalayas. Four to 10 hours, depending upon the destination in China, were required to complete each flight. The U. S. Army Veterinary Service was responsible for all loading and unloading operations. The enviable record established in this movement of animals will remain a challenge for years to come.

A review of the records of 43 of the largest rail shipments of U. S. Army animals made in the United States during World War II indicated that in moving 20,000 animals in shipments averaging 465 animals each and requiring from 3 to 10 days with an average of 5½ days in transit, only 93 animals were lost. Of this number, 51 died from exhaustion and overexposure of one 8-day shipment of 370 mules in open stock cars under unusually severe weather conditions. They had been loaded originally during a freezing rain and experienced unusually cold weather throughout the entire trip and were not unloaded for feed or water during the last 32 hours of the journey.

In this instance, the stock cars had not been protected with tar paper, as is customary when shipments are made in severe weather. In another shipment of 1,091 moved from a very cold to a very warm station under rather severe conditions, 31 animals died as a result of equine influenza, complicated by overexposure and exhaustion. The above two instances were the only ones made during the war where losses of any significance occurred incident to shipping. In all shipments only two animals died as a result of injuries received during shipment. The rail shipments of animals during World War II proved again conclusively that any deviation from the accepted, time-proven practices will lead invariably to unnecessary losses—not only from the mortality standpoint but also from the standpoint of loss of condition and animal effectiveness on arrival at destination.

The remarkably low incidence of disease among U. S. Army animals during the recent war can be attributed entirely to the established system of prevention and control of communicable diseases by quarantine, isolation and vaccination against the common highly fatal diseases affecting horses and mules such as anthrax, tetanus, equine encephalomyelitis (sleeping sickness). One needs but to review the results of the widespread epizootic of equine encephalomyelitis in the United States in the summer of 1938 to be convinced of the proven value and efficacy of the U. S. Army vaccination program against this disease. Since 1939 when this program was inaugurated, only one U. S. Army animal has died as a result of this disease, which is the most serious disease affecting horses and mules in this country. Many civilian-owned animals in areas adjacent to U. S. Army posts have been affected during the past seven years and the mortality rate among affected animals has been unusually high.

The routine administration of tetanus toxoid which

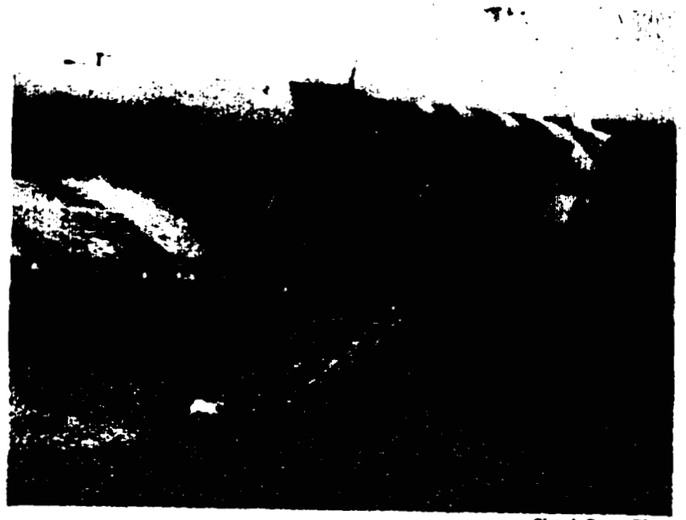
was initiated as a routine measure in 1941 has eliminated tetanus from military animals. Immunization against anthrax prevented even a single occurrence of this disease in Army animals though many animals were used in overseas areas where anthrax was prevalent.

Glanders, the scourge of all former wars, did not appear due to the rigid program of testing and prevention used by the Army since 1918. Mange and other insect-borne skin diseases were held to a minimum.

It must be remembered that during World War II, U. S. Army animals and animals belonging to our Allies were used in tropical climates and in the Orient where diseases, unknown in this country, are ever prevalent. A striking example of such a disease is surra—a blood-borne (Trypanosome) disease which is rapidly transmitted by biting insects. This disease appeared among the animals engaged in the Burma campaign. In the rear of that zone of combat a U. S. Army veterinary laboratory was established to study this disease and to test those drugs which the veterinary service in those foreign countries had accepted as being efficacious in the treatment and prevention of this debilitating disease of equines.

The U. S. Army Veterinary Research Laboratory was established at the Quartermaster Remount Depot, Front Royal, Virginia, in 1939 to study the more common diseases affecting horses and mules. At this laboratory also the toxic affect on animals of several drugs and chemicals used in this country and foreign countries in the treatment and prevention of diseases of horses and mules, have been tested. Further, viruses of several diseases obtained from clinical cases in main, have been tested to determine whether or not those viruses will remain viable in animals and whether or not animals may be a reservoir of these human viruses. The importance of these studies cannot be overemphasized. At this laboratory several important scientific investigations have been made, the economic importance of which to the livestock industry in this country cannot be measured from the monetary standpoint. The work done in that laboratory has proven conclusively that equine periodic ophthalmia (moon blindness)—a disease of world-wide distribution and known to man from time immemorial—is caused, in part, at least, by a vitamin deficiency. Riboflavin-deficient diets tend to produce this disease. There may be additional nutritional factors involved but the addition of Riboflavin in the amount of 40 milligrams daily in the feed to an animal will prevent the occurrence of this disease. The causative agent of equine influenza—a virus—was first isolated at this laboratory. Studies of this virus are continuing.

Through the application of sound principles of animal management, the use of time-proven methods in the shipment of animals, the application of the principles of modern veterinary science and the investigation of all outbreaks of contagious diseases affecting animals, the record of the U. S. Army Veterinary Corps in World War II stands unprecedented. Much credit is due to the invaluable assistance rendered by those civilian veterinarians who, seeing service in the U. S. Army, were in no small way responsible for the splendid achievements of the veterinary service of the U. S. Army during this most recent and devastating of all wars known to man.



Signal Corps Photo

An American soldier of an evacuation hospital in China unloads a horse of the 22d Chinese Division as the division was flown over the "Hump" from Burma in 1944.

ARMY AIR FORCES

Air-Ground Cooperation

by Israel Horowitz

THE problem of coordinating the efforts of ground and air units against enemy forces is intimately connected with tactical and strategic considerations. This was true in the last war and will hold true even more in any future conflict.

Strategic bombing of cities and industrial centers, with its reduction of the enemy's industrial potential and will to resist, bear directly on the type of ground operations that yield the greatest results. The isolation of battle areas by the process of interdiction has often given ground troops freedom of action otherwise unobtainable. U. S. Army Air Forces action, in close consort with combat ground troops, sped the successful culmination of campaigns.

Often it is difficult to delineate sharply between air actions of different types. They overlap both operationally and functionally; many times a single air action is of importance strategically and tactically. The classic concept of "air support of ground operation" is practically obsolete. More accurately, the interacting teamwork that brings victory on the battlefield may be described as "air-ground cooperation."

The large-scale attack at St. Lo, begun on July 25, 1944, provided one of the most spectacular examples of this type of cooperation in World War II. On that day, tons of bombs and incendiaries saturated an area 3,000 feet by 7,000 feet south of St. Lo–Periers highway. The first phase of the attack lasted two and a half hours and utilized 1,500 Fortresses and Liberators, 400 mediums and 550 fighter-bombers. The effect on German troops was devastating, casualties and shock having reduced greatly their power to resist. Enemy communications were completely disrupted.

American ground commanders lost no time in following up their advantage. They found the 14th German Paratroop Regiment, which had been holding up the American advance south of St. Lo, hard hit and largely demoralized by the bombardment. American commanders were united in agreeing that the major obstacle to their advance after the barrage was not the negligible enemy resistance. Rather it was in the difficulty of moving motorized troops over the incredibly pocked and cratered terrain.

Lead tanks, spearheading the advance, were fitted with two-way, very-high frequency radio sets. This made possible instantaneous communication between forward ground elements and the fighter-bombers ranging the skies above them. To insure that no unreasonable requests for air action were transmitted, the foremost elements of the tank columns carried qualified pilots. These grounded airmen took charge of ground direction of aircraft and advised ground commanders on the best use of air support.

In the normal prosecution of a campaign, any ground unit commander may initiate a request for air support. The request then will work its way up through normal command echelons until it reaches a command post which includes an air support party. Upon receipt of the request, the air support officer and the commander of the ground unit with which he operates immediately consult as to its practicability. Reaching agreement, they immediately forward their recommendations to the air support control.

Responsible officers at the air support control consider the request with respect to its furtherance of the general tactical plan. Special emphasis is placed by these officers on conditions affecting the successful completion of the air action. Of utmost importance in their deliberations are the number of airplanes required, the number of airplanes available for use, weather conditions along the route and at the target, and the type of bombs and ammunition required.

Data necessary for a true appraisal of the mission must be incorporated in the original request. Such data includes information detailing the type of target, its exact location and the direction and speed of its movement, if any. The location of friendly troops with respect to the target should also be included as well as the estimated time limit for effectiveness of the desired raid.

If the request is approved, it is forwarded in attack order form directly to the airfield of the supporting unit for compliance. Depending upon its state of readiness to insure success of the attack, the operational unit at the airfield takes the necessary action. The decision of the air support control, whether favorable or unfavorable, is transmitted through channels back to the ground commander who originated the request. If unfavorable, this message details the reasons which make the requested mission impossible.

As soon as the airplanes return to the field the air unit commander evaluates the results of the mission. This Intelligence and all pertinent data are reported to the air support control where the attack order originated. In addition, the ground commander, through the same channels used to route the original request,

reports the result of the mission as viewed from the ground and as affecting further ground operations. Thus, the air support control is provided with a rounded picture of the entire operation.

Since aircraft are more vulnerable and less easily replaced than artillery, only those targets not easily reached by artillery are normally assigned to supporting aviation. Air support cannot be guaranteed. It may be limited by weather, enemy action or mechanical failure.

The success of any combined air and ground operation is dependent primarily on accurate timing. Ground commanders must compute, with a high degree of accuracy, the time allowances for effective air action. Such computation, basically, includes time lapses for the transmittal of requests through channels, and for aircraft to leave the ground and reach the target area. Other conditions will vary with particular conditions.

To allow ground troops to take maximum advantage of air support and to protect them against casualties inflicted by their own aircraft, the last element of combat aviation may communicate with the ground. This communication may be either by flare or radio. The ground attack may be launched at the prearranged signal or at the expiration of a previously agreed upon time limit.

The types of missions used by tactical aviation in the support of ground troops resist all-inclusive cataloging. However, they may be said to fall into six general categories.

Combined reconnaissance bombing missions allow aircrew members the greatest latitude of action. The target is not usually detailed in advance. Rather it is developed and attacked at the initiative of the pilot.

Air attacks are conducted against enemy defensive organizations in the path of support ground forces when time does not permit the use of other attack methods. Such attacks, of particular value to mechanized and armored forces, add the fire power and moral effect of air action to ground operations, often essential to insure timely success.

Hostile ground units on the move toward a supported force are normally a remunerative bombing target. Air attacks on enemy reserves and reinforcements serve the purpose of blocking and delaying their movements, or effecting their destruction or demoralization.

Of major importance are attacks on approaching mechanized and antitank units before they gain contact with the supported forces. Often the destruction of the supply and maintenance elements of such enemy units can quickly render them impotent.

Attacks on hostile aviation serve the obvious purpose of achieving and maintaining control of the air. Supported ground forces are unable to operate with freedom unless hostile air attacks are reduced to a minimum.

In the case of operations in the support of parachute troops and other airborne units, the prime objective is to gain and hold air superiority over the contested terrain. Security must be provided for airborne troops while in transit and during landings, the periods when they are most vulnerable. Air attacks are aimed at enemy ground defenses at or near the objective until the goal of the supported unit has been attained. In addition to these targets, offensive air action is directed against enemy reserves or reinforcements that threaten the supported force.

Although no foolproof method exists which insures immunity to troops from bombardment by its own aviation, the observance of certain safeguards can keep such tragedies to a minimum. Rapid dissemination of intelligence is the most important single factor in this connection. Communication to the associated air support agency by the ground commander relative to any changes affecting the disposition of the troops in his command must be given immediate priority if such changes occur subsequent to a specific request for a support mission. Other safeguards are the thorough indoctrination and training of air and ground personnel in the visual identification of both enemy and friendly uniforms, matériel, planes, formations and signals.

Today new technical advances are being put to tactical use in increasing the sum of air-ground cooperation knowledge.

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Two companies of the 41st Infantry Battalion, a part of the Second Armored Division at Camp Hood, Texas, recently experienced *something different* from their predecessors in armored infantry basic training. Under a six-day program these companies went through a course in Air Transportability.

Each company trained for three days. The first two days they learned the technique of loading and securing their equipment into a Troop Carrier ship. On the morning of the third day they loaded the planes with a good sample of what they might carry on an actual mission—jeeps, weapons, ammunition, rations and water. Then the men donned combat equipment and parachutes and went for a short flight.

Though such training is of combat nature, it has a valid peacetime use too. These men, being air-trained, could be rapidly transported within the country in the event of disaster—flood, fire, earthquake—when they would be needed to keep order and protect property.

TANK ARMAMENT

*by the School of Tank Technology**

1. Design Procedure

THE tank-mounting designer can lay out a mounting for the gun with sighting gear and laying controls, building around them a fighting chamber with sufficient space for the crew, ammunition and other storage. He must fit this fighting chamber into the limits of weight, height and space between tracks allowed him by the general designer of the whole tank in view of transportation restrictions, and enclose it with armor of a specified thickness, in which must be fitted adequate means of outside vision.

If the mounting designer cannot get all this into a turret with all-round traverse and yet keep within the limitations of the general designer, the latter may be forced to offer the soldier a limited-traverse equipment, like the German Jagdpanther and Jagdtiger. The soldier has then to decide whether a powerful gun and thick armor are worth more tactically than 360 degrees of traverse.

2. Selection of a Tank Gun

All battle experience goes to show that infantry are the most important "arm" in any army. The destruction of the enemy infantry is the main purpose of all arms, including tanks, in our own army. Thus, for most types of tank, the enemy infantry, the defenses they hold, and their supporting artillery, are the main targets. The best type of projectile against such targets is high explosive shell.

Unfortunately, all armored vehicles are vulnerable, not only to ground antitank guns, but also to antitank guns mounted in enemy armored vehicles. Thus, the tank may be prevented from carrying out its main task, unless it can first defeat the enemy "armor." This requires an armor-piercing projectile.

Against infantry and "soft" targets, H.E. shell, even though small, will usually have some effect, whether these be direct hits or only near misses. On the other hand, against "hard" targets (i.e. tanks), only a direct hit with a suitably designed shell large enough to pierce the armor will be effective. In other words, the requirements for H.E. performance are not very critical, whereas those for armor penetration are extremely so. Thus, although H. E. firing may be the main purpose of tanks, A.P. firing will require more attention in design.

For armor penetration, the best type of projectile is the high velocity shot or shell, which depends mainly on its weight and striking velocity for effect. This necessitates a gun of caliber large enough to fire a shot of adequate weight, with a long barrel in which to develop sufficient velocity, and a large chamber in which to burn the amount of propellant required to provide the velocity. This results in a large and heavy cartridge and a cumbersome gun of short life.

For high explosive effect, one requires a shell with a large capacity for explosive filling. To get this, it is generally considered that the caliber of the gun should be at least 3 inches. If this shell is to be fired from the same gun with the same velocity as the A.P. it will have to be so thick-walled to withstand the severe firing stresses, as seriously to reduce its capacity for H.E. filling. Moreover, high velocities reduce the effectiveness of H.E. shell in several ways. For H.E. then, it is much better to use a low velocity, high capacity shell, which only requires a short gun with a small charge. This gives a small round, of which a large number can be carried in the tank, and a gun which is easy to mount in a turret and has a long life. Such a gun will, of course, be unable to fire any A.P. projectile, except hollow charge, which is inferior in accuracy and penetration.

The size of H.E. shell required is unlikely to increase much in the future because infantry can become neither more splinter resistant, nor able to make stronger foxholes! Tank armor, however, is getting thicker and thicker, so that A.P. weapons must get bigger and bigger as time goes on.

The soldier is then faced with the following problem:

He has to ask the designer to give him an A.P. projectile and gun powerful enough to penetrate enemy armor, yet this is only for what is really a secondary or support rôle. For present conditions this gun will probably have a caliber of over 3 inches. Shall he also ask the designer to produce for him a separate gun for firing H.E. to carry out the main task, and relegate the A.P. weapon entirely to a support rôle, or shall he fire his H.E. out of the A.P. weapon (probably with a reduced charge to give lower velocity)?

If he uses the A.P. weapon for H.E., he will not be able to carry many H.E. rounds, because of their uneconomically large cartridge cases, and because some of the stowage will already be occupied with A.P. The large cartridge will give only a low rate of fire. Moreover, the rapid wear with A.P. will necessitate frequent calibration for indirect fire and semi-indirect H.E. shooting.

If separate A.P. and H.E. weapons are asked for in emergency the A.P. weapon must, of course, be able to fire H.E. and the H.E. weapon hollow charge (in lieu of A.P.).

The decision the soldier arrives at, will depend on tactical considerations outside the scope of this article.

3. The Tank Gun Designer's Problem

The ideal tank gun should fulfill the following major requirements in order of importance:

*The Tank, British publication

(1) A light, short cartridge, the complete round not weighing more than about 45 lbs. with an extreme upper limit of 65 lbs. when the gun is mounted with limited traverse in the hull of the vehicle.
(2) An adequate life.
(3) A barrel as short as possible, with center of gravity as near the breech as possible.

Such other features as weight of projectile, caliber, and muzzle velocity must be so adjusted as best to fit the above and yet provide the specified performance. It should be noted here that the weight of the gun is of minor importance, although lightness is desirable from the point of view of turret balance.

For H.E. firing only it is quite easy to comply with the foregoing specification, but modern penetration requirements, even when special tungsten-carbide-cored shot are to be used, are so difficult to meet that it may not be possible in the future to provide a gun with reasonable life without exceeding the cartridge weight limitations—particularly if an all-round traverse turret is insisted on. It is important to note that the difficulty does not arise in loading the gun, but in getting the ammunition out of the stowage into a position from which it can be loaded. In this situation the fixed Q.F. cartridge ceases to be the quickest and easiest to handle inside an armored vehicle. Instead the round may have to be split into two or more easily handled components —the Separate Q.F. cartridge.

4. Some of the Problems of the Mounting Designer

The first endeavor of the mounting designer is to give a sufficient arc of elevation and depression for the weapons and yet provide adequate protection and ease of control.

If the arc is large it will be difficult to design a mantlet which does not leave gaps at the top or bottom at full depression or elevation, and is also completely splash proof against heavy small-arms fire. Current British practice is to provide 20 degrees elevation and 12 degrees depression, but other countries have had to use less—usually less depression.

As guns get longer and mantlets thicker, the centers of gravity of successive designs of mounting get farther and farther in front of the trunnions. If the designer tries to counteract this by moving the gun back in the mounting he will have to make the turret roof higher to clear the breech of the gun on recoil at full depression. Instead, he must neutralize the muzzle heaviness by a spring or hydropneumatic equilibrator inside the turret.

It is sometimes thought that the designer has difficulty in making the mounting strong enough to take the trunnion pull of the gun. So far is this from being a difficulty that several designers have been tempted to dispense with the recoil system and mount the gun rigidly in the cradle. They have had some measure of success, although other difficulties were introduced.

The recoil system is still then an essential of a tank gun mounting, and there is generally no difficulty in providing sufficient room behind the gun for recoil. If there were not enough room for recoil there would certainly not be enough space to load the large cartridges fired by present-day tank guns. The designer's two problems here are overheating and the use of ammunition of different muzzle velocities.

The function of the buffer is to dissipate the recoil energy of the gun by converting it to heat (due to the friction of oil passing through ports). Obviously, if a high rate of fire is maintained for some time the buffer will get very hot indeed, with the result that the gun fails to run out. Some modern guns may have a very large recoil energy to be converted to heat, so the designer has to provide rather a large capacity of oil to absorb it.

As stated earlier, when a gun fires both A.P. and H.E. it is better to fire the H.E. at a much lower muzzle velocity than is necessary for A.P. This results in a shorter recoil. It is then a problem to design a recoil system which will function equally well with both high and low velocity ammunition and allow sufficient length of recoil for the semi-automatic gear to function both types.

Another question that needs clearing up is the purpose of the muzzle brake. Its function is to reduce the backward momentum of the gun by deflecting to the side or rear some of the high pressure gases which emerge with high velocity from the muzzle after the projectile has left. The principle is the same as that of jet propulsion, the deflected gases giving a forward thrust on the muzzle. In general, a muzzle brake is undesirable on a tank gun, as it greatly increases the out-of-balance of the mounting and causes the gun to "whip" when travelling. It also increases the risk of injury to troops by diverting the blast to the rear. The chief reasons for fitting a brake are:

(a) When the designer "up-guns" an existing vehicle to counter the introduction of heavier armor by the enemy. This enables him to use the original recoil system.
(b) To reduce the amount of recoil energy which has to be converted to heat by the buffer, and so prevent overheating.
(c) To obtain improved steadiness of the vehicle when firing—especially armored cars.
(d) To improve observation by deflecting muzzle smoke out sideways. Whether it is successful in this depends a good deal on the wind and the dustiness of the ground.

5. Further Considerations

In an article of this length it has only been possible to discuss the selection and mounting of a tank gun. Such other topics as sighting and fire control, laying controls and the best layout of ammunition stowage would require a great deal of space to themselves.

FLAIL TANKS

*by Brigadier Nigel Duncan**

Brigadier Duncan commanded the 30th Armored Brigade in the British Liberation Army. This was part of the famous 79th British Armored Division that manned all the specialist armored devices such as Crocodiles, Flails, and Buffalos. Later he was second in command of the Specialized Armored Development Establishment. With his vast war experience with armor and the knowledge gained thereby Brigadier Duncan can well be considered an authority on armor.

MINES appeared in increasing numbers during the campaign in Africa until by 1942 they had become a very serious menace to the movement of troops and vehicles. Vast numbers of both antitank and antipersonnel mines had been laid by the enemy, and since they were covered by antitank or machine guns, clearance by hand was slow and expensive in casualties.

In order to speed up the rate of an advance, a tank was modified to detonate mines by mechanical means. It consisted of a rotor, suspended between arms protruding from the front of the tank, carrying chains on it and revolved by two auxiliary engines behind the turret. As the rotor turned the chains flailed the ground and the force of their impact detonated the mines. The machines were not very reliable but proved effective in Alamein where they were used singly to sweep a lane wide enough for one tank.

From these early machines several later patterns were developed. The last was the Crab, a Sherman tank carrying a rotor which was driven from the main engine and retaining the main armament—in other words as near a standard tank as any specialist weapon could be.

The Crab rotor was nine inches wider than the overall track width to provide a slight margin of safety and to make turning possible. The rotor centers were four feet and three inches from the ground and the radius to the tip of the chain was six feet.

Design of Crab

Later Crabs were self-contouring—the height of the rotor being conditioned by the beat of the chain on the ground, thus enabling it to follow slight inequalities better than those first models where depression of the rotor was limited by a stop. The end plates of the rotor carried wire-cutting blades which ran between cutter blocks to reduce the chance of fouling the chains. The Crab was designed for use at a flailing speed of one and a quarter miles per hour when the rotor required approximately 150 brake horsepower to drive it, the balance being available to move the tank. The rotor which was cylindrical was "dressed" with 43 chains attached to welded lugs, arranged in a spiral which, with the tank in first gear, gave a strike on the ground every four inches in both a forward and lateral direction, thus ensuring that the pressure plate of a Teller mine was certain to be struck. A dog clutch allowed, at will, power from the main shaft to be transmitted to a sprocket outside the tank from which a shaft ran alongside the jib to a bevel box which drove the rotor. The tank retained its normal armament less the lap Browning and some 20 rounds of 75mm ammunition which were displaced by the power take-off assembly.

The technique for flailing was developed under the direction of Major General Sir Percy Hobart, K.B.E., C.B., D.S.O., M.C., Commander 79th Armored Division, and was based on the "assault team," a combination of flails and engineer tanks, the former to clear lanes through mines, the latter to bridge obstacles. In order to provide sufficient room to handle the special bridges and fascines, and to allow tanks to pass each other, a 24-foot-wide lane was laid down as the minimum acceptable under service conditions. Three flail tanks working in echelon could provide this, allowing one foot overlap, but the standard of driving was necessarily very high. To provide for casualties a reserve of two tanks was considered necessary for each team, and this determined the size of a flail troop as five. Except in the seaborne assault when space in landing craft was all important, this troop was never split. Three flails echeloned to the right or left according to the direction of the wind, each one about 25 yards behind the other, moved at top speed to the edge of the mine field. The rotor driving gear was then engaged and the leading tank started to flail followed by the

*Commander Second British Armored Brigade in Italy

other two. Reserve tanks in the troop remained at the entrance to the lane giving covering fire until called forward to replace a casualty.

Three flail troops formed a squadron and there were three squadrons in a regiment. This organization was based on an infantry battalion with two companies forward. Each company required a "mine free" lane through the field and one reserve lane was needed by the battalion in case one of the company lanes was blocked. A flail regiment could therefore provide the necessary lanes for a Brigade attacking with two infantry battalions forward, leaving one flail squadron in reserve to support the reserve battalion in the exploitation role. The reserve squadron together with any reserve tanks not actually flailing was used in the initial stages to provide covering fire. The slow flailing speed made the tanks an easy target and tank gunnery from the supporting tanks became of the greatest importance. Good range facilities were available in England and a very high standard of gunnery was reached which materially reduced casualties.

Battle With Dust

Station keeping while flailing was not easy. The impact of the chains on the ground threw up dust or mud which made visibility very difficult. This dust cloud did not however rise very high and the adoption of special cowls over the periscopes, water spray devices to clear the glasses, and special markers on high standards eventually overcame the difficulty. The dust was sucked into the interior of the tank through the normal cooling intakes but although this reduced visibility inside the tank it never affected the efficiency of the crews. To prevent the turret races being jammed by dust, which would render the traverse slow or inoperative a turret ring seal was produced. A canvas shield over the 75mm mantlet with openings for the main armament, the telescope and the .30 Browning was also provided to avoid clogging the elevating mechanism.

The detonation of a single Teller mine had curiously little effect inside the tank. It was possible to hear the explosion and the tank shuddered as a ship will when a depth charge goes off some considerable way from her. Under the turret lights the dust-laden air became more turbulent and the engine note rose as revolutions increased with the raising of the rotor by the blast of the mine—otherwise nothing, no shock, no discomfort, no shattering effect on crew or machine.

Outside, the effect of the mine was to raise the rotor in the air lifting the chains momentarily clear of the ground. The rotor assembly fell by force of gravity and the tank continued to flail.

Chains were a difficulty; originally these were hand forged and proved most satisfactory. Productive capacity available could not meet requirements and a flash welded chain proved a complete failure. Ultimately a pattern of roller link chain with a link and swivel to

British Official Photo

The "Crab" at work. This is the latest development in flail tanks. Earlier such flails as "The Baron" mounted on a Matilda tank chassis was used.

allow the striking end to turn was adopted and proved satisfactory. It is not possible to give any accurate figures for the chain damage per mine. One chain—that which hit the mine—always lost some of its length. Of the chains immediately adjacent any number up to four might be damaged, either twisted or with links blown off. A shortened chain brought the force of the explosion immediately below the rotor and rendered it more liable to damage. The known maximum number of single Tellers put up by a single Crab without redressing chains is 34. On service 15 to 16 were frequently detonated without casualties, but the rotor was usually torn by blast and often so bowed by the force of the explosion that it was necessary to change it. Double and triple Teller mines, buried one above the other were encountered; the double mine usually damaged the rotor and the triple Tellers usually destroyed the Crabs. In the later stages of the Canadian attack toward Wilhelmshaven depth charges and 11" shells with pressure plates were encountered. The depth charge, destroyed the flailing gear without harm to the crew, but the 11-inch shell set at an angle acted like a fougasse and killed both driver and co-driver and damaged the tank beyond use.

The 30th Armored Brigade was entirely equipped with flails. XXII Dragoons and the Westminster Dragoons took part in the assault on Normandy in 1944. Due to limitations in the numbers of landing craft the normal troop organization was broken up. Either two or three tanks were loaded in each Landing Craft Tank, the balance being engineer tanks, flame throwers or bulldozers. Over 80 per cent of the required lanes were successfully made on Second Army front, through which other armor, infantry, vehicles and equipment of all kinds poured to hold the bridgehead.

Nine Squadrons

The First Lothian and Border Yeomanry landed a fortnight after D-Day, giving a total of nine squad-

rons—145 flails available to meet requirements. They proved effective against Teller and Riegal antitank mines, and against Schu mines which appeared in ever-increasing numbers. Practically every action where normal armor was used in the bridgehead involved the sweeping of lanes; and only the centralization of the equipment under 79th Armored Division made it possible to meet requirements. Squadrons were switched continually between Divisions and Corps to meet an ever-changing situation.

Flail tanks accompanied the Canadian Army in the breakout from Caen and the subsequent Falaise pocket action. Others moved with the Second British Army through Caumont and crossed the Seine with both armies. The assault on the Channel fortresses, Havre, Boulogne and Calais was made possible only by the use of flail tanks. Extensive mine belts covered all three towns but presented no real difficulty to the assault teams.

Mines were encountered again in some numbers on the South bank of the Scheldt where the swampy ground made flailing a difficult task; also round Nijmegen and on the Siegfried Line in the Reichswald Forest. Very few were met on the actual Rhine crossing where large numbers had been expected. It is difficult to ascertain the reason for this but it may well have been due to the lack of transport caused by Britain's Royal Air Force activities.

Flail squadrons from the 30th Armored Brigade worked with the Ninth U. S. Army on several occasions when they were confronted with mine fields, notably at the commencement of the offensive beyond the Roer which brought the Americans to the banks of the Rhine.

As the advance progressed into Germany some mines were encountered covering the biggest ports, but the numbers were never as great as had been expected.

So far the flail has proved the most satisfactory mine clearer yet devised. With the design used in France, 90 per cent safety under reasonable ground conditions with mines buried not more than four inches deep, could be guaranteed, and the safety factor was often higher than this. Further investigations may produce a new combination of rotor height and speed, coupled with a new chain design, which may make for greater efficiency.

Regiments of the 30th Armored Brigade in all detonated some 5,500 antitank mines from D-Day to VE-Day. This takes no account of the innumerable antipersonnel mines also destroyed. At the most conservative estimate this represents a very substantial saving on men's lives and material at a cost—thanks to good training and the efficiency of the crews—of relatively few lives.

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FLYING FOOT SOLDIERS

FOOT SOLDIERS may sprout wings in the event of another war if present day Army Ground Forces leaders have their way in the development of "flying armies."

And not only will troops be transported by air to the field of battle, their equipment including everything from a rifle up to a heavy tank will also wing its way through the sky at speeds estimated anywhere from 135 to 350 miles per hour.

These possibilities have already gone beyond the theory stage. The Airborne School at Fort Benning, Georgia, began on September 5, a course established by direction of Headquarters Army Ground Forces, to instruct ground force officers in the principles and techniques of the movement of troops, equipment and supplies by air. This course of 120 hours of classroom and field instruction will apply the principles of war to air transported troops, their employment in battle and the basic responsibilities of the air and ground units for the operation.

Ultimate goal of the program is aimed at making the entire army air transportable.

Air transport, according to the experts, is the key to speed, flexibility, multiple uses and elusiveness—all the necessary elements to a successful force in a modern war. Once armies become air transportable no longer will mud, blown out bridges and congested roads hold up the movement of a military unit. Aircraft will by-pass these obstacles that have given ground troops so much trouble in past wars.

There are two types of troops transported by air. First, there are the "airborne" units which are trained and equipped to enter combat by air and for making assault glider landings. These units include parachute and glider troops. In World War II such units were employed in Sicily, Normandy, France, Holland, Corregidor and others.

The second type is "air transported." These are normal ground troops with their equipment who can be transported by air and assigned a ground tactical role upon arrival at their destination. These troops do not parachute to the ground or ride in assault gliders. They are nothing more than ground troops transported by air.

Examples of this second type include the air transporting of the 11th Airborne Division from Okinawa to Japan. The Australian Seventh Division was air transported to the Markham Valley in New Guinea after the 503rd Infantry Parachute Regiment made the initial assault from the air.

The Markham Valley engagement is an excellent example of how "airborne" and "air transported" troops will be used together in any further wars. "Airborne" troops will parachute in to make the initial assault while "air transported" troops will follow to support and develop the operation.

There are, however, several drawbacks to air transporting troops at the present time. Such troops would be dependent upon weather for movement and on air superiority for protection and supply. The large Army Air Forces transport planes of today are extremely vulnerable because of their low speed and slight armament. These drawbacks are being studied and the increase in aircraft development is overcoming these hinderances by increasing firepower and mobility of transport planes.

At present the United States does not possess enough air power to make the entire army air transportable. But, the need for larger and better military transport planes has been recognized and an expanded program to develop planes of a sufficient size, quantity and range for a transportable army is under consideration. If the Army Air Forces is not limited too severely by a small budget the possibility of air transportable armies is a thing of the near future; perhaps within five or 10 years from now.

Let us look at the aircraft in existence today that can do the job of transporting troops.

The C-97 Stratocruiser will carry 20,000 pounds of equipment or 142 men thousands of miles.

The C-74 Douglas Globemaster is capable of carrying 125 men or 49,000 pounds of military equipment.

The Consolidated Vultee XC-99, which is being built at San Diego, is reported to be able to carry a 100,000-pound load for a distance of 1,500 miles.

The C-82, the Flying Boxcar, has a fuselage capable of carrying a two-and-a-half ton truck.

These aircraft and others that are still in the develop-

Here a light tank is being loaded into a "flying boxcar" —C-82. This aircraft has a fuselage large enough to carry a two-and-a-half ton truck.

AAF Photo

AAF Photo

An army truck backs up the ramp into the commodious fuselage of the C-97. This aircraft at present will carry 20,000 pounds of equipment or 142 men.

ment stage make "flying armies" almost a reality today.

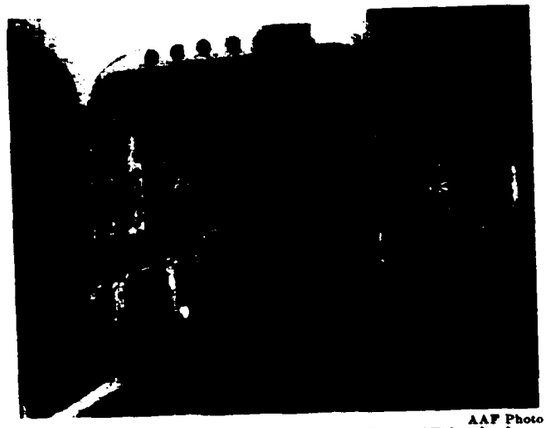
The Army Ordnance Department has developed and manufactured a light airborne tank. Its official name is Tank, Light, T9E1 and it weighs 15,800 pounds. It has a maximum speed of 45 miles per hour and mounts a 37mm gun and one .30 caliber machine gun. This tank is a step toward making armored units air transportable.

It has been reported that the Army Ground Forces has projected plans for making all its weapons of a size and weight to be air transportable by breakdown in the present aircraft or transportable in whole in larger aircraft yet to be developed.

The goal is to transport infantry equipment fully assembled so that the troops can go into immediate action upon landing.

When all problems of transporting troops and equipment by air are solved it will be possible to send any standard infantry or armored division into action hundreds of miles away from their home base in a few hours.

Perhaps in future wars all invasions will be made from the air rather than from the sea as in World War II. It is certainly in the realm of possibility.



AAF Photo

Here is an inside shot of the spacious C-82. This airplane was developed near the end of the war.

"A general may then employ with the same success, for battles, the offensive or defensive system; but it is indispensable to this effect:

"1st. That, far from limiting himself to a passive defense, he should know how to pass from the defensive to the offensive when the moment has arrived;

"2d. That he should have a sure *coup d'oeil* and much calmness;

"3d. That he command troops upon whom he can count;

"4th. That in retaking the offensive he should not neglect to apply the general principles which would have presided over his order of battle, if he had commenced by being the aggressor;

"5th. That he direct his blows upon the decisive points."—JOMINI.

The Mules of Mars*

by 1st Lieutenant Dan L. Thrapp, 2MC

PART I

MOST people think a Quartermaster has about as much business in a combat outfit as a steer in a breeding corral, but the QMC is a diversified outfit and its members sometimes find themselves dodging articles other than the proverbial bale of hay.

You take mulemen, for instance. The Quartermaster officers and men in the pack troops, or those who handle jackasses for Infantry or other branches of the service, occasionally reach the fighting areas. Each arm and service ordinarily trains its own packers, but a man who has a specialist rating as a mule packer usually is received joyously by combat donkey organizations.

When the 475th Infantry Regiment, veteran of the battle for Myitkyina (GI pronunciation: Mish-i-naw), went into intensive training at Camp Landis on the upper Irrawaddy late in 1944, it seemed likely that another campaign was brewing. Burma is strictly a mule country. It followed, then, that a Quartermaster pack officer who wanted to see some action should volunteer, be accepted and assigned—officially as third battalion assistant S-4, unofficially as battalion animal transport officer. This because the T/O called for an unneeded supply man, but no pack officer.

The 475th, together with the 124th Cavalry (dismounted), two battalions of pack artillery, the 31st, 33d, 35th, 37th, 252d, and 253d Quartermaster Pack Troops, and a field hospital, became a long-range penetration outfit, the so-called Mars Task Force. And there were those two damned elephants someone at Regimental Headquarters picked up and brought along. A mule can get used to almost anything, but he draws the line at an animal that hangs down at both ends. Sensible, not knowing whether an elephant is coming or going, the mule is inclined to play safe and take off, regardless of load, underbrush, leader, column, or common courtesy.

Five weeks were not too long to train for a plunge into enemy occupied country, especially when many of the replacements were not primarily Infantrymen. The 475th seemed destined to do its fighting with green soldiers. The deplorable situation at the battle of Myitkyina was widely publicized at the time. After that engagement, during preparation for the Mars job, replacements received to bring the regiment to T/O strength were largely Quartermaster remount men, and the 475th again had to start almost from scratch.

It had this advantage, however: unlike the situation the previous spring, this time there was a strong nucleus of veterans to salt down its greener elements, and it had a few weeks in which to train its new men.

The 35th Pack Troop was assigned to the third battalion. Its animals had been taken off a Liberty ship sent to Ledo by train, and within seven days were hoofing it down the 300-mile road to Myitkyina. There was no time to complete shoeing them, and the result was that they arrived at Camp Landis in very bad condition. An extra week at Ledo putting at least front shoes on the mules would have saved innumerable headaches for us later on.

Every effort was made to get enough animals in shape in time to get the battalion on the road. Saddles must be fitted—an important factor in mule operations, of which more later—and gun and ammunition hangars located, made, stolen, or secured on requisition. Sick mules needed doctoring, and all of them must be shod or re-shod.

A big job was to assign mules to a permanent task. Success of the mission would depend to some degree on how accurately we judged the capacities of each animal and how well each mule was "classified."

For example, there was no need to assign a stocky, solid, well-gaited mule to hauling grain, when gun and ammunition mules were needed. A pack troop is authorized nearly 300 animals, while the personnel totals about 75. Pack troopers are mounted on mules and herd their loaded animals, normally by platoons. That is the most efficient manner of working pack animals, because the mule can pick his own way and, to some extent, his gait; he can make things easy for himself. That method of operation is best for situations where packers must move supplies a comparatively short distance and do not have to operate with foot troops in the same column.

Naturally, when pack mules become part of a moving column, this system is impractical. The herd of mules, moving some five to six miles an hour, would constantly overrun the foot soldier, and doughs don't like that. On the other hand, the animals cannot be started out before the foot troops because there is the question of security for the animals, and there is also the quite important factor that the foot troops want their machine guns, ammunition, and mortars along with them, just in case. The same objections hold regarding advisa-

*The Quartermaster Review.

bility of running the mules up to the foot soldiers later in the day. A mule, like a man, is most efficient if he can be worked from dawn to noon or about 1300, rather than from, say, 1000 till 1700.

Mulemen have a great deal to do when camp is made, and their most important task is to take care of their animals and to graze them. Just as man cannot live on bread alone, so a mule won't go far on just grain. Or very far without it, either. The point is that bivouac should be established early enough in the day so that the animals can get their two hours or more grazing and can be properly rubbed down and picketed for the night.

For these and other reasons it was necessary to take the mules along with the column, and so each animal had to be led by a man on foot. Thus, the pack troop retained about seventy-two mules, one to be led by each man, and the other animals—some 220 of them—were turned over to the battalion, where they were divided, forty-two to each rifle company and the remainder to headquarters company and battalion headquarters.

Rifle companies assigned ten animals to headquarters and weapons sections and divided the rest among the rifle platoons. Headquarters company used about forty-five mules in the heavy weapons platoon, and split the rest among transportation, communication, pioneer and demolition, and intelligence and reconnaissance platoons. The medics needed some animals, and besides, twelve saddle mules were taken along, ten of them for casualty evacuation.

In the heavy weapons platoon, four mules were assigned each heavy machine gun and four each mortar—one in each instance to carry the weapon, the other three to pack ammunition. Additionally, four mules were to carry piecemeal a short-barreled pack 37mm., by means of which we hoped to spray Jap-bearing jungles with canister; other animals carried bazookas with ammunition, and incidentals. The set-up in the rifle companies roughly paralleled this, except that they were authorized light for heavy machine guns, and had but one 81mm. mortar, filling out with 60mm. weapons.

Mule packers of the 124th Cavalry Regiment and their animals push across a pontoon bridge in rugged Burma.
Signal Corps Photo

The Quartermasters have been using mules since the Corps was first organized. George Washington is rumored to have introduced the long-eared horse-donkey hybrid to this country by the progeny of some jacks he purchased in Spain, and some mules reputedly were used by both armies during the Revolution. As a result of almost two centuries of experience, the QMC has determined a lot of things about the animals.

A mule can carry about one third of his weight. The Army cargo packsaddle, with trappings, weighs in the neighborhood of 100 pounds, and the average mule we worked would weigh from 1,000 to 1,200 pounds. Stouter mules are kept for the artillery, which has the heaviest, most awkward loads.

Thus, you can figure that a mule payload should not go much over 200 pounds. For a long campaign, such as ours, we tried to keep each burden down to 180 pounds, and succeeded pretty well on the whole.

Our heaviest loads normally would be machine-gun ammunition, one animal's share consisting of ten 21-pound cans, for a total of 210 pounds. The load, however, was evenly balanced—most important factor in animal packing—and so was not too much.

In the weeks of training marches and preparation we worked out these and other problems. Supply was not up to zone of the interior standards in Burma in 1944, and we could not count on receiving what we requisitioned, so we had to make provision to acquire necessary items by means other than orthodox.

We gradually acquired enough of most items, although some of the equipment was not in good repair and there were no facilities at Myitkyina for renovating it. We made some hangars and improvised others, acquired a set of horseshoeing tools and saddler's equipment, and cut the customary pack-troop equipment to the bone. For instance we took along no picket lines, because we couldn't spare the animals to carry them, and successfully employed lash ropes instead; we took no rigging covers; we drastically reduced the number of mantas—canvas used to wrap individual loads—needed. Each animal carried a spare set of pre-fitted horseshoes and we divided up spare halters, shanks, breeching, etc., to avoid making special loads of these things.

Our worst headache was the mules. They had scarcely rested from their 300-mile jaunt down the Ledo Road, and were about to take off on an equally long journey, this time over no road at all. We had no veterinary officer with the battalion at the start, but depended upon the services of a bunch of fine vet technicians who perhaps did more than anyone else to get the show on the road.

At that we took thirty mules out of the sick corral and eight out of the hospital the morning we crossed the IP. We were proud of the fact that until we struck our first combat, one month and 150 miles later at Tonkwa, we had lost but two animals, one through heat exhaustion and the other from an unknown cause. The rest of the animals were in better shape then they were the morning we left Myitkyina.

The first stage of the campaign—the journey to Tonkwa—was in the nature of a shakedown cruise.

Brigadier (later Major) General Merrill, leader of the famed Burma Marauders, has been quoted as making the classic definition of the troubles of the leader who handles both men and mules. After the Marauder campaign from Ledo to Myitkyina, Merrill said:

"Next time give me mule skinners instead of doughboys, for it is easier to make doughboys out of mule skinners than mule skinners out of doughboys."

The general spoke from experience. There are tricks to leading mules, just as there are to anything else, and it sometimes seemed that we might have better luck if the animals had led the men. The average mule is one of the most intelligent, and certainly one of the most sure-footed, animals in the world. He can see a trail where a man can see nothing but rock. If left to his own devices he will never stumble, rarely slip or bog himself down, and almost never hurt himself. When, however, he is led by a man he can perhaps get into more trouble than any other creature on the face of the globe, and although his difficulty is directly attributable to his inexperienced leader, the animal gets the blame. We occasionally lost animals over the sides of mountains, in rivers or bogs, but we would have lost not a single one had they been free to choose their own way.

We crossed the Irrawaddy on an eight-mule ferry the second day of the campaign. Because of the danger that an animal might fall off the ferry, we unpacked them and repacked on the other side of the stream. The Irrawaddy is a swift-flowing river, wide, deep, muddy and cold, but the entire battalion crossed in less than a day. By reaching the other side before noon we had a good opportunity to graze the animals, and since they were on the wrong side of the river, there was no danger that they would suddenly recall the delights of their old Camp Landis stamping ground and take off. We found an enclosed paddy grown to grass and turned the animals loose, herding them on foot. We had no bell mares, of course, and from this time forward, herded the mules afoot when we grazed them, if the situation permitted. It proved impractical to send leaders out with their individual animals to graze them. The temptation to tie the mule to a tree and catch up on mattress nomenclature proved too strong for some.

On one occasion we tried tethering the animals to individual trees, using 30-foot lair ropes and leaving a couple of men on guard to untangle them, but a couple of serious rope burns convinced even the laziest that that wasn't a good idea. Rope burns perhaps cause more injuries to horses and mules than any other single thing, and it required constant vigilance to keep picket lines tight and halter shanks tied short enough to prevent the animals getting ropes twisted around their feet.

Sometimes when we bivouacked in the jungle or heavy forest it was impossible to find grassy spots for pasture. We cut either banana or bamboo leaves for the animals in that case. They liked the bamboo best and it was better for them, because the banana leaves have more water content than roughage.

We carried three days'—sometimes four days'—rations with us. Each donkey normally carried one day's grain in addition to his regular pack, and transportation mules in the headquarters sections carried grain in bulk to make up the other two days' supply. Each mule was allotted ten pounds of grain a day and the usual mixture included barley, peas or beans, and salt. The men carried three days' K or C rations, and one day's D ration, or at least they were issued those rations and carried that part of them they wanted or thought they could use.

A major task was to make the men carry their own load and not slip it onto the mules. By some quirk of T/O reasoning, mule leaders were authorized Garands rather than the light, less awkward carbines they should have carried. In addition, each man was required to carry a pack containing his bedding, rations, and other personal paraphernalia, and at times the temptation was considerable to slip the rifle onto the mule and put a few rations into the morning manta of organizational equipment. Some mules gradually developed into poor leaders and habitually hung back on the lead rope. The boys, carrying heavy packs plus heavy rifles plus steel helmets (most of which soon got "lost"), and dragging, all day long, a 1,200-pound mule, were mightily tempted to abandon what religion they possessed, and lurid language developed like a fog around the more obstinate of the animals. Riflemen had it comparatively soft during most of the campaign. When the bivouac area was reached, they had merely to look out for themselves and take the usual security precautions. The mule handlers, on the other hand, had barely begun their day's work. The argument, of course, was advanced that the riflemen were more exposed to danger from the enemy than the mule skinners, but that point was debatable. In addition, the sweetest-tempered mule knows how to kick, and is glad to do it, and for weeks we had more casualties from mules than from Japs.

We were supplied by air-drop every three or four days. C-47s and C-46s droned in by the dozen over a previously selected and marked drop field and parachuted rations and ammunition and requisitioned items to us, then free-dropped grain. Occasionally a plane load of grain would get mixed up with parachuted loads and we had some casualties and a couple of deaths from that cause. An 80-pound sack of grain gathering momentum through a thousand feet of space can hit a man pretty fast and pretty hard.

Once, near a place called Mong Hkok, the only available spot for a drop field was in a narrow valley with surrounding hills so high that planes could not get a

good shot at the field. A "stick" of grain sacks thudded across a series of picket lines and wrecked the battalion aid station, killing a Chinese soldier standing near by. Another time one of the best packers in my platoon was loading a mule while rations were being parachuted down on the field. A grain plane came in unexpectedly and free-dropped a dozen sacks, one of them hitting the packer. He was carrying a carbine across his back and the sack hit him on the shoulder, snapping the weapon into three pieces. The packer was evacuated with what the medics feared was a broken neck, but fortunately they were mistaken and he recovered.

The march south to our first combat was mostly over level country, the greatest difficulty being occasional bogs or river crossings.

The second battalion lost a couple of mules during a moonlight river crossing. Again a ferry had been provided, but the mules were not unpacked and two of them fell off the raft, their loads spinning them belly up and causing them to drown.

No climbing was required during this first stage—nothing but a dogged plodding through dust and heat. Yet this was a difficult period for the animals. The column walked at the pace of infantry. The average rate was just a little over two miles each forty-five minutes, followed by a fifteen-minute break. We took advantage of every halt to let the animals graze, and encouraged the men to turn them loose during this period even if it meant a short search when the column got under way again. After the first few days we ceased taking time out for the noon meal, but nevertheless we marched at the rate of foot soldiery, and the animals, even on a short hike, had to be loaded well into the heat of the day. This cut down on the grazing time we could give them and tired them extravagantly, since they could not be unpacked during the quarter-hour rest periods and thus derived no benefit from them.

On halts of twenty minutes or more we did unpack the mules, but often we did not know how long a halt was to be, since it usually came as a result of someone fouling up ahead somewhere and we had no contact with the head of the column except for urgent matters.

We skirted besieged Bhamo close enough to hear Chinese-manned .30-caliber heavies talking to Nambus, and went on south to Sikaw and beyond. It was somewhere along in here that I established the Burma 300-yard foot record. I was attempting to coax a skittish mule past an elephant at the time. Everything would have been okay, had the pachyderm not decided to tickle the mule on the business end with his trunk. The mule took off, and since I was on the other end of his halter shank, I took off, too.

The second battalion was committed at Tonkwa, and I Company from the third battalion, and part of the heavy weapons platoon of headquarters company, were assigned the task of cleaning out a patch of woods. Mule packers from the transportation platoon and others were employed to pack ammunition and supplies to both the second battalion and the elements of the third engaging the Japanese. Most of the work was short hauls, occasionally under inaccurate sniper fire. We suffered no casualties from this fire.

Our bivouac area was some two miles back of the second battalion's front positions. The Japanese had four field guns we called 77mm., although they actually were 75mm., chambered slightly larger than our 75s so they could use our ammunition and we could not use theirs.

They had excellently camouflaged positions for their guns, and in the morning and again in the evening would loose a salvo or two, then move their pieces. They were zeroed in on our bivouac area at a river crossing, and their fire caused us some casualties in men and animals. One tree burst accounted for seven animals. Another shell cut between two mules tied to a picket line and burst about eight feet behind them, but injured neither.

After a couple of days' fighting, the Japanese abandoned the Tonkwa sector and our units moved up about four miles across an immense paddy, now grown to grass, and into a wood, where they bivouacked near some abandoned enemy positions. Mules were used once or twice to pack supplies into the advanced positions, but otherwise were kept back well out of possible artillery range. Mules are difficult to replace under Burmese combat conditions. Patrol activity established that the Japanese had at least temporarily given up all the territory north of the Schweli River loop, although their patrols crisscrossed the area, as did ours. They supplied their patrols by means of pack elephants or little pack ponies or diminutive mules, using the typical Chinese wooden packsaddle. Chinese troops captured some of the little ponies, about the size of Shetlands, and did a brisk business trading them to GIs for cigarettes, flashlights, or other items they could later convert to cash in China.

Eventually, however, the brass arrived and, distressed by the unorthodox-looking "toy" animals in the outfit, decreed that the ponies were apt to spread disease among our mules and ordered their abandonment. This despite the fact that throughout the campaign our Kachin scouts used the same animals in our column, grazing and feeding and packing them alongside our mules, with no disastrous effects.

Even during a campaign one can get a little time off, and on Christmas Eve we spent the day hunting. Flocks of pea fowl were common, and they tasted just like turkey; a couple of the huge, 40-inch-long Burma black squirrels were good; and one of the boys even shot, cooked, and ate a tremendous hornbill, which looked more like a buzzard than anything I ever before saw in a cooking pot.

The Chinese came back to relieve us shortly after Christmas, and by New Year's Eve the entire regiment had turned east and plunged into the mountains toward the Burma Road.

(To be concluded)

Japanese Animals In Siam*

by Lieutenant Colonel C. R. D. Gray

AFTER the defeat of Japan one of the problems in the South East Asia Command was the disposal of the Japanese Army animals known to be scattered all over the countries in which Japanese forces had been operating. In principle, it was ruled that (1) no animals would be backloaded to India because of the danger of spreading *Epizootic lymphangitis*, and because India already had a surplus of Army animals; and (2) all animals fit for further work would be held and disposed of in the best interests of the countries concerned, through Remount channels, in conjunction with the local civil authorities.

In Burma, Malaya and French Indo-China, non-belligerent countries overrun by the Japanese, the problem was one of tracing the animals, and returning them to their former owners, or distributing them to civil authorities, without payment, for the rehabilitation of the country. Siam, however, had been an ally of Japan, and all animals found in that country were treated as enemy property, and therefore booty. No mutual aid agreement between Siam and Britain was then in existence, so it was ruled that such animals were to be sold, proceeds being credited to H. M. Government.

The Japanese submitted to us a list of their known animal locations in Siam, but it promised inaccuracy, as a footnote stated simply: "This list being made by tracing memories of investigated members, by the lack of data concerning we regret to say this list not exactly correct."

At the time of our arrival in September, 1945 the railway system had been thoroughly disorganized by the R.A.F., and the few roads were in a very bad state. We began inspections of the Japanese animals, but it took some time owing to these bad communications. Transport was extremely limited; only a few Jeeps had been flown in.

Our first inspection was at Bangkok, where the Japs had 510 animals; all were in poor condition, many being in an appalling state. A few were lying down quite unable to rise, while many had festering and flyblown sores on withers and ribs. Almost all had overgrown feet, dropped soles, and signs of thrush. Over two-thirds were selected for immediate destruction. The disposal of such a large number of dead horses was in itself a problem in the monsoon conditions as the water level was only two feet below ground, but it was solved by digging deep pits on the top of a rifle-range butt. The animals were led up on it, shot, and pushed over—an unpleasant experience.

The Japs had rudimentary ideas on animal management, but owing to the terrible climatic conditions, indifference of their officers, and lack of "horse-knowledge" among all ranks, animals were pitifully looked after. Horses, to them, were merely another method of transport, and suffered the same ill treatment as Jap cars and trucks. They were kept on undrained standings with no bedding. Tight headropes were common, and no grooming was ever done, although boxes of unused brushes and curry combs were found later in the men's barracks. Manes and tails were long and matted. Veterinary attention was skimped, and seemed to consist only in the application of mercurochrome to all sores and cuts; yet there were ample stocks of veterinary equipment all packed in beautifully fitted field chests.

Farriery equipment was excellent, a set consisting of two neat Yakdans fitted with full tools, an anvil and a built-in centrifugal blower. The shoeing, however, was bad, all the usual faults being common, *i.e.*, bad dumping, cutting away of heels and frog, high unnecessary nail holes, and rasping of the outer hoof walls.

The Jap soldiers showed several instances of being fond of their charges, but in curious ways. They could sometimes be seen squatting in front of a horse, hand-feeding it with offers of green grass, yet at the same time they seemed to ignore a cut mouth or a weeping eye. They gave their animals no bedding, but there was

The best horse found in Siam. This animal had great scope and jumped very well.

*Journal of the United Service Institution of India.

an issue of sun-hats for the horses—large discs of canvas-backed matting with ear holes and a throatlash. As a final instance—when the animals were destroyed many Japs stood at attention and saluted as the horse went down and some wept.

Jap soldiers were educated, and N.C.Os in particular were fond of paper work. They all carried satchels, buckled to their belts, in which were notebooks, writing paper, colored pencils, and often a Jap-English dictionary. In consequence elaborately written feeding charts, notices as to hours of parade, and rules for work and behavior were much in evidence. These were pinned up prominently in every *basha* and living quarter. Army orders were painted (usually with colored chalks) in meticulous picture-writing on blackboards.

This efficiency was carried to extremes. If, for instance, they were asked to say how much fodder was left, they would prepare an elaborate statement in English copperplate writing, showing amounts issued, consumed and required by day, week and month for one horse, all totals being shown in English measure, though their own system is metric. A N.C.O. would sit up all night to do this, and would present it next morning with much bowing and hissing. This hissing is really a quick intake of breath and is an automatic expression of humility and respect by an inferior before talking to or taking leave from a superior.

General discipline was so good that it was almost alarming. All orders were obeyed with a snap and on the run. Saluting was immediate and on sight—though the officer might be 200 yards away. A man carrying a load would drop it, salute, then pick it up again—or if without a hat, would bow deeply despite his burden, then proceed.

In Bangkok advantage was taken of this discipline and willingness to work by showing the Japs our standards of horse-mastership and stable management. Once they saw what was required of them they worked with a will. They were organized into a unit of two troops of four sections each, under their own officers, 45 men in all, and were taught stable routine for grooming, feeding, etc. They called themselves the "Horseguard Corps."

One indifferent interpreter was available at intervals, so most of the work had to be demonstrated by example. After a British Remount officer had groomed a horse in front of them they soon "caught on" and vied with each other in producing a shine on their horses. It was amusing to hear later that there had been much comment about this in their barracks, as it was inconceivable for a Japanese officer to instruct by personal example, let alone touch a horse to clean it.

Most of the Jap animals in Bangkok were pony stallions, and as the prisoners were required for dock labor, and only 45 men could be spared for Remount work, it became difficult to look after the captured animals in their standings, so it was decided to build paddocks for them. These were laid out on the usual Remount "kraal" system and were built without R.E. stores or assistance.

Timber, wire, roofing, etc., were "scrounged" from old bunkers, pillboxes, and disused huts, and a design was drawn by a Remount officer from which the Jap N.C.O.s produced their usual overelaborate plans with scales, distances, etc., all beautifully drawn in colored inks. The work was well done, and soon this unit had built a small depot, complete with six paddocks, a stable of 20 looseboxes, saddle room, office and grain store. A riding track, small school and a set of jumps were added later.

Inspections similar to that carried out at Bangkok were made at other Jap camps throughout Siam by Remount and Veterinary officers. Altogether 5,227 animals were inspected, of which 3,691 were destroyed, 1,536 being retained for disposal. Thus 70 per cent were destroyed, and 30 per cent retained.

Many varied types of animals were found in the Jap Army in Siam chiefly owing to the fact that they had received no reinforcements from Japan, and had made up deficiencies by capture or purchase. They were able to show receipts of all purchases from the Siamese. Here are some of the animals we found:

Japanese Horses.—These were bred in Japan from mixed Jap blood. About half were rides over 15 hands, used by Jap officers and N.C.Os. The remainder were transport horses of Percheron and heavy Waler stamp, and were used in high-wheeled single draught carts or in pair wagons. About 80 per cent were chestnuts; no greys at all were found.

The riding horses were only half-schooled as judged by our standards—with little flexion and rough paces. They were, however, all very quiet to mount and ride, and could be grazed at liberty and caught up at will. The Japs used them merely as a means of transport to march from A to B, and never attempted jumping or school work. In the course of selecting rides for British officers, a Remount officer rode 150 of these horses and found them all very quiet—a particular feature being the way they stood quite motionless when mounted, without being held.

Chinese Ponies.—These were of two types: (*a*) North China (Manchurian) shapeless animals about 13.3 hands, with a long, curly coat, roach back, good bone and uncertain temper; they were used entirely for pack work, and (*b*) South China—a lighter type used for pack work and riding—rather like Kashmiri ponies, but with heavier heads and thick coats.

French Indo-China Ponies.—A light narrow pony, about 12 hands, the same stock as Siamese, but showing a trace of European blood. Many skewbalds, piebalds and duns, but few true colors. A useless type of pony; very excitable and perpetually kicking and screaming, possibly because they were all stallions.

Java and Sumatra Ponies.—These were a mixed bag, some being captures from the Dutch Army, and some obtained from the villages. A light pony about 13 hands, with a breedy head but rather leggy, with cow hocks.

Could be easily recognized as all had prominently split or nicked ears. As rides they were fast, but also nervous and difficult to handle.

Siamese Ponies.—The smallest ponies seen. Known as midgets in Siam, they average 11.2 hands. The Japs used them in small, single draught carts, or as light pack ponies, for bedding rolls, etc. The best were like miniature New Forest ponies; they were extremely hardy, were fed only on grass, and had a very fast pacing trot when ridden.

Burmese Ponies.—A few only were found, brought back during the Jap retreat. They were a light type of 13.3 hands, and were probably captured from Burma Police or Frontier Force.

Indian Ponies.—Two were found, both bearing the "Mona" brand. They were in poor condition, and were destroyed.

Mules.—A mixed bag. A few Indian mules were found, but the majority were Chinese of a poor EI or EII type. Of all the mules found, very few would have been acceptable by our standards.

Japanese Saddlery

Saddles made in Japan were very similar to the British Officers' pattern issue saddle, but had neat detachable panels, which obviated re-stuffing, provided the new panels were available. They had prominent knee-rolls, and were only comfortable if ridden with long leathers. Briddles had a civilian-type curb and bridoon bit, with "rising-sun" brass bosses. Head collars were of string and webbing, worn under the bridle.

A. T. Packsaddles were similar to ours, but had adjustable arches and shaped sidebars. The Japs said that this saddle caused few galls, and that the majority of injuries come from the Chinese "X" pattern packsaddles of rough wood, which they had been forced to use of necessity. A. T. Carts were single draught. Those made in Japan were good, with pressed steel wheels and turned shafts. The larger ones had platform bodies only, not with side rails, as on our A. T. Carts. Many, however, were Chinese carts, with wooden wheels and axles.

The Japanese 37th Division was at Nakon Nayok, a hundred miles north of Bangkok, and it was here that out of 2,699 horses seen, 2,154 had to be destroyed. It was such a large proportion that we investigated the reasons, which were:

(1) This formation had marched by road the whole way from North China to Siam, a distance of 3,500 kilometers;

(2) It was at Shia-Chia-Chaong, S.W. of Peiping, when it received orders to march south to link up with the Southern Forces' drive on the American Airfields in South China;

(3) It covered the distance in four months, averaging 30 kilometers (20 miles) a day, marching six days a week.

(4) *En route* it fought two battles near Changsha, and it was this force that recaptured Kweilin. Moving south it crossed the top of French Indo-China at Vientiane, and from there went through Siam to Bangkok.

Animal casualties in this Division were heavy. Killed in battle numbered 220, died 700, drowned 10, destroyed as unfit 150. These 1,080 animals were replaced by captured Chinese and French Indo-China ponies, no reinforcements being received from Japan. South of Hankow no Army fodder supplies were forthcoming, and all grain and grass had to be obtained locally.

The Japanese stated that owing to the speed of the advance and the tiredness of the troops, the horses seldom got more than two feeds a day. Of the ponies they acquired, the Manchurian type stood up best. On our inspection they were the least emaciated, and had less galls than other types.

While resting at Bangkok, this Division received orders to move south to selected points on the West Coast of Malaya, but the war ended before the move started. Later, when examining their maps, a British Officer who had recently been on the S.E.A.C. Planning Staff, said that their marked destination was to have been the main landing area for our attack had it taken place. We repeated this to the Jap officers, and they showed very great relief—and amusement.

The Jap 15th and 33rd Divisions were at Nakom Patom, sixty miles west of Bangkok. These divisions had borne the worst of the Burma campaign, and were in very poor shape when they got back to Siam. The remnants were magnificent troops, and their discipline was high, even by Jap standards.

Their animals had had a bad time, and their records showed that they lost 5,000 on the retreat from Kohima, mainly from hunger. They ran out of food stocks, and as a result their animals died like flies, all along the escape route. The senior Jap Veterinary Officer said that only five horses returned from the original number at the beginning of the campaign. He also said that the best animals they had were the mules they had captured from the British forces.

A survey of the animal requirements of the Siamese showed that riding horses were required in Bangkok by the Siamese Army for remounting their 1st Cavalry regiment, that small ponies were wanted in the up-country districts, and that a few small ponies were required by the Pasteur Institute for serum manufacture (anti-snake bite). Sales by auction and private treaty were arranged, and two hundred riding horses, and 958 pack ponies and mules were sold.

In addition to the above animals, the Japanese had a few Army dogs, three of which were captured. They were good Alsatians, bred in Japan, and were used for guard duties, being trained to attack any man indicated by their handlers. They were sold by auction and fetched high prices.

Army Will Continue to Encourage Horse Breeding

THE Army will continue to encourage the breeding of horses, according to Colonel Fred L. Hamilton, Chief of the Remount Branch, Office of the Quartermaster General, who says the answer lies chiefly in the benefits which accrue to the civilian horse raisers and users of the nation who have demanded that the horse breeding program, in operation for the last 25 years, be continued by the Government to assure the present high standard of both draft and light breed animals.

Recently Congress appropriated $150,000 to continue the program for the fiscal year ending 1947 under the jurisdiction of The Quartermaster General.

When, during the reorganization of the War Department back to a peacetime basis, the existence of the breeding program was threatened with extinction, horse breeders of nearly all States, who are benefited by the availability of the Army owned breeding stock for the improvement of their own stock, mailed thousands of letters to Congress in protest against the abandonment of the program.

According to Colonel Hamilton, the civilian breeders claimed the following benefits: Fine breed Army stallions are available at widely distributed points throughout the country at fixed and extremely reasonable stud fees; breeders find it possible to instil good blood into their stock, developing horses with better endurance and vitality, and capable of better performance; that since initiation of the breeding plan, more than 200,000 foals have been reported to have been sired by fine-bred Army Remount Stallions, thereby definitely improving the national standards of civilian owned stock.

Based on the Army purchase price, a conservative estimate places the salable value of these colts at least $100.00 over the normal selling price of common stock and this, according to Colonel Hamilton, represents an increase in value of something over $20,000,000.

These and other benefits have accrued to the financial advantage of the horse breeders of the nation in general and fear of discontinuance of the program resulted in a deluge of mail to members in Congress when its appeared that the Remount Breeding Program would be abandoned.

Over the period of years between 1921 and the present, the Quartermaster Remount Service has increased its holdings of stallions from 165 to over 700, by purchases, donations, and the breeding activities at the various Remount Depots where bands of good brood mares are maintained. This number has recently been augmented by the acquisition of some of the finest horses in Europe, acquired as "war booty" from Axis countries. Early in August about 100 fine bred horses arrived in the United States from Bremerhaven, Germany. This means, as a result of victory, acquisition has been made of about 250 of the world's best stallions and brood mares, which include Thoroughbreds, Half-Breds, Arabs, Arab-Kinds and Lippizanners.

At the present time the Remount Branch has more than 500 stallions standing throughout the United States, but it does very little breeding on its own. The stallions are farmed out to agents throughout the country, located principally in horse breeding sections, who may charge not more than a $10.00 stud fee for breeding to mares belonging to others.

The trend toward mechanization of warfare is reflected in a comparison of horse purchases for World War I and World War II. In contrast to the 486,000 horses and mules purchased for World War I, The Quartermaster General Remount Service procured 57,242 for World War II, 55 per cent of which were draft horses and pack mules. The balance were riding horses, a number of which were provided for the Coast Guard Beach Patrols, the training and operation of which were supervised by the Remount Service.

In spite of mechanization, however, pack mules were used to great advantage in the mountainous terrain in Italy, and, although all the reports of World War II have not been completely evaluated, there is ample evidence that in China, Burma, and the South Pacific, animals played an important part in the successful supply of combat troops.

Because of 25 years of good breeding practice and the acquisition of fine stock from other countries, the Quartermaster Remount Service at the present time has one of the finest bands of brood mares in the world and some of the best of the world's stallions standing throughout the country which are available to civilian horse breeders.

The six Remount Purchasing and Breeding Areas distributed to cover the entire United States are:

The Eastern Remount Area, with headquarters at Front Royal, Virginia.

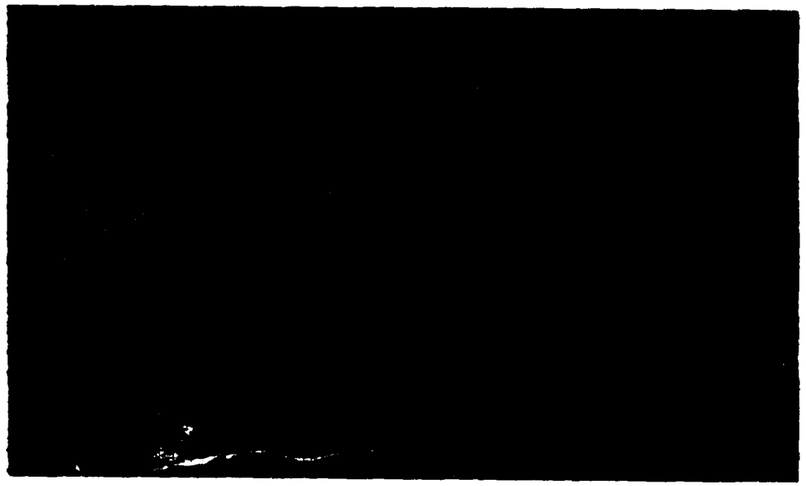
The Central Remount Area, with headquarters at Lexington, Kentucky.

The Northwestern Remount Area, with headquarters at Sheridan, Wyoming.

The West Central Remount Area, with headquarters at Colorado Springs, Colorado.

The Southwestern Remount Area is governed from San Angelo, Texas.

The Western Remount Area has its headquarters at Pomona, California.



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Ten thousand horselovers watch the show at Front Royal, Virginia. Some of the world's finest horses are maintained at this Remount Station.

★ ★ ★

Equine Reparations*

by Lieutenant Colonel Gordon W. Cook, 2.M.C.

DURING April 1945 General George S. Patton's Third Army, in its fast sweep across Germany, captured several German Government and German Army horse-breeding farms, and with them several thousand valuable horses. For twenty-five years the United States Army Remount Service has been attempting to improve the breed of riding horses in the United States through a system of placing good stallions with civilian agents throughout the country. When these two seemingly unrelated facts jelled in the mind of Colonel Fred L. Hamilton, Chief, Remount Branch, Field Service Division, Office of The Quartermaster General, this story had its beginning.

During early August, 1945, General Patton returned on temporary duty to Washington, and Colonel Hamilton had a long talk with him about the horse situation in Germany and Europe as a whole. He found that much valuable bloodstock had been captured by the Third Army and was being held in various German Government and German Army horse-breeding farms in the American Occupation Zone. War Department orders were issued directing Colonel Hamilton to proceed to the American Zone of Occupation to select and return to the United States such bloodstock as he felt would be of value in the Army Horse-breeding Program.

*The Quartermaster Review.

In order to appreciate the heritage of the horses which were brought from Germany it might be well to consider briefly the general history of Europe—a long story of conflict and of migrations and transmigrations of whole peoples, in all of which the horse played a major part. The Roman warriors in their chariots roamed the Roman Empire, of which Southern and Central Europe were a part. It is natural to assume that there was a certain amount of fraternization—equine as well as human. In the 9th and 10th Centuries the Magyars came out of Central Asia on horseback, overran Central Europe, and finally settled down in Hungary. Such a march would certainly eliminate the unfit, and the horses that arrived in Europe must have been really rugged. The Magyars were followed by Genghis Khan and his Mongols, and the whole thing was repeated. Then came the Turcanians, who by the 13th Century had overrun all Asia Minor and had secured a foothold in Southern Europe. As late as the end of the 17th Century the Turks were laying siege to Vienna, mounted on horses from Arabia, Syria, and Persia.

From the tested and proven war horses of the ages the Europeans have developed some remarkable light horse breeds. Numerous conflicts and changes of boundaries in more modern times have resulted in an almost continuous blending and amalgamation of this original horse blood. The Europeans, from choice and neces-

sity, take their horse business very seriously, and through thorough and careful selection they have developed breeds of specific types and for specific needs.

Our own story in America is quite different. The horse is not a native. Our foundation stock consists primarily of inbred wild bands descended from a few horses left by the early Spaniards and the horses brought over by the early colonists. While we have continuously imported heavy draft horses and an occasional English thoroughbred, we have had no great influx of foundation stock. As a result, our Remount Service in the meager twenty-five years of its existence, has been forced to resort to the violent crossing of a heterogeneous lot of horses. We have, therefore, not developed a type that will breed true, and, with our present stock, it would have been a long time before we did. You can't beat the laws of Mendel.

Colonel Hamilton proceeded to Berlin where he conferred with Lt. Gen. Lucius Clay, Deputy Military Governor of the American Sector, and discussed the entire matter with him. Colonel Hamilton then proceeded to the German Government thoroughbred breeding farm at Altefeld. The German Government established Altefeld in 1934, and immediately set out to accumulate superior foundation stock there. The war gave them almost unlimited opportunity in this respect. They assembled here the stallions Phalaris, Brantome, Bubbles, Antonym, Oleander, and Flamboyant, and a band of superior mares from all over continental Europe. The Germans established here not only the best possible foundation bloodstock but their best horsemen as well. Captain Falk, the veterinarian, had been in charge of the breeding at Altefeld for ten years. This breeding farm had been kept intact throughout the war, and in September 1945 it was still a well-run farm with most of its original complement of personnel.

Colonel Hamilton then visited Monsbach and Donnauworth, where the German Army had been carrying on a breeding program for many years. Here were established not only some of the best German stock but also some bloodstock captured in Poland, and many of the horses from the Hungarian State Stud at Babolna, which was established in 1789 by the Emperor Joseph II of Austria. As the Russians pressed into Hungary, the Germans evacuated the Babolna Stud to Germany proper.

After more than a month of looking at horses and selecting the better bloodstock for return to the United States, Colonel Hamilton completed arrangements for the shipment of 152 horses, consisting of sixty-four Thoroughbreds, forty half-breds, twenty-three Arabs, fifteen Arab Kinds, nine Lippizzaners, and one Russian horse.

The horses fall into two categories: First, those which were captured from the Axis armies and, as such, are legitimate prizes of war, in accordance with the Rules of Land Warfare and the Hague and Geneva Covenants. (In this connection it is interesting to note that one of the foundation sires of the great English Thoroughbred was Byerly Turk, captured by the British Captain Byerly in the Turkish war mentioned earlier in this story.) Second, those which were requisitioned by our occupation forces from the German Government and/or from private German breeders. Those horses which we requisitioned were appraised and accepted for subsequent inter-Allied reparation settlements in accordance with the Potsdam Agreement.

After days of tedious rail shipments to the Port of Bremerhaven, the horses were loaded on a lightly ballasted Liberty ship, and for twenty-one days they battled one of the worst storms of the North Atlantic. On one occasion several of the horses were thrown completely out of their stalls and out on the deck in a heap. Naturally they were a pretty sad sight when they arrived. That none were lost or permanently injured is a real tribute to the horsemanship of the six officers and seventy enlisted men who accompanied them.

The ship docked at Newport News, Virginia, in October 1945, and the horses were unloaded and shipped by rail to the Aleshire Quartermaster Depot (Remount), Front Royal, Virginia, where they went into strict quarantine. All during the winter and early spring they were conditioned, and were not shown to the public until April 7, 1946. At that time an exhibition of these horses was held before a crowd of several thousand visitors, including some of the best known and most distinguished horse-breeders of America.

Some of these horses are valued highly from a monetary standpoint. Their value to the Army Horse-breeding Program is so great that it cannot be measured in dollars and cents. Following is a short description of the various breeds and of a few of the better horses.

The main interest of civilian breeders, of course, lies in the Thoroughbreds, for they are the horses which are eligible for registration with the Jockey Club and for racing on the various tracks in the United States and all over the world. The top representative of this breed is Nordlicht, a five-year-old chestnut horse, for whom offers of up to $300,000 have been made. Nordlicht won the German Derby in 1944. His sire, Oleander, also won the German Derby and was an undefeated racer. These Thoroughbreds, as a whole, represent the finest bloodlines of all Europe. In their pedigrees the names of the famous stallions Oleander, Herold, Bubbles, Janitor, Alchemist, Teddy, Belfonds, Brantome, Blandford, Pharis, Pharos, Flamboyant, Tracery, Blenheim, Manna, Mannamead, Swynford, Phalaris, and Fairway appear again and again. In addition to Nordlicht, Athanasius, who also won the German Derby, Konig Laurin, an ex-steeplechaser, Tagfalter, and Taj Akbar, who formerly belonged to the Agha Khan and was second in the Epsom Derby, were brought to this country.

Also included in the shipment were twenty-three Arabian horses, bred in the Polish Stud in Janow and in the Hungarian State Stud in Babolna. The origin of

the Arabian breed has been the subject of much romantic invention. As a matter of fact, existence of the horse in Arabia proper is of comparatively recent date, the best horses of earlier times having been in middle Asia and Persia. One generally accepted version of the origin of the foundation stock of Arabians is the report that a tribe in flight from Mecca to Medina started out with ninety-five mares, only five of which reached Medina alive, and that these five were the foundation stock of the Arabian breed. The fact that one of the primary qualities of the Arabian horse is his endurance lends credence to this report. There are not a great many directly descended Arabian horses in the world —probably less than 30,000. The two best Arabians brought over in this shipment were Lotnik and Witez II. Lotnik is an eight-year-old grey horse, by Opal out of Mokka. He was bred in Poland and brought to Germany by the German Army as a yearling. The Germans felt, and horsemen of this country are inclined to agree, that he is one of the finest Arabian stallions in the world. He is both a nice horse and a good horse, having the quality, performance, style, and temperament that you hope to see in a nice horse, and the spirit and durability that characterize a good horse. Witez II, an eight-year-old brown horse, by Ofir out of Federacja, was bred in Poland and brought to Germany as a yearling by the German Army to be installed in their newly organized Arabian Stud. His sire, Ofir, represents one of the most popular Arabian lines. In the ten generations of his pedigree there appear eleven desert-bred horses, among them his grandsire, Kuhailan-Haifi.

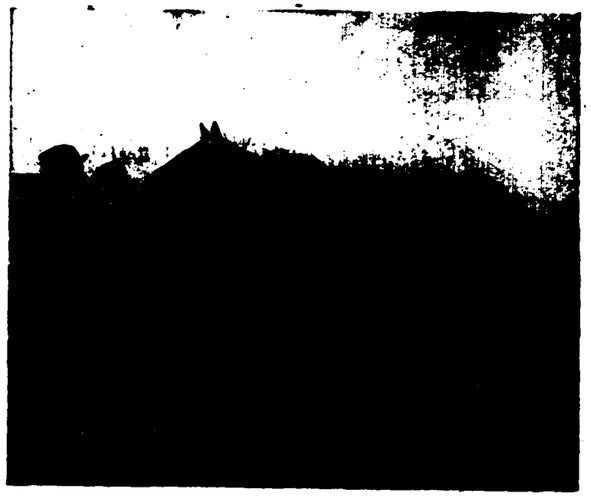
Fifteen Arab Kinds were included in this shipment. This particular breed comes from Hungary, and through it the Hungarians have attempted to maintain the original Arabian characteristics and, at the same time, improve the size and substance. They originally imported to Hungary, in the middle of the 18th Century, Shagya, of the Koheilan breed, and many others, including Obajan, Hadbar, and Siglavy-Bagdady. The fifteen brought over are descendants of these foundation stallions. Pedigrees of these animals have been recorded since the early 1800's.

Also included in this shipment were nine Lippizzaners, bred by the Hungarian State Stud at Babolna. They originated in Lippizza on the border of Italy and Austria. They were first brought into Austria in the 16th Century and are said to have the oldest recorded stud book of any breed in the world. These horses were bred primarily for coach horses for the royal family, high school horses for the Spanish Riding School in Vienna, and stallions for the farms where more active draft horses were needed. They are all descendants of the original five stallions of the Lippizzaner breed—Favory, Conversano, Maestoso, Neapolitano, and Pluto.

The forty half-bred horses which were also included in the shipment are probably, from a strictly Remount viewpoint, the best things that we have. Because of the splendid foundation stock in Europe, the Europeans have bred very intelligently, adding a little hot blood and a little cold blood where needed until they have developed a half-bred which is just about right. Not only has their breeding been intelligent but their selection has been based entirely upon performance. They introduced half-bred racing, and all the stock passed some very strenuous racing, endurance, and performance tests before being put in the nursery. One mare named Adian won a couple of races against many Thoroughbreds. One of these races was 34 miles and 6 furlongs; she won it in 1 hour, 50 minutes, and 40 seconds, carrying almost 200 pounds. Two days later she won a four-mile race on the flat, also against Thoroughbred horses. It is horses of this type that will do much to improve the breed of riding horses in the United States when put to use through the Army Horse-breeding Program.

The U. S. Army Horse-breeding Program had its inception in 1920. During the First World War, when the Army was purchasing a large number of horses, it was discovered that there were not sufficient qualified riding horses available in the United States. In 1919 the Secretary of War appointed a Remount Board, consisting of prominent civilian horsemen and Army officers, for the purpose of making a study and recommendations concerning this lack of good riding horses. The Department of Agriculture was carrying on a small breeding program with about thirty stallions throughout the country. The Remount Board recommended that the Army take over these stallions and expand the program to supply sufficient riding horses for civilian horsemen and for the Army's use in case of need. In the twenty-five years since the Program's inception the Army increased the number of stallions to a peak of

Nordicht, superb five-year-old stallion. He is one of the many splendid animals at Front Royal.



over 700, and at the present time has 500 stallions scattered throughout the United States with civilian agents in small communities.

The stallions imported from Europe will be of inestimable value in furtherance of the Army Horse breeding Program, and the mares will be placed in the brood mare bands in the various remount depots for the purpose of producing additional stallions to carry on the Program.

The Thoroughbreds remain at Aleshire QM Depot (Remount), Front Royal, Virginia, pending completion of their registration with the Jockey Club, the Arabs and Lippizzaners have been shipped to the Pomona QM Depot (Remount), Pomona, California; the half-breds have been shipped to the Reno QM Depot (Remount), Fort Reno, Oklahoma, and the Arab Kinds were split between Pomona QM Depot (Remount) and the Reno QM Depot (Remount). The majority of the stallions were used in the studs of these depots this year, and next spring will go out with agents to further the Army Horse-breeding Program to improve the breed of riding horses throughout the United States—a project which has met with the complete approval of the American ranchmen and breeders.

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CAVALRY LEADERSHIP TESTS TO BE RENEWED IN 1947

Armored Cavalry units will renew competitive tests in 1947 to develop leadership in platoons, it has been announced by General Jacob L. Devers, Commanding General, Army Ground Forces. Competition in 1947 will be restricted to units stationed in the continental United States.

These tests were instituted in 1928 when an anonymous donor gave $35,000, the income from which was to be expended on prizes and awards to encourage and promote cavalry leadership. They had to be abandoned at the outbreak of war in 1941.

The test will be divided into four parts, each part weighted as follows:

(1) Army Ground Forces Physical Fitness test, one-sixth.
(2) Disciplinary record of platoon, one-sixth.
(3) Army Ground Forces Platoon Combat Firing test, one-third.
(4) A tactical motorized march of more than two hours, bivouac and night movement to an attack position, inspection of clothing, equipment and clothing, one-third.

Three prizes will be awarded in 1947. Two will go to the Second Armored Division and the third will go to the Third Cavalry Group (Mechanized).

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The new Tables of Organization for the Armored Division call for an increase in the tank strength from 265 to 400 (increase to be in medium and heavy tanks), increased fire power, and an increase in personnel from 11,000 to nearly 15,000 officers and men. The new Armored Divisions will include addition of a battalion of heavy artillery, and there will be four infantry battalions instead of three as at present, with a company of infantry added to each battalion. Under the new organization, the Armored Division will have a strength of 16 rifle companies instead of nine, as at present.

The new organization will be equipped with approximately 50 light tanks for reconnaissance purposes and three battalions of medium tanks—improved General Sherman tanks (35 tons) to be armed with 76mm guns.

Added to the new Armored divisional organization will be another battalion of General Pershing tanks to be employed in assault operations. These heavy tanks, which weigh between 45 and 50 tons, will be armed with 99mm guns. The new organization will also provide for an increase in medium artillery.—*Army and Navy Register.*

The New National Guard

*by Major General Butler B. Miltonberger**

A NEW National Guard program is in the making in connection with the plans for the postwar military establishment. Our objective will be to keep secure the peace for which our armies fought. From the many lessons learned in this recent war the most outstanding is that preparedness is the keynote of military policy. The maintenance of a Regular Army alone will not provide this preparedness. The National Guard, organized and ready for immediate mobilization at the order of the Commander in Chief, will provide the first lines of defense if ever again we are threatened by another world conflict.

The National Defense needs of the United States require a broader dissemination of knowledge of military affairs, tactics, and technique through the rising generations of manpower than has ever been necessary before. I am strongly of the opinion that the best solution remains with some form of universal military training under Federal auspices with a close integration of that program with the civilian components of the Army and Navy.

The present authorization of troops by the War Department for the National Guard totals 682,000 including 620,000 Ground Force troops, 58,000 Air troops, and 4,000 for the Headquarters and Headquarters Detachments, which provide the administrative personnel in the offices of the Adjutants General of the States.

The Ground Force troops include 25 Infantry Divisions, two Armored Divisions, and considerable numbers of Antiaircraft Artillery, Armored Cavalry, Engineers, Field Artillery, Medical, Ordnance, Quartermaster, Tank, and Signal troops. Of the total authorized Ground Force troops all except 57,102 have been officially accepted by the Governors of the States.

It has been decided that, by and large, the new National Guard will initially be a veteran force. The officers holding posts in this force will be required to have performed efficiently in wartime federal service in the same positions or in positions of "corresponding and equal responsibility" to those to which they are appointed in the new National Guard.

But what of the enlisted men? Particularly, what of the noncommissioned officers?

A year ago this summer it began to be certain that the war was nearly over. We would want to use our war veterans to form the new National Guard. As the officers would come home, they would, under standing provisions of law, still retain their old "recognitions" in their old units. All enlistments would, however, have expired. The enlistment in the National Guard of a State is for three years. The induction was in 1940 and 1941. Those enlistments expired while the guardsmen were in federal service. A year ago we had no enlisted men in the National Guard at all, not even the returned soldiers to use as a nucleus.

So in August, 1945, we attacked the problem. The result was a circular issued in September, 1945, to permit the resumption of enlistments in the National Guard. Only men who had completed their federal service could be enrolled.

Then the Japanese surrendered. The War Department determined in October new over-all policies for the new National Guard. A plan for organization was prepared. Money was provided in appropriation acts of Congress. Equipment and supplies were provided. Training provisions were sketched. But still we had no soldiers.

This summer we were ready to go ahead, but it was a difficult problem. The war is even yet not over and Selective Service is still taking men for the army, although now between the ages of 19 and 29 only. The Recruiting Service is still enrolling people. We would be in competition with them for personnel. But finally the matter was settled.

The National Guard would start recruiting. It would have no prior claim on men eligible for induction through Selective Service. Those who had not helped in the war effort and who were eligible for the draft owe their first duty to the occupation forces. We would take veterans and would fill the first few low percentages of our strength from those who were experienced soldiers. We could take in some 18-year-olds not yet eligible for induction and season them but would release them to the draft when they would be called for Selective Service. The veterans would break these men in right, and would give them their first introductions to military affairs in the familiar surroundings of a home-town unit, with home-town support.

This procedure will give us two things: First, it will give us a seasoned backbone for the postwar National Guard and second, it will introduce the National Guard as a home-town force to the younger generation growing up.

Next to the Regular Army there will be no larger organized military force than the National Guard. We are aiming at a target strength of 514,000 to be reached within the next two years. This organized force is going to be ready to fight any place in the world under any combat condition.

We have enlarged the over-all troop basis two and a half times compared to what it was in 1940. We are going to train our National Guard the same as the Regular Army and we are going to employ the latest

*Chief, National Guard Bureau

developments in warfare to their best advantage. Radar, the target-seeking missile, the jet-propelled plane, and the proximity fuse will add to our National Defense and will be used by the National Guard in providing that defense.

We are going to train harder than ever before. That two-week field period must be two weeks of hard work and intensive training. But to make this training pay off we need leadership. We prefer for a time war veterans. We need them for our noncoms and for our officers. All of our plans revolve around the experienced leadership that can be trained into the National Guard by men who have that experienced leadership to start.

Upon receipt of the original National Guard troop basis of 572,000 the National Guard Bureau prepared a study allotting to each State, Hawaii, Puerto Rico, and the District of Columbia, the equitable share of troops based upon the military manpower of the State and also based upon a desire to provide a balanced force in each of the various parts of the country. We looked carefully into the facts as to what units, especially what types of units, had been furnished by the States for the induction of 1940 and 1941. We did this partly on account of the question of armory facilities because, as you well know, an artillery unit with specially heavy arms and equipment needs stronger floors and structure for its armories than a lightly equipped Infantry unit. We also were thinking that the localities from which the former units were drawn would very likely have a reservoir of war trained personnel for units of those types. But we were principally thinking of preserving, in so far as possible, the historical continuity of the units of your States.

The particular problem before us at this minute is to conform to the over-all needs for the National Defense as now presented and still not break the historical continuity of the units which the States furnished the National Government in 1940 and 1941. We have been in consultation with the Historical Section of the Army War College upon this subject and we have been assured that a little care in the administrative handling of the reorganization will definitely preserve unit histories. It may be understood that the units which the States furnished to the Federal Government upon induction have been returned to those States in accordance with the provisions of Section III of the National Defense Act, and that when the Governors agree to a change in allotment they have had those units in their hands and are agreeing not so much to surrendering them as to changing their character. Consequently, when they issue orders for the reactivation and reorganization of the National Guard of the States, they can preserve unit histories by having the orders read that the old unit is redesignated as the new unit.

Cavalry and armored units in the new schedule of National Guard troops will be quite different from those of the past. Prior to the war we had two cavalry divisions (in addition to several other cavalry units) and we had a tank company in each of the old square type infantry divisions. These were all reorganized between 1939 and 1942.

Now there will be no horse cavalry units at all. There will be a mechanized cavalry reconnaissance troop in each of the 25 infantry divisions. There will be other mechanized cavalry as follows:

California: 39th Cavalry Group with the 109th and 118th Reconnaissance Squadrons.
Illinois: 106th Cavalry Reconnaissance Squadron.
Idaho: 114th Cavalry Reconnaissance Squadron.
Iowa: 113th Cavalry Reconnaissance Squadron.
Massachusetts: 211th Cavalry Reconnaissance Squadron.
Missouri: 108th Cavalry Reconnaissance Squadron.
New Jersey: 102d Cavalry Group with the 102d and 117th Reconnaissance Squadrons.
New York: 101st Cavalry Reconnaissance Squadron.
Ohio: 107th Cavalry Reconnaissance Squadron.
Pennsylvania: 104th Cavalry Reconnaissance Squadron.
Texas: 56th Cavalry Group with 112th and 124th Reconnaissance Squadron.
Wyoming: 115th Cavalry Reconnaissance Squadron.

The total nondivisional cavalry strength in the new National Guard will total 609 officers, 45 warrant officers, and 9,402 enlisted, or an aggregate of 10,143.

There will be two complete armored divisions, the 49th in Texas and the 50th in New Jersey. Including these divisions there will be armored units which will total 1,356 officers, 98 warrant officers, and 17,803 enlisted, or an aggregate of 19,257. The nondivisional armored troops now allotted include:

Arkansas: 206th Tank Battalion.
California: 199th Tank Battalion.
Colorado: 193d Tank Battalion.
Georgia: 190th Tank Battalion.
Idaho: 200th Tank Battalion.
Indiana: 134th Tank Battalion, 299th Armored FA Battalion.
Iowa: 634th Tank Battalion.
Kansas: 635th Tank Battalion, 161st and 154th Armored FA Battalion.
Kentucky: 192d Tank Battalion.
Louisiana: 773d Tank Battalion.
Massachusetts: 177th Tank Battalion.
Michigan: 188th Tank Battalion.
Minnesota: 194th Tank Battalion.
Mississippi: 198th Tank Battalion.
Missouri: 196th Tank Battalion.
Nebraska: 195th Tank Battalion.
New Jersey: 695th and 696th Armored FA Battalions.
New York: 24th and 171st Armored Group with 116th, 180th, 801st, 802d, and 827th Tank Battalions.

Ohio: 107th Armored Group with 185th and 637th Tank Battalions, 987th Armored FA Battalion.
Pennsylvania: 172d Armored Group with 181st, 628th, and 629th Tank Battalions, 176th and 967th Armored FA Battalions.
Tennessee: 173d Armored Group with 183d, 775th, and 765th Tank Battalions.
Utah: 145th Armored FA Battalion.
Virginia: 182d Tank Battalion.
Washington: 652d Armored FA Battalion.
West Virginia: 197th Tank Battalion.
Wyoming: 300th Armored FA Battalion.

Other continuing studies that must be resolved in the immediate future deal with personnel, supply, and fiscal requirements.

In considering officer personnel policies, I will limit my discussion primarily to an interpretation of the requirements which have been established for initial procurement. Our War Department Policies establish a basic requirement for procurement of officers in the initial reorganization which limits initial procurement above the grade of second lieutenant to those officers who have served honorably in active Federal service in the Armed Forces for at least six month since 7 December 1941 and who, during that period, demonstrated their qualifications by actual service in the grade and position contemplated, or by satisfactory discharge of duties of corresponding and equal responsibility. The restriction limits selection of officers to certain groups. First, there is the group consisting of our National Guard officers who retain Federal recognition, some of whom are now under State control and some still in active Federal service. These officers constitute an immediate problem for the State, since they must either be absorbed in the reorganized National Guard or transferred to the Officers' Reserve Corps. These National Guard officers should be utilized to the fullest possible extent provided that they meet age-in-grade and physical requirements for continued recognition. Since reassignment will in many cases involve a change in grade, or arm or service, many of them will be required to appear before a board for examination as to their qualifications for the new assignment. This is sound procedure and I might suggest that it be followed in the case of all of these officers. Vacancies may be retained for those officers who are still in Federal service. Our phasing plan provides for this contingency since only 25 per cent officer personnel is necessary for recognition of a unit.

The War Department has recently lowered the age for enlistment in the Regular Army to 17 years by virtue of a special statute. War Department Policies state that National Guard enlistment standards will be the same as those provided for the Regular Army including the age qualifications. But we cannot make this change yet. We are still bound by the old law, that is by Section 58 of the National Defense Act, which still says, "not less than 18 years." The National Guard Association has made a definite suggestion for such an amendment.

The law permits the enlistment of men up to the age of 45. The Approved Policies restrict the age for original enlistment to 35, because that is now the War Department's upper limit for the Regular Army. Indeed, the age limits of 18 to 35 were those specifically mentioned elsewhere in the Approved Policies in blueprinting the new National Guard. I think we will get the young and vigorous men we want for an M-Day force if we hold to the lower limit of 35, men for our senior noncoms.

As for the supply plan of the National Guard it is the responsibility of the War Department to procure by purchase within the limits of appropriations made by Congress and to issue from time to time, upon requisition of the Governors, such material, clothing, and equipage as may be necessary to arm, uniform, and equip the National Guard for field service. Federal property will be issued within the limits of available appropriations on the basis of Tables of Organization and Equipment prepared by the War Department.

Before equipment is issued, the National Guard units to which equipment is to be issued must be Federally recognized or the State must accept for immediate activation a portion of the National Guard Troop Basis allocated to the State. No unit will be Federally recognized until the State has provided adequate and suitable facilities for the unit to store and care for Federal property. Determination as to the adequacy of such facilities is made by the Secretary of War. A State cannot be relieved from responsibility of Federal property issued to it which becomes lost, stolen, destroyed, damaged, or unserviceable unless it is clearly shown that reasonable precautions to care for and safeguard the property were carried out; that loss, damage, or destruction came about unavoidably through the fault or neglect of no one; and that the unserviceability resulted from fair wear and tear in the service.

In so far as supply is concerned, the State Headquarters is comparable to an Army Headquarters. The U. S. Property and Disbursing Officer, who is a member of the State Headquarters, is comparable to the station supply officer. The National Guard will be supplied from the same sources and use the same procedures that apply to the Regular Army in the Zone of Interior. The initial shipment of equipment and supply will be a fraction of the total authorized for the full strength organization and will be based upon actual requirements for meeting the training program.

When looking into the maintenance requirements for the National Guard, we find the same factors that apply to any military maintenance problem. The various Tables of Organization will give us the details of organizational equipment; the training program will give us information on which to estimate the usage of this equipment; the mission of the National Guard

demands that the equipment be in constant readiness for combat use.

We have three classes of maintenance—organizational, field, and base. The organizational and field maintenance will be the responsibility of the Guard itself within various States. Base maintenance will be a responsibility of the Technical Services. In comparison with the prewar situation, the Guard will have a greater quantity of increasingly complex equipment. Responsibility for organizational maintenance is within command channels and each organization and unit commander has his definitely fixed responsibilities.

In recognizing the limitations put on unit maintenance provision is made for unit caretakers. This unit caretaker will be classified as a matériel and maintenance mechanic and will be a full-time employee. He will be required to be a member of the Guard and of the unit concerned. In addition to having custody of the equipment and property of the Unit, he will perform unit organizational maintenance, within his capacity, under direction of the unit commander. In units, such as tank companies and artillery batteries, when the amount of equipment in the hands of the unit is such that the maintenance load is beyond the capacity of one caretaker, we expect to authorize additional caretakers.

We have in the troop basis a certain number of service troops. There are, of course, the divisional service troops in each of the divisions. In addition to these units, we have 11,000 ordnance troops, nearly 8,000 signal troops. In addition to the necessity for having all equipment for the Guard continuously in combat serviceable condition, we must also have these service troops at a high degree of readiness if our Guard units are to be effective in sustained combat. It is obviously impossible for these service units to perform any appreciable part of the required field maintenance during their authorized weekly drill period.

We have a provision in the law for the establishment of caretaker pools. We intend to use this authorization to establish in our service units the necessary number of maintenance pools to meet our responsibility for field maintenance. In general, these maintenance pools will be composed of members of the Guard service units employed on a full-time basis at mechanics' wages. We will utilize the Army technical schools for training these individuals to the extent required. Our current budget estimate provides for an adequate number for the fiscal year, 1947. The exact number to be required in the future will depend upon experience. In ordnance maintenance units, we may have up to 20 per cent of certain organizations on this full-time duty. In carrying out maintenance operations, they will utilize organizational equipment furnished to units and will replenish basic loads of supplies and spare parts by requisition. It is obvious that fully qualified service units will be the result of this system

Funds appropriated for the support of the National Guard will provide the salaries for all caretakers and reimbursement for supplies.

In addition to supply and maintenance responsibilities, it has been necessary for the National Guard Bureau to take the lead in establishing a firm installations and facilities program. In the National Guard policies, we have already stated that "The States will furnish the personnel, adequate armories, and storage facilities." The United States will supervise instruction and will furnish outdoor training facilities, pay, and all uniforms, equipment, and ammunition.

The interpretation was made that armories and related facilities for local use of the troops would be a State responsibility, and that the summer training camp would definitely be a Federal responsibility. There is an in-between matter of rifle ranges, week-end training sites, and other similar facilities, but this will have to be worked out as we go along. It was necessary to present specific cases to G-4 for definite reaffirmation of our concept of this approved policy. The following policy announcement resulted: "The facilities selected for summer training of the National Guard will be retained under Federal control in accordance with approved War Department policy. Necessary instructions have been issued to the Commanding General, Army Service Forces, to hold the post, camp, and station property necessary for the summer training of the National Guard and to provide necessary fire protection."

Based upon the proposed allocation of troops, which was submitted to the States, a total of 31 stations and 18 harbor defense installations have been approved by the War Department for the summer training of the entire Ground Forces of the National Guard. It is anticipated, at this time, that the Air units will do their summer training, in general, at their home Air Bases. The approved camps, except harbor defense installations, in some cases, cannot accommodate the entire Guard allotted at one time. It is obvious that for these stations the training periods must be phased. It is, however, intended that complete divisions, wherever they are organized, will train at summer encampments as a unit.

The unprecedented size and scope of the postwar National Guard under the approved troop basis has presented a major budgeting problem to the National Guard Bureau. The 1947 Budget is the largest budget estimate ever submitted for Federal appropriation to support the National Guard. Definite assumptions had to be made to form a basis from which to build the estimate. These assumptions included that activation of the National Guard would be early this year, that the attained strength as of June 1947 would be 240,000 officers and enlisted men, and that 72,000 of these would engage in field training at the end of the fiscal year 1947.

THE ADMIRALTIES. Historical Division, War Department. Printed by Government Printing Office. 40¢.

The first Cavalry Division and its conquest of the strategically important Admiralty Islands is the subject of this 150-page book published in October by the Historical Division of the War Department.

This is the eighth in a series of historical reports published by the Historical Division to be followed by others on all phases of World War II.

Every phase of the Admiralties campaign is covered in this interesting little book, from the assault on Los Negros and the battle to hold that beachhead, the control of Seeadler Harbor, the attack on Manus Island, the landing at Lugos Mission, the capture of Lorengau airdrome, to the capture of the outlying islands—Pityiu, Koruniat, Ndrilo and Rambutyo.

With an initial force of 1,000 men to the enemy's 4,300, the landing force not only overwhelmed the enemy but exacted a vastly disproportionate number of casualties from the defenders. Against American losses of 326 killed, 1,189 wounded and four missing, Jap casualties were estimated at 3,280 killed and 75 missing, an approximately 10-to-1 ratio.

The actions of men and individual units are described in detail in this book. Names of outstanding First Cavalry Division soldiers are on practically every page.

This is a book that every present and former member of the First Cavalry Division will want to own. It is also a book for everyone as it tells the story of one of the hardest fought campaigns in World War II.

It is highly recommended reading.

INCENDIARY WARFARE. By Colonel George J. B. Fisher. The McGraw-Hill Book Co. $3.00.

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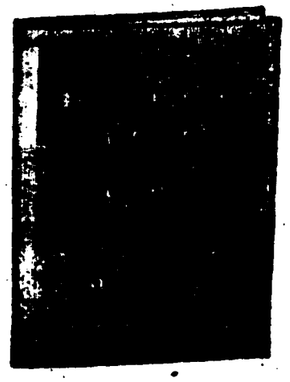

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THE FUTURE OF AMERICAN SECRET INTELLIGENCE. By George S. Pettee. Infantry Journal Press. $2.00.

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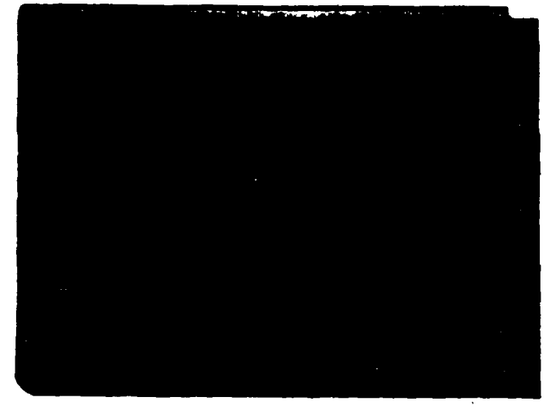

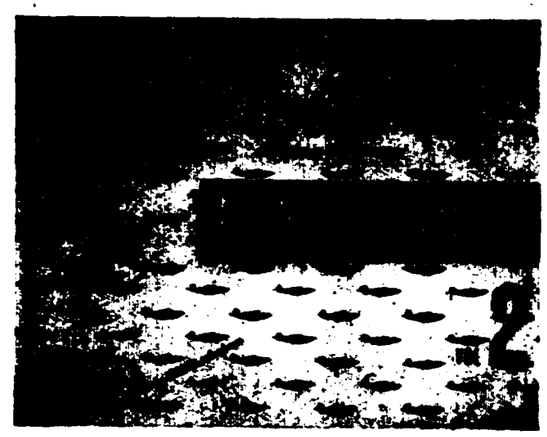

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