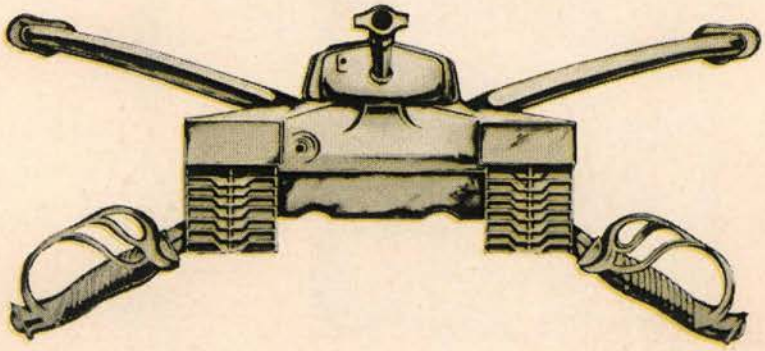
ARMOR



FOR ARMOR—A NEW INSIGNIA

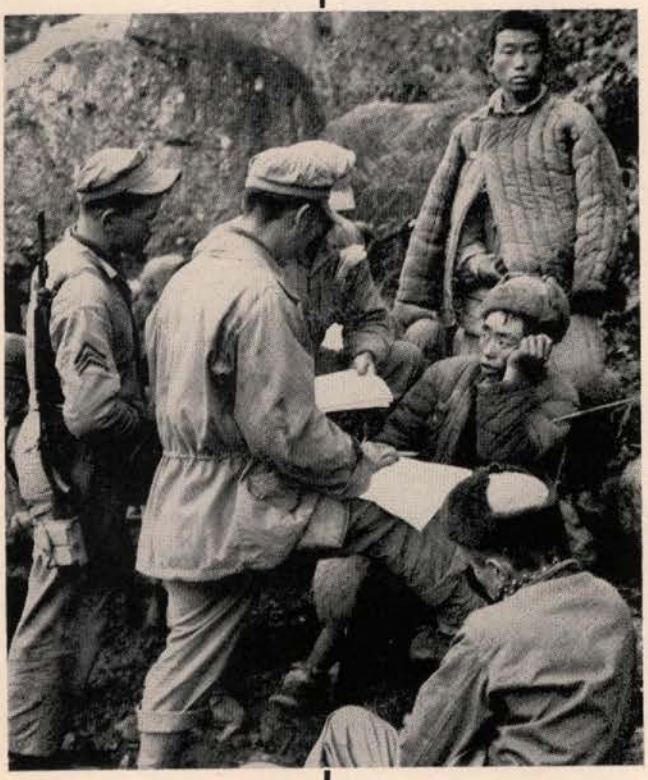
An M-26 tank, front view, with gun slightly raised, and superimposed upon two crossed Cavalry sabers in scabbards with cutting edge up. Of gold colored metal.

[See Page 12]

JANUARY-FEBRUARY, 1951

KOREA

American fighting men are in contact with several languages in the combat zone in Korea. Interpreters are not plentiful and timely information may mean the difference. In this instance a South Korean was on hand to interrogate Chinese Communist prisoners. It isn't always thus.



service around the world . . . . a world of languages . . .

occupation
military government
intelligence
conversation
interpreting
civil affairs
attaché assignment

Write for information

Spanish
French
German
Italian
Russian
Polish
Norwegian
Swedish
Finnish
Dutch
Portuguese
Irish
English
Afrikaans
Hebrew
Chinese
Japanese
Modern Greek
Czech
Esperanto

A Linguaphone Conversational Course is a complete unit containing every essential element to enable a person to learn the new language easily, quickly and thoroughly.

The basic value of a Linguaphone Course is, of course, the *Natural Method* itself—the scientific coordination of the spoken word, the illustrations and the printed text. It is primarily because of the perfect accuracy of this Method that Linguaphone Courses have achieved their extraordinary popularity and success.

A Complete Linguaphone Course consists of 16 double-faced records and a set of synchronized textbooks in a sturdy carrying case.

One of these records is devoted to the distinctive sounds of the language, recorded by outstanding native experts in phonetics. The other 15 records contain the 30 lessons of the course. Each lesson consists of two parts: 1. A Descriptive Talk. 2. Conversational Practice. The entire lesson deals with some scene of everyday life. Some of the lessons describe home life, others scenes in a restaurant, street sights and activities, a bank, traveling, shopping, the theatre, motoring, radio, television, sports, commerce. It is all practical, useful and usable.

ARMOR

Continuation of THE CAVALRY JOURNAL

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Captain William Gardner Bell

CIRCULATION
SFC Lester B. Smith

BOOK DEPARTMENT
Mildred F. Puterbaugh

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Volume LX JANUARY-FEBRUARY, 1951 No. 1

CONTENTS

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LETTERS to the EDITOR

From The Fighting Front

Dear Sir:

May I ask your assistance in securing two copies of the cover photo from the September-October issue of ARMOR, and two copies of the center photo on page 33 of that issue?

The tank in these pictures is number B-21, the tank of the Platoon Leader, 2d Platoon, Company B, 73d Heavy Tank Battalion. The scene of the action is north and west of Pohang-dong in the period 28-31 August.

I would like to incorporate one set of these photos in our unit history. The second set will be presented to 1st Lt. Dennis H. Hunter, the Platoon Leader, who received the Bronze Star Medal for his part in this particular action.

CAPTAIN OBA M. HEARN
Commanding Company B
73d Heavy Tank Battalion

APO 7

● *Copies of Stanley Tretick's excellent photos have been secured from Acme Newspictures and forwarded with ARMOR's compliments and congratulations to Reader Hearn.*—ED.

Use of Captured Tanks

Dear Sir:

In the May-June 1950 issue of the *Armored Cavalry Journal*, Mr. Garrett Underhill, in Part IV of "The Story of Soviet Armor," writes that the poor quality of Russian tanks is demonstrated by the fact that Germany made no use of the large numbers of Russian tanks (T34 and KV) which it had captured, although it used Czech tanks and, in the Balkans, in the fighting against the Partisans, French tanks.

This gives a false idea of the situation. In order to clear up this matter, I should like to make the following points:

It is undoubtedly true that from time to time the armor used for Russian tanks was of very poor quality and often did not have the resistance to penetration normally required.

But there are other reasons for the fact that Russian tanks, especially the T34, were not used by the German Army:

Mere possession of a captured tank is not enough. It is useless unless continuous maintenance of the vehicles is possible, and this depends on the availability of spare parts. Aside from technical difficulties, manufacture of spare parts for the T34 in German factories would have been possible only at the expense of a reduction in the number of German tanks turned out. For this reason the use of T34 tanks could not be considered.

In isolated instances the German Army organized captured-tank companies using captured T34 tanks and tried to get the needed spare parts from captured matériel. But the method was unsuccessful, and these captured-tank units were dissolved very soon. It was impossible to get enough spare parts from the matériel captured. The method also involved an irrational expenditure of effort, which was increased by the fact that maintenance itself required special experts thoroughly trained in the work and the manufacture of special repair tools.

As far as the Czech and French tanks were concerned the situation was different. Factories and repair installations for these types of tanks were available. However, the French tanks were at best useful only to frighten peasants; they were altogether inferior to the T34 regardless of the poor materials used in the latter's construction.

The fact that in the East the captured T34 was not used except in a few cases had a second and equally important reason:

From a tactical viewpoint the T34 was inferior to German tank types (Pz III and Pz IV with long-barreled 75mm gun) because it combined the functions of commander and gunner in one person. As soon as the commander began firing, he lost his over-all viewpoint and was unable to direct his tank. Even as gunner, however, he was unable to fulfill his mission because when functioning as such he had no commander from which to receive directions. As a result, the T34 was in most cases hopelessly inferior to the German tanks, especially after German tanks were armed with a long gun, in the spring of 1942. I often saw Russian tank attacks in which the T34's charged like a herd of wild bulls and continuously fired their guns, obviously without aiming, while driving forward. While the limited training given tank crews as a result of the high losses incurred may have been one of the reasons for adopting such tactics, it is certain that the union of the functions of commander and gunner in one person was a contributing factor.

Partly as a result of this tactical inferiority, in the Ukraine my Panzer regiment, from the end of October to the middle of December 1943, destroyed 356 Russian tanks, most of them T34's, with a total loss of only 12 German tanks. The regiment was equipped with a little more than 100 tanks, half of them Pz IV and the rest Sturmgeschuetz III (self-propelled assault gun), both equipped with the long-barreled 75mm gun model L 48.

H. B. MUELLER-HILLEBRAN
Generalmajor, former Chief of Staff of Germany's XXXVI Panzer Corps & Third Panzer Army.

Germany

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Rates: See bottom of contents page.

Facts, Not Prejudice

Dear Sir:

Please forward all future issues of ARMOR to my new address, as I have returned from Korea, due to wounds, and am no longer assigned to the 2d Infantry Division.

The opinion set forth herein is based upon my own observations, as well as discussions with other officers of various branches (Infantry, Artillery) as well as Armor personnel.

I was much impressed by the singular fact that both our advances, as well as our withdrawals, appeared to be based upon a "battle of road nets." This was reminiscent of our dash across France, and later Germany in World War II, but was vastly different because of the over-all *lack* of a developed road net. The situation being further aggravated by the restrictions in size and condition of the few roads themselves, certainly did not lend itself well to a modern highly mechanized army. Once at the desired location, deployment off the road could generally be effected. But to move from one position to another, practically no cross-country movement was effected.

After the widely heralded and much vaunted development of "cross-country mobility" in the Cavalry, as well as other branches, during the last ten years, Korea has shown that the vast majority of our mobility is dependent upon roads!

The most convincing action, and the bitterest pill to swallow when it developed, is that which is even now continuing. A vast force of troops consisting *primarily* of foot and horse soldiers, supported by pack animals, has caused our highly mechanized, heavily equipped forces to withdraw so far, and so rapidly! Initially, the heaviest weapon the enemy used was the 120mm mortar. No artillery, no tanks or SP guns, and no aircraft! Later, of course, these forces have been added and increased.

In fact, the very dependence of our forces upon the roads (*i.e., our lack* of cross-country mobility) caused the withdrawals to stall—almost tragically! Day and night our machines moved to the rear, bumper to bumper, road bound, for miles, moving—halting—moving and halting. Sometimes a move of only a vehicle's length, as voices on the various radio nets frantically attempted to keep the column going, as the enemy pounded at the rear guard.

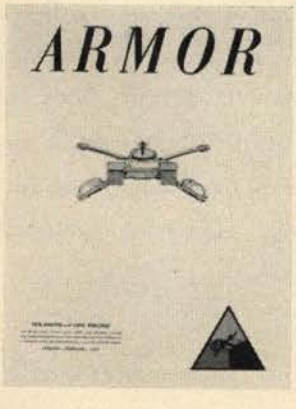
I saw, and spoke with, some of our Infantry soldiers who were using captured horses to support their units on the line. In one group of six animals (all, apparently, of Japanese stock averaging about 15 hands) I saw three with U.S. Army modified McClellan saddles on them. One of the six horses was a particularly good looking mare. I presumed these saddles to have arrived there through lend-lease via Russia, or perhaps our previous efforts to support and train the South Koreans.

In view of our world-wide commitments, and in consideration of some of the terrain included in those possible areas of action, it appears that the horse and mule still should be given a place in our forces—QM pack trains, pack artillery, and cavalry (or, if necessary, call it "Mounted Infantry"—it would not be something new).

A final and more disturbing thought is based upon the expressed opinion of learned statesmen and scientists to the effect that an atomic war can become a long war of attrition. In such a war our Class III supplies will be among the first to become critical (ask those who were civilians in World War II; and what happened to General Patton's 3d Army in Europe one time?), and subsequently one of the first to disappear! So also will manufacturing (therefore spare parts, and replacement major end items) be rapidly diminished in a war of attrition (ask the Germans who served in the Panzer divisions!). Therefore, men on foot, and horses (priority on POL would no doubt go to the Air Force and Navy) *could* be the last line of defense under such circumstances.

As the old saying goes, "An ounce of prevention . . ."

CAPTAIN ROBERT C. MCCALEB
Tacoma, Washington.



THE COVER

In the short span of years encompassing two World Wars, armor has had a somewhat fluctuating experience in searching out the right path on which to lay down its tracks. The stretch from the pillbox conception to full mobility is evidenced by the number of representative insignia strewn along the way. Now out of the morass, armor is properly hinged to mobility, fire power and shock, a combination nicely articulated in the new insignia just approved for the Armor Branch.

Wrong Target!

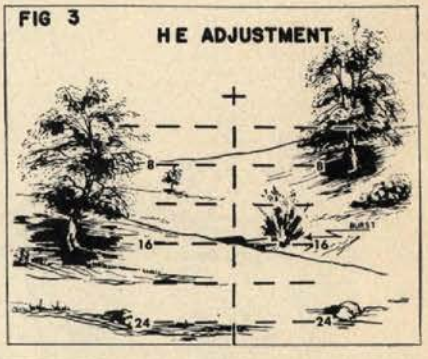
Dear Sir:

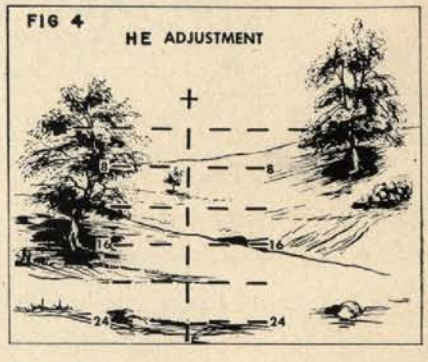
I have read with great interest the story "Advanced Tank Gunnery" in the November-December issue. There is, however, one thing about this article that puzzles me greatly.

The upper pair of drawings on page 25 illustrates adjustment of HE by the "burst on target" method, with the target apparently a tank at a range of about 1,500. In the left-hand drawing I would sense the round as right and over, but to correct this your right-hand drawing indicates the gunner would increase range to about 1,800. I cannot understand how increasing the range for an over will get the projectile any closer to the target, either by advanced tank gunnery methods or the old-fashioned "burst on target" method we learned to employ at Fort Knox in 1942.

Apparently I am misinterpreting either Col. Hammack's article or the illustrations, and I should appreciate being set straight on this point.

CLEMENT R. HURD
Colonel, USAR
Department of State
Washington, D. C.





Dear Sir:

No excuse, SIR! The gunner tied it up; he loaded the wrong pictures when this article was forwarded to you. The initial target was intended to be a house, but an antitank gun is shown.

Inclosed is Figure 3 with the correct Figure 4 (see above).

COLONEL LOUIS A. HAMMACK
Director, Weapons Department
The Armored School
Fort Knox, Ky.

● *In red-faced shame we share the blame.*—ED.

In our kind of activity promotion is a continuing thing. Periodically we must get out and beat the bushes to flush out the holdouts. Some of the patches are pretty dense, and we're liable to be pricked by the briers along the way. Some of the barbs might sink in except for the fact that in this kind of activity you acquire a pretty tough hide.

The fortunate thing is that most shafts levelled in our direction come from a bitter core of minority. Rather than respond in kind we prefer to exercise our benevolence, parrying the thrusts with the shield of good reason working in our behalf. Herewith we parry . . .

We're a branch magazine. Our first responsibility is to Armor. Our 65-year-old constitution sets it out. "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 Armor of the Army of the United States.

Now, how do we bring this to life?

A branch member, to become a member of his professional association and receive its publication, pays a fee of $4.75 annually. Every penny of that money *works!* It goes into the end product—the magazine. It constitutes *meat!* Why?

The Association has an active duty staff. The Congress and the Army years ago recognized the value to the service of assigning qualified professional personnel to this kind of activity. A total of four military personnel and one civilian are serving thousands of our military personnel around the world.

Our administrative expenses are negligible. We own no property. Our rent is so low it's laughable (we hope the landlord doesn't see this!). Ours is strictly a working shop.

Summing that up, your money goes into the primary product—the magazine. You are not paying to maintain an expensive civilian staff. You are not paying to maintain property. You are not paying for any subsidiary enterprises over and above the publication of the magazine.

What other expenditures of your money do we have in mind? For one, we want to make an annual contribution to the Armor Leadership Tests, as we've done through the years. These tests, supervised by Army Field Forces, have been going forward for years, stimulating individual and small unit achievement in our field.

We have in mind also the publication of several books and pamphlets that are badly needed in Armor. And we are working at the acquisition of a library of material on Armor that will be second to none—a library for editorial purposes, for membership use, for research and for history.

These things can be done within the annual income from our present subscription rates. They can best be done if we push along closer to the goal of 100% membership-subscription by all Armor officers in all components. We don't fool ourselves that we'll ever make that 100%, but we know from what we have now and the trend that we'll come as close as anything comes in this line. We're in great shape. The crescendo is reaching a roar! The NCO membership, the Infantry, Artillery, Engineer and Marine activity, is interest and support that we highly value.

Now let's look briefly at some of the reasons for not joining up.

Most of them are based in the fact that the magazine is readily available. For example . . . "I read ARMOR at my company . . ." (or mess, library, day room, or friend's room).

This leads us to a thought which may not reach many of the nonsubscribers. What are you doing in support of your professional branch association? To us this is a two-way proposition. We're a nonprofit organization whose sole purpose is to do our branch and the military a professional service. To carry that out we need over-all group support, all individuals banded together in full cooperation. You may say that one more member more or less couldn't make much difference. But it does, we can assure you. And remember—every penny of your $4.75 goes right back to work for *you,* not for *us!*

At the moment we think the product is pretty good. But we never feel that it has reached perfection. Winston Churchill once said "to improve is to change, to be perfect is to have changed often." We've got some more changes in mind. How about helping out, you nonmember-subscribers? How about jumping in the pot, boy!

The Editor

P.S. The Editor is a *paid-up* member.

Integrated Training for Armor

U.S. Army

With the goal of strengthening the mental, moral and physical fiber of the American soldier, the Chief of our Army Field Forces some months ago directed an acceleration and intensification of the training program. How is this program being applied in Armor—at The Armored School, the four training armored divisions, the many armored units of all components? The Dean of our College of Armor tells the story.

by BRIGADIER GENERAL THOMAS L. HARROLD

IN these times the need for sound training is essential. And more than ever, the time element has entered the training picture. General Mark Clark, Chief of Army Field Forces, in a recent speech struck the keynote. The Armor Branch, along with the entire Army, has been geared to action made mandatory by the current critical situation. That action is the "Acceleration and Intensification of Training," directed for all units of the Army.

The objective of the intensification program is to prepare each soldier to meet a ruthless and savage enemy who adheres to no established rules of land warfare; to instill in our soldier the spirit of the offensive; to win over this vicious foe on the battlefield, despite any and all odds.

The 17-Series T/O&E

To achieve these objectives the Armored Branch has prepared 23 training programs for 17-series T/O & E units which guide a unit from training of untrained fillers in basic military subjects to participation in field exercises and maneuvers with other units as part of the combined arms team. In addition, two separate programs have been prepared for the training of individuals in the basic entry MOS: Tank Crewman and Reconnaissance Crewman. The objectives of these programs are to develop untrained fillers in basic military subjects; to train them for combat; and to train them as members of a vehicle crew in any armored unit.

These training programs outline training missions and objectives for each type unit as well as for the individual.

All training programs emphasize practical work rather than theoretical instruction. Lectures and conferences are kept to a minimum and are designed to bring out briefly the points to be demonstrated and applied, or to show the relationship between a subject and the over-all training objectives.

The hours of instruction prescribed in these training programs have been reduced to a minimum by eliminating nonessential subjects. Principles, procedures, or skills not directly related to the operational performance of the individual in combat are forgotten. Time allotted is considered adequate to introduce each period of instruction and to conduct an initial period of practical application.

Constant Application

Proficiency comes through subsequent application provided by *integrating training*. Once a subject or a portion of a subject is introduced, it is applied at every appropriate opportunity thereafter. Only by doing this will commanders be able to accomplish the objectives in the time allotted. As an example of this method of training, the hours devoted to tactical training of the individual in camouflage and concealment, hasty fortifications, and defense against aircraft and armor, formerly scheduled in the basic training program for 12 hours, have been reduced to 8 hours. The three subjects can be adequately covered in this time if the principle of integration is followed. Another example of integrated training is the application of the principle of dispersion in defense against aircraft, use of the compass, and care of the feet during a period allotted to marches and bivouacs.

Also included in each of the programs is "Battle Indoctrination" training. This is the means by which men are conditioned mentally and hardened physically; the period when discipline is instilled, in order that they may become accustomed to and capable of withstanding the shock of battle. Battle indoctrination training consists of subjecting the individual to the noise of small-arms fire; day and night negotiation of prescribed infiltration courses; practice in infiltration methods; and the experiencing of overhead artillery fire to demonstrate the effect of artillery employed in close support missions.

Night Training

Since many actual operations are conducted under cover of darkness, at least one third of the applicatory stage of all tactical training and training in movement will take place during the hours of darkness. Here will be opportunities to stress individual night discipline.

The intensified training program as applied to the training division, where the newly inducted recruits are trained, is a direct departure from peacetime instruction. In the peacetime army a recruit went through fourteen straight weeks of basic training along with a liberal dose of citizenship instruction. Then he was given branch training in the type unit to which he was assigned. The present program is broken down into basic and branch advanced individual training. The time for training remains at

U.S. Army

Brig. Gen. Thomas L. Harrold, Commanding The Armored Center and School. During the war General Harrold commanded CCA of the 9th Armored Division, later took command of the division.

fourteen weeks but instead of spending a considerable amount of time on developing the citizen-soldier the time is packed not only with basic military subjects but also instruction on vehicles of armored units, their capabilities and limitations, weapons firing, and maintenance of vehicles and equipment.

A newly inducted enlisted man upon entering the service is given a series of tests which will determine his general intelligence and any aptitudes he may have for a particular type of work. If it is determined that he is qualified for armor he will be sent to one of the four training armored divisions.

Here he receives his first training in armor as a Tank Crewman or Reconnaissance Crewman along with basic training. Basic training in the revised training programs comprises 6 weeks, or 288 hours, of the fourteen weeks' total training time, and covers those common subjects which are prescribed by Army Field Forces, such as personal hygiene, map reading, military justice, weapon instruction, battle indoctrination and squad tactical training.

The remaining 8 weeks, or 384 hours, are devoted to advanced branch training for the individual either as a Tank Crewman or Reconnaissance Crewman.

The Tank Crewman

The Tank Crewman program is designed to train the individual soldier in the subjects necessary to qualify him for satisfactory performance of duties of basic entry MOS 3795 Tank Crewman; and to furnish him a satisfactory basis upon which to assimilate further training through combat experiences and instruction from more experienced members of the crew.

The Reconnaissance Crewman program is designed to train the individual trainee in the subjects necessary to qualify him for satisfactory performance of duties of basic entry MOS 4733, reconnaissance fighting team; and to furnish him a satisfactory basis upon which to assimilate further training through combat experiences and instruction from more experienced members of the reconnaissance team.

The integration program has been molded into one well-rounded program. Initially, trainees receive basic soldier training and basic infantry training. In the fourth week, the Tank Crewman and Reconnaissance Crewman start training in their respective fields.

Through the eleventh week the Tank Crewmen learn how to operate and maintain the tank. This includes firing the tank guns, driving the medium tank, use of auxiliary fire control instruments, use of binoculars, the mil formula, range determination, squad tactical training, tank crew and platoon tactical training.

The Reconnaissance Crewmen

The Reconnaissance Crewmen learn about operation and maintenance of the light tank and wheeled vehicles of the reconnaissance platoon. This training includes driving the light tank and ¼-ton truck, firing the weapons of the reconnaissance pla-

U.S. Army

Tank driver training in armored units is extensive and thorough in order that drivers will know how to handle the tank over all types of terrain.

toon, determining range, and operating tactically in a squad and platoon.

Bivouacs are held for both groups during the twelfth and thirteenth weeks. The field bivouacs are conducted under an assumed tactical situation requiring attention to dispersion and concealment from air observation. Local security measures are taken when they do not interfere with scheduled training. Bivouac areas are changed frequently to accustom individuals to the rapid movement required in combat. Combat firing for tank crewmen is emphasized in the twelfth week while both groups receive battle training during the thirteenth week.

The fourteenth week is devoted to firing several types of small arms and a proficiency test.

Unit Training

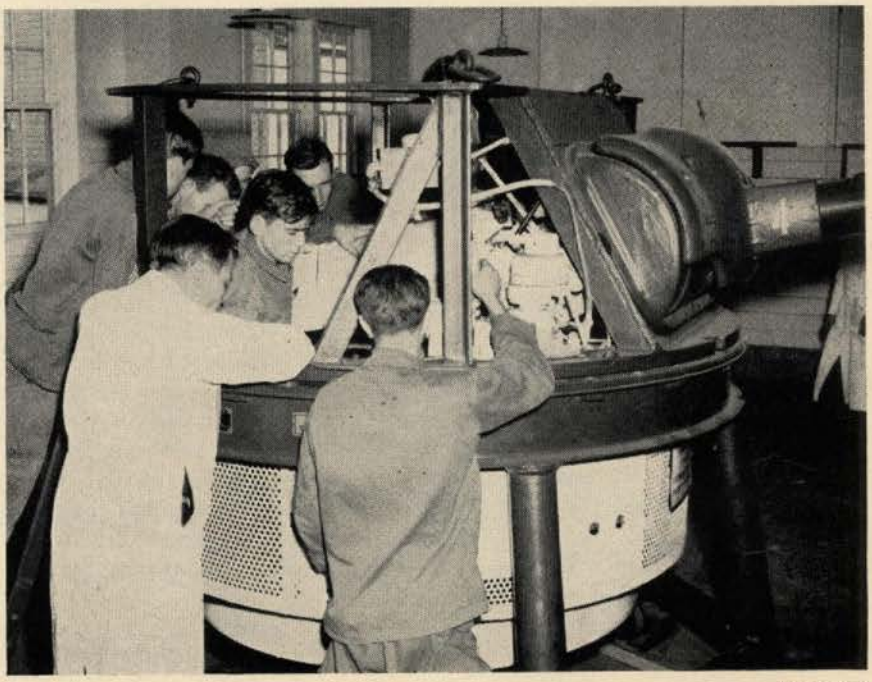
The unit training programs for 17-series T/O&E units are based on a 38-week training period. Policies of economy, of time, integration of training, elimination of frills, and toughening are again followed. These programs carry the unit not only through basic and advanced individual training, but up through small unit teams, platoon, company, battalion and combat command training, and combined arms training of these units with comparable units of other arms and services.

Development of the tank-infantry teams is stressed by inclusion of this type of training early in small unit training. At the squad and platoon level especially, stress is placed on thorough indoctrination in the offensive capabilities of the tank-infantry team, and the techniques used to employ this team.

The training programs incorporate the many features of the Tank Crewmen and Reconnaissance Crewmen program, but more time is provided for maintenance of equipment. Particular emphasis is placed on maintenance of weapons, vehicles, and other equipment throughout training. A weapon, a radio, or a vehicle that isn't serviceable affects the efficiency of the unit. For maximum effectiveness armor must maintain the ability to move, shoot and communicate.

Testing the Program

Certain of these programs are being used in the training of newly called civilian component tank units and recently activated tank battalions. At Fort Knox, the recently activated 30th Tank Battalion, which acquired the unit history and battle streamer of the famous wartime 702d Tank Battalion, is using the training programs prepared for the tank battalion. This battalion started with a trained cadre and received untrained fillers to bring the battalion to T/O&E strength. This is an excellent test of the effectiveness of the programs, since they were designed to train units in which a cadre would take personnel received direct from civilian status, and mold them into "armor indoctrinated" soldiers capable of functioning efficiently as members of an armored team. Although the above unit has not completed its training at the time of this writing, results so far indicate that the



U.S. Army

Armored School training, attended by students from all units, features the liberal use of cutaway models and clever training aids on all subjects.

U.S. Army

Tank crews are thoroughly instructed in the operation of all positions in the vehicle so that they may capably fill any crew post in an emergency.

training objectives will be accomplished.

The success of this battalion's training, and also of the training given in the 3d Armored Division, is a good indication of the effectiveness of these new training programs in meeting the "Acceleration and Intensification of Training" objectives. Most of the potential members of the Army's fighting team may never have seen a tank or other armored unit vehicle prior to their transformation from civilian to soldier status, but these programs should meet the need for developing well trained armored soldiers in a minimum of time.

Academic Changes

Meanwhile, The Armored School, to support the intensification program, has revised its existing programs of instruction. It has lengthened the training week from forty hours to forty-four hours and has scheduled night classes to handle the increased student load and resulting increase in number of classes. Also, it has eliminated such time-consuming subjects as preparation of research monographs, remedial reading, and other subjects which do not contribute directly to the training of an officer or enlisted man to be proficient in his MOS field. Finally, stress has been put on indoctrination of students with the reasons for learning certain subjects; why they must concentrate on acquiring the skills required; and the possibility of immediate commitment to combat.

In addition, The Armored School has added to the intensification program by preparing the training programs described previously for training individuals and units of armor. These programs were prepared after considerable research was made to determine what type and amount of training must be given an armored soldier to insure that he will be successful in combat. The recommendation from battle lessons, after-action reports, observer reports from World War II, and personal experience of officers and enlisted men who trained and fought in units of World War II; and the observer reports, action reports, and personal experience of officers and enlisted men who fought and are fighting in Korea, were the guiding factors for this research.

Since these programs have been completed, preparation of check lists for training inspection and training tests for all types of armored units have been prepared. In addition, continuous research is being conducted at The Armored School to find new and better methods of training for armored personnel and units, and to recommend changes in armor doctrine and tactics made necessary by new weapons and equipment.

Fighting Men—For Peace

The Armored Center is the hub of American Armor. From this hub, spokes lead out in many directions—to armored units in all the components, to occupation forces, to the fighting front in Korea. The sum of all this is our aim to assure highly trained fighting men for Armor, a key component of the fighting team standing forth for peace.

U.S. Army

Tankers must know the mechanics of their vehicles. The functioning of the tank motor is well demonstrated by means of cutaway models at Ft. Knox.

In the past few weeks movie-goers have been turning out to see a show called "Rio Grande." Starring Actor John Wayne, it is the most recent of a trilogy of screen epics depicting the Cavalry's part in the development of our country's frontier. Teamed with "Duke" Wayne's fine acting is the fine touch of John Ford's directing. The whole adds up to a real contribution to the perpetuation of the history and tradition of American soldiery, a tribute to some of

The Men Who Put the Arm in Army

by JOHN WAYNE

THEY may have changed the Cavalry to Armor, but nothing can ever erase the great tradition of its heroic past. And in the very change itself the Cavalry is living up to its famous heritage.

In spite of all the glamour of the name, the Cavalry was never just an arm on which the lavender and old lace of chivalry could be draped. The American cavalryman has always been trained to fight as the circumstances demanded. He was a first-rate infantryman when he had to fight on foot, and he quickly got the knack of artillery. As a member of the Armor Branch, the cavalryman is sure to give the enemy "hell on wheels."

And what does a movie actor know about the Cavalry? Well, you might say I'm a cavalryman by profession: a "veteran" dating back to the 1870's. You see, I was a cavalryman in "Fort Apache," in "She Wore a Yellow Ribbon," and recently in "Rio Grande."

Actually, I am in a unique position to be able to choose my favorite branch of the service. In my film roles I've been in the Army, the Navy, the Air Corps, and the Marines. I've even been a rifleman in the Second Kentucky Regiment of Civil War days. If anyone were to ask which branch I choose, all I can say is "give me my boots and saddle."

It's no accident that a great producer such as John Ford at least three times chose the Cavalry as the subject for great motion pictures. In selecting the Cavalry he chose a subject with built-in thrills, and with the drama and spine-tingling action recorded in history by men like "Light Horse Harry" Lee, Francis Marion, "The Swamp Fox," of Revolutionary War fame; men like Jeb Stuart and his Civil War raiders; men like Phil Sheridan and his "Yellow-leg" troopers of the Army of the West. History has recorded them all: Custer, and Patton, and all those nameless heroes who helped to mold this country's destiny.

Actor John Wayne.

My roles as a cavalryman awoke an interest in this great branch of our Armed Forces—an interest which led me to a new appreciation of the heroes who fought on horseback. Of the Arms which in a modern army are auxiliaries charged with the duty of assisting the Infantry in accomplishing its mission, Cavalry is the only one which has a military history as a self-sufficient fighting force.

The armies with which the Moslem conquerors, as well as Genghis Khan, carved out their empires were composed almost exclusively of Cavalry. With the passing of the Age of Chivalry, along with the development of firearms, the Cavalry inherited the pride and traditions of the ironclad knights. They developed the technique of utilizing the mobility of Cavalry for surprise, and its shock power for disrupting the enemy lines. The well timed Cavalry charge against a vulnerable flank or line became the conventional knockout punch of competent commanders.

Even the so-called blitzkrieg is merely the Cavalry tactics of the American Civil War, streamlined, and moved by machines instead of horsepower; supplied with increased firepower, tremendously speeded up, and supported by planes.

In World War II, horse Cavalry troops with speed and daring carried out vital reconnaissance missions in the rugged mountains of Central Italy. They penetrated ravines and reached precipitous mountain peaks inaccessible to mechanized troops. They gained information of unmapped trails and roads which the infantry used in moving up to surround and capture objectives.

The Cavalry has been an important part of the U. S. forces since the first dragoons of Washington's Army. But it was in 1832, when the Sacs and Foxes became restive along the Upper Mississippi, and General Scott was making the Army famous for its pacification measures, that the Cavalry really came to the front. After the War of 1812 the Cavalry had fallen into the discard. Now it was rejuvenated with a force of 600 mounted "rangers." From then on Cavalry grew to its golden age. Cavalry was essential to pursue the hard riding Indians, and first a full regiment of dragoons was drummed to the colors, and then a second regiment.

When the new territories of New Mexico, Arizona, Colorado, Nevada, Utah, and California came under the flag, with an army of but 8,000 men to cover and protect a vast area, the role of the Cavalry was plain.

The 3rd Dragoons marched 2,500 miles from Leavenworth, Kansas, to Oregon, in those days. By 1855 the army had five regiments of Cavalry to ten of infantry. After the Civil War, Indian tribes in the West began again a war of extermination against the whites, and it was then that the Cavalry came into its own. Ten regiments, the striking force of a small but tough and rigidly disciplined army, were placed in the field. There were 300,000 Indians facing General Sheridan, who had but 1,200 Cavalry and 1,400 Infantry when the campaign started.

It was this great era of the Cavalry that John Ford chose for his pictures. And somehow, I feel that it was Ford's most recent, "Rio Grande," that made me a full-fledged cavalryman.

It was early in September of 1947

Victor McLaglen provides much of the comedy as a rough, warmhearted NCO.

that Ford read a story called "Mission With No Record" in the *Saturday Evening Post*. It was an amazing and little known story of a heroic but unsung chapter in the colorful history of the U. S. Cavalry following the Civil War. Ford bought the rights to the story, and then set it aside for the time when he could produce a picture based on the event.

The time came when Herbert J. Yates and John Ford signed a long term contract, and Ford chose this thrilling Cavalry epic for his first movie for Republic Studios.

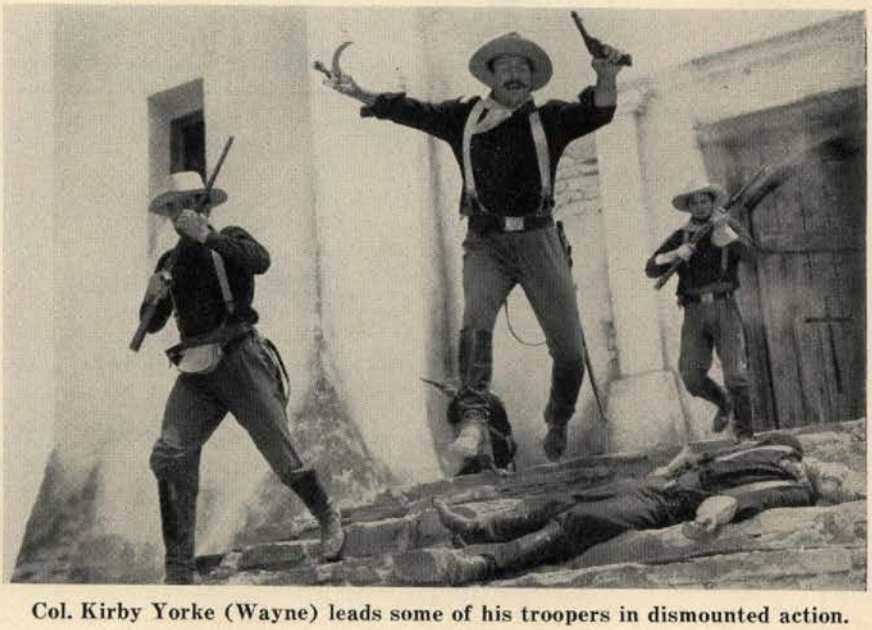
The movement of the filming crew and cast to the location site resembled a Cavalry and Armored manoeuver in itself. Thirty-two pieces of equipment transported camera and lighting equipment. Five horse trucks transported twenty-five horses from Hollywood, and 90 more horses were obtained from surrounding ranches. The construction crew built in its entirety a mammoth Cavalry fort.

Filming of "Rio Grande" began on June 15, 1950: and to capture some of the thrills and action that are associated with a movie depicting part of the history of the Cavalry, $50,000 was spent by Republic on stunts alone.

Months of preliminary research preceded the actual filming of "Rio Grande," and I spent many a fascinating hour with Ford reading up on Cavalry lore, even to the music favored by cavalrymen of the past.

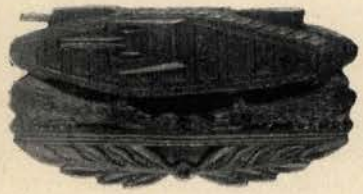
Back in 1870, for example, when Phil Sheridan's outnumbered troopers waged their fierce battles against the Apache and Sioux, the ringing notes of "The Girl I Left Behind Me," played by the post band, would be the last thing the intrepid "Yellowleg" detachments heard as they galloped through stockade gates after the enemy.

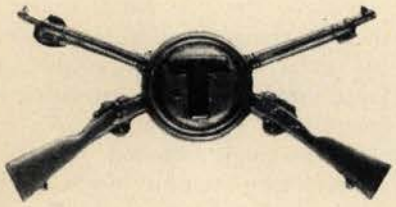
But no single historian—least of all a movie actor—can put into words the whole thrilling story of the Cavalry. No more than any legislation of Congress can ever change the true meaning of the word Cavalry. They may have taken the word out of the Army: but they'll never take it out of our history.

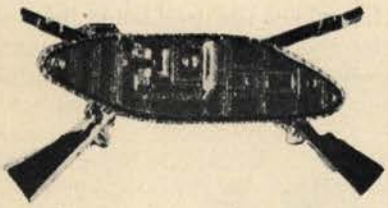


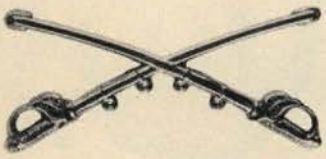
Col. Kirby Yorke (Wayne) leads some of his troopers in dismounted action.

. . . GIVING PLACE TO NEW

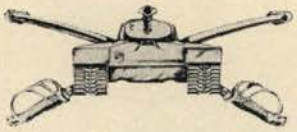








FOR ARMOR — A NEW INSIGNIA



On January 3, 1951, the Department of the Army approved new insignia, branch color, guidon and cap braid colors for the Armor Branch. Under the provisions of the Army Organization Act of 1950, Armor became a continuation of the Cavalry.

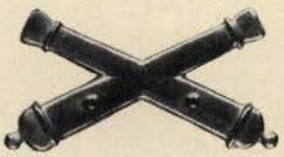
The Armor insignia (see cover) is a front view of an M-26 tank (original version of the Patton tank) with the gun slightly raised, and superimposed on two crossed Cavalry sabers in scabbards with the cutting edge up. The officers' insignia is the usual outline type, of gold-colored metal, 13/16 of an inch in over-all height. The enlisted insignia will be the same, reduced in size for wear on a one-inch disk.

Yellow, the color of the Cavalry, will be the Armor Branch color. Guidons will be yellow, with green insignia, letters and numerals. Cap braid for enlisted personnel will be yellow.

The Department of the Army announced that new insignia will not be available for some time. In the meantime, personnel are authorized to wear present insignia. The Army has also authorized continued use of present standards and guidons until such time as replacement is necessary.

ARMOR is pleased to see this important question settled. It is another step in the professional grounding of the branch; for representative insignia are so much a part of all-important identity—not only through tangible marking of the trade, but in the more intangible matters of mission, morale and *esprit.*

AND ARTILLERY



At the same time that Armor was getting its new insignia, the Artillery received a new one, in a sense. Under the provisions of the Army Organization Act, the Field Artillery, Coast Artillery and Antiaircraft Artillery branches were consolidated into one, to become the Artillery Branch. The single branch will retain the "crossed field guns" insignia which has been used by Field Artillery for more than 100 years. The branch color is the traditional Artillery scarlet, with scarlet guidons carrying yellow insignia, letters and numerals. Cap braid also is scarlet.

IN THE HANDS OF TROOPS

"We are preparing the capacity to produce 35,000 tanks a year. We are not now ordering that many, and we hope that we never have to, but we mean to be able to turn them out if we need them."

Thus spoke the President of the United States in his recent State of the Union message.

The tank program is progressing. Light tanks (T/41) are on order with the Cadillac Division of General Motors. Medium tanks (T/42) are on order with American Locomotive Works. Heavy tanks (T/43) are on order with Chrysler Corporation. These are new designs, not World War II models. In the hands of troops they will put additional backbone into the United States Army. Meanwhile, the Shermans, Pershings and Pattons are holding up their end in good style, not by claim, but through demonstration.

ARMOR's thoughts now turn to that phrase "in the hands of troops." Our eyes are focused on the exit end of the assembly line. Where are those tanks going? What units will get them? After the critical needs of any front of that moment are met, what then?

We're thinking of the armored division. We had sixteen of them in World War II, a war in which Armor established its place in ground warfare with an outstanding record on the field of battle. That firm record seems to have dimmed somewhat in the postwar period. Korea has dusted things off a bit, but there are certain limitations there, as we mentioned last issue.

Sixteen armored divisions in World War II. One Regular armored division today—which has not been mentioned in official releases as being ready for combat. Four armored training divisions, three of them recently organized—but all training. Two National Guard armored divisions. Three Reserve armored divisions.

A number of National Guard infantry divisions have been called up for active Federal service. Why no armored division? Where is the corps potential of two to one? Where does that leave the type field army?

The armored division functioned with great effect in North Africa and Europe. Those are areas which remain critical today. North Africa and Europe—not Korea. Armored divisions, not battalions.

The emphasis on small armored units is disturbing. In turn, the splitting up and parcelling out of those small units, and their tie to foot troops, confronts us with a threat—that of failure to prepare major armored units for employment as such in those areas where employment would be mandatory and where decisions of real proportion may come.

ATTENTION MOVIE DIRECTORS!

Elsewhere in this issue there is a story by John Wayne on the series of frontier Cavalry pictures in which he has starred under John Ford's able directing. We confess to having seen all of these shows and many others about our Cavalry and enjoying them to the hilt. But there is one thing that has us stumped. Why has armor been overlooked in the rash of movies about the military? How long will it be before some director and company realizes that in armor there is every phase of great adventure, with everything in the way of built-in thrills and action, ready to catch the dullest imagination?

ELIMINATE THE NEGATIVE

There's one word in this here military lingo that we oughta find another one for it 'cause when you use it it usually sounds like it means somethin' else and don't do anyone any good anyway. . . . Or so Fibber McGee might say it. The word is "relieved." It has a negative connotation. When the word appears in connection with a change of assignment, it is accepted by many as an indication that someone has messed up. Such may not be the case. The person may be going on to a higher post. There's one word in this here military lingo. . . .

Despite the development of highly modern weapons in all dimensions of warfare, the amphibious operation remains—and most demonstrably so—a vital method of warfare. The story of history's greatest amphibious operation, the Normandy assault, is the subject of a forthcoming volume in the series UNITED STATES ARMY IN WORLD WAR II *being prepared in the Office of the Chief of Military History. Titled* Cross-Channel Attack, *it will be the second in the sub-series* THE EUROPEAN THEATER OF OPERATIONS. *The article presented here is part of a chapter from the coming book, and deals with the beach landings and the critical moment, described by the author, when "the great names drop out . . . In their place will be the corps and division commanders, the colonels, the lieutenants, and the privates. For the few will be substituted the many, as the battlefield, so long seen as a conceptual problem, becomes a confused and disparate fact—a maze of unrelated orchards and strange roads, hedgerows, villages, streams and woods, each temporarily bounding for the soldier the whole horizon of war."*—THE EDITOR.

Hitting the Beaches

by DR. GORDON A. HARRISON

Office of the Chief of Military History

WHILE U.S. airborne troops dropped on the Contentin and British paratroopers landed near Caen, the invasion fleet was bringing the main body of the Allied armies to the shores of Normandy. The assault convoys, after turning back for the day's postponement, reassembled during the morning of 5 June and sailed again for the transport areas 22,000 to 23,000 yards off the French coast in the Bay of the Seine. Behind mine sweepers which cleared and marked ten lanes through old enemy mine fields in the Channel, the huge convoys, under constant air umbrella of fighter squadrons flying at 3,000 to 5,000 feet, made an uneventful voyage unmolested by the enemy either by air or sea.

The weather was still cause for concern. During the passage a gusty wind blowing from the west at fifteen to twenty knots produced a moderately choppy sea with waves in mid-Channel of from five to six feet in height. This was a heavy sea for the small craft, which had some difficulty in making way. Even in the assault area it was rough for shallow-draft vessels, though there the wind did not exceed fifteen knots and the waves averaged about three feet. Visibility was eight miles with ceilings at 10,000 to 12,000 feet. Scattered clouds from 3,000 to 7,000 feet covered about

U.S. Army

half the sky over the Channel at H-hour, becoming denser farther inland. Conditions in short were difficult though tolerable for both naval and air forces.

Most serious were the limitations on air operations. Heavy bombers assigned to hit the coastal fortifications at OMAHA Beach had to bomb by instruments through the overcast. With concurrence of General Eisenhower the Eighth Air Force ordered a deliberate delay of several seconds in its release of bombs in order to insure that they were not dropped among the assault craft. The result was that the 13,000 bombs dropped by 329 B-24 bombers did not hit the enemy beach and coast defenses at all but were scattered as far as three miles inland. Medium bombers visually bombing UTAH Beach defenses from a lower altitude had slightly better results, although about a third of all bombs fell seaward of the high-water mark and many of the selected targets were not located by pilots. Of 360 bombers dispatched by IX Bomber Command, 293 attacked UTAH Beach defenses and 67 failed to release their bombs because of the overcast. On the whole the bombing achieved little in neutralizing the coastal fortifications.

Anchor off Utah

At about 0230 the *Bayfield*, headquarters ship for Task Force U (Rear Adm. Don P. Moon) and VII Corps (Maj. Gen. J. Lawton Collins), dropped anchor in the transport area off UTAH Beach. Twenty minutes later the *Ancon*, flagship of Admiral Hall and the headquarters ship for Task Force O and V Corps, reached the OMAHA Beach transport area. Unloading of assault troops into the LCVP's that would take them to the beaches began.

Up to this point there had been virtually no enemy reaction. The German radar stations still in operation had failed to pick up either the air or the sea approach. Because of bad weather Admiral Krancke had no patrol boats in the Channel during the night, nor did he order them out after he heard of the airborne landings. Tidal conditions would not permit them to leave the harbors before daylight and, besides, Krancke was still not sure that a major attack was in progress. Shortly after three o'clock, however, *Naval Commander Normandy* reported sighting ten large craft lying some seven miles off the coast north of Port-en-Bessin. This news, in conjunction with an increasingly sharp definition of the extent of the airborne landings, at last convinced Admiral Krancke that he was confronting a large-scale landing. He gave such orders as he could. The *Western Defense Forces* were to patrol the coastal waters; the *Landwirt* submarines were to be alerted; the *8th Destroyer Flotilla* was to move up from Royan to Brest; the *5th Torpedo Boat Flotilla* was to reconnoiter the Orne estuary area; and the *9th Torpedo Boat Flotilla* was to patrol off Cap de la Hague. The torpedo boats of the *5th Flotilla* left Le Havre at 0430, but an hour out of port they met six Allied warships escorted by 15 to 20 destroyers. After firing torpedoes at the Allied vessels, the small German boats were attacked from the air. They succeeded in driving off the attackers with antiaircraft fire, but then had to return to Le Havre to replenish their load of torpedoes and ammunition. Two torpedo boat flotillas reconnoitering out of Cherbourg were forced by heavy seas to return to port at dawn. This virtually concluded German naval activity for the day. Admiral Krancke wrote in his diary: "It was only to be expected that no effective blow could be struck at such a superior enemy force." He made plans, however, to attack the Allied fleet that night.

German coastal batteries began sporadic firing at 0535, or only fifteen minutes before Allied naval bombardment opened prearranged counterbattery fire. Projectiles from Allied battleships and cruisers and destroyers continued to thunder over the heads of the troops making the final run-in to shore until a few minutes before the touchdown. Beach drenching was then taken up by the close-support craft. Although the time schedule went generally according to plan on both American beaches, the volume of fire laid down on vital targets was considerably less at OMAHA than expected. Most enemy coastal defenses were sited to cover the beaches rather than the sea approaches. They were therefore well concealed from observation from the sea and were correspondingly difficult to hit. The beach drenching seems generally to have missed its targets; a large percentage of the rockets overshot their marks.

Naval gunfire coupled with the air bombardment, however, had one important effect at OMAHA Beach which was not at first apparent to the assaulting troops. The Germans credit the Allied bombardment with having detonated large mine field areas on which they counted heavily to bar the attackers from penetrating inland between the infantry strong points. Preparatory fire seems also to have knocked out many of the defending rocket pits. But it was supporting naval gunfire after H-hour which made the substantial contribution to the battle, in neutralizing key strong points, breaking up counterattacks, wearing down the defenders, and dominating the assault area.

VII Corps Plans

In the VII Corps zone the 4th Division (Maj. Gen. Raymond O. Barton) planned to land in column of regiments on a two-battalion front of about 2,200 yards. The 8th Infantry (Col. James A. Van Fleet), with the 3d Battalion of the 22d Infantry attached, would make the initial assault. It would first occupy the high ground along the road between Ste. Marie-du-Mont and les Forges and would be prepared to move with the bulk of its force thereafter westward across the Merderet River in the zone of the 82d Airborne Division. One battalion would be left in the area west of St. Martin to protect the division's north flank until the arrival of the 22d Infantry. The 22d Infantry (Col. Hervey A. Tribolet), next infantry unit to land, beginning at H-plus-85-minutes, would turn north from the beaches to seize the causeway across the inundations at les Dunes de Varreville. Continuing the push northwest, the regiment would capture Quinéville and occupy the high ground at Quinéville and Fontenay-sur-Mer. In the center of the beachhead the 12th Infantry (Col. Russell P. Reeder), landing after H-plus-4-hours, would advance with two battalions abreast to seize the high ground between Emondeville and the Merderet River. One battal-

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Captured German Photo

Planning the defense. Rommel and staff officers on the Normandy Beaches.

ion of the regiment was at first designated as division reserve to pass to division control in the vicinity of Turqueville. By the late May change of plan, following the alteration of the airborne missions, the battalion was instead released to regimental control and the 12th Infantry was assigned the additional mission of seizing a crossing over the Merderet at le Port Brehay just southwest of the regiment's main objective area. One regiment (the 359th Infantry) of the 90th Division, the first follow-up division, was attached to the 4th Division to begin landing on D-day. It would assemble in reserve near Foucarville. In May, enemy activity was observed on the St. Marcouf Islands flanking UTAH Beach on the north. It was therefore decided to land detachments of the 4th and 24th Cavalry Squadrons two hours before H-hour to clean out what was suspected to be an enemy observation post or mine field control point.

The airborne troops had done their job well and the 4th Division therefore had little difficulty getting ashore. The cavalry detachments (132 men) found the St. Marcouf Islands unoccupied though heavily mined. From mines and a concentration of enemy artillery that hit the islands in the afternoon the cavalry units lost two men killed and seventeen wounded. The small craft (LCVP's) carrying the first waves of the 1st and 2d Battalions of the 8th Infantry were launched in relatively sheltered water and had no serious trouble with the wind and surf. At H-hour there was no enemy opposition. The thirty-two DD tanks supposed to land in the first wave were delayed by the loss of a control vessel that struck a mine. All but four, which were lost when the LCT carrying them hit a mine, were beached approximately fifteen minutes late. But, as it turned out, the assault troops had no immediate need for them.

Leading elements of the two assault battalions touched down approximately on time but almost 2,000 yards south of where they were supposed to land. The error was probably caused in part by the obscuring of landmarks by smoke and dust raised by the naval bombardment and in part by the southeast coastal current. In any case it turned out to be fortunate since it brought troops in on beaches much less heavily defended than those designated in the plan. Although the mislanding meant that the tasks assigned to each assault section could not be carried out as planned, the lack of serious enemy opposition permitted reconnaissance and speedy reorganization for improvised maneuver. After company-size task forces had reduced the very lightly defended field fortifications covering the two middle beach exits, both assault battalions began their advance across the flooded area. The 1st crossed toward Audouville-la-Hubert; the 2d turned south to pick up the Pouppeville road.

The first infantry wave was followed by engineer and naval demolition parties to clear the underwater obstacles. The obstacles were all dealt with dryshod and were so much sparser than expected that the original plan of blowing fifty-foot gaps was abandoned in favor of clearing the entire beach on the first tide. The job was completed in an hour. Engineers then proceeded to their next tasks of blowing gaps in the sea wall behind the beach and clearing mine fields. Enemy opposition consisted only of intermittent shelling.

While engineers worked on the beach, the 3d Battalion, 8th Infantry, supported by tanks of the 70th Tank Battalion, and the 3d Battalion, 22d Infantry, were landing and moving out. Well before H-plus-3-hours the beach area had been cleared and landings were virtually routine, harassed only by sporadic enemy artillery fire.

Early success and extraordinarily light casualties on UTAH Beach contrasted sharply with the difficulties experienced during those first critical three hours at OMAHA. The German *LXXXIV Corps* and *Seventh Army* believed through most of D-day that the OMAHA assault had been stopped at the water's edge. It was late in the morning before General Bradley aboard the *Augusta* could have contradicted that view and much longer before the Allied command could feel secure about the V Corps beachhead.

V Corps Plans

Leading the attack of General Gerow's V Corps was the 1st Division (Maj. Gen. Clarence R. Huebner) assaulting with two regiments abreast, the 116th Infantry (attached from the 29th Division) on the right, the 16th Infantry on the left. Each regiment was to land two battalion landing teams at H-hour with initial missions to clear the beach defenses and seize and secure that portion of the beachhead maintenance line in their respective zones. The beachhead maintenance line roughly followed the ridge of high ground parallel to the main coastal road and was in most places from two to three miles inland. From this line the assault regiments, supported by the 18th Infantry landing after H-plus-3-hours and the 26th Infantry landing on order of the Commanding General, V Corps, would punch out toward the D-day phase line. Occupation of that phase line would mean securing a coastal strip

five or six miles deep astride the Bayeux highway.

The 116th Infantry was responsible for capturing the Pointe du Hoe coastal battery. On the assumption that the six partially casemated 155mm guns would not have been destroyed by pre-D-day bombardment and the heavy naval fire directed on them just before H-hour, two Ranger battalions were attached to the 116th Infantry with the special H-hour mission of taking out the guns. Three companies of Rangers from the 2d Ranger Battalion were to land at the foot of the cliff which the fortified battery surmounted, scale the cliff by means of rope ladders, and attack the German position. Another company, landing on the 116th Infantry main beaches to the east, would attack the fortifications at Pointe et Raz de la Percée and then continue westward to cover the flank of the Ranger force at Pointe du Hoe. The rest of the Rangers would land at Pointe du Hoe, provided the initial landings succeeded; otherwise they would come in on the 116th beaches and assist the right battalion of the 116th in attacking westward.

Beach Exits Important

The whole right flank of the V Corps assault forces would thus swing due west almost immediately on landing while the left battalion of the 116th and the 16th Infantry pushed south. It was hoped to clear the coast as far as Isigny by the end of D-day. It even seemed possible that Isigny itself might fall either to the 116th or to the 115th Infantry. The latter regiment, landing on corps order, would initially leapfrog the 116th to organize the high ground around Longueville.

Perhaps the most important job assigned to the first assault waves was the reduction of enemy positions defending the roads leading from the beach inland. The gently sloping sand of OMAHA Beach was backed by an embankment of loose stones, or shingle, in places as much as fifteen yards wide. In the Vierville sector the shingle piled up against a part-masonry, part-wood sea wall. On the rest of the beach there was no wall, but the shingle lay against a sand embankment or dune line. Both the shingle and the dune line was impassable for vehicles. Behind the beach rose scrub-covered bluffs 100 to 170 feet high of varying steepness and merging east and west with the cliffs, which at Pointe et Raz de la Percée and east of Colleville marked the extremities of the 7,000-yard crescent beach. The bluffs were cut by five draws. Through four of these ran unimproved roads, one connecting with the main coastal highway at Vierville-sur-Mer, two at St. Laurent, and one at Colleville. The fifth draw northeast of Colleville was steep and contained only a trail, but it was considered capable of development as a vehicle exit. The plan assumed these exits would be open to traffic at least by H-plus-2-hours when the heavy flow of vehicular reinforcements was scheduled to begin. The importance of the beach exits was, of course, as obvious to the Germans as to the Allies and local coastal defenses were grouped to deny their use to the attackers. On the other hand, the 1st Division had precise information on the location of these defenses and every provision was made to give the assaulting infantry the heavy fire support needed to knock them out.

At H-minus-50-minutes, two companies of DD tanks (741st Tank Battalion) destined for the 16th Infantry beaches were launched 6,000 yards offshore and almost immediately began to founder. Of the thirty-two tanks launched only five reached shore. These were the first of the casualties to the weather. There were others. The assaulting infantry was transferred from transports to LCVP's ten to eleven miles offshore. At least ten of the ferrying craft were swamped on the way in. More serious for the operation was the sinking of much of the artillery. The attempt to ferry guns ashore in DUKW's through the heavy seas proved disastrous. All but one of the 105mm howitzers of the 111th Field Artillery Battalion were sunk. Six of the 105's belonging to the 7th Field Artillery Battalion suffered the same fate. Five of the six howitzers of the 16th Infantry Cannon Company were also swamped. In addition to these wholesale losses the 58th Armored Field Artillery Battalion, whose guns were mounted on LCT's and had taken part in the initial beach drenching, lost three of its pieces when the craft carrying them hit mines. In short, the artillery that was planned to support the infantry attack particularly in the advance inland did not reach the shore.

The weather contributed also to navigational difficulties. Mist mixed with the smoke and dust raised by the naval bombardment obscured landmarks on the coast; in addition a lateral current of from two to three knots tended to carry craft eastward of their touchdown points. The actual errors in landing caused thereby were considerably less than at UTAH, in most cases amounting to not more than a few hundred yards. On the other hand, they proved much more serious for the tactical situation, partly because the errors were not constant, with the result that units became scat-

U.S. Army

Planning the offense. Gen. Eisenhower and Allied commanders plan invasion.

tered on the final approach. Since the men had been briefed only for their particular areas, they were confused by the changed picture. The difficulties were compounded by the heavier enemy opposition which had the effect of isolating boat sections only a few hundred yards apart and at first made reassembly and reorganization for improvised missions almost impossible.

Naval gunfire had temporarily neutralized some of the enemy batteries and fortifications but most of them were still able to fire at the incoming troops as soon as the bombardment was forced to lift inland. The 1st Division men in the first LCVP's could hear machine-gun bullets splatter against the steel ramps of their craft before they grounded. Debarking in water sometimes up to their necks, the troops on some sectors of the beach were met with a hail of bullets that drove some to seek shelter under the surf, others to scramble over the sides of the craft. Control of boat sections was thus often lost before the men were even started in to the beach. The troops, overladen with heavy clothing and equipment, waded slowly through the surf and through fire that increased as they approached the beach. Some stopped to rest or seek shelter behind obstacles. Some lay at the water's edge and were able eventually to crawl in with the tide. But casualties generally were heavier among those who delayed in getting up onto the beach. Many of the wounded were drowned in the rising tide.

Not According to Plan

The first wave should have landed nine companies evenly spaced along the beach. Because of withering enemy fire and mislandings, however, the right wing all but disintegrated; two companies bunched in front of les Moulins, and the remainder of the landings (elements of four companies) clustered in the Colleville sector. One company was carried so far to the east that it landed an hour and a half late.

The two right-flank companies (Company C of the 2d Ranger Battalion, and Company A of the 116th Infantry) landed as scheduled in front of the Vierville draw. One craft foundered and one was hit four times by mortar fire. Men from the remaining craft struggled to shore. Intense small-arms fire took toll of about two-thirds of Company A and more than half of the Ranger company before any reached the comparative shelter of the sea wall or the base of the cliff. Of the sixteen tanks scheduled to land in this sector just ahead of the infantry, only eight survived enemy artillery to reach the shore. All had been brought in on LCT's as 116th Infantry officers decided the sea was too rough to launch the DD's.

U.S. Army

Some of the many. Soldiers move from craft to their "whole horizon of war."

In the eastern part of the 116th Infantry zone the initial landings had not gone much better: a 1,000-yard gap separated the troops who touched down there from the remnants of the two companies on the right. The two companies of tanks that landed first were brought in on LCT's without losses. This initial success was not shared by the infantry. Only two of the three companies of the 2d Battalion, 116th Infantry, landed within the regimental zone. One of these companies lost a quarter of its men to enemy fire during the forty-five minutes which it took them to cross the beach to the protection of the shingle bank. The remainder had better luck in landing in front and just west of les Moulins where the bluff was obscured by smoke fires and enemy fire was sporadic and inaccurate. Even these men were somewhat disorganized and the officers who survived with them were confused by the knowledge that they had landed east of their designated beaches.

The experience of the 16th Infantry on the left flank of the division duplicated that of the 116th, as scattered landings and heavy casualties left the first boat sections incapable of undertaking their primary assault missions. In the 16th's zone, however, one soft spot was discovered. Four boat sections of the 2d Battalion, 16th Infantry, landing between the St. Laurent and Colleville exits, crossed the beach with only two casualties from enemy fire. The local defense of this sector of the beach was the Colleville strong point, which was planned as three mutually supporting resistance nests. Of these the field fortified position atop the bluff midway between the two draws was unoccupied in February 1944 and seemingly remained unoccupied on D-day. Apparent German negligence that left the beach northwest of Colleville without immediate defense was balanced at first by Allied ill fortune in landing so few men there. Except for those four boat sections of the 2d Battalion the first wave of the 16th Infantry (Companies E and F) touched down immediately in front, or east, of the occupied fortifications of the Colleville strong point and was there caught in machine-gun fire as intense as that which decimated the 116th Infantry. Many of the men of Company E, hard hit and exhausted in their efforts to wade ashore, flopped on the sand and crawled in ahead of the tide; nearly half of them did not survive.

Because of the swamping of most of the DD tanks and immediate enemy destruction of five of the company of mediums beached from LCT's, the 16th Infantry had initially only a third of the planned armor support. Those tanks available went into action on the beach between the St. Laurent and Colleville exits.

Feeling the Effects

The heavy losses and disorganization of the first wave had repercussions on each succeeding wave through the morning of D-day. The first serious effect of the failure to neutralize enemy beach defenses was the inability of the 6th Special Engineer Brigade and naval demolition parties to blow gaps in the beach obstacles as planned. Weather conditions also played a hand in hindering the engineers from accomplishing their mission. Half the demolition teams were delayed in landing and only a third of them touched down on their appointed sectors. Since the rest were carried eastward by the coastal current, the 116th Infantry zone received substantially less than the scheduled effort. But enemy fire also took a heavy toll of both men and equipment. Of sixteen bulldozers only three could be put into operation on the beach, and one of these was prevented from maneuvering freely by riflemen who sheltered behind it. . . .

The second group of assault waves, consisting of five separately timed landings, was to complete the build-up of the two assault regiments by H-plus-1-hour and bring in the 81st Chemical Battalion, two combat engineer battalions whose principal task would be to clear mine fields for the advance inland, naval shore fire control parties, and advance elements of artillery, medical, and antiaircraft units. In the zone of the 116th Infantry the remaining three companies of the 1st Battalion were to come in behind Company A on the right. On the left the heavy weapons company of the 2d Battalion would land to complete that unit and would be followed by the 3d Battalion.

The right flank, however, continued to be an area of particular misfortune. Only scattered sections of the reinforcing units managed to land there and they were hit by the same destructive fire that had virtually knocked Company A out of the battle. The battalion headquarters company, including the beachmaster for the 1st Battalion sector, landed at the base of the cliff west of the rifle companies and under such severe enemy small-arms fire that it was unable to move most of the day. The heavy weapons company, scattered and hard hit on the approach, took two hours to assemble survivors. It salvaged only three mortars, three machine guns, and a few rounds of ammunition. Only one company of the 1st Battalion survived as an organized group capable of pursuing its assault missions. This was Company C, which mislanded 1,000 yards east of its planned beach within the area of the bluffs covered by the smoke of a brush fire. With few casualties and equipment virtually intact, the company waded in on a front of not more than a hundred yards and reorganized in the shelter of the sea wall.

Next to land in the 116th zone were the Rangers. The 5th Ranger Battalion together with two companies of the 2d Rangers had waited offshore for news of the assault on Pointe du Hoe, which would determine whether they landed there or came in on the 116th Infantry zone. The Pointe du Hoe assault, however, had been delayed forty minutes by the eastward drifting of the craft carrying the Rangers. There was therefore no news at all, and the Ranger reinforcements, concluding that the assault must have failed, proceeded with the alternative plan. The 5th Ranger Battalion followed Company C, 116th Infantry, and shared the relatively easy assault in landing too far east. But the two companies of the 2d Ranger Battalion came in about where planned on the fire-swept right flank behind elements of Companies A and B. Only between a third and a half of the two 65-man companies survived to take shelter at the head of the beach.

In the 2d Battalion zone, the second wave brought in the heavy weapons company and battalion headquarters. Company H suffered such losses and disorganization that it could be of little immediate help in supplying mortar or machine-gun support. The battalion commander, Maj. Sidney V. Bingham, Jr., coming ashore near les Moulins, organized a few sections of Company F which had landed in the first wave and attempted an assault on the enemy positions in the draw. The attempt made with only a handful of men was unsuccessful, but in the meantime the 3d Battalion was landing bunched up astride the regimental boundary just east of les Moulins. It was somewhat disorganized by the intermingling of units but suffered little from enemy fire in crossing the beach.

At the end of the first hour the 116th Infantry had at least a nucleus of force which could be organized for attack against the enemy's beach positions. Most hopeful was the situation roughly in the center of the regi-

U.S. Army

Over the top. Troops leave the comparative safety of a wall to move on inland.

mental zone just west of les Moulins where enemy fire masked by smoke was light and ineffective, and where shortly after 0730, by great good fortune, the regimental command group with Col. Charles D. W. Canham and Brig. Gen. Norman D. Cota, the assistant division commander, came ashore.

The experience of the 16th Infantry's later waves was similar to that of the 116th. Losses were lighter but the confusion and intermingling of units on the beaches became more serious. The two remaining companies (G and H) of the 2d Battalion followed by the 1st Battalion landed about where planned, due north of Colleville. The 3d Battalion completed landing on the left shortly after 0800. The 3d Battalion headquarters, however, landed to the west and could not join its troops for several hours. The 16th Infantry suffered another misfortune when the regimental executive officer, coming in with the first section of the headquarters, was killed together with thirty-five of his men. The commander, Col. George A. Taylor, did not arrive until 0815 with the second headquarters section.

Command was generally one of the gravest problems faced by assault units, not only because officer casualties were high and mislanding of command groups had left many units leaderless, but also because of extreme difficulties of communication. Three-quarters of the 116th Infantry's radios were destroyed or useless. Furthermore, in the confusion of the mixed units, which were under heavy fire in some places, their men huddled along the shingle embankment or sea wall and generally shaken by the shock of the first few minutes of severe action, it would have been impossible for any commander to exercise control over more than a small group of men on a relatively narrow sector of the front.

In these first few hours on OMAHA Beach, the OVERLORD operation faced its gravest crisis. Deprived of the expected air support by accident of weather and preceded by a generally ineffective beach drenching, the 1st Division had gone in against the one sector of the Normandy coast that had anything like the kind of cordon defense which Field Marshal Rommel counted on to hold and smash the Allies on the beaches. Instead of attacking in the sector of one regiment of an overextended static division as expected, General Huebner's troops hit on the front of a full attack infantry division, the 352*d*, whose presence in the coastal zone had been missed by Allied intelligence even though it had been in place for almost three months.

To the German officer in command of the fortifications at Pointe et Raz de la Percée it looked in these first hours as though the invasion had been stopped on the beaches. He noted that the Americans were lying on the shore seeking cover behind the obstacles, that ten tanks and a "great many other vehicles" were burning. The fire of his own positions and the artillery, he thought, had been excellent, causing heavy losses. He could see the wounded and dead lying on the sand.

Sketchy reports to V Corps and First Army must have painted very much the same picture for the American command. From a DUKW cruising 500 to 1,000 yards offshore, Col. Benjamin B. Talley, the assistant chief of staff of V Corps, radioed General Gerow what he could observe of the progress of the landings. Observation was difficult, and on the whole Colonel Talley refrained from reporting mere pessimism. However, he had to report something of the evident disorganization. He could see that the beaches were jammed with infantrymen and that enemy artillery and machine-gun fire was still effective. He sent a message to that effect about 0930. What particularly concerned him was the fact that reinforcing waves were being held up by the continued enemy opposition and the LCT's were milling around offshore like "a stampeded herd of cattle," although some of the more daring commanders took their craft into the hail of enemy fire and beached them. This situation seemed to Talley to continue without alleviation until midmorning, and it was the situation conveyed to Generals Gerow and Bradley.

Already, however, as Talley sent forward his discouraging reports, the

crisis was bit by bit dissolving. Among the groups of scared, tired riflemen huddled along the beach were a few intrepid leaders—officers, noncoms, and privates on whose individual backs the big responsibility at the moment lay. They began by example and exhortation to prod the men to get up, leave such poor shelter as they had found, and walk or crawl across the beach flat and up the hills where the enemy was dug in with rifles, mortars, and machine guns. From the larger perspective the combined weight of Allied arms was gradually wearing down the defenders. The *916th Regiment* in the center of the *352d Division* sector, while reporting that the landings had been frustrated, added that its own casualties were mounting chiefly from the heavy Allied naval fire and that consequently reinforcements were needed. Reinforcements, however, could not immediately be spared since they were much more urgently needed elsewhere.

The gravest immediate threat for the Germans arose to the east of V Corps where the British assault cracked through the coast defenses in some places during the first few hours. The British Second Army attacked with three divisions abreast under control of 1 and 30 Corps. Immediately on the flank of the American attack, the British 50th Division landed two infantry brigades supported by tanks of the 8th Armoured Brigade and assault teams of the 79th Armoured Division and the 47th Royal Marine Commando. The troops touched down approximately on time at 0725.

Opposition was heavy at certain points, but on the whole it was much less determined than at OMAHA. In the 50th Division zone le Hamel, strongly defended by the *1st Battalion, 916th Regiment,* resisted until late in the day. To the east, however, the British division's left brigade struck a soft spot in the German defenses. The strong point at la Rivière held out only a few hours and when it fell at about 1000 its defenders, the *441st Ost Battalion,* attached to the *716th Division,* broke and pulled out, leaving the road to Bayeux open. This development, however, was not known to the British. Opposition continued to be reported south of Buhot, at Ryes, St. Sulpice, and Summervieu. It was always difficult in the early stages of the assault properly to distinguish enemy delaying action from major opposition or to discover where the holes were in the German defense. The 50th Division, moreover, still had only its assault forces ashore. Rising tide had prevented effective clearance of underwater obstacles. Enemy opposition and mines delayed the opening of beach exits. Caught in the resulting congestion, the two follow-up brigades of the 50th Division were two hours late in landing. When they did arrive, they found their assembly areas still not entirely cleared of enemy. Elements of the *352d Division,* in fact, were still on the Meuvaines ridge after midday.

From the German point of view the crumbling of the *441st Ost Battalion* was immediately critical. The gap had to be plugged at once. The *915th Regiment* reinforced (*LXXXIV Corps reserve*) had been stationed near Bayeux and had often practiced just the maneuver now required—counterthrust, toward Crépon. But earlier in the morning (at 0400) the *915th* had been ordered to the Carentan—Isigny area to attack reported large-scale enemy airborne landings between the Vire and Douve Rivers. The report was discovered to be unfounded at just about the time the hole in the *716th Division* opened up. Threatened with having his whole right flank rolled up, Generalleutnant Dietrich Kraiss, the commanding general of the *352d Division,* secured corps approval for the return of the *915th Regiment.* But an hour was consumed trying to reach the regiment. Then it had to countermarch almost twenty miles from a point nearly five miles west of the Forêt de Cerisy. The march was made partly on foot, partly by bicycle and French motor vehicles which suffered numerous mechanical breakdowns. Another three hours passed before even a portion of the unit was in position to attack. That delay proved crucial, for in those hours much happened to change the situation on OMAHA completely.

Ernest Hamlin Baker, U.S. Army, Bachrach

Mrs. Anna M. Rosenberg, recently named Assistant Secretary of Defense.

General Dwight D. Eisenhower, commander of integrated forces of West.

Brig. Gen. Frank H. Partridge, commander of new 7th Armored Div (Tng).

Sum & Substance

A regular feature in ARMOR, where you may express your views in approximately 500 choice words—the effective medium between the letter and the article. This section is open to all on any subject within the bounds of propriety. Name and address must accompany all submissions. Name will be withheld upon request. No pseudonyms.

In the close reappraisal of armor going on today the word "universal" has cropped up. It is perhaps to be expected that the search for short cuts and savings should spark the idea of a "combination tool." Fortunately, the tank seems to have weathered this storm; we have progressed to the "family" of tanks. However, there are rumblings that seem to indicate that the next fashion may be the "universal division," an all-purpose organization designed to shoulder the team tasks of our present ground force branches. In an effort to garner the best professional thought, ARMOR has asked some of the top military men in various countries around the world to express their views on **TRENDS IN ARMOR ORGANIZATION.** *Their significant opinions follow.*—THE EDITOR.

The writer of the following, graduate of France's Military Academy of St. Cyr, served with the 9th Cuirassier Regiment in World War I. As Professor of Cavalry at Saumur (1931-34) and the Armed Forces College at Versailles (1936-39), and as member of the 1st Light Armored Division (1934-36), he was closely connected with the evolution of Cavalry toward Armor, the study of motorization of the Army, and the experimentation with armored units. In the 1940 Belgium-Dunkirk action he commanded the 2nd Cuirassier (Tank) Regiment, moving on to North Africa to command a Cavalry Brigade, and then an Armored Brigade in the Tunisian Campaign. He commanded the First French Armored Division from St. Tropez to Mulhouse in 1944. In 1946 he became Chief of Staff of the French Army, and then Deputy to General de Lattre de Tassigny, Inspector General of the Army. He retired in 1947.

Faced with the multiple dangers which lie in wait for it, can the tank hold its own on the battlefield? How should it be adapted to new conditions of warfare?

France's Du Vigier

The search for protection against blows inflicted upon him by his adversary is an instinctive necessity for the fighting man. Going back to Minerva, the goddess of ancient wisdom, we find her depicted not only carrying a lance but taking shelter under a helmet and shield as well!

With improvement in armament, however, shields became breastplates, then armor, and as a result man lost all his agility. His strength was no longer sufficient for him to handle his weapons alone. So the horse came to his rescue and for centuries steel-clad knights ponderously hurled themselves at one another. But the overloaded horse in its turn also lost its mobility, especially on rough terrain. In 1415 knighthood heard its knell sounded at Azincourt where it was unable to escape the arrows of the archers of the King of England, and a few years later the appearance of early firearms completed its ruin. From that time on, instead of protecting him, the knight's armor marked him out for the blows of his opponent. This same misfortune is threatening today's tank!

Terror-stricken by the efficiency of artillery—as we are by the devastations of the atom bomb—our ancestors thought only of digging themselves into trenches, or of taking shelter behind fortifications. It required a Napoleon to be bold enough to declare that battle on the open field would *decide* the fate of a campaign.

At first his successes were overwhelming but balance was restored as soon as Napoleon's foes learned to imitate him—and so came Leipzig, then Waterloo. The nineteenth century vainly endeavored to upset this balance. In 1914 again, opposing armies continued to struggle and wear themselves out in vain. They had no choice but to die face to face, in front of their barbed wire entanglements, beaten down by increasingly powerful and accurate firing.

Later when light engines made possible the creation of aircraft and tanks, maneuvering regained its value. Employed en masse, the tank turned Foch's mighty 1918 offensives into victories.

Hitler understood this lesson. He built up the tool of his revenge—the tank, escorted by planes, and supported by self-propelled guns. Like Napoleon, he dreamed of subduing Europe; like him again, he succumbed after the Allies had finally gathered strength enough to upset him.

1945—Berlin—that was yesterday. Then came Hiroshima! And there have been many other equally terrifying inventions since then. Will the tank be compelled to disappear, like the Azincourt knight, overwhelmed by improvements in weapons specially designed to combat it? It will not if it can adapt itself, as Napoleon did, through the resources of modern science.

In order to *scout* tomorrow's maneuver, we must learn to make full use of all currently available means—electrical ones first (radar, listening posts, television, etc.), air power and partisan combat, of course, and armored details acting with flexibility, speed and daring. A number of fighting vehicles should be enough to achieve that aim. In order to be fast, they should be light, ten to twelve tons should be enough. They should probably be multiwheeled rather

than full tracked vehicles, in order to ensure a high strategic mobility on roads. They should be equipped with very high grade means of detection (for planes, mines, tanks, etc. . . .) and of long and short range radio communications.

As for the battle, it will be *decisive* only if the main striking forces are powerful enough to immediately tip the balance in their favor. The heavy tank, very strongly armed and protected, must be this *irresistible* element on behalf of which all the other fighting units will combine their efforts. Nothing must be in a position to stop their moving forward—neither torpedo-bomber planes, nor guns, nor bazookas, nor mines. This means it must be a veritable mobile fortress. Its weight will probably reach a very high figure, perhaps 100 or 150 tons. Under such conditions, research should be immediately initiated, in order to determine the technical and tactical requirements it will have to meet—probably a nuclear energy engine—an asset which would replace gas supplies, unfeasible under combat conditions; strategic transport in several distinct loads, to be reassembled only when tactical use is decided upon; the most powerful possible armament against aerial as well as ground threats, etc. . . . These very heavy tanks will be difficult to build. They will be very expensive. Only the industrial powers will be in a position to afford them.

On the other hand it will not be necessary to have a great many of these tanks available. It will suffice that the enemy be in no position to oppose their devastating advance, and even that he *think* he is in no position to do so. A few elephants were sufficient for Hannibal to cross the Alps; a few guns for Charles VIII to conquer Italy; a few light armored vehicles for Hitler to achieve the Anschluss and a few tanks again for Patton to give the Wehrmacht a final blow.

The tank will survive, but only if it can adapt itself to conditions. To this end we must follow nature's example and produce an "ensemble" embracing the aggressive nimbleness of the small tiger and the overwhelming bulk of the huge elephant, ranging from light vehicles useful for scouting missions to powerful tanks strong enough to force a victory.

LT. GEN. JEAN LOUIS TOUZET DU VIGIER.

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The writer of the following, a graduate of the Royal Military College, Sandhurst, England, was commissioned in 1928 and posted to the 7th Light Cavalry of the Indian Army. In World War II he served as both staff officer and unit commander in Eritrea, Abyssinia, the Western Desert, and Burma, where he was the first Indian to command an armored unit in action. Since the war he has served in French Indo-China, Java and Malaya. Following attendance in 1947 at the Imperial Defense College in London, he returned to India and the Army Headquarters Staff. Since May of 1948 he has commanded India's First Armored Division, except for a several-month period in late 1948 as Military Governor of Hyderabad State.

I would like to confine this article to trends in the organisation of armour as it might be in countries which are semi-developed industrially, and as regards communications. Trends in the more highly developed countries are always under review and though there is much argument, there is also much unanimity.

India's Chaudhuri

Firstly, for the tank itself. That the gun it carries is the most important feature of any armoured vehicle has always been apparent. Unfortunately, the better the performance of the gun, the heavier within certain limits it must be. This naturally conditions the rest of the tank. Despite certain disadvantages with regard to weight, the tendency in the countries I speak about must not be to sacrifice gun performance in the interests of overall weight. As far as possible, every other factor must be subordinated to getting the best gun possible. Once this has been obtained, the designer must think of three things. The power-weight ratio, simplicity in use and ease of maintenance. In the type of country over which the tank will have to operate, it seems that nothing less than twenty horses to each ton will suffice, if it is to have any performance at all. If complicated in use, the crews may, and probably will, not use the refinements correctly. The expense will thus not be justified. If it is difficult to maintain, and this is considering maintenance in all forms from field maintenance to factory repair, the numbers on the battlefield will fall quickly.

Secondly, there is the question of whether there should be one tank, two types of tank or a type for every purpose. Here again, the trend should be towards simplicity, tempered with reason. Wherever it fights, the armour must be prepared to destroy the enemy tanks, to support its own infantry and to exploit success. These will be its primary roles. If the gun is a suitable one and the handling of the armour is correct, one tank should be able to do these tasks. But, the roles that would fall to the armoured car in highly developed countries, roles that will include use in battle as well as use in civil disturbances, will require a lighter tank, for wheels don't carry you very far where there is no road. Perhaps the trend will be towards two types but rationalised as far as possible.

Thirdly, the organisation. The truism that an armoured formation is really a closely knit group of all arms, becomes even truer in semi-developed countries. To make any progress at all, the armour supported by the infantry, or vice versa, and both supported by artillery, is imperative in all stages. The trend must be towards an even closer knit organisation; not only closer knit but more compact. Where there is only one road, an armoured division strung along two hundred miles of it is not only wasteful but military absurd. The trend must be toward eliminating over insurance as regards ammunition and fuel; to ensure that every man has a worthwhile battle task; to dispense with all luxuries; and to see that every vehicle is essential, is of the correct type, is carrying the right load and is in the right place. Where possible, the infantry must travel

on the tanks. In this organisation, the trend must also be towards an increase in fire power of the non-armoured components, fire power of the type that will make them more self dependent both in attack and temporary defence. Further, in semi-developed countries, distances will be greater, transport will move slower and casualties will become a greater problem. The trend will be towards a much closer liaison with the air arm, both operationally and administratively.

Finally, while keeping an eye always on the ideal, the whole trend of thought on organisation must be to get the best out of actuals. There must be a realistic outlook as to what is and what can be made available. The adversary must not be over or underestimated, while the tasks set must be in conformity with capabilities.

MAJ. GEN. J. N. CHAUDHURI.

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The writer of the following, pioneer in armored warfare, served overseas with the Canadian forces in World War I. From early World War II command of the 1st Canadian Army Tank Brigade, he moved on to command of the Fourth Canadian Armored Division in its European campaigns. During 1945 he was Commander in Chief of Canada's Pacific Command, becoming General Officer Commanding Western Command in 1946. Now retired from active military service, he is Canada's Civil Defense Coordinator.

It would be futile to forecast the future trend of armour organization without knowing what is in the minds of the general staffs of both the Communist and Western groups of nations. Not having this occult power I can only render a few abstract opinions.

Canada's Worthington

However, the future trend of organization will depend largely upon three basic fundamentals which have exercised considerable influence in the past and present organizations of armour formations.

These three fundamentals are the prejudice, design and tactical conception.

In connection with the above, it is well to consider some of the important lessons of the past, so far as it concerns the Western groups of nations. The tank came into being in the first world war under the most adverse circumstances possible. It was the Admiralty and not the War Office that gave the first impetus to a weapon that would prove vital to victory on land. At the conclusion of this war, most of the eminent soldiers of the time allowed the orthodox views of the military hierarchy to create a strong and virile prejudice against armour. Efforts were made to remove or at least paralyze this illegitimate child of the army.

A few men, such as Fuller and Liddell Hart, were among the foremost advocates of mechanization and armour, but theirs were voices in the wilderness, and for the most part went unheeded.

Because of this prejudice, design in the armoured fighting vehicles and their auxiliaries lagged behind those of our erstwhile enemies. There were one or two short spurts toward the tactical organization potential, but these were short lived. All of this had a profound effect upon the trend and development of armour and the older tank men of the time were forced into the position of appeasement in accepting any design or organization as being better than nothing. We, therefore, entered the Second World War with fighting vehicles that were under-gunned, under-powered and under-armoured. Nor did we at any time overtake our enemies in this field other than having a preponderance of numbers.

The three fundamentals mentioned above are still vitally important in the trend of armour organizations.

Prejudice. There is evidence that this old prejudice of thirty years is not yet dead despite many outstanding lessons of the Second World War. In the past this prejudice may have been based on ignorance and the fear that armour would supersede more favoured arms. Today there is no such excuse. But unless a very clear concept of armoured potential exists, it may well be that the future trend of organization will be as spotty, as unsound as it was in the past.

Design. To our everlasting shame as nations of great technical potential we never did produce an armoured vehicle capable of matching the best our enemy had. The designers were not entirely to blame, but many of the eminent men of this field could not or would not produce what the fighting man wanted. There was a large gap between the actual fighter and the designer. More often than not, the policy of design was dictated from a level so high that it could not, under any stretch of imagination, interpret the views of the fighting soldier. An example of this is the well meant policy of producing the universal tank.

The modern trend of design appears to be more in the direction of creature comforts and gadgetry. The armour fighting vehicle should be built around the gun; it should be simple and expendable. The Russians have done this and so can we.

Tactical Concept. The tactics of armoured formations must be based on the characteristics of the prime vehicle within that formation and should not be unduly influenced by the tactics of other arms. One of the prime functions of an armoured formation is the breakthrough and exploitation; in other words, mobility and manoeuvre. Therefore, air and armour have a natural affinity. In consequence the tactics of these two arms should be developed to the highest degree of efficiency.

Organization. It is my opinion that an armoured formation should contain no elements incapable of cross-country performance. In the last war our armoured divisions contained a very small war head of armoured vehicles with a long tail and soft belly of wheeled transport. When in march route formation it occupied upwards of 200 miles of road space. There is still not much change. An armoured division should be a tactical formation designed to fight and contain only the bare minimum of administrative

and supply elements. This latter is better placed under Corps. Moreover, I believe it incorrect to mix armoured and infantry divisions into the same Corps. An armoured division should contain a suitable balance of artillery and infantry, the last named being heavy in fire power and trained to fight with the armoured elements.

I believe that tactical air groups should be trained to fight with armoured formations as combat teams. Nor is it unreasonable to suppose that air reconnaissance, and even supply upon occasion, is impracticable. There are many lessons to support this belief.

If the present conflict develops into a more open struggle, we will be competing against a manpower army, the bulk of which will be well trained and reasonably well equipped. In the past when we have faced large manpower armies they have, for the most part, been equipped with primitive weapons, and in consequence small forces with better weapons have been able to be victorious. I suggest, therefore, that our key to the future is not to match man for man, but develop our technical and mechanical efficiency, and from this create tactical techniques of our own rather than those of our enemy.

MAJ. GEN. F. F. WORTHINGTON.

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The writer of the following served with Germany's field forces in World War I. In the period 1936-37 he was in charge of Germany's First Panzer Force School, and in 1939-41 the Second Panzer Force School. During World War II he was a divisional commander in North Africa, and commanded the 7th Panzer Division and Grossdeutschland Division on the Eastern Front. He became Commanding General of the Fifth Panzer Army and was promoted to General der Panzertruppe on 1 January 1944. His name has been mentioned in connection with the formation and command of a new West German Army.

The commitment and use of troops determine among other things their form of organization, both on a small and on a large scale. The technical progress of the individual weapons also influences their form of organization. For this reason a few of the technical demands made by the fighter upon the technician will be outlined herein, and subsequently a possible form of troop organization will be dealt with.

The designer of tanks is faced with the following requirements, briefly put, which the fighter formulates with respect to the construction of tanks: weapons of great fire power, accuracy and rapidity of fire; good means of observation and aiming; armor-piercing ammunition with destructive effect; heavy armor; low silhouette; high cross-country speed; good means of steering; modern, easily handled and quickly interchangeable radio equipment; and ability to climb and cross shallow watercourses.

In the construction of tanks to meet these requirements, the limit with regard to gun capacity, armor, and power of the engine for giving the tank the necessary high cross-country speed is, according to my experience, *fixed by the speed and the maneuverability which the tank must have on the battlefield.* This is true because weapons combating it have improved likewise. In May 1944, in the Rumanian theater, the division which I commanded put out of action Stalin tanks which were then appearing for the first time and which today are probably still the strongest tanks in the world with respect to guns and armor. These tanks were not disabled by our Tigers (Mark VI) or Panthers (Mark V) but by our Mark IV's, a medium type of tank armed with a long-barreled 75mm gun, which stealthily approached these tank monsters, skillfully taking advantage of the terrain and fully exploiting their high speed, and fired on them from the side, opening fire in surprise assaults, with the result that not a single Stalin tank remained in action.

Germany's Manteuffel

It must be emphasized that tanks need improved target reconnaissance and communication equipment, both for notification within the armored unit and for communication with the tactical air force most closely cooperating with it. On tank armament, muzzle flash and report should also be softened. Equipping tanks with night aiming mechanism should cause no difficulties, in view of experience gained with night fighter airplanes; this kind of mechanism is urgently necessary because, in future, march, assembly and combat will take place in hours of darkness to a much greater extent than we have been accustomed to. The combat troops accompanying the tank nucleus, such as infantry, engineers, artillery, rocket details, etc., must have the same speed on the battlefield as the tank unit, in order that all these troops may be able to fight in close cooperation with the tanks. Only in this manner will they be capable of lending adequate—meaning *effective*—assistance to the tanks. They too, of course, must be at least lightly armored and run on caterpillars. The accompanying infantry in the tank unit will fight as a rule from its armored vehicles and will dismount for fighting only in special cases. Continued development of "Goliaths" like those which we had in the Wehrmacht should be attentively pursued and spurred on. These vehicles were small, armored explosives carriers on caterpillars, resembling in shape their large colleagues, the real tanks. They were steered by remote control and were tremendously effective.

For the sake of completeness I should remark here that some of the supply services of armored troops—unless these are supplied by air—must have at their disposal vehicles capable of bringing necessary supplies to the troops on the battlefield, that is, capable of moving cross-country. The same applies to some of the vehicles of the maintenance services.

The question of the organization of troops cannot be dealt with in a few words. In addition to the material basis many other factors must be considered, such as the soldierly qualities and the educational level of the nation concerned, the geographic situation and condition of the potential theater or theaters of operation, the strength of the presumable enemy or enemies and the question

Under Secretary of the Army Archibald S. Alexander Before the Society of Automotive Engineers.

The President, in his State of the Union message, outlined . . . what is before us.

There are two parts of the President's address which I should like to recall to your attention. He set the build-up in personnel strength of our Armed Forces at 3½ million and said: "We are going to produce all the weapons and equipment that such an armed force will need. Furthermore, we will make weapons for our Allies, and weapons for our own reserve supplies. On top of this, we will build the capacity to turn out on short notice arms and supplies that may be needed for a full-scale war."

At another point in the President's address—and this should be of particular note to the automotive industry—he said: "We are preparing the capacity to produce 35 thousand tanks a year. We are not now ordering that many, and we hope that we never have to, but we mean to be able to turn them out if we need them. . . ."

General Collins, Army Chief of Staff, in an article published this month, after describing the close partnership between the Army, Navy, Air Force and Marines, identified the basic problem facing our ground forces, the Army and the Marines. The problem is to produce "sufficient mobility and fire power for our ground forces. . . ."

. . . our plan for tanks will comply with the President's directive that we equip our increased armed forces and create the capacity to make 35,000 tanks a year. And the same will be done for other items of equipment and supplies. . . .

The Army's plans for the fiscal year 1951 require the spending of more than 4 billion dollars in the tank-automotive field alone. . . .

Looking at the record of the last war, I am sure we shall succeed in what we are trying. The automotive industry, which in 1940 made 331 tanks, made 25,000 in 1942. And though the tanks of today and tomorrow are and will be far superior to those of World War II vintage, and though the cost of most things has doubled since 1942, the tanks we are now buying in quantity cost no more per unit of horsepower than the tanks of World War II. The chief credit for this is due to the engineering brains and the manufacturing skills of the automotive industry working with the Army tank specialists. . . .

whether the campaign will be conducted by mass armies in a small area or by numerically small armies in a large area.

Always a maximum of fighting power and mobility must be achieved and the high command must be able to carry out its will safely and quickly. To this principle everything has to be adjusted.

Regarding the organization of units up to division level I suggest organization on a four-unit (rather than triangular) basis. It affords the subordinate commander a chance, in a fast moving situation, to take immediate advantage of opportunities, enabling him to exploit a tactical success by resolute and appropriate action. With organization on a four-unit basis he is in a position to "feed the battle" from his own reserves without having to wait for the attachment or assignment—and thus for the arrival—of further forces, which always costs time. We all have learned that time thus lost generally benefits the enemy!

The combat technique of the troops will have to be in conformity with modern weapons, their possibilities of application and their effect. This is true of march and assembly as it is of fighting itself. In the future, movements and battles will have to take place in hours of darkness to a greater extent than hitherto, in order to impede enemy reconnaissance and action from the air. An appropriate combat procedure needs to be developed and perfected. Where terrain permits, the troops, supported by the greater effects and longer ranges of their modern weapons, will be able to fight in greater width and depth. In contrast with 1945, they can leave certain areas unoccupied, and may even be *compelled* to do so, because the weapons of the enemy have also improved.

In addition to strategic concealment of all operations, tactical concealment is of very great importance. It includes among other things the choice of terrain in accordance with over-all plans, surprise action, and habitual concentration of all weapons for surprise fire.

The tank troops must not be content with driving off attacking enemy tanks from good firing positions. They must *annihilate* enemy tanks whenever they see them or suspect their presence. For this reason the tanks must themselves attack again and again to destroy those enemy tanks which from great distance are giving fire support to their own attacking tanks.

A further relevant point is the following: The armored troops breathe through their services of supply, that is, supply of fuel and spare parts and their towing and maintenance. Their importance became plain to us when a large part of these services remained stuck in Russian morasses and snow fields, owing to a lack of proper organization or leadership, while combat was in progress. Organization, equipment, and mobilization of these various services are of decisive significance. Those units which directly support the combat troops, and that includes a large part of them, need a tactical command like the combat troops themselves.

HASSO ECCARD VON MANTEUFFEL.

The Requirement For Armor

by COLONEL HAMILTON H. HOWZE

SOME months after a nation commits its armed forces to battle there normally occurs a healthy process of military self-examination. Many searching questions are being asked now, not only by professionals, but by all citizens conscious of military matters. I believe we can acknowledge that the war in Korea has been a full-scale conflict, definitely not susceptible to description as a mere police action. It is also true that it is being fought without the employment of a single armored division or light armored regiment.

There are obvious reasons why these units were not employed in Korea, among them being that our order of battle lists, under armored divisions, exactly one. It nevertheless remains true that *tanks* have participated very importantly in this extensive action, and none of these tanks belong to what are generally considered to be the primary formations of the armored branch. These facts would seem to lead logically to the conclusion that the Korean war is prima facie evidence in support of the concept of the "universal" division—in effect, an infantry division beefed up with sufficient tanks and transportation to enable it to fulfill not only its own role but also that commonly accorded to an armored division.

The Korean experience may encourage many infantry commanders to contend that the infantry division right now meets all the major requirements of the universal division: just a few more fighting vehicles and trucks here and there will do the job. An infantry division is in truth very strong in armor, having organic a standard tank battalion plus the full equivalent of a second. Additional tanks, in separate tank battalions, are available in the Corps and in the Field Army. It might seem crassly selfish of Armor as a branch to regret the fact that the Infantry, having been made organically so powerful, finds itself in a position to do without major armored units in most combat situations. On the other hand if this concept is generally accepted, and therefore reflected in the organization of the Army as a whole, I believe that great damage will have been done.

It is difficult to see how the organization of the war Army will *not* be affected. I suggest that the process will be about as follows: in the hurry and stress of mobilization, emphasis will be upon putting divisions into the field; new infantry divisions may be activated and made operational in a somewhat shorter time than armored divisions; the case may logically be made that these infantry divisions can do most of the things that armored divisions can do, since they approach the "universal"; each activated infantry division will soak up its full, and considerable, proportion of tanks, which must be expected to remain in short supply; the operational readiness of new armored divisions will thereby be repeatedly deferred, in the interest of expediency and because of a shortage of its basic weapon: the tank.

This paradoxical situation might be accepted if it were based on sound tactical principles—but it is not. The armored division has a battle role that is totally unique, a role that cannot be adequately fulfilled by a standard infantry division through any process of adaptation. It is necessary, however, that Armor acknowledge that this concept imposes on Armor a rather awesome responsibility: it must be capable of fulfilling its *special role* with *special excellence*. Unless it meets this criterion it loses the right to exist.

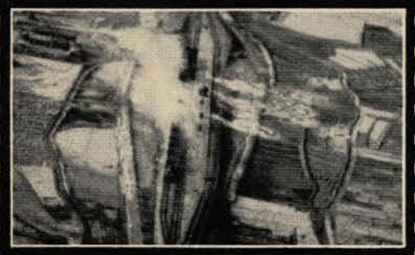
To meet the challenge the armored division cannot, on any account, be fought simply as an organization with a somewhat larger proportion of tanks-to-infantry. The armored division must design all its tactics with special reference to the unique capabilities of the tank, which may be stated in simple form as the ability to move and the ability to kill. Those capabilities *are* unique only in the sense of degree: the infantryman has the same powers, but he cannot move as far and he cannot kill as extensively. Please note that I have not assigned to the tank as an important asset the ability to absorb punishment by virtue of its armor plate—this is a secondary consideration for tanks of the armored division, and must always remain so if the division is to operate with "special excellence."

Moreover, the true role of armor cannot be fulfilled merely by the provision of *any* sort of equipment, however organized or however perfect—a certain psychology, or mental attitude, is involved. Like the cavalry of Forrest and Sheridan and Jeb Stuart, our major armored formations require officers who understand the true value of mobility, the essence of which is "quick decisions, quick movements, surprise attack with concentrated force; to do what the enemy does not expect, and constantly to change both the means and the methods to do the most improbable thing whenever the situation permits; to be free of all set rules and preconceived ideas." Armored officers must also know what Clausewitz meant when he said that no subordinate commander must be held accountable for the *success* of his part of the battle, although fully responsible that his troops are skillfully led and fought vigorously "in a spirit of self-sacrifice"—the theory being that if a commander is too preoccupied with success, as such, he will put undue emphasis on the protection of his flanks and other precautionary measures, and will thereby eschew the bold approach. This is not a theory for amateurs.

In the possibly forthcoming struggle for Western Europe there will be an indispensable requirement for powerful, mobile troops; the greater the disproportion in total numbers, between ourselves and our opponents, the greater the requirement. General Martel, of the British Army, says that 20 armored divisions could do the job. Whether that figure is too large or too small cannot be decided on the pages of this or any other magazine, but certainly it would seem desirable to set about the provision of proper and adequate armored forces by the earliest possible time.



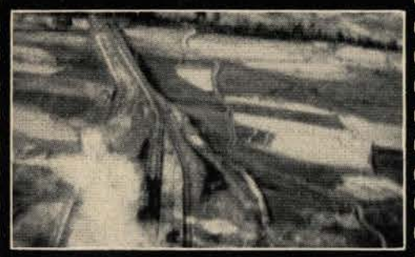


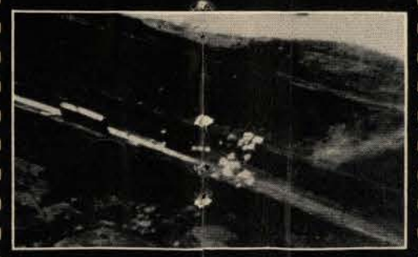


















AIR STRIKE

In Korea, the air strike has been pounding the enemy. Army, Navy and Marine jet and conventional planes have struck at enemy armor, transportation, front-line positions, troop concentrations, rail points and other targets. In most instances, the gun camera mounted in tactical planes has recorded these strikes. ARMOR has viewed several thousand feet of combat film footage, picked out some representative strips of movie film from which intermittent frames have been cut and reproduced in still form. On these pages are shown five missions. From top to bottom you may follow a strike from the start of a run, on through firing on the target with guns and rockets, and the pulling out. This is tactical air at work.—*The Editor.*

TANK ECONOMY: Analysis of Combat and Operational Losses

Tank losses in or out of combat must be the subject of continuing analysis as a basis for corrective action on the part of the maker and the user. Here is a discussion of some most important measures.

by BRIGADIER GENERAL P. M. ROBINETT

A TANK is a very expensive instrument of war—probably the most expensive item of equipment issued to the ground troops. Improvements are constantly making this increasingly so. Collectively, therefore, tanks constitute not only a very great financial drain on the national economy, but a drain on essential resources as well. This is true because of the amount of strategical raw materials required to build tanks and because of their vulnerability to enemy action in battle. Certain groups of military men have overrated these considerations with the result that the development of defensive weapons has been unduly emphasized. This tendency toward the defensive, though not totally condemned if held within limits, is not in keeping with the mechanical genius of the American people or the traditional American adherence to the principle of the offensive in the conduct of war. While economy is vital, it should not be at the expense of decisive offensive weapons.

The principle of economy of force is taught in all our military schools and permeates our Army, but the implications of the principle apparently are not fully appreciated. The principle of economy of means or of equipment is an element of the broader principle which is commonly understood in terms of manpower. Of course man is, by all odds, the most important element. This should be apparent even to the most brutal realist, for quite obviously there is a limited source of supply and it takes eighteen or more years to grow a soldier plus one to two years to train him at a great cost. But even if equipment can be made and put into service in less time, it has become so intricate and expensive that the strictest care and attention must be taken to insure maximum results in operations. There are strategical, organizational, logistical, tactical, and technical matters to be considered in developing a sound program for utilization of tanks or any other major weapon.

At the end of World War II, American tanks far outclassed those of Italy, Japan, and Great Britain but still compared unfavorably with those of Germany and Russia. However, there was a pronounced tendency during the war to cover up our deficiencies by propagandistic statements to the effect that American tanks were the best in the world. Certain high-ranking field commanders and technical specialists did much to spread this idea. The statements might have been adequate for the uninformed public at home, but were recognized by the fighting men at the front for what they were —mere bunk. If evidence is needed to show what their attitude was, consider the words of Lieutenant F. A. Daubin, 1st Armored Regiment, who was one of the first Americans to face the long barreled 75mm gun of the German Mark IV tank. He was shot out of his M-3 light tank and lived to tell the story.

"Tracer-tailed armor piercing bolts streaked out of the American's muzzle and bounced like mashie shots from the plates of the Mark IV. The German shed sparks like a power driven grindstone. In a frenzy of desperation and fading faith in the highly touted weapon, the M-3 crew pumped more than eighteen rounds at the Jerry tank while it came in. Through the scope sight the tracer could be seen to hit and glance straight up. Popcorn balls thrown by Little Bo Peep would have been just as effective. . . . Death, unexplainedly deferred these many seconds, struck as the light tank backed out. . . . The slug struck the vertical surface of the heavy armored driver's door and literally caved in the front of the M-3. With its driver instantly dead, the bow gunner blind, stunned, and bleeding, the leader cut down by machine-gun fire as he sought cover, the little tank, though sheathed in flame, backed on through the battle until stopped by friendly hands. Safely in a ditch, his thoughts were on two things; how long would it be before the German tanks swept past him and finished him off; and how was the loss of faith in their chief weapon, the 37mm cannon, going to affect the future battle performance of his platoon, company, and battalion?" Victory, however, covers up all failures and inadequacies in war, and did in World War II.

To the fighting man weapons are the symbols of power. It is worse than useless to try to convince a soldier that his weapons are the best in the world when his own experience tells him otherwise. Commanders who repeated the propagandistic statements to the men at the front only tended to destroy the respect in which the soldiers held them. It is best to tell a soldier how to get the most from his weapons.

Brig. Gen. P. M. Robinett commanded American armor in the Tunisian Campaign. Later Commanding General of The Armored Center, he is now retired and is Chief of the Applied Studies Division in the Office of the Chief of Military History, Department of the Army.

On the other hand, a commander should not speak well of the enemy or of his weapons to his men; it is better to take the advice of Frederick the Great and damn them. General Patton practiced this principle assiduously. It is the part of wisdom, however, to adopt and teach a tactical doctrine that is appropriate to the equipment and to the circumstances under which it operates. This requires great flexibility on the part of commanders since new or improved weapons first appearing on the battlefield come as a surprise. Failure to adjust tactics to operational conditions might well lead to defeat. This point is illustrated over and over again both in World War I and in World War II. But any adjustment made to meet a surprise is merely a temporary solution. A real solution can only be found in better-handled, superior weapons. The basic problem is, therefore, technical rather than organizational or tactical. This article will deal primarily with the technical aspects of the problem, largely from the point of view of the combat troops.

New Tank—New Problems

Coincident with the introduction of a new tank, new problems of tactics, maintenance, and operation arise. These are anticipated, as far as possible, in field manuals, in maintenance charts and regulations, and in technical manuals. All these should be developed and issued with the equipment. Even when available, these first instructions are always incomplete or faulty—the tank itself, in spite of all efforts to the contrary, still has certain bugs to be eliminated. This is understandable as it is impossible for even the most intelligent and imaginative individual or group of individuals to anticipate every possible condition or situation. It is therefore necessary that most accurate information concerning mechanical shortcomings or failures be maintained, transmitted, collated, and analyzed. Based on this analysis appropriate specific, corrective instructions should be given to both the user and the manufacturer.

Operational analysis is of the highest importance and concerns all echelons of command. At the highest level, it is necessary that: (1) comparative studies of American and foreign tanks should be made and kept current; (2) integration of tanks in military organization should be constantly reviewed with regard to prospective theaters of operation; (3) maintenance and operating techniques suitable to the climatic and terrain conditions of possible theaters of operation be anticipated; (4) proper instructions be issued to insure the accumulation of adequate operational and combat data relative to the performance of the tanks; (5) information concerning our own and foreign tanks and tank operations be disseminated to the Armored School and the Ordnance Corps; and (6) adequate inspection controls be maintained to insure execution of the program in all lower echelons of command.

Ordnance the Repository

The technical services, particularly the Ordnance Corps, should be the final repository of operational and combat data concerning tank equipment. It should also be the agency to make the technical analysis necessary for the improvement of equipment. Nevertheless, the Armored School should also study the problem from the standpoint of the user and should, therefore, receive copies of all pertinent data. This work should help in developing tactics suitable to our equipment and in reducing operational failures. It should thus favor the maximum effectiveness of tanks at the fighting front. It should also establish the causes of tank losses by enemy action and suggest measures to be taken to reduce these losses.

In a theater of operation, all commanders should be constantly conscious of the principle of economy of means and should exert their influence to insure that ground troops get the maximum advantages from their equipment. This requires a mental reorientation by all commanders, if mechanized warfare is to be conducted in the most efficient manner, and will entail an attitude of mind very similar to that of naval officers, who have always been ship conscious. Army officers must become tank conscious. They should carefully husband the tank strength but not hesitate to go all out or to take risks when the prize is equal to the expenditure of means. At the same time they should insure that all tank units maintain the offensive spirit and the will to assault and overthrow the enemy. They should take due precautions to insure that coordination and close teamwork between the various arms—Armor, Infantry, Artillery, and Air—is carefully preserved. However, there may be times in the pursuit where this careful co-ordination may be temporarily abandoned in order to overwhelm and destroy a beaten force. In such cases it is appropriate to accept heavy losses of equipment for the sake of the advantages to be gained. In this connection it is to be noted that the physical possession of the battlefield was never so important as it is today, because our own damaged and abandoned equipment is not only recovered but the enemy's falls into our hands as well. Even the most severely damaged tank is a mine for repair parts and the less damaged tanks can quickly be put back into operational condition. Special recovery equipment should be developed for the withdrawal of disabled tanks for repair.

Regulations for a tank remount or replacement service should be prepared and all plans should include provisions for replacement equipment. Data on which to make the computations for replacement tanks should be accumulated in the course of every war, just as it was for horses in the past.

Conclusion

To recapitulate, the principle of economy of means should be understood by all commanders in mechanized ground warfare. This principle should be given careful consideration in developing strategical plans and organization, and in the actual conduct of operations. It is possible to accumulate much operational data in peacetime that will be applicable in war, but this will require the employment of tanks under all climatic and terrain conditions and the careful accumulation, collation, and analysis of data gained from these operations. In wartime data should include failures from both operational and combat causes. Analysis and study of the data should facilitate an immediate adjustment of tactical doctrine to the situation and, ultimately, the production of tanks superior to those of the enemy. Procedures should be established at all echelon levels to insure the accumulation of necessary data. Finally, inspection controls should insure the execution of the program at all levels of command.

Loudspeakers used for Psychological Warfare proved effective when used against North Korean troops. Many surrenders were directly attributable to the front line use of this propaganda medium.—From various news sources.

The "Propaganda" Tank

by A. T. HADLEY

EVERY armored soldier knows that one of the essential characteristics of all tank action is shock. Shock, that strikes at the enemy's mind, increases his anxiety and paralyzes his ability to fight. Psychological warfare is that branch of the Army whose primary concern is lessening the enemy's ability to fight through action on his mind. One would think because of this similarity that Psychological warfare and Armor would be constantly working together. Yet, probably because of the woefully limited use made of battle propaganda during World War II, the two have not trained together during this uneasy peace.

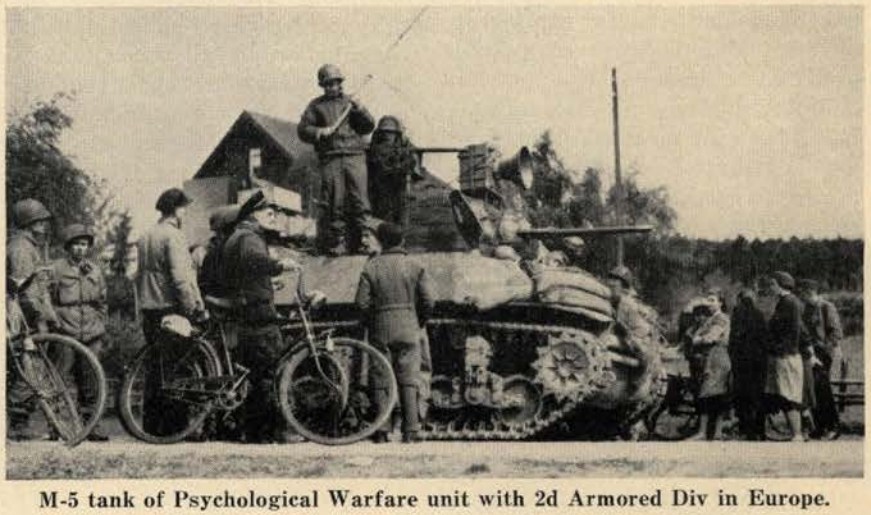
Properly used combat propaganda exploits the speed, violence and surprise inherent in every well planned armored attack to tremendously increase the shock effect. The effect of this shock causes the enemy such anxiety that he can no longer fight effectively and may even surrender. This saves American lives and gets the commander on the objective that much more quickly.

To aid the combat soldier, battle propaganda employs two weapons: the tactical leaflet and the tank mounted combat loudspeaker. This latter is the most important to the tanker. The new light (25 lbs.) loudspeakers just coming into production can throw the human voice with understandable clarity for a range of two miles. They are mounted on tanks so that they can go into action along with the assault wave, exploiting the initial shock caused by the appearance of tanks before, or even better, behind, or on the flanks of a position.

Because so little is known about the operations of tank mounted loudspeakers a glance at a World War II operation is instructive. The tank mounted loudspeaker was operating with an advance column of the 2nd Armored Division. Arriving before a fortified town the column deployed. Some fire was received from the town. The loudspeaking tank informed the garrison of the town that a large armored task force stood on the outskirts. The broadcast also informed the people that the commander didn't want to destroy the town. The garrison was then informed that American artillery was ranged on them.

Over the tank communciations system, word was sent back to the artillery. Six leaflet shells, containing surrender instructions for towns, burst over the village. The occupants of the town were then informed that American fighter-bombers were overhead. The Forward Air Controller called down a P-47, that laid a leaflet bomb squarely over the center of the town. The tanks then moved forward without firing, while the loudspeaker continued to call on the town to surrender. As the tanks brushed through a light curtain of fire, the firing stopped and white flags appeared. A garrison of some 800 men with antitank weapons surrendered.

Admittedly, this was an ideal operation. Usually the results achieved are not so spectacular nor is the coordination so perfect. However, several important aspects of battle propaganda can be gathered from this operation. Most important of these is the realization that no one is surrendering to the propaganda. What they are surrendering to is the military force, the tank attack. However, that force has been exploited by the battle propagandist for its fullest psychological effect. Nothing could be more wrong than the idea, unfortunately prevalent in many quarters, that psychological warfare is a wonder weapon operating by itself to achieve spectacular results. It



M-5 tank of Psychological Warfare unit with 2d Armored Div in Europe.

A. T. Hadley, at present with the Washington Bureau of *Newsweek* primarily covering the Defense Department, is a Captain in the Psychological Warfare Reserve. During the war as Psychological Warfare officer with the XIX Corps he participated in the development of the tank-mounted loudspeaker and pioneered the tactical use of this weapon, receiving the Silver Star from 2d Armored Division for this work.

Thousands of Germans surrendered to this unit with 7th Armored Div.

is merely another supporting weapon, though of overlooked power, and like any supporting weapon its fullest results are only achieved through cooperation.

In this particular instance the tanks and supporting infantry never returned the hostile fire. This is a customary battle propaganda device that exploits the shock action of tanks to the fullest. Once the fire fight has been joined the enemy gets some relief from his anxiety in action and it becomes harder to get the maximum psychological result. This points up the need for peacetime training in this field. It takes a well disciplined unit to hold their fire. During World War II it would take on the average of ten to fifteen loudspeaker missions before troops learned to make the adaptations necessary for psychological warfare to be a success. Some outfits that had bad initial experiences with loudspeakers never learned. The intricacies of tank-infantry-loudspeaker cooperation should be forged now in training.

The individual tanker and armored infantryman also has to be trained to think in terms of psychological warfare. At the time the enemy first starts to surrender, any single soldier can change the outcome of a battle by shooting down the surrendering soldiers. This makes the enemy feel betrayed and he settles down to really fight. Also the belief that it is "sissy" to take prisoners must be eradicated. It is a far more soldierly course to get on the objective quickly with few casualties through taking prisoners, than to reach the objective after a hard battle in which no prisoners were taken, so heavily hurt yourself that you cannot exploit your gains. After all, Armor is the arm of speed and violence and taking prisoners often will increase your speed a hundred fold.

There are a host of other questions that should be ironed out in training. What is the best position for the loudspeaking tank to take in an attack? How should its radio set be hooked up? Who should command it? Through what chain of command? Then there are the technical questions of the best form of power supply, the best position for the loudspeaker on the tank, the exact distances the speaker can be heard in different terrain and weather?

There are also to be investigated the numerous supplemental benefits that derive from the presence of a loudspeaker tank. The most striking of these is the use of the loudspeaker in the control of infantry during an attack. The loudspeaker can reach every infantryman at once without having to go through the radio net. For example, after the tanks have finished putting fire on a strongpoint, the infantry can be informed of this over the loudspeaker. This way they can attack the strongpoint immediately without that lag that lets the enemy reorganize. The 2d Armored used this method with great success, particularly in towns where control was always difficult.

"Psycho" at work in Korea today.

The question of how many loudspeaker tanks there should be and the command channel should also be gone into. The combat arms have a vital interest in this question, yet few armored experts have given the problem more than passing attention. At the risk of sounding like that famed loser of future wars "the old expert," I believe the following to be the proper ratio of loudspeakers.

There should be one organic loudspeaker tank with every tank battalion in the armored division. There should be two such tanks with the separate armored mechanized reconnaissance regiments that operate out of Corps. There should be a PW officer in Division HQ responsible for training the crews in PW techniques and leading the key loudspeaker unit in combat. The loudspeakers must be organic. World War II proved that you cannot attach them to a division for an operation any more than you could attach a tank battalion to an infantry division on the eve of an operation and expect real results.

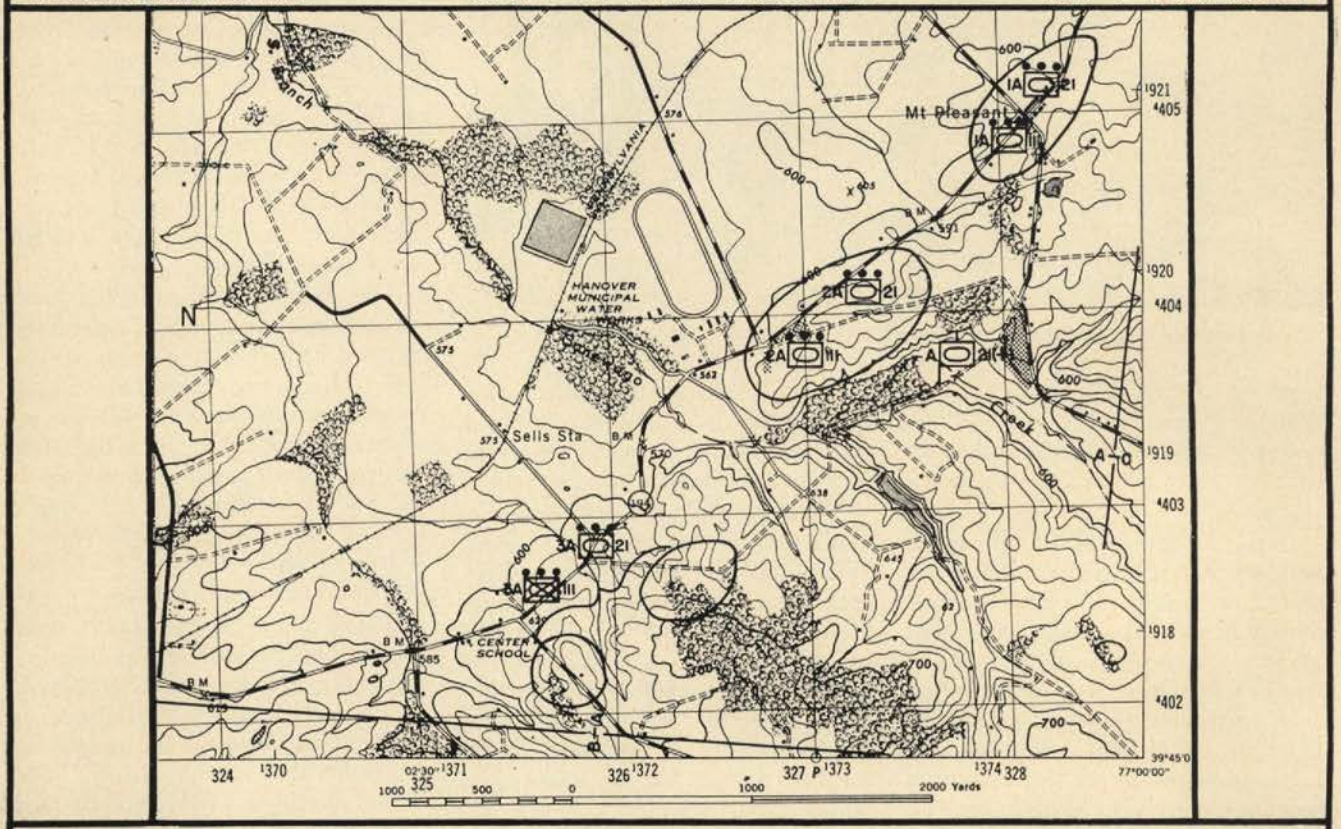
Looking briefly into the future, loudspeakers are due to play a tremendously important part in airborne armor units. In the air head, which is shock action at its highest, the mobile loudspeakers will range 'round the perimeter. Everywhere confusion is found they will exploit it, calling on the enemy to surrender, enhancing his fears with battle noises, increasing the confusions through phony orders to his troops.

To further its mission Armor needs the tank mounted loudspeaker and the techniques of battle propaganda. To be effective, battle propaganda must work with Armor and the other mobile combat forces. The lateness of the hour almost demands that the marriage take place soon.

HOW WOULD YOU DO IT?

Reinforced Tank Platoon in the Mobile Defense

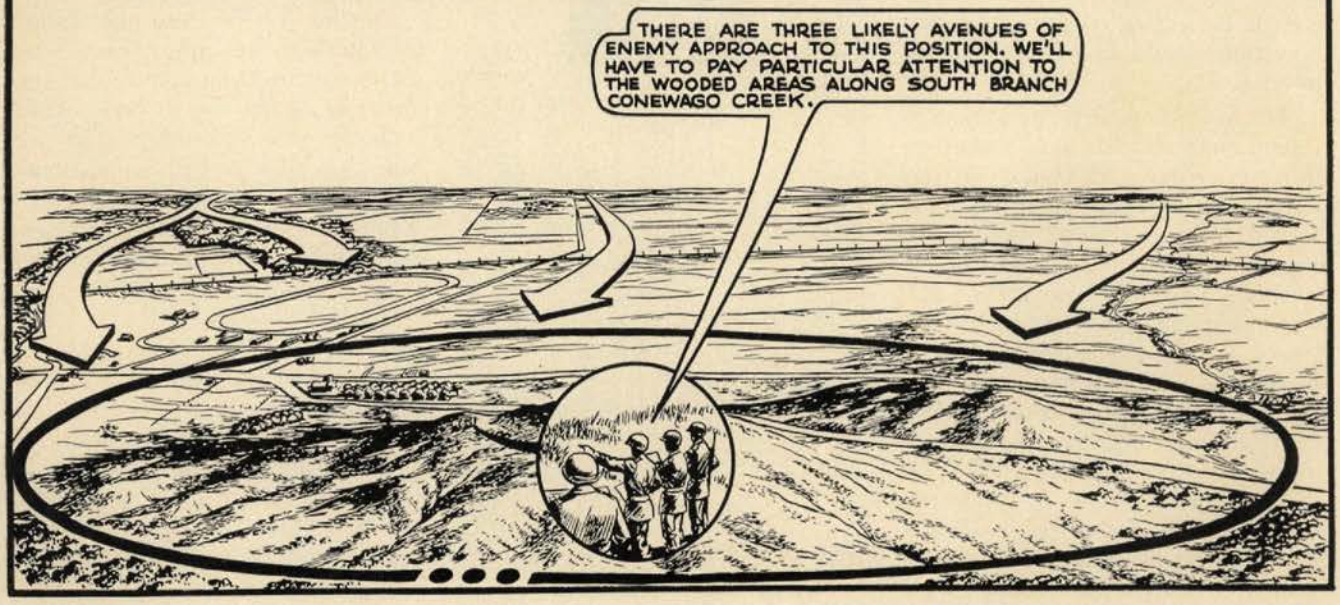
AN ARMORED SCHOOL PRESENTATION — AUTHORS: MAJ. V. J. FENILI MAJ. J. A. RANKIN — ARTIST : M SGT. W. M. CONN



SITUATION:

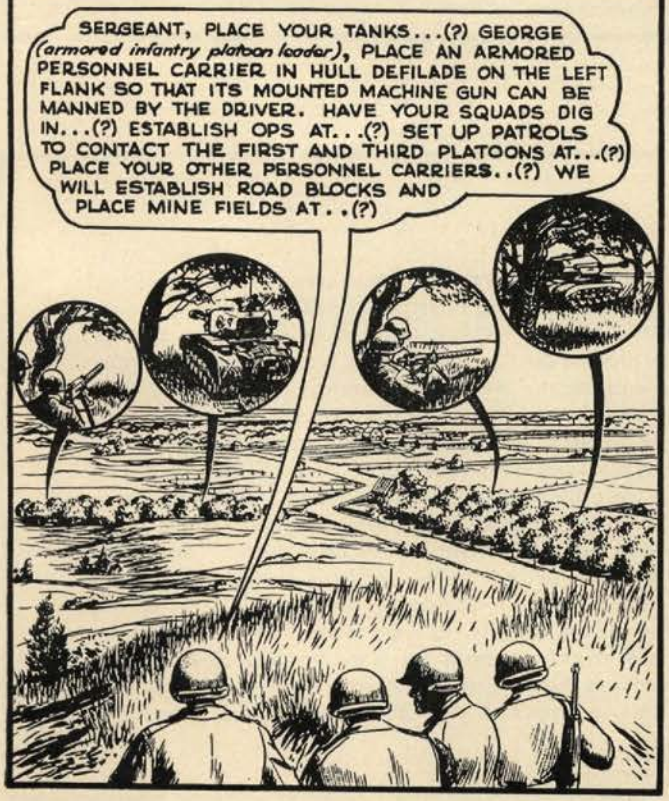
THE 21ST M TK BN (REINF), PART OF CCA, 301ST ARMD DIV, HAS BEEN ATTACKING NORTH TO SEIZE AN IMPORTANT ENEMY COMMUNICATIONS CENTER. BECAUSE OF A LARGE-SCALE ENEMY COUNTERATTACK ELSEWHERE ALONG THE FRONT, THE 301ST ARMD DIV HAS BEEN ORDERED TO HALT AND DEFEND GENERALLY ALONG LINE HIGHWAY 194. WITH THIS EXTENDED FRONT, THE DIVISION COMMANDER REALIZES HE MUST EMPLOY MOBILE DEFENSIVE TACTICS. THE 21ST M TK BN (REINF) HAS BEEN ASSIGNED A PORTION OF CCA'S SECTOR OF THE OUTPOST SYSTEM. CO A, 21ST M TK BN (REINF) HAS BEEN ASSIGNED THE SECTOR SHOWN ON THE SITUATION MAP. YOU ARE PLATOON LEADER 2D PLAT, CO A, WHICH HAS BEEN REINFORCED WITH 2D PLAT, CO A, 111TH ARMD INF BN. YOUR COMPANY COMMANDER HAS POINTED OUT YOUR REINFORCED PLATOON STRONG POINT ON THE MAP AND ON THE GROUND. HE HAS ORDERED YOU TO ORGANIZE THE STRONG POINT FOR THE DEFENSE.

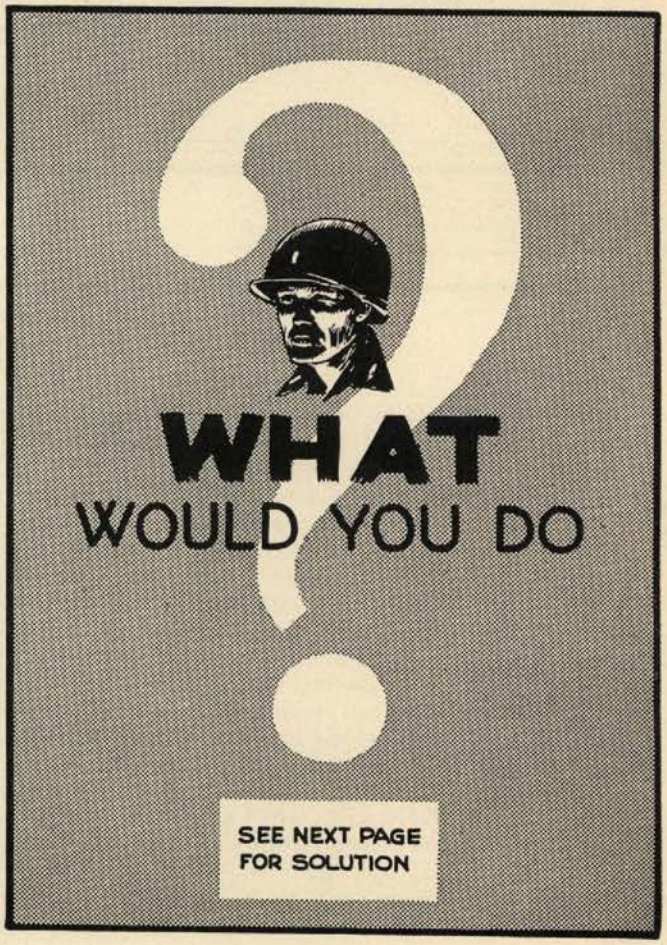
YOU AND THE ARMORED INFANTRY PLATOON LEADER AND THE PLATOON SERGEANTS STUDY THE TERRAIN—ON BOTH THE MAP AND THE GROUND—FORWARD OF THE PLATOON POSITION.

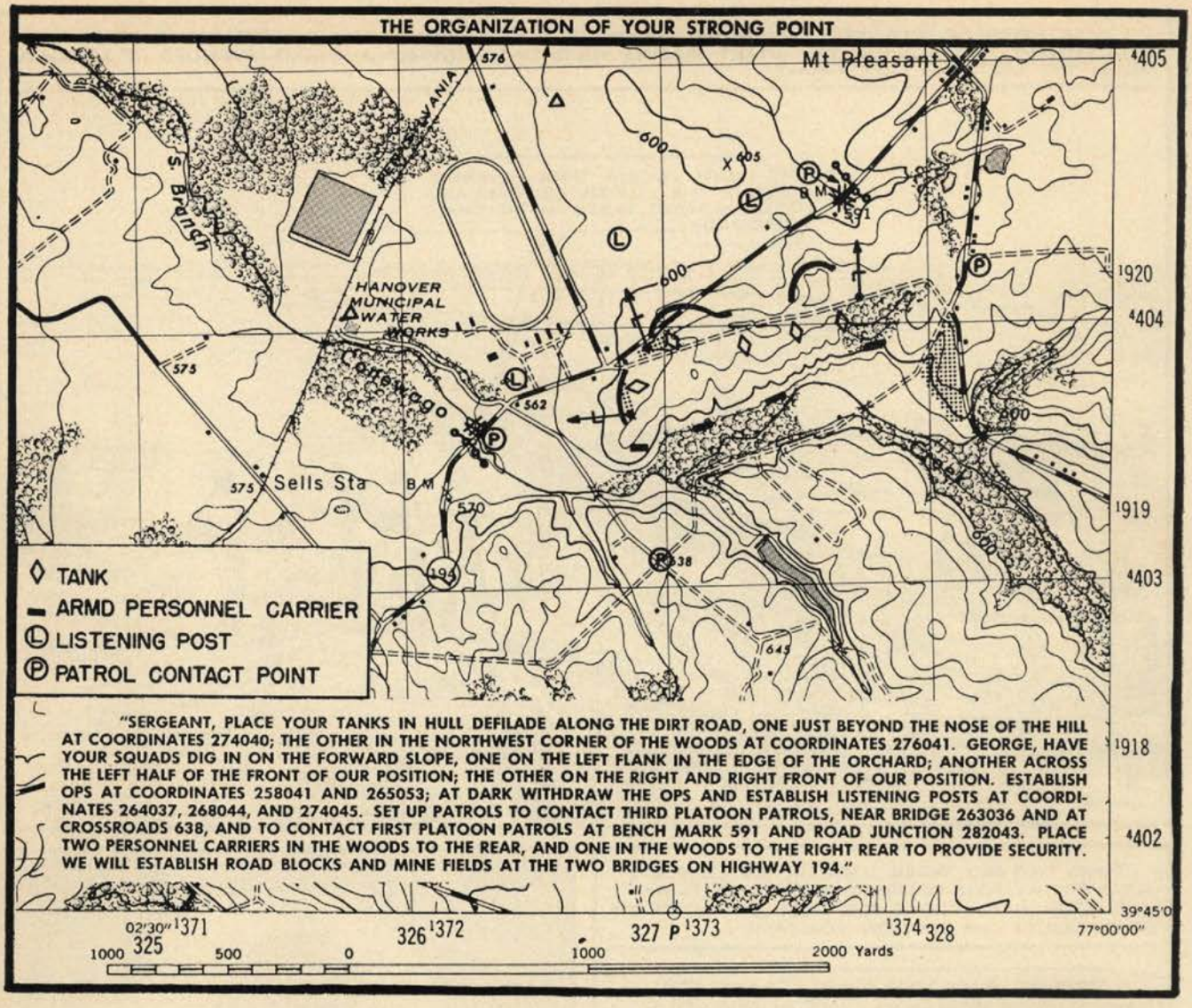


A STUDY OF THE TERRAIN SHOWS PLENTY OF COVER, BUT LITTLE CONCEALMENT. USING WHAT CONCEALMENT IS AVAILABLE, YOU START PLACING YOUR TANKS COVERING ENEMY AVENUES OF APPROACH FROM THE LEFT AND LEFT FRONT.

TANKS TWO AND THREE LOCATED, YOU COMPLETE AUTOMATIC WEAPONS COVERAGE OF THE LEFT FLANK AND ISSUE INSTRUCTIONS FOR ORGANIZATION OF THE REMAINDER OF THE PLATOON POSITION.







DISCUSSION

Strong points in the mobile defense are organized on critical terrain features which dominate likely avenues of enemy approach into the defended area. The mission of units at strong points is to deceive the enemy, to slow him down, to force him to deploy, and, if possible, to stop or destroy him. Tanks and automatic weapons are placed on the position so as to provide a maximum volume of fire covering enemy avenues of approach. Personnel carriers, because of their vehicular machine guns, may be used in organizing the position; otherwise they are assembled in a covered position within the strong point. Range cards are prepared for each position. Road blocks and mine fields are established and covered by tank and small-arms fire. These obstacles should be located so that they do not hinder the counterattack by the reserve. Advantage is taken of all natural obstacles to delay, slow down, and harass the enemy. Observation posts are established during daylight hours, and listening posts at night when observation posts are pulled in. Contact between strong points is maintained primarily by radio. However, patrols are usually operated between strong points during hours of darkness, and are used during daylight to safeguard areas covered neither by the strong points, nor by observation. At night, or when visibility is limited, tanks and automatic weapons should be sited to fire down roads or similar likely avenues of approach in order to ensure hits on approaching enemy vehicles and personnel. Armored infantry normally will dig in along forward slopes of strong-point positions.

We must have integration of armor, integration "in the sense that we are prepared mentally as well as physically and in every other way for mobility . . ."

INTEGRATED ARMOR

by COLONEL ROBERT J. ICKS

THE impression gained from Lieutenant Colonel Pickett's article "Tanks in Korea," in the November-December 1950 issue of ARMOR was that our officers still fail to understand the use of tanks. This is amazing at first glance and yet, in the light of Brigadier General Riley F. Ennis' "Statement on Armor" in the same issue, it is understandable. General Ennis may be surprised at such an interpretation of his remarks as well as to learn that I received my first tank training from him when he was a First Lieutenant. But that is beside the point.

General Ennis summarized briefly but very well, without intending to do so, the reasons for this failure in our training. Armor was, as he says, the product of men of vision, but leadership in this field passed from hand to hand and from country to country. The reason is that there have been, from the beginning, two schools of thought and one or the other has been in the ascendancy at different periods. There was and is one school made up of officers and civilians with imagination, those who grasp the possibilities of this type of warfare. The other is made up of those who fail to see the possibilities in anything new or who aggressively resist change.

He pointed out that the pendulum of the theory of armor employment has swung first one way and then the other. World War I developed the view that armor was but an infantry support weapon. Thinking changed in 1928, principally due to British influence which we followed, as later did the Germans. During the earlier phases of World War II, the concept of armor was as an independent entity. Then the pendulum swung again to a midpoint. General Ennis says that this is the reason that today "armor forms a hard core in our army which extends in depth through all of the major tactical units."

It seems to me that this continual swing has failed to develop in our army a corresponding "hard core" of tactical thought. Regardless of the T/O & E, we do not seem to have been able to make up our minds. There still are evidences of the influences of the past thirty years in each position of the pendulum and many of them are negative influences. It is not to be wondered that many of our combat officers fail to understand the use of tanks. The same thing could be said about many staff and general officers.

Prior to June, 1950, the official view was that Korea was unsuitable for tank use but the NK's apparently were not familiar with that doctrine and used tanks without knowing any better. That forced us to do likewise. I say forced because, on the basis of official doctrine, the terrain was unsuitable for their use. Where was the "hard core" of tactical thought among the officers who made that decision?

Military men are greatly interested in the war in Korea and the lessons to be learned from it. Colonel Pickett's article pointed out nine of them. Those lessons could have been written during World War I, during the period between both World Wars, during World War II and the period since World War II, as well as about Korea, if one substitutes earlier types of antitank weapons and communications equipment for those in use in each corresponding earlier period.

Here they are:

1. Failure on the part of our officers to appreciate the cross-country mobility of tanks.
2. The necessity for teamwork between infantry and tanks.
3. The measurement of tanks in numbers rather than units.
4. Use of personnel lacking tank training.
5. Poor maintenance, resulting from inexperience.
6. The need for maintenance along the axis of advance.
7. The importance of camouflage.
8. The sense of security the "super bazooka" gives to infantry.
9. The difficulties of FM radio communication in hilly country.

All during the period from 1918 to 1950 the statement has been made by the conservatives that the tank had had its day, that in any battle between tank and gun, the gun would be victor. It is just as sensible to say that in any duel between a man with a gun and one without, the latter will always be defeated. This is a surface conclusion. The fact that large numbers of infantry do survive a war is proof of that. Were it not true, wars would have ceased long ago. It is a surface conclusion likewise to say the tank has had its day. Such categorical conclusions fail to consider the imponderables of man's adaptability, his ingenuity and his imagination.

Colonel Robert J. Icks, Ordnance Reserve, is a recognized authority in the field of armor. Now in private business in Chicago, he is the author of the book *Tanks and Armored Vehicles.*

At any rate the pendulum has swung, not just a few times, but many times and our doctrines have swung with it. After World War I, the French became imbued with the doctrine of fire power and we aped them. Then, after the British experimental armored force was established, we started off in that direction as well. The idea was to retain the fire power of the infantry-artillery team and to give cavalry a new highly mobile striking power, but it had rough going. General Chaffee and others succeeded in creating some enthusiasm for using tanks with imagination, in spite of many heartbreaks and the pinch-penny attitudes so frequent in peacetime.

General Ennis goes on to point out that the opening of World War II gave this idea very considerable support. The initial successes of the Germans in their use of armor caused us to copy them and their methods—or so we thought. The British and ourselves even went so far as to copy their organizational setup, believing that to be the secret of their success. Then, as the Germans changed their organization due to political and logistical considerations and we began to take part in the war under varying conditions, we became confused, having failed to see that we had copied the wrong things.

The Germans' armored force came into being in 1935. In Germany, as in other countries, there were disputes between those with imagination and the conservatives. Many of the German generals wanted to tie armor down to infantry but were not completely successful. The brilliant use of armor by the Germans early in the war was not followed up and the pendulum there also swung back.

Since World War II we have gone through the same sort of thing. This time though, the conservatives received the backing of a famous scientist who was held in awe by our military and civilian leaders. He said tanks were obsolete as part of the general "one-weapon, easy war concept" which he helped to make popular. At any rate, our official view followed this line and it was not until 1948 that the pendulum swung back to the present view of an integrated tank-infantry-artillery team, which puts us right back to where we were in the early 'twenties.

Is it any wonder that our officers do not realize the capabilities and potentialities of armor? How can they be anything but confused?

Our concept of fire power is fine. Let us keep it by all means. With our limited manpower, fire power will become of increasing importance. Major General Christmas' article "Effective Development and Use of Armor" made a plea for evaluating machines and manpower so as to overcome our handicap in the latter should we meet in out-and-out war a potential enemy possessing unlimited manpower. Such an evaluation should, in my opinion, let the pendulum of thought on armor swing back again in the direction of mobility.

Fire power has demonstrated its importance in Korea and its retention is not in question. But, since it is apparent that our present doctrine concerning armor has not seeped through completely to all concerned, if we do decide to revise that doctrine, why not take a look at the doctrine of mobility too as a means of conserving manpower? And then by every educational means at our disposal, pound home our revised "hard core of tactical thought" to all ranks from Army, Corps and Division Commanders down to the last private soldier.

Why not give consideration to this evaluation of machines versus manpower? Why should we not think in terms of ingenuity tactically? Why have we become Montgomerys instead of Pattons? We have never tried an armored force as such or even an armored division. Neither have the British or the Germans even though we thought they did. Why don't we try it? The Russians have come closer to it than any of us because of conditions inherent in their military and economic structure and because they have become adaptable and militarily ingenious.

Back in 1918, the Allied General Staff planners had in mind the possibility that the war might go on into 1919. The plans for 1919 have been consistently overlooked since then, undoubtedly because the lessons from the four years of war as they were actually fought transcended any lessons from plans which were never carried out. Yet the four years of the war as fought had led directly to the plans intended for 1919. Those plans contemplated tank-infantry-self-propelled-artillery teams plus a separate armored force to exploit the breakthrough. That armored force was, I contend, the only genuine armored force that was ever visualized as a definite part of a plan for war.

Why? Because it was to consist entirely of tracklaying vehicles. In the article "Tie-In in Korea" in the November-December issue of ARMOR, which was based on a report by Lieutenant Colonel James H. Lynch, there was the following significant statement: "With orders to move aggressively . . . the three lead tanks shortly outdistanced the slower moving truck column, despite attempts to control them by radio."

That in a nutshell is the problem we have kicked around for thirty years without a real attempt at solution. We have completely ignored that 1919 plan. With about 300 tanks in a so-called armored division, we have many times that number of wheeled and half-track vehicles. What is the good of developing a tank with a speed of thirty miles an hour if we intend to use it as an infantry accompanying vehicle? Why tie down its mobility by wheeled vehicles unable to keep pace with it? Why organize a division, ostensibly an armored division, if it is our intent to parcel out its tanks in driblets to accompany infantry.

Now we intend manufacturing the new light tank T41. It is even faster than the M46. What a curious paradox. Lighter, faster, more mobile tanks with great fire power, intended for—what? Mobility? Where will we use it if we are committed to a slugging policy tactically, or are tied down to roads with the present wheeled transport of the division, or with the muddled thinking which exists among our officers, high and low? If all we want is an infantry-accompanying tank why are we having difficulty making up our minds regarding the manufacture of one of the several models of heavy tanks which are available in pilot form?

There is a related point, too, which was mentioned by General Christmas. He made a plea to the Using Services to stop being so "gadget conscious" in their demands for the perfect vehicle. No potential enemy has a perfect tank but one of them has a hell of a lot of tanks that will serve his purpose just as well.

One of our industrial engineers

working on a contract for a new tracklaying combat vehicle expressed this thought to me recently when he said that the Army has gotten to be "a bunch of one-per-centers." What he meant was that every contingency imaginable is dreamed up as a possibility and must be provided for. When he complained about the installation of a bilge pump which the Army wanted in the vehicle because it might be needed some time, not only was the bilge pump retained but the design was changed to add another one as a spare, in case the first one should get out of order!

Perhaps this is representative of our problem—that we think in terms of one perfect tank instead of armor as an integrated force of broad and mobile consequence.

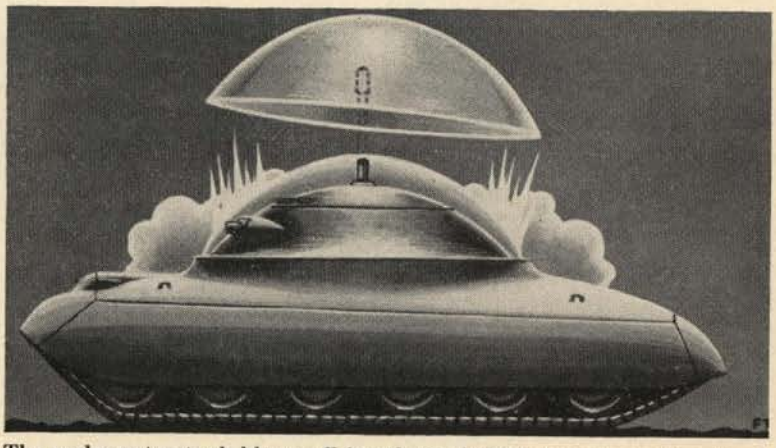
I do not consider myself a prophet but for many years my view has been consistent in believing that the 1919 plan is still a good one and worth consideration. Armor should be integrated with infantry and artillery but integration is needed over all. Not integration in the sense that everything is subordinated to slugging, hard hitting fire power but in the sense that we are prepared mentally as well as physically and in every other way for mobility; in the sense that we develop a true armored force containing a minimum of overhead and no vehicles but tracklaying vehicles; that we develop cross-country tracklayers for carrying infantry and supplies; that we develop a tactical air force for the hard hitting combat team and another trained to cooperate with a true armored force; that we really evaluate machines and manpower.

On the other hand if we are going to continue with a "hard core of armor" throughout all our tactical units with fire power and more fire power the end goal, let's say so and quit deluding ourselves with talk about mobility, because we won't have it. Then at least our troops will not be caught mentally in between the swings of the pendulum.

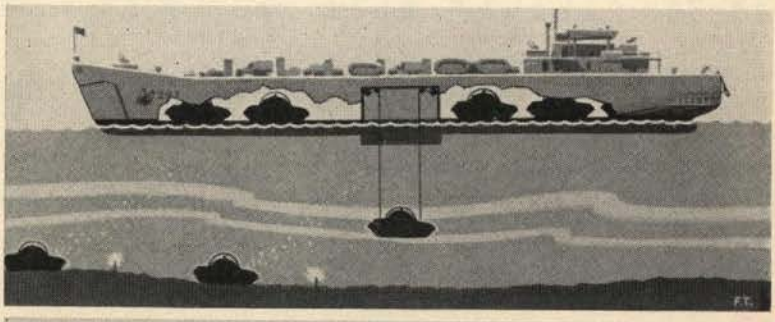
Today there should be clear concepts resulting from thirty years of experience. Let's have integration of thought as well as integration of fire power. Let's really integrate armor so it can never be said about the new Army now building that "our officers still fail to understand the use of tanks."

UNDERSEA TANK

Technical engineers have designed an undersea tank of the future for amphibious operations. Still in the blueprint stage, it is designed to overcome underwater obstacles and carry the punch against shore strong points in the critical initial phases of a landing. The illustrations below are from *Mechanix Illustrated Magazine*, and show the steps in landing the tank from the point offshore to arrival at beach.



The underwater tank blows off its plastic bubble top on reaching land.



Unloading offshore for the underwater approach, a submarine on tracks.

Arms are 105mm recoilless, flame thrower and machine guns, turret mounted.

U.S. Army

ARMORED INFANTRY IS *DIFFERENT*

by CAPTAIN CHARLES W. KOBURGER

teamed, not alone—mounted, not afoot—mobile, not stationary

ARMORED infantry and standard infantry differ greatly in mission, organization, and tactical employment. Armored infantry is *not* simply regular infantry mounted in armored personnel carriers.

The purpose here is to examine some of the outstanding tactical differences between the two. Before we can begin this, however, we must touch on the other factors mentioned —mission and organization—since they materially affect our subject.

Mission

The mission of the armored infantry battalion is to close with and destroy the enemy by fire and maneuver; to repel hostile assaults in close combat; and, most important, to support the tank units of the armored division.

The fundamental difference between armored and other infantry may be summed up by stating that in the various infantry divisions the tanks are there to get the infantry forward; in the armored division the infantry is there to get the tanks forward. There are four armored infantry battalions in an armored division. The division's three medium tank battalions are the division's main striking force; it also has one heavy tank battalion. Armored infantry is designed to accomplish one *primary* mission: infantry support for these tank units. There is no other reason for having armored infantry in the division.

Organization

To accomplish its mission the armored infantry battalion—the largest armored infantry unit—now has a headquarters, headquarters and service company, four identical rifle companies, and a medical detachment.

As to differences, organization-wise, firstly, the armored battalion, unlike its standard counterpart, is administratively independent. It is mounted entirely on tracks or wheels; the regular battalion is not (riflemen walk). The armored battalion has a greater proportion of automatic weapons in the lower units, but has no recoilless weapons at all. Lastly, it has four, not three, rifle companies, but lacks the dismounted battalion's heavy weapons company.

Tactical Employment

Armored infantry battalions are highly mobile, lightly armored tactical units capable of executing most standard infantry missions and some unique ones. They can accompany tanks in offensive action—either in armored personnel carriers, dismounted, or mounted on the tanks—to close with and destroy the enemy in close combat. They can absorb reinforcing units to form a team of combined arms, and can furnish armored infantry companies to other units for the same purpose. They can also reduce and establish obstacles, supported by tanks and other arms, and organize and defend ground, supported by tanks and other arms.

Some of the outstanding tactical differences between armored and regular infantry battalions, speaking generally, are as follows:

1. Armored infantry normally functions as a part of the tank-infantry

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team in all operations. There are always some tanks with the infantry and some infantry with the tanks. This is not the case with standard infantry. (Alas!)

2. Armored infantry in the attack rides from the attack position to the assault position, while regular infantry moves on foot.

3. Armored infantry uses a mobile-type defense; standard infantry uses a sustained-type defense.

4. Armored infantry defends avenues of approach; regular infantry defends a main line of resistance.

Let's discuss these a little.

Armored infantry is meant to be used as an integral part of the armored fighting team—tanks, infantry, and engineers, closely supported by artillery and air.

The policy of exchanging companies between tank and armored infantry battalions, often one for one or two for two, is usual for normal armored operations. A reinforced armored infantry battalion could, therefore, consist of two rifle companies, two tank companies, and its own headquarters, headquarters and service company.

Tank Guns Serve

Where you see armored infantry units of even the smallest size you will see tank sections or platoons. This explains why there are no recoilless weapons in armored infantry T/O and E's; they are not needed; tank guns serve instead. This also explains why armored infantry does not perform *extreme* independent (long-range infantry-only) missions as well as lighter-footed standard, mountain, or airborne infantry; armored infantry is heavy infantry, and that greater proportion of automatic weapons gets to be quite a load. (On the other hand, neither do the other types work as well with tanks.)

There are exceptions to the rule, naturally. Night patrols, breachings of minefields, river crossings, and night attacks all involve dismounted armored infantry acting in the traditional infantry manner, either because of the necessity for stealth and surprise, or because obstacles absolutely prevent any vehicles from accompanying them. These are special operations, limited in scope. They are overwatched by the guns of the tanks.

However, it should be noted, there are surprisingly few places a tank cannot go, as was proven in Italy and Korea. General George Patton, who proved it, said, "There is no such thing as 'tank country' in a restrictive sense. Some types of country are better than others, but tanks have operated and can operate anywhere." Armored infantry is busy infantry.

The Armored Personnel Carrier

To increase its effectiveness in support, armored infantry rolls—all of it—on tracks or wheels. The armored personnel carrier with which it will be equipped is full-tracked, lightly armored top and sides, and armed, I believe, with one (1) 50 caliber and one (1) 30 caliber machine gun. It is given to the infantry to enable it to accompany tanks any time, anywhere, and under all circumstances. It is, however, almost never used as an assault vehicle; the infantry develops to full power only on foot attacking with rifle and grenade.

Where the infantry dismounts, the personnel carriers may be used to form or supplement the base of fire or to supplement the defensive fire plan as the situation requires. They may also be used for protection of the flanks and rear of small units. Their considerable firepower is, in any case, not allowed to go unused.

The Attack

It is the tin-can doughboys' job to aid and abet armor's speed (mobility) and violence (firepower) and to exploit the resulting shock to the utmost. The possession of an armored personnel carrier for the combat troops enables armored infantry, in the attack, to ride from the attack position to the assault position, under the cover of and usually right behind attacking tank units. Again, armored infantry then dismounts and assaults on foot.

There are at least three distinct advantages to this. Firstly, armored infantry arrives fresh and on time. Secondly, more of it gets there. Lastly, the attack is made at the speed of the vehicles, not at the speed of walking infantry. Some astronomical percentage of infantry's casualties is normally incurred moving the 1,000 or more yards from the LD to within assaulting distance of the enemy. This loss is minimized by riding the distance at 15 mph (not walking at 1.5 mph) in armored vehicles, making maximum use of the fire of tanks and of supporting artillery and air to keep the enemy's mind on other things.

Defense

This high protected battlefield mobility of armored infantry also enables it, together with its cooperating tanks, to defend an area by fire and maneuver. This mobile-type defense places small infantry-tank teams on an OPLR, holding key terrain features, roadblocks, crossroads, etc., while the bulk of the force (including *most* of the tanks) remains in mobile reserve. When the enemy has committed himself at a definite point, this tank-heavy reserve counterattacks, hitting the flank(s) of the attack, with an objective forward of the OPLR where possible, to *destroy the enemy*. If regular infantry should try this, and the enemy has artillery in any strength, the counterattack would be smothered in short order.

Armored infantry uses a mobile-type defense partly because of the extended frontages it must ordinarily hold, and this in turn prohibits it from defending every inch of the ground. What armored infantry does is figure a calculated risk and defend only the likely avenues of approach, covering the rest of the ground by observation and fire or with patrols. Regular infantry, denied maneuver, holds its battle position at all costs; its defense is based on an MLR with an FPL (a continuous band of grazing fire) placed along its front; limited counterattacks are made only to restore the battle position.

Armored infantry defends by fire *and maneuver*, and makes no attempt to hold everything in its assigned sectors. It defends only likely avenues of approach, and then only to locate the enemy's main effort, canalize his attack, gain time and space for the decisive counterattack of the reserve.

Armored infantry can accomplish 99 44/100 per cent of the missions it should be called on to handle at least as well as or, in most cases, much better than standard infantry—but not always in the same way. The continuous cooperation of large numbers of tanks and the possession of an armored personnel carrier together increase the battlefield mobility of *armored* infantry to many times that of regular infantry. When this difference is understood, armored infantry really begins to realize its full potentialities as a key member of the armored fighting team.

Let's Talk About Armor

by JANUS

ARTICLES appearing in our service magazines, discussions at the service schools or colleges, and pamphlets issued by the War Department lead to the belief that the American military student of the World War may be led astray in formulating conclusions on tactical questions and on organization, since the circumstances surrounding quoted instances of our participation in the war are not usually presented in sufficient detail to enable one to correctly judge the situation studied. Furthermore, the majority of our officers had but a brief experience in battle and were so hard-pressed before, during, and immediately after engagements that it is difficult for them to make an accurate, critical analysis of the battle tactics involved, and it is well known that a single example is apt to prove a dangerous guide for future action."

How true! Although the above quotation was written in 1921 for the *Infantry Journal* by Major George C. Marshall,* it is equally applicable to modern military thought—especially in the field of armor.

Perhaps a brief review of armor, past, present and future, might clear up part of the haze which apparently surrounds too much of the thinking on the subject. Until his mental perspective is well-grounded, the soldier will be inclined to arrive at a conclusion confused by factually unsubstantiated examples of the past and ensnared by glittering yet unfounded hopes for the future. And U. S. obligations under the North Atlantic Treaty, with the attendant requirement to prevent war or to fight in Western Europe—to say nothing of the balanced collective force idea—make it imperative that the correct solution to armor be obtained immediately.

*Presently Secretary of Defense.

The Past

With this requirement in mind, let us turn back and examine the past of armor. Like the infantry, the armored division has had its growing pains and, like the infantry, it has undergone many reorganizations.

Although U.S. tanks saw action in World War I, they were considered to be one of the supporting weapons for the infantry. During the period between World Wars our armor consisted only of a few separate tank companies, plus one tank battalion and the tank school at Ft. Benning as a part of the infantry. Tank doctrine still contemplated only limited objective attacks in close coordination with the infantry. Actually, an Army regulation prohibited moving tanks more than 50 miles except by rail. During this period the cavalry did some experimenting with a mechanized cavalry unit and finally, in 1940, the separate tank units were assembled at Fort Benning and formed into a provisional tank brigade.

Meanwhile, the war in Europe was characterized by increased use and importance of armored divisions operating in close coordination with air and motorized units. These highly mobile striking forces had great speed and power and were uniformly successful in their operations.

The use of the mechanized cavalry unit and tank brigade in the Louisiana maneuvers resulted in the present concept of armored warfare and led in July, 1940, to the organization of the First and Second Armored Divisions. The training of these, as well as the units organized later, in the maneuver areas of Louisiana, Carolina and California proved the soundness of the concept. In fact, in 1941 General Patton first demonstrated the possibilities in the employment of an armored division by maneuvering his "Hell on Wheels" division more than 100 miles and overrunning the rear areas of the opposing Red forces in Louisiana. His action emphasized the chief characteristics of armor: mobility, tremendous fire power, shock action and flexibility. By 1 July 1941 the United States had four armored divisions with two more being activated.

The armored divisions have undergone some drastic organizational changes since General Patton's audacious move. The first came immediately after the maneuver and the heavy armored division was evolved. Then operations in Africa, Sicily and Italy demonstrated that the division was too big. The mountainous terrain usually permitted use of armor in battalion strength only; objectives were limited; movement forward was measured in yards; and so the light armored division was born. Again, after the St. Lo breakthrough in Normandy, when the opportunity arrived for the armored divisions to use their mobility and race around the German flanks and into his rear areas, it became apparent that the light armored division was lacking in the necessary supply organization to make it self-sustaining in prolonged operations. Hence, since the 2d and 3d Armored Divisions fought the war as heavy divisions and the rest as light divisions, the experience obtained made it possible to incorporate the desirable features of both types into the present division.

Armor was used in division strength in North Africa, Sicily, Italy, and Europe and in smaller formations in the

Who is this guy Janus?

Well, I'll tell you about him, see!

In Roman mythology he is the god of "beginnings."

He had two faces, and could look east and west at the same time.

He had a temple that was shut in time of peace and opened in time of war!

Golf, anyone . . . ? Or shall we talk about armor . . . ?

Southwest Pacific, the Central Pacific, the Philippines and Okinawa; yet World War II statistics show that armored units, even though heavily engaged, suffered fewer casualties than infantry divisions. The average number of men killed per tank destroyed was 1⅓. An armored engagement wherein 30 tanks were destroyed was a terrific fight, yet the total killed in action averaged 40-50 men. In a similar action, an infantry division's losses probably would be in the neighborhood of 400-500 men. Thus, since the U.S. is faced with a manpower shortage at a time when we must contribute to the defense of Western Europe, the desirability of taking advantage of our superior industrial capacity and, at the same time, conserving manpower by using armored divisions (16,053 men) instead of infantry divisions (18,894 total strength) is readily apparent.

Armor was the master of the battlefield in World War II and its accomplishments must not be forgotten. Rommel's actions in the desert of North Africa, Patton's mad dash to Palermo, Harmon's breakout at Anzio and Patton's race across France are historical facts today. So is the German use of armor during the early days of the war when their panzers raced through Western Europe, Poland, Greece and into the Ukraine.

The Nazi attack in Poland was begun by an all-out effort to eliminate the Polish Air Force by air action. The Germans accomplished this feat quickly and immediately sent their panzers and mechanized units racing into Poland. The panzers by-passed any strong resistance, leaving the mopping up of these units to the infantry divisions which followed. The German armor smashed deep enough to attack the Polish military forces in the rear. As a result the Polish fighting machine disintegrated. This use of mobility in the form of air power and armor surprised the world. In 18 days the fighting was over. The total depth of armor penetration was 300 miles.

Again, in 1940, the pattern was repeated in the West. German panzers plunged 180 miles in 6 days. And again, German armor did not attempt to disrupt civilian governments: it merely contented itself with disrupting the rear areas of the military forces opposing it. The Polish Campaign was the tip-off that linear defense systems were outmoded: the German successes in the West confirmed the fact.

The attack against Russia in 1941 started off in the same way. German armor penetrated 200 miles in 10 days. The panzer units were used to effect surprise, to attack new objectives from different directions, and always to execute the pincer double envelopment. Actually, German armor had the war practically won. At one time, the Russians in the southern sector began to cease fighting.

Then Hitler entered the planning and directing picture and the victory which was within German grasp was lost irretrievably. Hitler wanted all of Russia within the line Leningrad-Moscow-Stalingrad-Caucasus Mountains.

As a result of his decision, the German armies had to penetrate deeper into Russia instead of destroying Russian armies nearer to the border, and this move used up a lot of infantry divisions, necessitated that fighting units be used to hold the country, and overextended the lines of communication. Supply for the mechanized units became a huge problem and soon the Russians could equal the Germans in armor. In Poland and France, the panzers went after the enemy forces—and got them. In Russia they were ordered to go after a far-off boundary and failed.

Perhaps the Germans provided one of the best examples of the use of armor defensively when they employed it against our lodgement on the Cotentin Peninsula. It was German armor that slowed up the Allied timetable, especially the British progress at Caen. Then, after the St. Lo breakout, when the 2nd and 3rd U. S. Armored Divisions were given the mission of pushing out and cutting off the German Army in Western France and sealing the Falaise Pocket, German armor in the form of tanks at every successive road junction forced our own armor to continually deploy, often call for air support, and invariably waste precious time while the bulk of their units were extricating themselves from the planned trap. German use of the inherent mobility and fire power of their armor saved the day for the bulk of their Westwall units.

The Battle of the Bulge also provided a good example of how armor can be used decisively One must remember that, just prior to the German attack, the Allies were on the offensive. No doubt the most heroic action in the Bulge was the holding of Bastogne by the 101st Airborne Division. However, the fact still remains that, when Von Rundstedt did smash through, fortunately Allied armored divisions were available and were rushed to the scene and choked off the threat. The 4th Armored broke through to the surrounded paratroopers. The Allied attacks against the shoulders of the Bulge by the First Army from the

north and the Third Army from the south were finally successful when the 2nd and 11th Armored Divisions met at Houffalize in the center of the Bulge.

Everyone agrees that armor played an important role in World War II, but few realize what happened to the armored divisions after the war.

The Present

Demobilization is part of the answer. After the Germans and Japanese surrendered, practically all of the units which were brought back to the United States were demobilized. All of the armored divisions were returned as it was considered that infantry divisions were much more suitable for occupational duties. As a result, the Regular Army ended up with 7 infantry, 2 airborne and one armored divisions.

The inevitable economy program which follows every war kept the strength of the Armed Forces down. Further, inasmuch as tanks were expensive—roughly $200,000 each—no additional armor to speak of was created.

Another factor which probably militated against increasing the ratio of armored divisions in our peacetime Army was the concept, later embodied in the book, *Modern Arms and Free Men,* of Dr. Vannevar Bush. Dr. Bush is regarded as one of the leading scientists in the country and is very close to the hierarchy in the Pentagon.

In his book he points out that the scientific improvement of weapons has just about reached the stage where the defense has an edge over the offense to the point where weapons in the hands of infantrymen will drive the tank from the battlefield. Guided missiles, he avers, will make air attacks impracticable. In fact he looks upon the guided missile as a weapon of great potentiality, both for the offense and for the defense against certain types of atomic attack. He appears to champion the thesis that we can win a war with weapons rather than with men.

Tank advances, in his opinion, will be impossible in the face of shaped charges. He points out the fact that the latter weapon is much cheaper to produce than is a tank, but he neglects one important factor of war—to win, one must take the offensive.

Dr. Bush has apparently failed to test his conclusions by applying them to past developments in the field of weapons. For example, why did not the rifle drive the infantryman from the battlefield? Certainly a rifle can kill a man at a greater range than any presently visualized light weapon can kill a tank. Similarly, the German "88" did not drive the tank from the battlefield, the VT fuze did not prevent German infantry from holding positions or attacking as the scientists had prophesied, nor did the V-1's and V-2's cause England to capitulate. All of these weapons necessitated changes in tactics and techniques as well as concurrent development of other new weapons. Furthermore, no defense has yet been designed that cannot be overcome by a properly planned and executed offense.

However, since Dr. Bush is a consultant, he has considerable influence in shaping current military thought, including that on armor.

The Korean action has highlighted the armor situation in our Army. Before the North Koreans attacked, the tank was said to be a military handicap in that country of mountains and rice paddies. Tanks would of necessity be limited to the roads.

But the results proved the so-called experts wrong. In the first place they didn't weigh the psychological factor involved. Even though every South Korean regiment had an antitank platoon; even though they had eight engineer battalions especially trained in dealing with armor; the fact remains that they didn't stop the North Korean tanks. In fact the armor was responsible for chewing up two of the four South Korean front line divisions north of Seoul, leaving the ROK capital wide open. Admittedly, the South Koreans were untried troops and had no tanks. It isn't surprising that confusion resulted, units broke in the face of enemy armor, ground was lost. The American units also pulled back from positions in front of Seoul because of the lack of armor.

The situation at the beginning of the Reds' attack in Korea brings to mind the words of General Harmon, now retired, who once stated that, "The purpose of tanks is to get the infantry onto the objective with the minimum of casualties to the foot soldier. To permit our infantry to become overrun by hostile armor is one of the greatest crimes that can happen on the modern battlefield."

In the first place, General MacArthur's divisions had been stripped of their full complement of organic tank units. One explanation has been that the bridges in Japan wouldn't support them: another that occupation forces didn't need tanks: a third that the economy program necessitated cuts and the Far East Command could better withstand such cuts than our forces in Europe.

U.S. Army

Adding mobility. The 105mm recoilless rifle is jeep-mounted. Obvious limitations—shorter range than tank; no protection; wheels, not tracks.

The facts were obvious. Our tank weaknesses were both qualitative and quantitative. Much lip service was given to the idea that we cannot hope to match any prospective enemy, tank for tank, but must compensate for our numerical inferiority by a qualitative superiority. The type field army was considered acceptable, but it was still a "paper" army. The "family of tanks" idea was also a sound concept but very disappointing in development.

A comparison of the present T/O & E of the infantry division with the old type division reveals that actually less men are assigned the mission of tank and antitank work in the new division. The antitank company has been abolished and its place taken by the relatively short-range bazookas and recoilless rifles.

The tank battalion of the infantry division is organic instead of being attached. The tank destroyer battalion was replaced by tank companies in each regiment.

Korea emphasized the need for organic tanks in the infantry division, but it also emphasized the need for an armored division in a corps to make the Army corps a balanced force. The United Nations forces had to get tank superiority on the battlefield before they could advance, despite the fact that, by our standards, Korea was not good tank country. General Gay actually fought his division like an armored division, organizing task forces of armor, infantry and artillery. The breakthrough operations very probably would have been rendered much simpler and would have been accomplished more quickly if an armored division was available. Then too, when the Chinese communists began pouring into North Korea, armored divisions would have been useful in eliminating this threat.

One fact must be remembered in connection with any discussion of the infantry and armored division. It is true that the former has a lot of organic tanks, but the armored division has more inherent mobility and better communications. The infantry division still must be dismounted to fight.

In short, Korea showed the result of not having a complete team in readiness for action. It proved that the best way to defeat a tank on the battlefield is still the tank: that the pendulum which was allowed to swing from blind acceptance that armor is invincible to the belief that it has been rendered obsolete by antitank weapons, must be corrected. Korea proved that talk of potential weapons of the future as if they were actualities is a dangerous practice.

The Future

Now let us take a look at the future of armor. In many ways we have a problem similar to the one which confronted us in 1940. However, the problem is much clearer. We are committed to participation in the defense of western Europe and we know the composition and strength of our only potential enemy. The Soviets have in being a great number of armored divisions, mechanized divisions and an adequate supporting tactical air army.

Obviously, any contention that armor is the panacea for all of our ills in this respect would be erroneous. However, armor has proven itself to be one of the means whereby speedy success in large-scale military operations can be obtained.

The Mutual Defense Assistance Program in its military phase is based on the development of a small but highly mobile force consisting of both mechanized ground units and tactical air which will be capable of quick movement and great fire power. Obviously armor must play an important role in any such organization, for it has been proven that only by the liberal use of armor, backed by mobile infantry and supported by tactical air, could a similar force hope to meet and halt any offensive launched by a great army.

In discussing the future of armor one must consider the time element. Today armor can be used as it was in World War II. Its probable use in the far distant future is speculation: but so is the probable use of jet planes, carriers, infantry divisions and airborne units. The fact remains that we need armor today. Furthermore, we need it where the fight would begin.

Possible Course of Future War

But perhaps an outline of a possible course of a future war might serve to illustrate some of the points pertinent to armor.

Defensive Phase

The NATO countries will not begin a war: an enemy would choose D-day. Hence that D-day would be heralded by an offensive, spearheaded by masses of armor and mechanized divisions. The initial requirement during the defensive phase would be the means to stop and hold this steamroller while the Allies were building up their forces. Armor and air have proven capable of this task. A mobile defense, made possible by superior mobility and communications, will enable armor to delay as the Germans did after St. Lo, counterattack as U.S. armor did in the Ardennes, force the

Acme

Mobile antiaircraft weapons, like this 40mm self-propelled unit on the Korean front, may be more active with increased Red activity in the air.

enemy to deploy, lose time, and worry about his flanks and rear. It is important to remember that during this defensive phase when limited attacks will be made, armor can counterattack with less chance of being cut off than can infantry divisions, and with less danger if cut off, because of its mobility. Actually, armor could only be cut off and rendered ineffective if the terrain is bad. Guderian, for example, was cut off several times from his supply base during his drive to the West in 1940, but, because he had suitable terrain in which to maneuver his armor, the fact that he was cut off did not operate to affect his efficiency.

Then, too, if our own infantry or airborne units are themselves cut off, armored divisions or task forces heavy in armor will be needed to come to their rescue.

And tank development won't remain static. Much has been written and said about the U.S. tank not being able to match the tanks used by the North Koreans. But if scientists like Dr. Bush are correct concerning our ability to out-develop any other nation, surely no reason exists for our not having the best tanks in the world. After all, we have better planes, television sets, refrigerators and automobiles than any other nation. If the decision is reached to produce tanks there is little doubt that U.S. industry can produce a better product than the Russians. The services can set up the military requirements and desirable characteristics in a weapon and give the problem to industry. Then, with leeway in changing specifications as long as the military requirements and characteristics are met, industry can develop the necessary techniques for mass production.

Tanks carry antitank guns. They combine, more than any other weapon, fire power, protection and mobility. They have the advantage in offensive capabilities, and wars are not won by remaining on the defensive. In the future, as in the past, the secret of successful tank warfare will be in mobility and momentum. The military simply cannot discount the mobility of armor unless stalemate and attrition form the basis of doctrine.

The defensive phase of a future war will mean slowing the enemy armored advance by effecting maximum delay on their panzer spearheads and by preventing our infantry from being cut off.

Infantry divisions are best suited for organizing and holding critical terrain: armored divisions are not. Normally the armor is held in reserve, prepared to counterattack and, because of its high mobility and tremendous fire power, it is especially suited for a rapid concentration of superior forces at a critical point. Appreciating the latter statement and employing armor in this way enabled Rommel to win his victories in North Africa.

Armor can delay in front of the main battle position. It can engage massed enemy armor. In the event of a breakthrough, armor is suitable for moving rapidly to establish blocks in front of enemy armor while, at the same time, counterattacking the enemy flanks in order to restore the position. Then, too, armor can deal effectively with any enemy airborne units which have been employed to secure river crossings, bridgeheads, and the like.

The Battle of the Bulge is a good example of the need for armored divisions when defending on a broad front. An extract from the *History of the 2d Armored Division* will make the point.

"With only three hours' notice the entire division packed up, turned its Roer River line over to the 29th Infantry Division, staged a forced march by night on 22-23 December from Germany to Huy, Belgium. All combat elements covered the 75 miles over strange roads within 22 hours, in spite of a shortage of maps. . . . Von Rundstedt's spearheads were threatening Liege, Dinant, and Namur at the time. Upon arrival in Belgium patrols immediately moved out to the south and east, making contact with the enemy on 23 December near Haid, Belgium. . . . Other enemy units had penetrated within three miles of the Meuse River at Dinant, and were only six miles from the Belgian-French border at Givet."

In this action, after making a forced march through rain and snow, the armored division blocked the head of the German advance on 23 December, more than a hundred miles from the defensive position it had held on 21 December. At 0800 on 25 December, the Division attacked. In the five-day battle that followed, the Division was given credit for destroying the German 2d Panzer Division, which had paced the enemy's 60-mile westward advance. General Collins' VII Corps

summarized the action as one that "may well be remembered as having one of the most far-reaching effects of any action of World War II." The histories of the 3d, 4th, 6th, 11th and other armored divisions probably give similar accounts of being rushed to the fire in the Ardennes.

Offensive Phase

After the build-up phase, infantry divisions will be needed to develop the breakthrough, open a gap in the enemy positions and hold the shoulders of the opening. They will breach obstacles in fortified areas, establish bridgeheads and secure ground which will enable armored units to launch an attack. The latter will exploit the breakthrough, advance rapidly in order to link up with any airborne divisions used in the offensive, seize critical terrain in the enemy areas, destroy his reserves, overrun his artillery and disrupt his communications. Armor will keep the enemy off balance, prevent his becoming set, and create the stage for his destruction. The tank problems will be the breakthrough and exploitation, and supply. Perhaps a breakthrough at night will be feasible.

In such an offensive phase it would appear that for an army to operate effectively in the face of an atomic threat it will be necessary to have a highly mobile force capable of quick dispersal for its own protection and of rapid concentration for offensive strikes. The book, *The Effects of Atomic Weapons,* prepared by the Atomic Energy Commission and the Department of National Defense, indicates that people behind shielding will be protected to a great extent from atomic bursts. Armor, with its mobility, certainly has not been rendered obsolete by the atomic bomb. The tank crews will be protected from blast and heat and their tank will provide considerable shielding from the radiation. An infantry division in the attack would not have this advantage.

Rather, today and in the foreseeable future the tank can still be considered as the decisive ground weapon of the battlefield. The distant future of the tank is still in the impenetrable mist. So is the infantry, the H-bomb, the plane.

The United States and its Allies must offset any opponent's manpower superiority by utilizing its industrial superiority. The Western countries require a mobile army; mobility to outmaneuver enemy mass; mechanization which will provide this mobility. And mechanization, simply stated, is superiority in armor and this superiority will determine battlefield maneuverability.

Today we have 12 infantry, 2 airborne and 1 armored divisions in the Army. The question arises as to whether this proportion is correct in view of the publicized build-up to 18 divisions. It is very difficult for the National Guard to maintain an armored division in the high degree of readiness which will permit early deployment. It is well known that more time is needed to train men to fight in armored units than in infantry divisions. It also takes longer to produce the equipment needed for an armored division. The current lead time in tanks, for example, is eighteen months. In an emergency, manpower can be shunted into infantry units quickly, as was done in Korea by putting South Koreans into our own infantry divisions, but men cannot be picked up who can drive tanks, fire the guns and use the radio equipment. It would seem, therefore, that the Regular Establishment should have more armor and depend upon the Guard for infantry divisions. Actually, there are only 2 armored divisions in the National Guard while 25 infantry divisions are available.

Invariably the point about "costs" arises. Admittedly, tanks cost a lot of money, but so do planes, antiaircraft guns, carriers. We can afford to lose tanks rather than men.

Airborne divisions are very expensive units, yet we have two of them today compared to one armored division. And airborne units are designed for offensive roles. Armor would be needed on D-day, airborne would not —unless they are used as infantry divisions in the defense: certainly an expensive solution to the problem.

Presently we are deficient in numbers, quality, and in tactically trained units, as far as armor is concerned. This should and would be corrected if the role of armor for the foreseeable future is appreciated. Mechanized warfare should be a "natural" in our industrial nation. Although armored warfare is still taught at Knox and Leavenworth, the present organization of the Army will not permit large-scale

armored operations. The Army should have at least one armored division for each corps of 3 infantry divisions and mobilization plans should include a requirement for at least one armored corps.

An increase in armor would be politically acceptable to the nation for it would emphasize our technical superiority. Psychological factors also favor more armor. U.S. strength in armor will make a favorable impression on any possible enemy. Superiority in equipment; armor, planes, and other weapons, will create respect and thereby act as a deterrent. Armor is more acceptable to the average American as he is perhaps more mechanically inclined than is the average youth of any other nation. More armor will be gratifying to our Allies and lend greater strength to the Atlantic Pact. Finally, armor is vital to the national security—we can never hope to win battles without it.

Conclusions

Hence five points are readily apparent. First, armor is not a thing of the past but a very necessary part of any efficient and effective fighting force. Second, the present proportion of armor to infantry and airborne divisions leaves much to be desired. Third, the United States needs more armor in place and operational for a D-day—which means we must have the units before that D-day. Fourth, the development of the atomic bomb has not signalled the end of the armored division as a military arm. And fifth, blind acceptance of weapons of the future which to date have not been developed or tested may well lead to disaster.

The tank has just reached the crossroads of discussion that the aircraft carrier reached several years ago. Much heated debate, good and bad publicity, charges and countercharges, and study resulted before the fact was established that the carrier was still a necessary unit in the Navy. We in the military should do some careful thinking and not allow ourselves to be swept away by unfounded predictions if we are to prevent armor from getting into that type of limelight. We must remember that the Army must be prepared to fight effectively today or tomorrow as well as any time in the future. To do this we will need weapons today. Armor is one of those weapons.

THE BOOK SECTION

". . . FROM ALMOST UNINTERRUPTED DISASTER TO ALMOST UNBROKEN SUCCESS."

THE HINGE OF FATE (The Second World War, Vol. IV) by Winston S. Churchill. 1,000 plus xiv pages. Houghton Mifflin Co., Boston, 1950. $6.

Reviewed by MARK S. WATSON

In the fourth volume of his monumental history of the Second World War Winston Churchill marches once more at the majestic pace which his best writing maintains, a pace which one is relieved to discover was lost only temporarily in the third volume. It is therefore (like so many of his earlier writings, from the Boer War to the world conflict in which he was Britain's towering chief) a momentous book worthy of its momentous theme so aptly sounded in the title *The Hinge of Fate*.

This volume deals with 1942, in all the theaters, reaching into the fourth year of Britain's participation in the great war, with three more years of costly struggle to come.

In it we turn from almost uninterrupted disaster to almost unbroken success. For the first six months of this story all went ill; for the last six months everything went well. . . .

We were alive and at bay; but that was all. On the other hand, what a cataract of disasters had fallen upon us. The fiasco of Dakar, the loss of all our Desert conquests from the Italians, the tragedy of Greece, the loss of Crete, the unrelieved reverses of the Japanese war, the loss of Hongkong, the overrunning of the ABDA command and all its territories, the catastrophe of Singapore, the Japanese conquest of Burma, Auchinleck's defeat in the Desert, the surrender of Tobruk.

It is indeed remarkable that I was not in this bleak lull dismissed from power or confronted with demands for changes in my methods, which it was known I should never accept. I should then have vanished from the scene with a load of calamity on my shoulders, and the harvest, at last to be reaped, would have been ascribed to my belated disappearance. . . . I was not denied the right to share in this new phase of the war, because of the unity and strength of the War Cabinet, the confidence which I preserved of my political and professional colleagues, the steadfast loyalty of parliament, and the persisting good will of the nation. All this shows how much luck there is in human affairs, and how little we should worry about anything except doing our best.

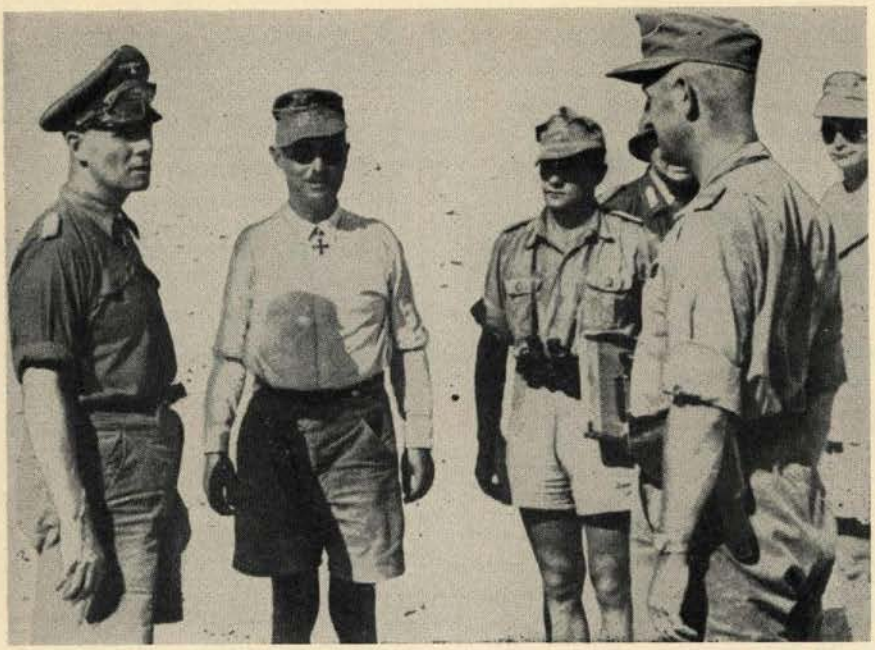
The United States had its troubles, certainly, but Britain's unmistakably were more numerous, more varied, and so much more urgent at times that the reader must look with admiration not at the "luck" but at the manner with which this indefatigable and unscareable Premier, holding too the title and full responsibility of Defense Minister, could keep a watchful eye on all matters at home and abroad and move incessantly from one undelayable task to another. We see uninterrupted a determined guidance of British (and often Allied) strategy, a prodding of supply and administration, a correction of errors and a sub-

The Author

Winston S. Churchill, outstanding statesman of the half-century, and leader of His Majesty's opposition in another critical time, comes forward with the fourth of five volumes in his series on The Second World War. Titled *The Hinge of Fate*, it becomes one of a final eight volumes, including the trilogy on World War I, which, in Mr. Churchill's words, will "cover an account of another Thirty Years' War."

The Reviewer

Mark S. Watson, artillery officer in World War I, war correspondent in World War II, and longtime student of military affairs, won the Pulitzer Prize for international correspondence in 1945 for his dispatches to the *Baltimore Sun*. He is author of the recently published book *Chief of Staff: Prewar Plans and Preparations*, sixth volume in the series THE U. S. ARMY IN WORLD WAR II.



British Official

Some of the disasters in the making. Rommel and staff confer in the Desert.

stitution in plans and planners, a dazzling skill at dealing with partners Roosevelt and Stalin, and with an occasionally obdurate commonwealth chief or a sometimes cantankerous Cabinet member—all the time adjusting impulse to necessity and employing all his arts to gain agreement, or at least time. Sometimes it was his tenacity which did the trick, sometimes his robust humor, sometimes (as with Stalin) a grim but dignified statement of reality in inspiring contrast with the calloused insolence of the Russian, sometimes (as with Fraser of New Zealand) a half-smiling reproach for a complaint because forecasts had been optimistic:

> The events of this war have been consistently unpredictable, and not all to our disadvantage. I am not sure that the German General Staff have always forecast events with unerring accuracy. For example, the Battle of Britain, the Battle of the Atlantic, and the Russian resistance must have shaken Hitler's faith in careful calculation of military appreciations.

To Mr. Curtin of Australia, overfearful of Japanese capabilities, Mr. Churchill had to speak more plainly. He gives the record of "a painful episode in our relations with the Australian Government and their refusal of our requests for aid" as an essential means of explaining the Burma disaster. Certain aspects of Singapore's fall still amaze him and, while he admits that as Defense Minister he presumably should have known that Singapore's guns protected only the seaward side of the peninsula, he adds that he thinks some of his professional advisers ought to have realized it themselves. His own persistent questionings on Singapore's situation are impressive and include almost every aspect of the defenses save that incredible circumstance of the guns' limitation—as improbable as "a battleship being launched without a bottom." He is still surprised that today, eight years after the disaster when war's security demands no longer forbid it, there still has been no court to consider "the worst disaster and largest capitulation of British history."

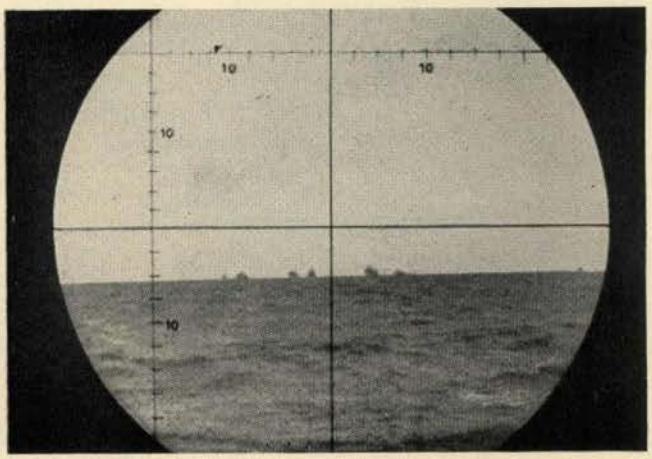
He is extremely blunt too about Rommel's humiliating defeat of the British Desert force in 1943, particularly the Tobruk surrender. "Nor should the British nation, in probing these matters, be misled into thinking that the technical inferiority of our tanks was the only reason for this considerable and far-reaching reverse." In brief, he thinks and says that it was poor command.

He is almost equally blunt about American failure in 1940-41 to develop coastal defense by planes and patrol craft, as well as convoy techniques against the U-boats—even while wholeheartedly grateful for the indispensable aid in these respects which America gave to an England in desperate need. This directness and precision of critical statement, favorable or otherwise, is one of the striking virtues of a book whose appreciations are thereby the more persuasive.

There were many differences of opinion with President Roosevelt on Far East matters. If the United States Chiefs of Staff were more realistic than Churchill about the prospects of the Southwest Pacific islands and Malay-

Wide World

DISASTER: Fall of Singapore. Japanese-British conference.



Wide World

DISASTER: German U-boat menace. Periscope on convoy.

U.S. Army

Some of the successes in the making. Roosevelt and Churchill at Casablanca.

sia, Churchill was very much sounder than the President in his estimate of China's powers, so far as World War II was concerned, and that "was quite enough to go on with for the time being." China had to be kept in the war no doubt, but in Mr. Prime's view that was solely to keep Japan's forces away from India.

The chapters on India are of profound interest as revealing how much indeed, for imperial purposes, was done for the great subcontinent where, despite magnificent service by both Moslem and Hindu soldiery, the politicians of the Indian Congress and the Moslem League "were either actively hostile or gave no help." Despite the politicians' whimperings Mr. Churchill points proudly to the fact that 2,000,000 volunteers were enrolled, "a glorious final page in the story of our Indian empire." There is a sorrowful chapter on ABDA, destroyed before it was out of swaddling clothes, for all the gallantry of the Dutch soldiers and sailors who with their allies died in trying to block a superior foe.

There are sharp passages here too about Mr. Roosevelt's views and about American concern with Indian affairs "on which they had strong opinions and little experience. . . . States which have no overseas colonies . . . are capable of rising to moods of great elevation and detachment about the affairs of those who have." The issue was not "one upon which the satisfying of public opinion in the United States could be a determining factor."

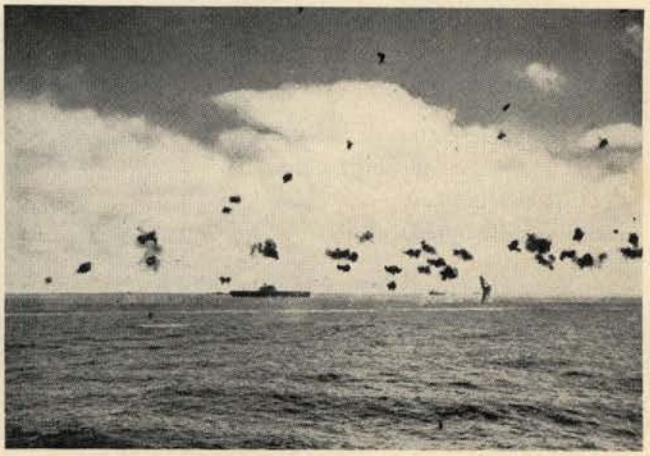
An interesting letter from Roosevelt in April 1942 (a great many are quoted) offers some surprising criticism of hostile American newspapers. In this somewhat cocksure letter the President decided to be "brutally frank when I tell you that I think I (Roosevelt) can personally handle Stalin better than either your Foreign Office or my State Department."

There is an immense amount of material on Russian relations in that critical year. Mr. Churchill is as spirited in his praise of the "magnificent struggle" of the Russian fighters as in his cold wrath at the "sullen, sinister state" represented by the suspicious Molotov, and his chief, Stalin. The Russians' terror of being assassinated tickled Churchill, who apparently never gave his own security a second thought. He tells of the Russians' arrival in orderly England, and their being put up at Chequers Court, the premier's home.

> On arrival they had asked at once for keys to all the bedrooms. These were provided with some difficulty, and thereafter our guests always kept their doors locked. When the staff at Chequers succeeded in getting in to make the beds, they were disturbed to find pistols under the pillows. . . . Molotov's room had been thoroughly searched by his police officers. . . . The bed was the object of particular attention: the mattresses were all prodded in case of infernal machines, and the sheets and blankets were rearranged by the Russians so as to leave an opening in the middle of the bed, out of which the occupant could spring at a moment's notice, instead of being

Acme

SUCCESS: El Alamein. British advance against the Nazis.



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SUCCESS: Coral Sea-Midway. Japs lost ships, men, planes.

THE SOLDIER'S LOAD AND THE MOBILITY OF A NATION

by Colonel S. L. A. Marshall

The riflemen who waded ashore at Omaha and Utah beaches carried more than eighty pounds. Some of them never made it *because of the weight they were carrying*. Many were physically so weak from the shock of combat that they drowned under the intolerable load. Many who made the beach "lay there motionless and staring into space. They were so thoroughly shocked that they had no consciousness of what went on. Many had forgotten they had firearms to use . . . their nerves were spent and nothing could be done about them."

It has been proved that the fear and shock of combat weaken almost any man. When that man has been previously weakened by carrying an intolerable load for long periods of time and long distances, it is no cause for wonder that he arrives at the firing line too frightened to fight.

In the past we knew no better than to overload the fighting man. Since World War I, and especially with the experience of World War II under our belts, we know better. We know better but we do nothing about it.

Col. S. L. A. Marshall, who is considered one of our true military thinkers, has analyzed brilliantly the subject of overloading the combat soldier.

$1.00

tucked in. At night a revolver was laid out beside his dressing gown . . .

With all of the well-bred Englishman's contempt for Russian uncouthness and bad manners and plain savagery (as in the treatment of the 15,000 Polish officers at Katyn) there is no stinting of admiration for Russian fighting will, repeatedly referred to with solid understanding of what it meant to Britain. For this is a book which recognizes merit and demerit alike for what they are. Here is a swift but glowing recital of what took place at Stalingrad and why and how. Here is one of the finest and most compact stories yet written of our own naval victories in the Pacific in 1942 when the hinge of fate was turning against Japan as well as against Germany. Here is a lucid story of Alamein, free of unnecessary detail and most remarkably effective; and again, in recording Montgomery's sureness and skill in passing the Mareth Line, a more direct recital than one is likely to find elsewhere; likewise of the tactics in Tunisia. If one looks for idle pleasantries about the leaders, British and American, he will be disappointed. There is a frank declaration of errors in planning and in execution, which it will do us no harm to read, with as little rancor as the author's.

The effectiveness of all this is enhanced by the author's patent sincerity. If he is calm in his criticisms, he is warm in his grateful acknowledgement of what our *Wasp* did for Malta's relief, and what our tanks did for Egypt, and what the promptness and fullness of American aid did for Britain. There is a moving recognition of General Marshall, not only as "a

Previous Reviews in the Churchill Series

The Gathering Storm, first of the Churchill books on The Second World War, was reviewed by Captain William Gardner Bell in the July-August 1948 issue of this magazine.

Their Finest Hour, second volume of the series, was reviewed by Charles Collingwood in the May-June 1949 issue.

The Grand Alliance, third volume, was reviewed by Morgan Beatty in the May-June 1950 number.

Military Management For National Defense

by John R. Beishline
Colonel, U.S. Army

Critical times like these demand more from us than just men, ships, money, planes and guns. They require the highest degree of efficiency in the administration of our armed forces. This timely book presents the military and industrial techniques for achieving this goal.

The first book to apply the science of industrial management to military problems. It fuses time-proven techniques of industrial management with the best principles of military organization.

For a clear understanding of the problems and techniques involved, Colonel Beishline breaks down military management into four basic functions: Planning, Organizing, Commanding and Controlling. He analyzes in detail such essentials as basic problems in military administration . . . objectives and policies of military management . . . military functions . . . structure of military organizations . . . leadership and morale in military management and organization . . . and the composition and duties of the General Staff.

$5.00

rugged soldier and a magnificent organizer and builder of armies" but as "a statesman with a penetrating and commanding view of the whole scene."

There is a particularly crisp discussion of the Darlan episode, in which the rocklike Churchill supported Eisenhower against a large, if somewhat addled, hostile opinion in England, echoed by an American group understanding little of General Ike's dilemma, of his need for immediate decision and of his wise choice of Darlan rather than of a much worse alternative—with no third choice at hand. Likewise there is a defense of the "unconditional surrender policy" which should be read in full—if only to discern how widely the policy was accepted in advance of its enunciation, and by people whose memory later failed them. More important, it sought, says Churchill, to avert this time anything like Germany's misuse of the Fourteen Points after World War I; it certainly did not imply an intention of treating a beaten foe in barbarous manner—and Churchill doubts that it prolonged the war.

Finally, this book portrays the necessity of mid-war thinking on post-war desires as well as on military victory. Britain's parliamentary system perhaps makes this obligatory, to a greater degree than does our form of government. Certainly some memorable passages in the book are those which deal with Churchill's necessary and proper concern with *intranational* as well as *international* policy, and the reasoning back of this concern can apply to our own country. In this respect, as in others, it can be examined with great profit by our American statesmen, of both parties.

MAGAZINE ROUNDUP

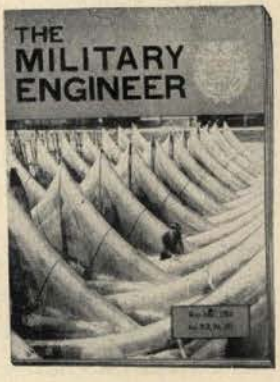
In which ARMOR rounds up some suggested reading for the military in some top publications of the service field.

INFANTRY SCHOOL QUARTERLY, only magazine devoted exclusively to Infantry, in its October issue carries an article by Lt. Col. Bruce Palmer titled *Infantry and VT Fires*, which is a rebuttal to an article in the July number by Lt. Col. George Pickett, who had visualized a totally mechanized army in which infantry, relatively few in number, would employ the killing power of machines to offset a numerical inferiority in men. Col. Palmer takes exception. INFANTRY SCHOOL QUARTERLY now unclassified.

January's MILITARY REVIEW looks at *The Personnel Function Within the United States Army*, as set forth by Armor Instructor Lt. Col. William H. Patterson. It concerns the scientific approach to the utilization of manpower—the idea of putting the right man in the right place at the right time.

The November-December issue of ANTIAIRCRAFT JOURNAL carries an article on *The Armored Division* by Colonel Hamilton H. Howze, one of a series in this magazine on the different types of divisions. Another lead article of great interest is Maj. Gen. W. F. Marquat's *Automatic Artillery in Korea*, story of the use of our fine antiaircraft in a ground role.

THE MILITARY ENGINEER for January-February has some important dope from Korea —a story on the combat engineers. Titled *Engineers in Korea—Operation "Shoestring"* and authored by Col. P. N. Strong, this is a broad picture of the key work being done in support of combat operations. There are several photos showing graphically the big problem and the work of rebuilding necessary.



In its first issue of 1951, ORDNANCE has an article on *Russia's Jet Aircraft* by William Green and Roy Cross. In addition to the interesting basic information there is a two-page picture spread showing the different types of jet aircraft including the MIG models about which we are hearing in reports from Korea. Also of interest in the issue is an article on *Hypervelocity Missiles.*

The January issue of COMBAT FORCES JOURNAL carries an article by the Chief of Staff of the Army, published simultaneously with *Coronet* Magazine, in which General Collins stresses that we can secure the future only if we have an Army superior in mobility and fire power. Major Paul Linebarger writes of the Red activities in Malaya.

AIR FORCE Magazine puts its January issue under way with an article on the delta wing type of aircraft, *Delta Wing: How Near?* There is some information on the British and Swedish work in this field. Carrying along is another interesting piece called *A Noise Annoys*, which deals with the work of the Air Force Aero-Lab, where studies are in process which are aimed at finding out the destructive capabilities of noise on the eardrums, and means of devising protective measures.

Captain James F. McInteer's piece on *The New Weapons Company in Korea* gets the lead spot in the MARINE CORPS GAZETTE for January. The article deals with the recoilless rifles and bazookas in the employment of the company, and mentions the lack of mobility of the mortar platoon. Another interesting item in the issue is a *Letter from Korea*, by MSgt William G. Feningno. Some of the comments from the fighting level are interesting.

THE UNITED STATES ARMOR ASSOCIATION

THE 62d Annual Meeting of the United States Armor Association was held on Monday, 15 January 1951 at the Army and Navy Club in Washington, D. C. Upwards of half a hundred members were present in person and hundreds more were represented by proxy, members on duty all around the world.

Lieutenant General Willis D. Crittenberger, President of the Association, presided. The group heard the report of Captain William G. Bell, Secretary-Treasurer of the Association and Editor of ARMOR, covering the activities and financial status for the year 1950.

Three amendments to the Constitution of the Association were passed by the membership. The first set up a new type of membership in the Association, to be known as a Junior Membership, for students at the various military academies and ROTC institutions. This will be available at a reduced rate in the interests of assisting in the careers of our military students.

The remaining two amendments concerned the broadening of the Executive Council. The first added two additional posts of vice-president, making a total of three for the governing body, and specifying that one each should be filled by a representative of the Regular Army, the Reserve and the National Guard.

Second of these amendments provided for the addition of three new posts on the Council. This brings the Executive Council to a total of 17 members, not including the honorary positions.

With the passage of these amendments, the next order of business became the election of officers to fill the posts on the Council. General Crittenberger was again elected to fill the top post. Major General Guy V. Henry, retired, a distinguished cavalryman, was elected to be Honorary President. Major General Clovis E. Byers, Major General Donald W. McGowan and Colonel Herbert H. Frost were elected to the posts of vice-president, to represent the Regular, National Guard and Reserve components respectively. Two men distinguished in the field of mobile warfare were elected to be honorary vice-presidents: Major General Charles L. Scott and Colonel John L. Hines, Jr.

The twelve additional member posts on the Council were filled as follows, a top group of officers in the branch, representing a cross section of Armor in the United States Army: Maj. Gen. Hobart R. Gay, now commanding First Cavalry Division in Korea; Maj. Gen. Albert Sidney Johnson, commanding the 49th Armored Division, Texas National Guard; Brig. Gen. Thomas L. Harrold, commanding The Armored Center and School; Brig. Gen. John T. Cole, member of the Military Staff Committee, United Nations; Col. Henry C. Gardiner, Reserve, who served with First Armored Division in the Tunisian Campaign; Col. William J. Bradley, Chief of Armor Branch of Career Management Group; Col. Hamilton H. Howze, G-2; Col. L. K. Ladue, Joint Chiefs of Staff; Col. John C. Macdonald, Chief of Staff, The Armored Center; Col. Charles Bromley, Office of the Armor Inspector, AFF; Col. R. J. Butchers, Chief of Staff, 2d Armored Division; and Col. John R. Pugh, 3d Armored Cavalry Regiment.

1950 was a significant year in the history of the 65-year-old Association and its 62-year-old magazine. The membership, voting on a merger proposal, elected by a substantial majority to continue their own branch magazine. The name of that magazine changed at midyear from *Armored Cavalry Journal* to ARMOR, with the organizational name changing from U. S. Armored Cavalry Association to U. S. Armor Association—all conforming to the legislative change of branch name as contained in the Army Organization Act of 1950.

With the first issue of the year 1951 going to press amid a flood of heartening and most gratifying comment on the magazine, coming in from all sides—along with full support and a tremendous surge in subscriptions—'51 will go over the top!

FINANCIAL STATEMENT

of

THE UNITED STATES ARMOR ASSOCIATION

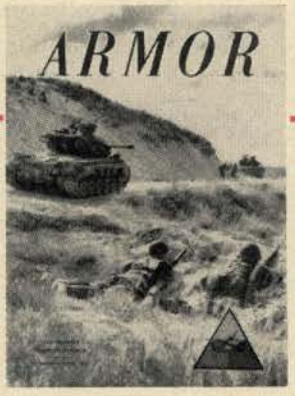
For the Year Ending
31 DECEMBER 1950

CASH STATEMENT

Department	*Receipts*	*Expenditures*
ARMOR Magazine	$16,123.31	$14,161.72
Book Department	3,357.46	2,109.52
Rent & Rental Expense	825.00	1,849.24
11th Armored Div. Assn.	2,253.99	556.60
Income from Securities	177.75	
Redemption of U.S. Bond ($1,000)	970.00	
Miscellaneous	155.70	576.86
Council Meeting Expense		159.91
Insurance		37.61
Salaries		2,016.24
Taxes:		
Social Security		51.30
Withholding		180.00
D. C. Sales		2.04
D. C. Personal Property Tax		24.29
Stationery & Postage		1,744.58
Office Supplies		552.93
Telephone & Telegraph		376.07
Janitor Service		66.00
	$23,863.21	$24,464.91
Bank Balance 1 Jan. 1950	1,091.42	
Bank Balance 31 Dec. 1950		489.72
BALANCE	$24,954.63	$24,954.63
Total Assets		$ 8,193.90
Total Liabilities		$ 188.30
Net Value of the Association 31 December 1950		$ 8,005.60

free . . . *if you're fast and mention it when you write*

the first 25 *NEW* subscribers to send in a subscription for calendar 1951 will receive a free bonus of the first three issues of ARMOR, thus enabling them to start off with a complete file



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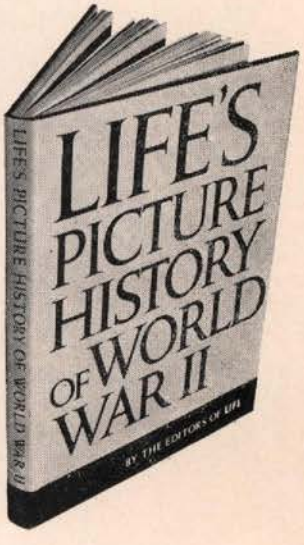
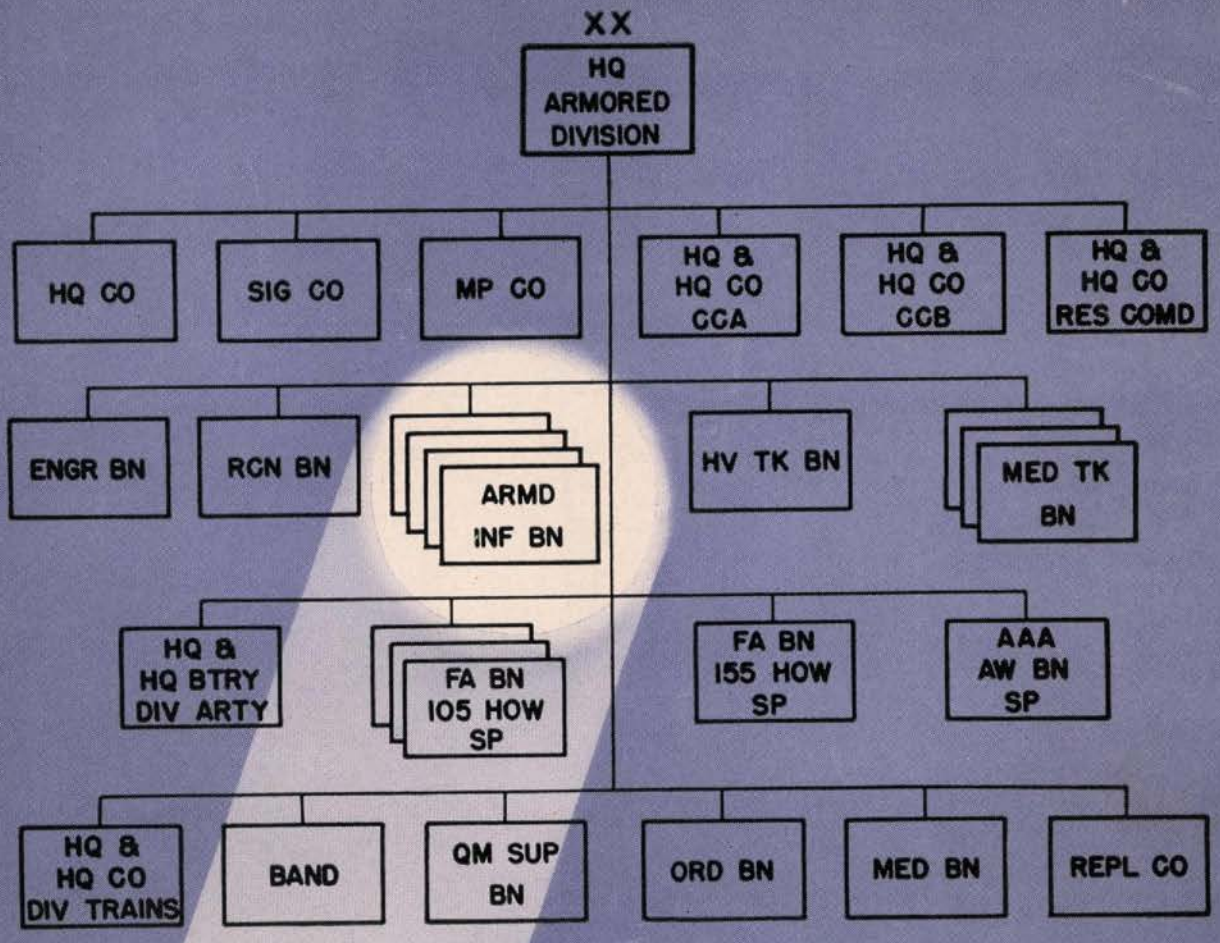
LIFE'S PICTURE HISTORY OF WORLD WAR II

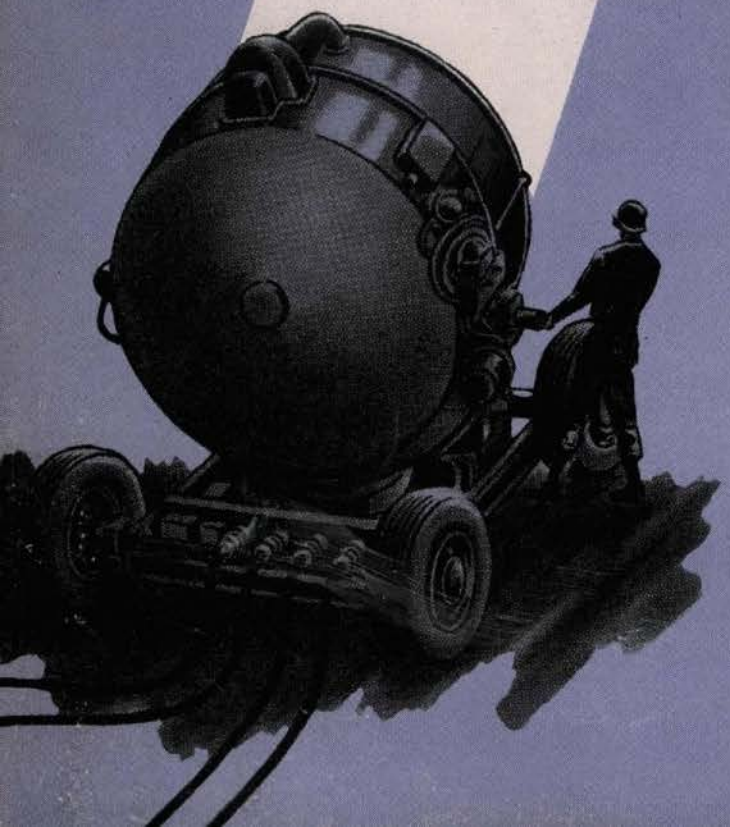
THE fused talents of LIFE'S entire photographic and editorial staff have gone into this superb new kind of history book. It contains nearly 1000 photographs, paintings, maps, many in color, and 75,000 words of brilliant narrative by John Dos Passos, Robert Sherrod, and others. Foreword by Henry R. Luce.



The first printing of this monumental book is one half million copies; the size 10" x 14"; the weight, approximately 6 lbs. Each copy comes in its individual carton. Price $10 a copy; de luxe edition $12.



ARMOR'S SPOTLIGHT ON INFANTRY



In modern military organization armor extends in depth throughout our ground forces. There is infantry in the armored division (see above) and armor in the infantry division. If you're an infantryman you should read ARMOR, for on the field of battle you will be fighting with or against armor every time. Keep up with the big thunder in ground combat! Subscribe to ARMOR!

ARMOR

The Walker Bulldog

FOR ARMOR—A NEW LIGHT TANK

Unveiled and christened during a recent visit by President Truman and top Army officials to Aberdeen Proving Ground, the T41 light tank weighs 25 tons, mounts a high velocity 76mm gun, has automatic stabilization, an air-cooled engine and a top speed in excess of 40mph. It is on order with GM's Cadillac.

MARCH-APRIL, 1951

ARMOR

Continuation of THE CAVALRY JOURNAL

EDITOR

Captain William Gardner Bell

CIRCULATION

M Sgt. Lester B. Smith

BOOK DEPARTMENT

Mildred F. Puterbaugh

ASSISTANTS TO THE EDITOR

M Sgt. J. William Joseph

Sgt. John A. MacDonald

Volume LX MARCH-APRIL, 1951 No. 2

CONTENTS

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LETTERS to the EDITOR

The Record Shows

Dear Sir:

In the November-December, 1950 issue of ARMOR, an article by Lt. Col. Pickett stated that the M4A3 tanks were not capable of coping with the Russian-made T-34. He also inferred claims of destruction of enemy tanks by friendly air forces were not borne out.

Since I have personally examined over 300 knocked-out T-34's and have records on over 500, I believe I am entitled to claim knowledge on both points. I have witnessed many tank versus tank fights on all sectors of the front and in the September-October advance, so I can assure you that the M4A3 in the hands of our tankers has not failed to demonstrate its superiority over the T-34. This does not mean that we do not desire to improve our medium tanks, because they must be improved to cope with modern tanks.

The greatest proportion of determinable kills was due to air action.

COLONEL WILLIAM P. WITHERS
Armor Officer
Eighth Army
Korea

● *For additional details see "Report From Korea" on page 23.*—ED.

Dr. Bush Again

Dear Sir:

During recent months renewed publicity has been given to vaunted new antitank weapons which will supposedly make the tank obsolete as a weapon of war. For example, Dr. Vannevar Bush, one of the nation's foremost scientists and a former chairman of the nation's Research and Development Board, in an address on 5 March 1951 carried by the Mutual Broadcasting Company, commented on this matter. One of his statements is quoted here:

". . . Relatively small recoilless antitank guns mounted on a jeep or handled by four men can put a heavy tank out of business, with a high probability of doing it before the enemy can get off his first shot, even at ranges of 1,500 to 2,000 yards. . . ."

Dr. Bush went on to discuss the tactical use of atomic weapons, stating that a well defended line including land mines, antitank obstacles, artillery and other weapons would force the enemy to mass a "huge concentration of armies, artillery and tanks—the kind of thing the Nazis did in 1944 just before the Battle of the Bulge."

"But with A-bombs in existence," he continues, "this becomes a very different matter. An A-bomb delivered upon such a concentration by an airplane, or possibly by the use of a gun or guided missile, would be devastating. In its presence, concentration of this sort would not make sense."

Dr. Bush is one of the outstanding scientists in America today, and his opinions cannot be cast aside lightly. However, Dr. Bush in his writings has tended to emphasize the defensive qualities of new weapons while passing over the offensive qualities. As Armor is principally an arm of mobility best used in the attack and counterattack, serious consideration should be given to the offensive qualities of all new weapons. Use of the atomic bomb in conjunction with offensive action will greatly reduce the necessity for concentration. As a line is fixed and an alert enemy might be expected to know the location of vital defense areas, a well trained, highly mobile force can move into the area and attack with little warning. Dr. Bush failed to mention the fact that, while the Germans knew the location of our lines prior to the attack at the Battle of the Bulge, we did not know the exact location or size of their concentrations.

The tank with its armor plate is the least vulnerable of ground weapons to atomic explosions. Infantry in the open might be destroyed over an area many times greater than the area in which

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Manuscripts: All content of ARMOR is contributed without pay by those interested in furthering the professional qualification of members of the Armed Services. All manuscripts should be addressed to the Editorial Office, 1719 K Street, N.W., Washington 6, D. C.

Change of Address: All changes of address should be sent to the Editorial Office in time to arrive at least two weeks in advance of publication date of each issue, which is the 25th day of the odd months of the year: *i.e.*, Jan. 25 for the Jan-Feb issue, Mar. 25 for the Mar-Apr issue, etc.

Rates: See bottom of contents page.

tanks would be destroyed. Likewise, jeep-mounted and ground-implaced recoilless weapons with their four men crews would in many cases be put out of action, while tanks remained operative. While in some cases an atomic explosion over a force in process of breaking through a fortified line might completely destroy unprotected personnel, many tanks would be able to continue with the mission.

In new antitank weapons, the tank has formidable opponents. However, any light sight with range finding equipment which can be carried on a jeep or by the crew of a ground weapon which will allow hits at 1,500 to 2,000 yards can be carried equally well on a tank, so that small antitank weapons, while having no real advantages over the tank, have the disadvantages of no armor plate and limited mobility. Tanks must continue to overcome and evade antitank weapons with fire power and mobility. It is possible that tactical use of atomic weapons with tank units may greatly overbalance the deterring effect of new antitank guns.

MAJOR GARTH STEVENS
Hq., Armed Forces Special Weapons Project
Washington, D. C.

● *Major Stevens expounds some related ideas in his article "Tank Defense Against Atomic Attack" on page 28.* —ED.

A Bit of a Twist

Dear Sir:

This is with reference to the article "Napoleon's Sidelights" by Doctor Roger Shaw, which appeared in your November-December issue, 1950.

In this article, Dr Shaw states "Hofer was captured. . . . He passed through Meran, then Bozen (now Bolzano) down through the magnificent Brenner Pass and was finally locked up in Mantua."

The French Deputy Chief of Staff, Lt. Col. Robert Fauveau, French Occupation Forces in Austria, who read this article with great interest, desires to inform the author that his geographical portrayal of the route indicated is inverted. In order to proceed to the towns mentioned, one must *first* go through the magnificent Brenner Pass.

Your magazine enjoys great popularity within the headquarters here, and although my basic branch is Infantry I desire to keep abreast of the progress and developments of the allied branches.

MAJOR ROBERT WARD
U.S. Liaison Officer
Liaison Mission, U.S. Forces Austria
Innsbruck, Austria

Some Questions on Tanks

Dear Sir:

Perhaps you or your associates can answer some of the numerous questions which have posed themselves to me since I read my first issue of ARMOR (July-Aug. '50).

1. What is the difference between the vertical volute spring suspension of the M3-M4 medium tank series and the suspension on the M4A3E8? When was the track widened?

2. On page 37 of the Sept.-Oct. issue is an alleged Patton M46 on the 40% grade. It has a double-baffle gun and double lugs for lifting on the front deck. I thought both were single on the Patton and had depended on this difference for identification.

3. Are any details available yet on the new British Centurion?

SAMUEL BERLINER III
Cedarhurst, N. Y.

● *M3-M4 series had the same suspension when put into production. With continuing development by R&D, this suspension was improved for the M4A3E8, a horizontal spring suspension, accompanied by wider track, in 1945. Patton tank is an improvement of the Pershing, thus changes in outer appearance are few. Patton can be identified by outside exhausts, bore evacuator sleeve on gun tube. Major change is inside tank, i.e., new engine, etc. For details on Centurion, see page 32.*—ED.

THE COVER

On February 17, President Truman, accompanied by Secretary Pace and General Collins, visited Aberdeen Proving Ground to see some of the Army's latest weapons. At an impromptu ceremony on the Munson Test Course, it was decided to name and release general information on the new light tank, the T41. With the Commander in Chief deferring to the Secretary of the Army, and the Secretary to the Chief of Staff, General Collins made the announcement: Honoring the late General Walker, the T41 tank became the Walker Bulldog.

reconnoitering

When we dashed off an editorial squib last issue decrying the fact that the movie makers were overlooking a real bet in films on armor action we had no idea we'd be taken up so quickly. Before we could say M4A3E8 we were involved! We *had* to open our big mouth. . . .

It seems that some months ago, even as we were negotiating for the John Wayne article and mulling over the tie-in editorial item, both of which appeared in the last issue the J. Arthur Rank organization, British film producers, were on location on the Continent, retracing the path of the famous Guards Armored Division with a tank-action story by Terence Young, who had recognized the stuff in armor, had written his story, and was on hand to direct it.

The title of this first film based on armor—"They Were Not Divided." When the J. Arthur Rank organization approached us on the subject of the Armor Association being the honored guests at the American Premiere, we thought it was an excellent idea. We jumped into the details.

Since we're trying to forget that two-week period of negotiations within which fell two week ends and a holiday and within which fell invitations . . . lists . . . programs . . . admission cards . . . telephone calls . . . yes . . . no . . . telephone calls . . . bands . . . searchlights . . . color guards . . . telephone calls . . . no . . . protocol . . . ding-a-ling . . . yes . . . bells . . . why we'll just not even mention it. Taking it from there, this is how things went.

On the last day of February at eight o'clock in the evening two great searchlights lighted up the front of the Playhouse theater on 15th Street in the heart of the Nation's Capital. A forty-piece unit of the United States Army Band under Assistant Director Loboda greeted the first nighters.

A distinguished group of guests included Secretary of the Army and Mrs. Frank Pace and senior British and American military officials of the three services. The Armor Association was well represented by members and their guests from the entire Metropolitan Washington area and from as far distant as the 3d Armored Cavalry Regiment at Fort Meade, Maryland.

Powerful searchlights lend atmosphere to Capital film premiere.

MC Jay Carmody of the "Star" greeting the guests.

A dozen members of the Women's Army Corps acted as usherettes, several of them dressed in the new WAC uniform now being tested. A twenty-piece concert unit of the United States Army Band, conducted by Lieutenant Herbert W. Hoyer, entertained as the house was filling.

The formal program was opened with the posting of the British and American colors and the playing of the National Anthems. Jay Carmody, Movie Critic of *The Washington Star* and Master of Ceremonies for the program, greeted the guests and introduced Lieutenant General Willis D. Crittenberger, President of the United States Armor Association.

General Crittenberger spoke on the significance of seeing a film on armor action and Allied cooperation at a time when British and American forces were once again fighting side by side on another battlefield. He then presented to Kenneth Bates, representative of the J. Arthur Rank organization, a scroll commending the film company for its production of a film portraying armor action and American-British comradeship in World War II. The curtain raised, the house lights dimmed for "They Were Not Divided."

We don't profess to be a movie critic. We only know what we like and don't like. And we came out of "They Were Not Divided" with the thought that it takes more than a story idea and the tanks to make a film. The idea and the tanks were there, and both were fine. But the story never fleshed out. It seemed to lack heart and warmth, and never reached any heights. We were disappointed. You take it from there.

It has come to our attention that several American companies are now looking over tank stories. That cheers us. We're most interested to see what Hollywood will do. And there's one thing we can tell you. Should the occasion ever arise again . . . well, . . . we've learned a few things about premieres!

The Editor

Gen. Crittenberger presents scroll to Kenneth Bates.

The U. S. Army Band greets the British-American first nighters.

ARMORED CARS

Their Past and Their Future

The emphasis on tracked vehicles has left the wheeled armored vehicle in an uncertain position. Convinced of its value, France and Britain continue development, but most activity elsewhere seems to center on the past-to-present period. Have the light tank and the airplane banished the armored car from the modern battlefield?

by RICHARD M. OGORKIEWICZ

RECENT events have provided yet another example of the fluctuations in the fortunes of armored vehicles, whose popularity periodically rises and falls with the changing conditions and theaters of operations. But perhaps in no case are these fluctuations more marked than in that of the wheeled armored vehicles. From widest possible use in large-scale mobile operations or in the deserts they have several times disappeared almost completely during periods of positional warfare. Now once again their future is far from clear or certain.

The development of wheeled combat vehicles began half a century ago, when the first attempts were made to use the autocar for military purposes. They were originally conceived as highly mobile carriages for the then newly developed machine guns or as fast reconnaissance vehicles. At first slow, the development, including armoring, was greatly accelerated by the early fluid stages of the First World War. But with the onset of trench warfare came an end to their effective use on the major fronts and the stage was left clear for the appearance of the first tracked armored vehicles

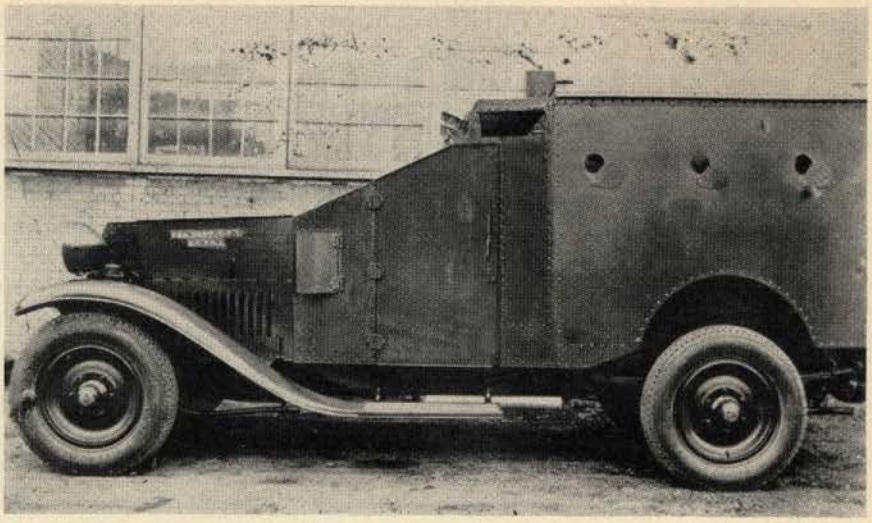
Richard M. Ogorkiewicz, born in Poland, educated in England, is engaged in lecturing and research in mechanical engineering at the Imperial College of Science and Technology in London. He has long studied the development and employment of armored vehicles.

—the British and French tanks of 1916 and 1917.

However, armored cars were used with success in the deserts of the Middle East and in many minor roles. As a result, the armored car emerged out of the war with an established reputation in some fields to balance their shortcomings in others. Since they were based on well tried commercial chassis, they were reliable, quiet and fast on roads—advantages armored cars still enjoy today—which made them particularly useful for long-distance reconnaissance and raids. These characteristics and armor protection made them equally useful for police work in troubled areas. They were also often used to support mounted units, many armies following the example of the French, who gave all the tanks to the infantry and the armored cars to the cavalry.

The chief shortcoming of the armored car was—and generally still is—its poor performance off the roads. This, like its good points, was in part due to the use of conventional, commercial chassis. Various improvements, such as short rubber tracks instead of rear wheels (as on the French Citroen-Kegresse and U.S. half-tracks), the development of six-wheeled trucks, improved pneumatic tires, during the 'twenties all added to improve the cross-country performance of what were essentially standard trucks.

For the sake of the obvious economic advantages of using standard commercial chassis, disadvantages in other respects had to be accepted. These were reflected in the type of vehicles produced, such as the M1 Armored Car of 1931 and other contemporary designs. They were large, with front engine and no front wheel drive, had hard springing and low ground clearances. However, since contemporary tracked vehicles still had many of their own troubles to overcome, these features did not handicap the armored cars too heavily.



U.S. Army

From the past—the U. S. La Salle Armored Car.

The initial cost of such armored cars was one of their main attractions and a great advantage over the tanks. The latter required special manufacturing facilities and were consequently expensive to produce as well as to run. With an armored car things were very much simpler: given a sufficiently strong chassis, some steel plate and the facilities of a small workshop, "armored cars" could be built without difficulty.

When time and resources allowed, more elaborate designs were, of course, produced. But time and time again improvised armored cars have appeared in minor revolts and in full-scale conflicts: England after Dunkirk and more recently Palestine provided numerous examples. And when conditions were favorable even improvised cars could be used with considerable effect, often in the role of a poor man's tank.

It is interesting to recall that the development of the U.S. Cavalry armored and scout cars in 1927-28 began with just such improvisations. Armored Car T1 was a standard Pontiac phaeton fitted with an armor shield and a machine gun.

However, with the demand for more powerful equipment with better cross-country performance and the simultaneous improvements in tracked vehicles, the position of the armored cars was seriously challenged. British Carden-Loyd light tanks, Christie tanks (T1 Combat Car, T3 Medium Tank and others) with independent suspensions, Vickers-Armstrong short pitch cast manganese steel and the U.S. rubber bushed tracks mark the steps in the development of faster tanks with more durable tracks. This greatly increased track life, as compared with earlier types and speeds of 30 mph, or more, made it possible for the new tanks to compete with armored cars in roles in which previ-

U.S. Army

The U. S. 6-wheeled Armored Car M1. Early 1930s.

ously they would have had little chance of success.

As a result, from about 1932 onwards armored cars began to be replaced by tanks both in fighting and reconnaissance roles. In the U.S. and French Armies, for instance, wheeled armored vehicles were confined to scouting only. Similar changes were taking place elsewhere.

In face of such formidable competition from light tanks, armored car designs had to improve considerably, particularly as regards cross-country performance. This implied greater ground clearances, improved flotation tires, more flexible suspensions and, above all, all-wheel drive. Together with this came demands for reduced over-all dimensions, improved layout with engine at the rear and so on. For such vehicles adapted commercial chassis would no longer do and the new armored cars were more specialized and hence more difficult and expensive to produce.

All the improvements and its inherently superior road performance enabled the armored car to avoid complete extinction. It managed to retain partly its position, mainly in the field of medium- and long-distance reconnaissance. But, on the whole, in the years immediately before the Second World War attention paid to it was small.

In the British Army, for instance, no armored cars were to be found either in the armored division or in the mechanized reconnaissance regiments of the infantry divisions. Shortly before the war a new 4x4 6-ton Guy armored car was introduced but the only vehicle which was to be produced in quantity was a small Daimler Scout Car.

After the 1940 campaign in France the position altered considerably. First the urgent demand for quantities of armored vehicles in the immediate after-Dunkirk period produced a whole crop of improvised armored vehicles. These ranged from light reconnaissance cars on passenger car chassis to flamethrower armored cars and even self-propelled 4-inch naval guns on eight-wheel trucks.

A more favorable view was also taken of the properly designed armored cars, partly in the absence of a satisfactory light tank at that time. As a result, after 1940 an armored car regiment became the reconnaissance element of British armored divisions. The shifting of the scene of land operations to Africa in the following two years favored further increased employment of wheeled armored vehicles.

The exceptional opportunities in the desert not only favored the large-scale employment of existing types and fostered many improvised types, but led to the development of considerably heavier armored cars intended for combat. Up to that time British development was concentrated on maneuverable, short wheel base 4x4 armored cars of between 6 and 8 tons. Such were the Guys, Humbers and Daimlers—the last armed with a 40mm gun, being by far the most advanced and successful. From about 1942 onwards, considerably heavier types began to appear: the Chevrolet built 14-ton 4x4 Staghound (T17E1); the 14-ton A.E.C. armed with a 57 or 75mm gun; an even heavier model, the 25-ton 8x8 Boarhound (T18E2), built to British specifications in the United States.

These vehicles, however, arrived too late to be used in North Africa and the changed conditions in Italy and then in Normandy forced the armored cars to assume a much more modest role. The swing of the pendulum not only eliminated all the special "desert" cars, but in 1943, in preparation for D-Day, the Armored Car Regiments of British armored divisions were replaced by Armored Reconnaissance Regiments. These were based on fast medium tanks—the 40 mph 30-ton Cromwells armed with 75mm guns. After the Normandy breakthrough the armored cars got another chance and reappeared again at divisional level, having spent the intervening period in corps reconnaissance units.

The only wheeled vehicle which was little affected by all these changes was the Daimler Scout Car. A very successful prewar design, which was to have been used by the French as well as the British, it was a turretless, completely armored 4x4 vehicle only 4 feet 10 inches high and weighing only 3 tons. It carried a crew of two and one machine gun and was used throughout the whole war for scouting and liaison work.

While Britain and the British Commonwealth made the most extensive use of wheeled armored vehicles during the Second World War, both as regards quantity and variety of purposes, it was the Germans who initially used them most. Apart from the Russians they also had the largest number.

Their two main types were a light 5-ton 4x4 car, and the 9, later 12, ton eight wheeler. For their time both were well designed, though the heavy 8x8 car was rather complex, and had fair cross-country performance. On the light vehicles the armament, consisting of coaxial 20mm gun and machine gun, was very sensibly mounted to permit elevation for antiaircraft fire. Together with motorcyclist riflemen the armored cars constituted the reconnaissance battalions of the early Panzer and motorized divisions: there were 48 in the former and 24 in the

U.S. Army

German 8-wheeled Armored Car with 75mm gun. Tunisian Campaign.

Captured German Photo

German Light Horch Pz. Sp. Wg. (M6).

latter, in the ratio of one heavy to three light cars.

The two elements worked successfully together in the early Blitzkrieg campaigns, as in France for instance. However, the weather and the excellent road network favored them there. In the much more difficult conditions in Russia the motorcylists found the going very heavy and had to exchange their mounts for the 4x2 Volkswagen cars. The armored cars fared somewhat better, but like all wheeled vehicles frequently found the conditions very trying. Also, for units which were expected to fight for their information their fighting power proved inadequate. An attempt to remedy partially the latter was made by rearming the eight wheeled armored cars with short 75mm guns. But nothing was done about a really new and improved wheeled vehicle—and there certainly was room for improvement. Instead they were gradually replaced by ¾-track vehicles, with excellent cross-country performance, and in the end the Germans were tending toward fully tracked vehicles. Light tanks in fact, which they neglected after the Pz.Kpfw.II. No doubt a special wheeled armored vehicle, with limited fighting power, did not appear worth the trouble in the circumstances, though the existing armored cars continued to render useful service, particularly in screening and delaying operations.

Compared with Russian tanks practically nothing has been heard about Russian armored cars, although considerable numbers existed at the outbreak of the Second World War. This, however, is not surprising when one bears in mind the terrain and the type of car used. Both main types, the light BA 20 and the heavy BA 10, were adaptations of standard truck chassis with engine in front and no front wheel drive and consequently all the limitations of that class. The Germans did not even deign to include the BA 20 in their 1941 antitank instructions and the only point worth noting about the BA 10 (apart from the absence of reverse gear) was the armament. Its 45mm gun made it for a long time the most heavily armored car in the world.

Since the usefulness of such armored cars was very limited they were replaced by light tanks and when these in turn failed to stand up to the requirements most of the reconnaissance and similar duties were performed by the T-34 medium tanks, on which Soviet production concentrated. The T-34 had by far the best cross-country performance and since it was mainly close-range battle reconnaissance the power of a medium tank was highly desirable. With its high mobility the T-34 performed successfully most tasks hitherto entrusted to armored cars—including security police well behind the lines—but very often it was a rather wasteful method. So perhaps partly for that reason in the later part of the war the Russians introduced a light 3-ton 2-man armored car, the BA 64, which, more recently, has also been used in Korea.

Unlike the other major powers, the United States had no armored cars at all—not counting a few obsolete vehicles—when the war began. The only wheeled armored vehicle used was the M3A1 Scout Car. A conventional and rather large front-engined 4x4 vehicle with open top, it was a carrier for dismounted action as much as anything else and it formed the main equipment of the early reconnaissance units. The heavier element when required—as in the reconnaissance battalions of the armored divisions—was supplied by light tanks of which there was one company to three reconnaissance companies—a feature characteristic of U.S. wartime organization.

But useful as it was, by the time it went into action the M3A1 Scout Car was neither sufficiently maneuverable nor adequately armed for mounted reconnaissance. In 1943 the need therefore arose for a new vehicle to take its place.

Although armored cars were officially dropped in 1937, as a result of the lessons of the German Blitzkrieg campaigns, in Poland in 1939 and in France in 1940, and of the early British operations in the Western Desert, there was a revival of interest in wheeled armored vehicles. This led to the appearance in 1941 and 1942 of several experimental armored cars, such as the 13-ton 8x6 T13, the 6x6 T17 and T19, and the 8x8 T18. However, none of these was adopted by the U.S. Army, except for some T17's used by Military Police, while the T17E1 was produced for Allied forces.

At the same time several wheeled self-propelled antitank guns were experimented with, types ranging from the 37mm gun on a ¾-ton 4x4 truck to the 3-inch T55E1 on an eight-wheel chassis. Again none was adopted, but out of this class of vehicles came the M8 Armored Car, which initially, under the designation of 37mm Gun Motor Carriage T22, was intended as a light, highly mobile gun carriage capable of mass production. A low silhouette (until the .50 cal. ring mount was fitted), fast,

Sovfoto

Russian BA 20s on parade in Red Square.

and, by comparison with other types, remarkably quiet vehicle, the M8 saw considerable service in Europe before the war ended and was, in fact, the first armored car used in any numbers by the U.S. Army.

Perhaps because it was the last to introduce armored cars in quantity, the U.S. Army was also the last to experience a reaction against them. Anyway, according to the Tables of Organization published after the war, armored cars were to disappear completely from armored divisions, sharing the fate of the half-tracks, whose place was also taken by fully tracked vehicles.

Yet armored cars continue to be used. Quite recently, for instance, orders were announced for new armored cars for the French and British Armies. Other wheeled vehicles are also by no means being abandoned. To what extent then, one might ask, are the frequent tendencies to abandon armored cars justified? Or, if not, in what circumstances did the armored cars fail and why, and where can they still be effectively employed?

The answer lies partly in the past development of the armored car, which has been outlined above. Partly it is to be found in the present characteristics of wheeled vehicles and in possible future trends.

During the Second World War the initial successes of the German armored cars and the even more extensive and successful employment of British cars in Africa tended to obscure the limitations of wheeled vehicles. The favorable conditions in the desert not only facilitated their use but encouraged attempts to extend very considerably the field of activity. This applied in particular to attempts to reintroduce the armored car as a fighting vehicle and brought forth or perpetuated the more heavily armed and inevitably heavier types—partly at the expense of an improved, maneuverable light car.

However, the size and complexity alone of a heavy multiwheeled drive armored vehicle—of 10 tons or more—which was necessary for this role made it compare unfavorably with contemporary tracked vehicles. It is not surprising, therefore, that in more difficult terrain where the chief advantage of high speed disappeared the popularity of the wheeled vehicles fell. Such was the fate of the German armored cars in Russia and of the British in Italy and Normandy.

Also since armored cars could not, in the long run, compete with tanks in fighting power they could not remain as the principal equipment of units which were expected to fight against a well armed enemy. Thus, because reconnaissance units were expected to fight for their information or to protect the withdrawal or advance of the parent formations without the stiffening by other arms their armored cars had to be replaced by tanks.

Once started, however, the reaction did not stop at eliminating the large and heavy cars, such as the German and American eight wheelers or the British A.E.C., or at crossing armored cars off as fighting vehicles. The wisdom of such decisions can hardly be questioned. But whether there was an equally strong case against the lighter vehicles is doubtful.

It might be argued that in view of all the improvements in the design of tracked vehicles, wheeled military vehicles have little to commend them. They certainly have nothing where fighting vehicles are concerned since outstanding performance over all types of terrain is rightly, the first

U.S. Army

Russian BA 64 Light Armored Car captured in Korea.

U.S. Army

The U. S. M8 on reconnaissance in Brittany during World War II.

consideration. Track life is still short, however, and operating costs of tracked vehicles high, both in terms of gasoline and track replacement.

It seems probable that tracked vehicles will continue to be handicapped to a certain extent. The complexity and bulk of an armored, multi-wheel, cross-country vehicle of any size—with all its differentials, driving shafts, universal couplings, steering rods and so on—will in turn cancel many of the advantages of a wheeled suspension. But for the lighter vehicles the outlook is far more favorable.

Such a vehicle of 5 tons or less, can have quite a good performance without any complex drive arrangements or large silhouette. The successful operation of many wheeled agricultural and engineering tractors, and other developments, would show that except in the very extreme conditions it could operate satisfactorily. Also because of the smaller size, and hence automatically reduced obstacle crossing ability, the advantages of track would be relatively smaller. Improved independent suspensions, large diameter low pressure tires should all contribute to improved performance. Integral chassis-hull construction and the development of lighter components, particularly engines, make possible considerable weight savings. If required, powerful lightweight weapons—rocket launchers or recoilless rifles, could easily be mounted.

Now, finally, if it is agreed that light wheeled vehicles will have many advantages over tracked ones of similar size and that it may be worth sacrificing some of the cross-country performance for the sake of simplicity and more economical operation, the question still remains whether armored vehicles of this size are really wanted.

The answer obviously lies in the number of functions which such a vehicle could perform effectively, more efficiently than others. The list is bound to vary somewhat with individual opinions but one may include in it scouting, observation, liaison as well as various peacetime and wartime duties of patrolling and policing and the functions of a light carrier. Looking back there is no lack of examples illustrating the need for equipment to carry out a variety of auxiliary but very important duties. At various times these were performed by motorcycles, Jeeps, Volkswagens, Bren Gun Carriers, scout cars, armored cars and light tanks with or without turrets. Most are still used but each has its limitations and is by no means best suited for the service into which it has been pressed. The vulnerability of the Jeep, for instance, is in many cases only too obvious and the use of tracked vehicles is often unnecessary and wasteful. On the other hand most armored cars tended to be far too heavy and large and few have had performance worthy of note.

Past limitations and shortcomings must not, however, obscure present possibilities and the failure of the armored car as a fighting vehicle must not prevent it from playing the role of a useful auxiliary. It cannot, of course, be based on any truck chassis as this would produce no better results than it did in the past. It must be regarded not as a car with armor but as an armored vehicle with a wheeled suspension—at first sight a small, but in fact a very important difference. Further, to take full advantage of its wheel drive it must be as light, simple and robust as possible, which in turn will further contribute to its being easier to manufacture and more economical to operate for long periods with the minimum of maintenance. With this in view all gadgets and frills, however attractive, and all unnecessary refinements must be eliminated from the start. It must do this if it is to avoid—which it should do at all cost—being a further burden on the maintenance units which at the moment are all too busy keeping the tracked vehicles running. To repeat, the aim should be not to produce a vehicle to compete with tanks but a type of armored car which would be a really useful auxiliary to them and which could be used in all the different roles where it is uneconomical to employ tracked vehicles.

There appears to be a definite place for a really fast, reliable and inconspicuous auxiliary, and a well designed wheeled armored vehicle should successfully fill this.

To Armor — A Personal Message From . .

In order to utilize their combat experience in the training programs necessitated by the mobilization of American fighting power, the Army recently reassigned a number of general officers from combat commands in Korea to key training

I AM indeed happy and honored to be returning from Korea to assume command of the Armored Center and the Armored School. Though it has been over eight years since I left Fort Knox, it is like coming home to return to the "Home of Armor." In the years between, it has been my good fortune to observe the competent performance of duty of many officer and enlisted graduates of the Armored School, and to hear from them of the progressive activities continuously undertaken there.

I consider it a great privilege that my career in the Army has directed my footsteps along the path of the development of Armor—from tank school days at Camp Meade, Maryland in 1923 to duty at Fort Eustis in Virginia in 1930 during the creation of the Mechanized Force, and again at Fort Knox with the organization of the Armored Force in 1940. These periodic assignments afforded me the rare opportunity of knowing the pioneer exponents of armor in our Army and of watching the development of techniques and doctrines and organization of armored units which reached significant force in our armored divisions on the battlefields of World War II.

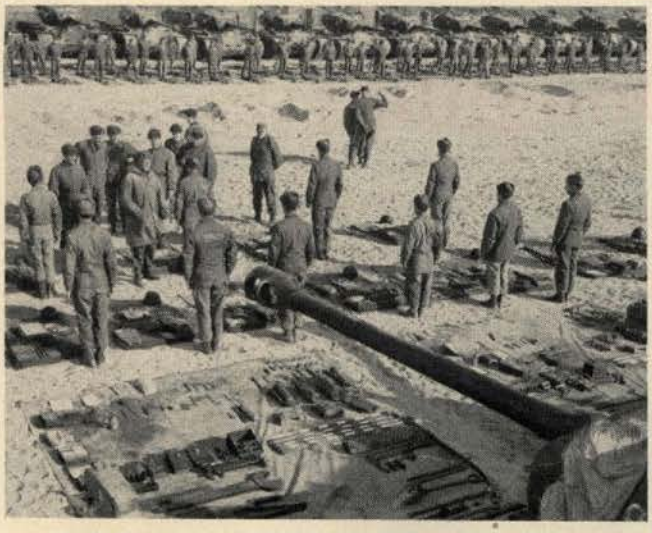
My recent command of the 7th Infantry Division in Korea enabled me to observe the employment of armor in that theater of operation, and what I saw served to convince me that the broad principles of employment of armor and doctrines that have been taught in the Armored School remain sound. I saw the use of tank elements as a highly mobile reserve on the Taegu front where they were used to plug gaps in the line, and to keep the enemy off balance by making demonstrations on various parts of the front. I saw the psychological effect that the presence of our tanks gave to friendly infantry, and how contagious the offensive spirit of the tanker could be for all our fighting troops. Our tankers and our tanks in Korea have done well in handling the T-34 tanks in an open fight, and have demonstrated that the Russian-made T-34 tank with its 85mm gun is no match for our American tanks. Armor in Korea has proven that although certain kinds of terrain are not as favorable as others for armor employment, our tanks can go almost any place provided the will to do so and the imagination to seek out solid footing exist in the personnel operating our equipment.

The value of tanks in the exploitation has been demonstrated in several instances. One that I have in mind was the use of armored task forces to effect the link-up between the advancing Eighth Army and the forces moving south from the Inchon landing. Another instance that I was particularly proud of was the task force built around a company of the 73d Heavy Tank Battalion of my division that moved swiftly from the Inchon landing to the capture of the Suwon airfield. In this action an enemy force estimated at 15 T-34 tanks and some three to five hundred infantry troops was routed, and five enemy tanks were knocked out with only slight losses to our forces. Later, task forces built around other armored units conducted independent opera-

Maj. Gen. David G. Barr was commissioned in Infantry from OCS at Fort Oglethorpe, Ga., in 1917. His tank service began in 1923 with the Tank School at Camp Meade, Md. From school he was assigned to the 18th Tank Battalion at Meade, then the 4th Tank Company at Camp McClellan, Ala. In 1927, while serving in the office of the Military Attaché at Paris, he attended the French Tank School. Next came a tour with the 15th Tank Battalion at Benning, and in 1929 a transfer to the 1st Tank Regiment there. In 1930 he became Adjutant of the Mechanized Force at Fort Eustis, Va. Graduate of the Infantry School, the Command and General Staff School and the Army War College, General Barr in 1940 was Asst G-4 and G-4 of I Armored Corps. In 1942 he became Chief of Staff of the Armored Force at Ft. Knox. From 1943-45 he served as Chief of Staff of ETO, MTO and Sixth Army Group. Next came tours at Army Ground Forces and as Chief of our Advisory Group to China. Gen. Barr took command of the 7th Division in May 1949.

The Commanding General, Armored Center

posts at home. Major General David G. Barr left the 7th Division to take command of the Armored Center and Major General John Church left the 24th Division for the Infantry Center command. Their rich experience will pay off in training.



Gen. Barr inspects 7th Division tankers in Korea.

tions beyond the 38th parallel in October 1950, and the speed and control of these actions elicited favorable comment of commanders and war observers alike.

Action in Korea has shown that the principles of tank-infantry employment will work, but that thorough indoctrination should come about through hard training prior to combat. Today's training programs will insure this. Infantry and tankers have learned to respect mutually the ability possessed by each. They realize that their combined abilities can only be effected through a constant cross channeling of information between elements of the tank-infantry team as to their intentions. A healthy awareness has grown that the success of both is fostered by an uninterrupted advance by both tanks and infantry, and that a halted tank becomes extremely vulnerable especially when left by its accompanying infantry.

My belief in the soundness of the broad principles of the employment of armor remains unshaken. Armor, when used in mass, becomes a striking and destructive weapon available to the ground commander in his combined arms team, and should be so used whenever possible. In speaking of armor in this way, I feel that we should consider it more as a concept in which a properly balanced combined arms team possessing mobility and fire power is employed in sufficient mass to produce violent shock action. Armor is primarily an offensive weapon to be regarded as a thrusting weapon—a spear, not a club. Armor is the means by which tactical advantage can be taken of successful penetrations made by infantry divisions. Armor used in such exploitations can seek out objectives deep in enemy territory, destroy enemy lines of communication, capture supply depots, or link up with an airhead or bridgehead as was done in Korea.

American manufacturing know-how, and the inherent native aptitude of the American soldier to handle mechanical equipment have lent themselves to making armor in our Army a vital force. Much conjecture in recent years has been raised as to whether or not armor has outlived its usefulness. I am convinced that as long as protection for attacking troops is needed, that as long as mobility and speed of attack are required, that as long as heavy caliber direct fire guns are needed to defeat enemy armor, and a combination of fire power and mobility will be employed in mass to create violent shock action, armor will have its place in the combined arms team. Change may come, and undoubtedly we will find new weapons, ammunition, and vehicles; but the principles of armor employment—careful planning and violent execution—will still give the commander a decisive weapon of ground warfare.

It is a distinct privilege to have been assigned command of the Armored Center. I pledge to all personnel in armor that no effort will be spared here to continue to train officers and NCO's as specialists and small unit commanders who will be qualified to carry forward to greater heights the prestige and battle worthiness of armored units.

On today's battlefield it is not unusual for the foot soldier to go up against enemy tanks without the support of friendly armor. Thus our weapons development program is aimed at placing in the hands of the infantryman the physical means for victory over the tank, while our training program concerns itself with the creation of the moral strength so imperative to success in the man versus tank action. What are the odds for the man on the ground as against the man in the tank? An experienced member of the Defense Group, Department of Tactics, The Infantry School, reviews the subject of

Doughboy . . . . . .

A MODERN tank, protected by tons of steel armor plate and pouring out a tremendous volume of fire, bearing down on an infantry soldier, who has the protection of a steel helmet and is armed with a rifle, presents a picture of a pretty uneven match at first glance. But if the doughboy has the necessary courage to fight against the natural advantages of the tank and the resourcefulness to take advantage of the tank's inherent weaknesses, it is not such an uneven match after all.

In considering the infantry soldier as an adversary of a tank, it must be remembered that he doesn't fight by himself. He is part of a coordinated team. He has a variety of weapons in support of him—tactical air, armor, and artillery—which go a long way toward squaring up the odds when he comes up against a tank. And he has a variety of weapons of his own, many of which were especially designed for use against tanks, to assist him in his battle. But before considering these weapons and their employment, it would be well to make a comparative analysis of the tank and the doughboy, considering both their capabilities and limitations.

First, let us examine the characteristics of the tank which give it a natural advantage over the foot soldier.

To begin with, it has protective armor. The tank itself and the crew which mans it are practically invulnerable to the infantryman's small arms fire and the fire of his supporting mortars and light artillery.

Secondly, the tank is characterized by a great volume of fire power. Its large calibre gun plus several machine guns and the individual weapons of the crew add up to far more fire power than that possessed by any infantryman, or by any squad of infantry for that matter.

Next, the tank is mobile. It can move across the battlefield, even though it is on the receiving end of direct small arms fire and the fire of light high trajectory weapons.

Finally, all of this adds up to shock action. This huge steel monster, blazing violent death and destruction, smashing and crushing its way down against him, is bound to have a severe adverse morale effect on the man crouched in the foxhole which he has scratched and scraped into the ground to give himself some slight measure of protection.

Now take a look at the other side of the picture.

Lt. Col. Embert A. Fossum was integrated into the Regular Army, in Infantry, after World War II. During the war he served with the 28th Infantry Division as Rifle Company Commander and Battalion Executive Officer. Since the war he has served a tour with the 7th Infantry Division during its occupation of Korea, and has graduated from the Advanced Course at The Infantry School. He is now Instructor in the Defense Group, Tactical Department, The Infantry School.

. . . . . vs. Tank

All Photos U.S. Army

by LIEUTENANT COLONEL EMBERT A. FOSSUM

The tank is big, heavy, noisy, and cumbersome. Its massive shape presents an easy target compared with that presented by a soldier on the ground. Its size restricts its operation in wooded or close terrain where a foot soldier can frequently do his best job. And swampy ground, steep slopes and boulder-stream areas which hardly impede the mobility of a man on foot may be a complete obstacle to the movement of a tank.

The element of surprise is all on the side of the infantryman. It is easy to imagine a soldier quietly stalking a tank or silently lying in wait to ambush one. But it is impossible to conjure up a reasonable vision of a big, hulking tank, with its crashing tracks and roaring motors, sneaking up on a doughboy.

Probably the most important point of all is the tank's inherent weakness of limited vision and the existence of "dead space" against which it cannot fire at any given time. When a tank is buttoned up, taking full advantage of its armored protection, the crew inside cannot see a lot of things which are going on around it. And when the tank is buttoned up, its fire power decreases. The individual weapons of the crew members are useless then, and so is the machine gun mounted on top of the turret. While the guns mounted in the turret have a complete traverse of 360 degrees, they can only fire in one direction at any given moment. When the turret is pointed toward the left it cannot fire to the right until it is swung in that direction—a matter of a few seconds at least, or long enough for a man to fire without being fired on by the tank. Because there is a limit to the angle to which turret guns can be depressed, there is bound to be a circle of "dead space" all around the tank where the buttoned-up tank cannot fire at all. The elevation of the turret guns is also limited, in most tanks to about 25 degrees, and they can't hit anything above the line of fire. That means that a buttoned-up tank cannot hit a man on a roof or high embankment, while he can fire down on the tank.

Although tanks have a certain amount of armored protection all around, it is not of equal effectiveness in all places. So a trained infantry sol-

The bazooka is one of the infantryman's most effective weapons against a tank.

dier will remember that their armor is thickest in front and on the turret, thinner on the sides and rear, and thinnest on top and bottom, and will direct his efforts against the weaker areas. He will also work against other vulnerable and exposed parts of the tank, such as the tracks, drive wheels, sprockets, and idlers, in order to cripple or stop it. And if he gets it stopped, he has deprived it of one of its greatest advantages.

Tankers Are Aware

Obviously, tankers are aware of their own vulnerability. That is why they work as sections, platoons, and companies, providing mutually supporting fires and covering the dead spaces of one another. And that's why you will almost always find supporting infantry around them. So before the infantryman can go to work against a tank, exploiting the full potential of his antitank weapons against its inherent weaknesses, he must reduce this mutual support and as far as possible remove the protecting infantry.

He does this by calling down everything he can get against the tanks and their supporting infantry. His small arms and mortars and artillery probably won't stop tanks, but it will separate them from their infantry and it will force them to close their hatches, reducing their fire power and seriously limiting their vision. And with this accomplished, he can go to work with his antitank weapons at fairly even terms. The most effective of these is the tank itself, and there are 22 of them in every infantry regiment. But a regimental defense area will normally be so large that this company of tanks won't be able to cover all of it, so many soldiers will have to rely on something else for antitank purposes.

For longer ranges—up to about 800 yards—there are recoilless rifles. A well-aimed shot from the 75mm and 57mm rifles against the tank's weaker areas—the flanks, rear, or track assembly—can do the job. The greatest disadvantage of these weapons is the difficulty in maintaining concealment. Their terrific back blast makes them easy to locate as soon as they have been fired. But they are light enough to be quickly displaced to new firing positions. And the crew of the opposing tanks are not in a position to see a great deal anyway if they have been forced to keep their hatches closed because of continuing fire from small arms, mortars, and artillery.

At closer ranges—up to about 200 yards—the 3.5 inch rocket launcher, better known as the "super bazooka," has proven itself to be a match for any tank that has ever come up against it. Its greatest weakness is its short range, and this can only be overcome by putting it on the shoulder of a soldier who has enough "guts" to hold fast until the opposing tank is within effective range.

For even shorter ranges, the infantryman has a variety of grenades, all of which can be effectively employed against tanks by a courageous soldier who takes advantage of the tank's limitations—its "dead spaces," blind spots, and more vulnerable areas. At about 50 yards, antitank rifle grenades can wreck a track assembly or even penetrate a tank's armor. White phosphorus rifle grenades can be used to blind a tank, or even to set it on fire. Even a small particle of white phosphorus can do a lot of damage if it can get down through the ventilating grates and into the motor of a tank. And it will burn the rubber off the tracks and set fire to accumula-

Used by a courageous infantryman, a variety of grenades will stop a tank.

tions of grease and lubricants in the track assembly. W-P hand grenades can do the same job.

While it takes a lot of courage for a soldier to get within grenade range of a tank, it also takes a lot of courage for a tanker to remain inside that steel oven when white phosphorus, with its great incendiary potential, is exploding on it or around it.

Burning is one of the best methods of knocking out a tank. Fire on a tank can ruin its motor and cause mechanical failure of the track assembly. And when a tank is burning, the fuel or ammunition inside might blow up at any time. If the crew starts bailing out because of this danger, they offer fine targets to the man with the rifle or machine gun.

So good doughboys will fight tanks with fire when they can. Flame throwers, if they are available, can reduce a tank to a raging inferno. And if the infantryman doesn't have a flame thrower, some field expedient such as a "Molotov Cocktail" can do the job. The "cocktail," which dates back to the Spanish Civil War, is merely a bottle of gasoline with a rag for a wick. It is ignited and thrown against the tank, preferably on top of the motor compartment, with enough force to break the bottle and spread the fire. To prevent too much splash, which would dissipate the effect of the flame, the bottle should be wrapped in cloth. One good way to do this is to slip it inside an old sock.

The well trained infantryman will find the Molotov Cocktail a good item.

Another good weapon against tanks is the thermite grenade. If it can be lodged on the rear of a tank, it will burn right through the protecting armor and wreck the motor.

Still another way for infantrymen to combat tanks is with antitank mines, which are part of the basic load of ammunition of every infantry regiment. If properly placed on roads or in defiles or on any good tank approach, they can immobilize attacking armor. And if such minefields are covered with antitank and antipersonnel fires, both the tank and its crew can be finished off after it has been stopped.

A crippled or stopped tank becomes, in effect, a pillbox. And a smart antitank man will always remember this. When he gets a tank stopped he will continue to pour in antitank fires until he is sure that it won't come to life again, and he will always be prepared to knock off the crew members if they start out the hatches.

All of the weapons described so far can best be used from concealed defensive positions or ambushes in which the doughboy waits for the enemy tank to move up within effective range. But a good soldier with an aggressive spirit—that's another way of saying "guts"—can move against the tanks, carrying his "bazooka" or grenades or flame thrower with him. That is, he can do this after he has separated the tanks from their protecting infantry and has forced the tanks to button up and stay buttoned up.

Doughboy Can Hold His Own

In spite of the admitted capabilities of mechanical warfare, the doughboy with his "tin hat" and rifle can still hold his own on any battlefield. But before he can successfully match himself against those death-dealing iron monsters which we call tanks, he must be aware of the capabilities and limitations of both himself and his opponent. He must be trained as a member of a team and know when and where to best employ the fire power of all component parts of that team. He must be alert and ingenious, seizing every opportunity and every means available to get in his "licks." And he must have courage—not foolhardy recklessness, but cool, calculating courage which will enable him to wait for his chance and then hit the tank with the right weapon in the right place at the right time.

Antitank mines planted in logical areas of tank approach will stop armor.

TANK MINDED ONCE AGAIN

The fighting in Korea has made the American public "tank minded" once more.

The effective employment of tanks by General Ridgway has emphasized their role in battle.

He has made the most of their mobility, their fire power and their shock.

This does not come as a surprise to those American soldiers who have fought tanks all over the world.

It simply reaffirms the confidence they have in their weapon.

But it does come as welcome news to the reader public, which had been led to believe that "the day of the tank is over."

This same public, the taxpayer, who recalled with pride the World War II battlefield achievements of the "Old Ironsides," "Hell on Wheels" divisions and others, previous to Korea had read frequent articles discounting armor.

The ground soldier in Africa, Italy, and Europe of a few years back, who always breathed a sigh of relief when he saw a friendly tank come rumbling up to support him, had been told in these intervening years that some sensational weapon would drive the tank from the battlefield.

Then came Korea.

Immediately tanks were in high demand to round out the ground combat team, combat enemy armor.

The public knows the rest:—

"Armor Spearheads Attack."

"Tank Led Infantry Knifes Through Enemy."

Scarcely a day passes that the press does not mention the exploits of American and British tanks.

And this despite the fact that the terrain of Korea is rugged, and somewhat roadless, rather than a rolling countryside facilitating armored operations.

To the experienced tanker it recalled the oft repeated bugaboo of prewar days, that such an area "was not suited for tank operation." But somehow or other when war came the tanks seemed to reach their objective.

And so, we Americans get a lift out of the part this characteristically American weapon, the tank, is playing in the combat team in far off Korea.

Our President in his declaration of a national emergency set a figure of 35,000 tanks as a possible goal for industry, if the urgency of the international situation were to require that many.

And inasmuch as war with us is a national effort, in which we capitalize on the entire resources of the country, we are gratified that the United States possesses the industrial potential of turning out 35,000

ASSOCIATION TO SPONSOR MOUNTED SERVICE MUSEUM

The President of the United States on June 23, 1950 signed the Army Organization Act of 1950. Under the provisions of this legislation the branch name Cavalry gave way to the continuation name Armor. Thus, after nearly one hundred and seventy-five years of service, a name of great military significance has passed into history. But everything it signifies carries on in the field of mobile warfare.

Upon the passing of the word Cavalry from our military lexicon, the Executive Council of the United States Armor Association (continuation of the United States Cavalry Association) took under consideration a proposal advanced by Colonel Herbert H. Frost, USAR, for the establishment of a Mounted Service Museum in which would be collected those things which have been a part of the horse Cavalry, Artillery, and Quartermaster these many years—the representative uniforms, the rifles, the sabers and pistols, the horseshoes, saddlery and leather equipment, the guidons and standards, the books, photographs and paintings; in fact, all the accoutrements of historical worth. In advancing his proposal, Colonel Frost offered as a nucleus his valuable personal collection of guns and saddles, and an extensive library.

Obviously, a Mounted Service Museum is an undertaking of some proportions. The problems of location, housing and maintenance are perhaps more difficult than the assembling of the contents.

As discussions got under way suggestions came from several sources where similar ideas were generating. Many civilians expressed a sincere interest and the idea expanded beyond the limitations of a purely military museum to embrace a National Gallery of the Horse. Colonel Jeffrey Galway, retired, presented this broad concept and in a report to the

of these battle proven, fighting weapons.

In Korea, it is a practice to attach a company of tanks to an infantry regiment, or a platoon to an infantry battalion. Frequently this attachment is somewhat permanent—at least during a particular phase of combat.

This attachment permits the development of that close understanding, and camaraderie, which augurs for success on the battlefield.

The infantryman comes to know and depend on a certain nearby tank or platoon with its supporting fire power and mobility.

The tanker, on the other hand, leans on that infantry squad to help him through some tight places.

And that is where the team strength comes in.

Of course the Korean fighting is a special kind of war, and a very important one to us Americans. In it we have learned again many lessons, including reaffirmation of the close inter-support between infantry and tanks that enhances so much the combat effectiveness of each.

Based on this battlefield experience we are confident that it will continue to be the practice for divisional tank units closely to support infantry in combat.

Looking beyond Korea to possible action in Western Europe—a completely different situation from Korea—we anticipate that full weight will be given to the value of the Armored division and combat command, when the make-up of the North Atlantic Treaty forces is determined.

There we can see the urgent necessity for the hard-hitting, self-contained armored units that knifed their way across France and Germany.

Armored units of divisional size, made up of armor, infantry, artillery, engineers, and all service components, supported overhead by tactical air.

No American can doubt the combat effectiveness of our proven United States Armored divisions. They demonstrated their worth in World War II, and they will do it again, if ever called into action.

So, while giving the fullest possible accolade to the small tank units fighting so magnificently in Korea, we must not lose sight of their big brother, the armored division, and the proven wallop he carries.

Both are essential to present-day American success at arms.

That is why the recent announcement that the famous 1st Armored Division is to be reactivated is encouraging news to those World War II soldiers who know the battlefield value of an American armored division.

Executive Council, indicated the wide and active interest in civilian fields.

The ideal museum or gallery would be a separate and private building in the Nation's Capital, maintained by a separate fund amassed for the purpose. Financing of the project is the key item here. Alternate possibilities would be a separate wing in an established museum, or the use of a building on a military post. A primary consideration must be a location available to the greatest number of people, a condition best fulfilled by Washington, D. C.

Undoubtedly there is much valuable material in old warehouses or records depots in military posts around the country which is increasingly in danger of discard. It is essential at this moment that any person possessing a knowledge of such archives earmark them for preservation, notifying the Association in order that proper steps may be taken to acquire them. In this respect, the United States Armor Association solicits the attention and assistance of post and organization commanders.

Although plans are not yet far enough along for the actual collection of historical items, the Association will appreciate hearing from those with information on the location of appropriate archives of the Mounted Service. A special committee of the Association has been appointed to make a study of the subject and to lay the groundwork. It is composed of Major General Guy V. Henry, Honorary President; Colonel Herbert H. Frost, Council Member; Colonel Jeffrey Galway, Member; and Captain William G. Bell, Secretary. All communications should be addressed to the Secretary, U. S. Armor Association, 1719 K Street, N.W., Washington 6, D. C.

organization

for Armor—
more striking power
in the reactivation of

The 1st Armored Division

A MESSAGE FROM GENERAL CLARKE

Today, in assuming the task of reactivating and rebuilding the 1st Armored Division, I am mindful of the tremendous responsibilities that are involved. With the 1st Armored Division again in being we now have two active armored divisions. This is the same base for further armored division expansion that existed at this time in 1941. Should a need for further expansion again arise this base will once more have to carry the load and point the way for those to follow.

The 1st Armored Division was an outstanding outfit under the leadership of such commanders as Generals Magruder, Ward, Harmon and Prichard. It is with a feeling of pride that I follow in their footsteps.

We, who are charged with rebuilding the division, have one great advantage over our predecessors ten years ago. We have the advantage of their experience to draw on as well as that of many other armored division personnel trained during World War II. We shall constantly make the most of this advantage.

Those of us of the present 1st Armored Division assure those who served with it before and those who served with other armored units, that no effort will be spared to make the 1st Armored an outstanding member of the Armor family.

BRUCE C. CLARKE
Brigadier General, USA
Commanding

ON February 28 the Department of the Army announced the reactivation of the famous 1st Armored Division, at Fort Hood, Texas, with Brigadier General Bruce C. Clarke as Commanding General. General Clarke served with the 4th and 7th Armored Divisions during World War II.

The 1st Armored "Old Ironsides" Division was activated at Fort Knox, Kentucky, on July 15, 1940, an experiment in a new type of organization—a self-contained fighting unit built around a nucleus of tanks. The troops necessary to form the organization were drawn from many sources.

The heart of the formation was supplied by the 7th Cavalry Brigade Mechanized, which included such seasoned units as the 1st Cavalry, 13th Cavalry, 6th Infantry and 68th Field Artillery. Completion of the organization brought the division tanks, artillery and infantry in strength. In direct support were tank destroyers, maintenance, medical, supply and engineer battalions.

To become efficient armor soldiers, most of the division attended The Armored Force School at Fort Knox, learning about their newly acquired tanks, half-tracks and guns. Thus a year of training got under way.

Brig. Gen. Bruce C. Clarke is a graduate of the United States Military Academy, class of 1925. His long experience with armor dates back ten years to his assignment as Chief of Staff of the 4th Armored Division. In 1943 he became commander of CCA of the 4th Armored, leading it overseas. A year later he was designated commander of CCB of the 7th Armored Division. He commanded armor across France, Holland, Belgium and into Germany in the Allied campaigns. In early 1948 General Clarke was named Assistant Commandant of The Armored School. In mid-1949 he assumed command of the Second Constabulary Brigade in Germany, returning recently to command the newly reactivated 1st Armored Division.

In September of 1941 the division left for maneuvers in Louisiana, a period of tough training which was later to pay off. With foul weather, night driving, field conditions and constant practice, a better division returned to Fort Knox on the day before Pearl Harbor.

Based on experience gained, a reorganization took place, and in March of 1942 the division moved out for Fort Dix, New Jersey, and staging for overseas shipment. Major General Orlando Ward replaced Major General Bruce Magruder in command.

The division landed in northern Ireland in May and June of 1942, there to undergo another period of rigid and exacting training. Mentally and physically the organization was reaching the "ready" stage.

The next step took CCB and elements of the division to England and Scotland, there to board ship as a part of the force sailing to the invasion of North Africa. On the morning of No-

vember 8, 1942 they made the landings in the Oran area in Algeria, capturing the city, a vital supply point for the North African Campaign, in a plan which included infantry landings from east and west, armor attacks from southeast and southwest, and a seaborne assault on the city's harbor. Oran surrendered on November 10. The 1st Armored Division had undergone its battle initiation.

Desert Campaign

Tunisia came next and the elements of the 1st Armored moved east to join the British Eighth Army. There followed a period of bitter fighting, some offensive, some defensive, and the history of the outfit is built around such names as Tebourba, Medjez el Bab, Ousseltia, Maktar, Station de Sened, Faid Pass, Kasserine, Sbeitla, Maknassy, El Guettar, The Mousetrap, Mateur, Ferryville, Tunis. In April Major General Ernest N. Harmon replaced General Ward as Division Commander.

Although the division did not find itself in a position to fight as such until the late stages of the Tunisian Campaign, in the Mateur area, it was laying the groundwork for other American armored divisions to follow, and was establishing the principles of tank-infantry teamwork which was to play such an important role in the future. With the close of the Tunisian Campaign the division moved to Rabat in French Morocco and another period of preparation for things to come.

1st Armored Division was represented by the 27th Armored Field Artillery Battalion and the 16th Armored Engineer Battalion in the landings at Salerno, as part of Fifth Army forces, invading Italy, on September 9, 1943. The division as a whole arrived in Italy in mid-November.

Mt. Porchia was the first of a long line of names which are geographical spots to most people but were battle scenes to men of the 1st Armored Division.

In late January the division landed on the Anzio Beachhead, to take part in all of the bitter fighting of that diversion and to join in the breakout and linkup with the main front and follow through on the race to Rome. Following the capture of the Eternal City they moved north for a return to action in late June just above Grosseto.

FORMER COMMANDERS

Maj. Gen. Bruce Magruder.

Maj. Gen. Orlando Ward.

Maj. Gen. Ernest N. Harmon

Maj. Gen. Vernon E. Prichard

High spots in division history were Pomerance and the Arno River, where the front stabilized in preparation for the North Apennines Campaign of 1944-45. Additional reorganization took place here, putting the division on the basis already in effect in most other armored divisions. Major General Vernon E. Prichard replaced General Harmon as Commanding General.

The mountain campaign of the winter period restricted the employment of the division to support in various sections of the front and many personnel gave over their specialized work to become foot soldiers for the static period.

Mobility again became the watchword as spring of 1945 brought the Po Valley Campaign. The division lanced north and northwest in the 19-day campaign which brought the end of Nazi resistance in the Mediterranean area and completed 30 months of combat for the 1st Armored Division.

Peacetime Pursuits

Designated as a part of the occupation force, the 1st Armored went on to Germany to serve a period under more pleasant circumstances. One member, Private Nicholas Minue, of the 6th Armored Infantry Regiment, had won the Medal of Honor, credited with bayoneting ten of the enemy and silencing two machine guns before he died in a one-man action in Tunisia. The 3d Battalion of the 6th Armored Infantry Regiment had received the Distinguished Unit Citation for their efforts to fulfill their difficult mission in the Oran Port. Many other members of the organization had received awards.

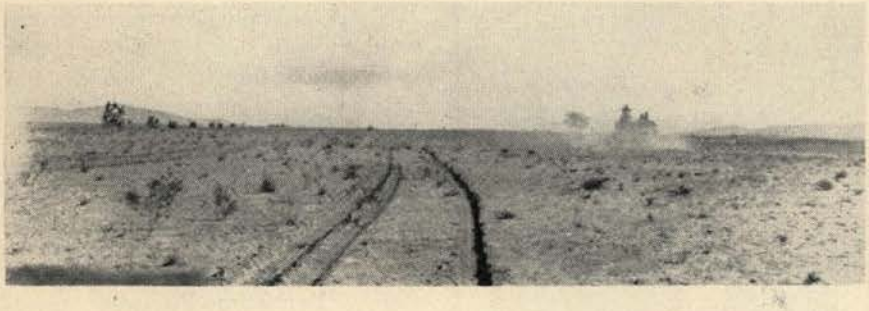
The division returned to the States where, after nearly six years of active service, over half of it overseas, it was inactivated in April, 1946.

Thus the 1st Armored Division amassed its own record which, in company with the honors awarded its component units in the periods of their respective histories, adds up to a heritage of which every new member of the division may well be proud.

For some picture highlights in the early history of the 1st Armored Division, turn to the next page.

1st Armored Division Highlights

EARLY DAYS AT FT. KNOX



SENED IN THE TUNISIAN CAMPAIGN

ROLLING ASHORE AT ANZIO

CLIMBING INTO THE NORTH APENNINES

REPORT FROM KOREA

by COLONEL WILLIAM P. WITHERS

Armor Officer, Eighth Army

U.S. Army

Col. Withers photographs knocked out T-34 tank.

IN the November-December issue of ARMOR there appeared an article titled "Tanks in Korea," in which the author stated that the M4A3 tank was inferior to the T-34 Russian-made tank. I would like to submit the following data which must be somewhat sketchy in view of the fact that security regulations prohibit extracts from Secret files.

The earliest M4A3 tanks were committed on the south flank. There were no M4A3's in action before August. In June and July M24 light tanks, mounting 75mm guns, and armored cars were the only armored vehicles in Korea. In August, one M4A3 was destroyed by three rounds of 105mm HEAT, all hitting the vertical side armor in the same place. The range was 200 yards. Another M4A3 was hit in the right final drive by an AP projectile, probably 76mm, at a very short range, under 500 yards. It was subsequently recovered and repaired. Two M4A3's were hit by AP projectiles at short range. One of these was pierced at the junction of the top deck plate with the side armor, exactly at the weld. The enemy gun was in position on a high hill, trajectory was approximately downward, 45 to 60 degrees from horizontal.

These tanks were committed to save a surrounded battalion, and the mission was accomplished successfully.

Farther to the north of the perimeter, at least one M4A3 was hit by a concealed T-34, at 40 yards range. Another M4A3 tank, 25 yards distant, was likewise hit, in the right sponson. In this action, 10 enemy T-34's were destroyed. Our loss was two tanks. The cause of our loss may be attributed to the fact that there was no ground or air reconnaissance. Personnel casualties were three men killed in the second tank and one man wounded superficially when he was blown out of the turret.

Near Waegwan, an M4A3 tank was hit on the deck, 8 inches behind the driver's hatch, which was open, by a 120mm mortar shell. The deck armor was broken, with a 3-way crack radiating from the center and pushed in to a depth of 3 inches. This same battalion had three M4A3 tanks hit by 85mm guns, two on the front plate at a range of 50 yards. The third tank was hit on the sponson under the turret. Total casualties in these three tanks were one killed and no wounded.

I have witnessed many kills of T-34 tanks by M4A3 tanks. In one day, Friday, 13 October, one tank company encountered and destroyed 8 Russian-made T-34 tanks. Most of these were destroyed by M4A3 tanks mounting 76mm guns. Only one of the eight T-34's is known to have been destroyed by 90mm guns. At the same time, the tanks killed crews of four 120mm howitzers, one 45mm AT gun and two heavy machine guns. One tank ran over a 120mm howitzer, bending back its armored shield.

Some 500-600 Red tanks were uncovered by the September-October advance of the United Nations Forces. Over half of these have been examined by teams of experts, and the greatest number of determinable kills have been credited to airplanes. It is unwise to underestimate the value of air support. The reason for the small number credited to tanks is that the Reds do not expose the T-34 to our tanks if they can help it.

These are the conclusions of the Armor Section of the Eighth Army:

a. The M4A3E8 tank has proven itself superior to the T-34 in every tank-versus-tank action.
b. Logistical qualities of the M4A3E8 are excellent compared to other medium tanks. Mechanical failures which occurred have been studied and many are due to overwork. All can be corrected by proper employment, normal maintenance, and inspection before commitment.
c. M4A3E8 crews like their tanks.
d. United Nations Air Forces have done a fine job against enemy tanks.
e. Many enemy tanks, loaded with ammunition, have surrendered, due to lack of fuel or parts.
f. Our tank gunners are superb marksmen.

The above statements are made from personal observations and official records.

With two organic tank battalions the airborne division packs a lot of punch. How does armor fit the pattern of airborne operations? The Commanding Officer of the 82d's 44th Tank Battalion reviews the subject.

ARMOR IN THE AIRBORNE DIVISION

by LIEUTENANT COLONEL JOHN F. FRANKLIN, JR.

THE current airborne division, unlike its very specialized World War II predecessor, is so organized as to be the equal of the infantry division in sustained ground combat. The trend has been to make it organically equal to a standard division for normal operation with the added capability of participation, with the bulk of its combat and service elements, in airborne operations. With the continued development of heavy cargo and assault aircraft it is conceivable that even the heaviest of the support units may be lifted into the Airhead in certain types of operations. Once on the ground, however, and until such aircraft are available, the organic armored elements of the division are employed offensively and defensively in accord with the same general principles as are applicable in the infantry division. Some minor departures from established practices are possible and desirable due to peculiarities of organizations and equipment. For an understanding of these a quick look at the over-all organization of the division is necessary.

Organization

The airborne division is the basic unit of combined arms for use in airborne operation. Its organization and equipment are essentially that of the infantry division, with only slightly less heavy equipment and a somewhat lower ratio of supporting units.

Its regiments, while otherwise very similar to the standard regiment, do not include either tank or heavy mortar companies. The functions of these latter two units are combined into a support company which includes two heavy mortar platoons of four mortars each and an antitank platoon of six towed 90mm AT guns. The additional armored and antitank support needed is supplied by two organic divisional tank battalions, in lieu of the one found in the infantry division. Also a separate antitank platoon of four towed 90mm guns is found at division headquarters.

Lt. Col. John F. Franklin, Jr., graduate of the Cavalry School and Armed Forces Staff College, served in the South Pacific and OPD during World War II. He served with the Marshall Mission to China in 1946, and was with the Plans and Operations Division, Department of the Army, for a tour. For the past year he has commanded the 44th Tank Battalion of the 82d Airborne Division.

The two tank battalions are organized under T/O & E 17-35N as Tank Battalions (Medium) and are identical to those found in standard infantry divisions and the armored cavalry group at corps level. They are separate administrative and tactical units with the normal supply maintenance, and evacuation capabilities. Each consists of Headquarters Headquarters and Service Company and three tank companies of four platoons.

The Artillery

Division Artillery consists of Division Artillery Headquarters, three towed 105mm Howitzer Battalions, one towed 155mm Howitzer Battalion and one AA (AW) Battalion. The equipment and organization closely parallels that of the ground division except that the old four gun battery is retained and the AA (AW) battalion is considerably smaller than standard.

In organization for an airborne operation the division is normally divided into an assault echelon, a follow-up echelon, and a rear echelon. The assault echelon is usually further organized for combat into combat teams and divisional units and is capable of being entirely landed by parachute. The follow-up echelon contains both service and heavy combat elements and is air landed or rejoins the division as soon as possible by land or sea. The rear echelon contains only administrative elements and joins the division when the situation permits. All elements organic to the division except the medium artillery battalion and the two tank battalions

Bell

Advances in air transportation and transportability will have great effect on the use of armor in the airborne division. M24 tank enters a C124 plane.

are capable of being, in whole or in part, committed in the assault echelon. These exceptions must, because of the present limited capacities of cargo aircraft, join the division with the follow-up echelon either by sea or overland. The assault echelon is extremely vulnerable to enemy armor prior to the arrival of the follow-up echelon with the organic tank battalions and medium artillery. Therefore, it has been necessary to greatly increase the antitank potential of the airborne infantry unit over that of comparable ground units who operate with the ever-present antitank support of their organic regimental tank company and divisional tank battalion.

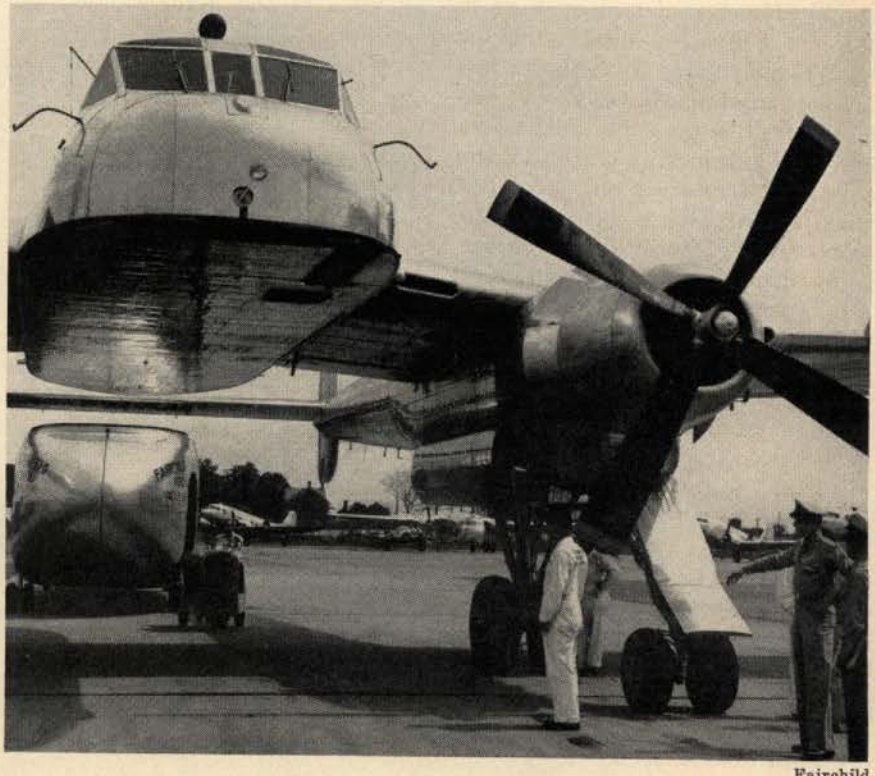
This antitank potential is a matter of constant study and currently it is understood that proposed changes will provide four antitank companies, each of twelve guns. One of these companies would be organic to each infantry regiment and one would be at division level.

The present antitank capability, and particularly the contemplated greatly increased antitank strength, coupled with the presence of an additional tank battalion headquarters, provides the airborne division commander with much greater flexibility of command. He is immediately better able to employ armored strength in its primary offensive mission, rather than necessarily devoting any large portion to an antitank mission. It may not be necessary for the division or regimental commanders to break down tank units that might otherwise be employed in mass solely for the purpose of antitank defense. The very bad practice of dividing the number of tanks available by the number of units to be supported is readily avoided. Thus, with this added flexibility, the possible organizations for combat outlined in FM 17-33, Tank Battalion, can be multiplied many times. Many of the additions, in the opinion of the writer, being sounder, for command and tactical reasons, than those available in the infantry division.

ORGANIZATION FOR COMBAT

Offensive Operations

With the division operating offensively in a ground role, either after the arrival of the follow-up echelon or after entrance into combat on a purely ground operation, the principles for employment of armor in the airborne divisions are identical to those in the infantry division. These principles include the purposes of offensive action, the forms of offensive action, the distribution of forces, frontages, zones and axes. However, due to the greater flexibility of command available in the existence of two tank battalions, the task organization for combat within the distribution of forces, in the airborne division as compared to that in the infantry division, will differ considerably. It may be inferred by the presence of two tank battalions in the division, that one battalion normally will be broken down with one of its companies going to each of the three regiments. This arrangement, of course, provides the airborne regiment with the same armored support as is found in the normal infantry regiment. Admittedly, it does insure that the tank-infantry teams on the individual and crew level are well acquainted and accustomed to operating together. Likewise, it is further in-



Fairchild

The detachable fuselage pack plane has aroused speculation over the possible adaptation of the idea of a detachable tank for airhead operations.

Fairchild

The threat of enemy armor to our establishment of an airhead calls for early drop of the 90mm antitank weapons until friendly tanks hit the scene.

ferred by the existence of the two battalions, that the same battalion habitually will be in the unit which operates with reinforcements on a separate mission. Such a procedure, wherein the same battalion is always separated into attachments and the other battalion always operates as a unit, is not practiced. It would sacrifice the added flexibility of command available to the airborne division commander. Both units rather than just one, should be trained and capable of acting independently as part of a task force. The matter of insuring that the tank-infantry teams on the individual level are accustomed to each other can be achieved by providing that, whenever any attachments are made, the same tank company from either battalion is sent habitually to the same regiment. By insuring that both battalions complete all phases of training and by equalizing the type commitments and operations placed on each battalion, the Division Commander develops maximum flexibility of command, so essential in the organization of balanced formations for specific missions.

Keeping in mind the flexibility of command attainable in the airborne division reference the armored elements, and likewise insuring that no one tank element is superimposed on another, the two tank battalions may be employed in a number of tank organizations, of which the following are a few examples:

One, when the terrain, and other factors affecting armor, are favorable in front of one regiment and the division commander decides to make the main effort in this regiment's zone he can: Attach one battalion to the assault regiment making the main effort; make the other battalion, less a company, a part of the Division Reserve; and attach the remaining company to the other assault regiment.

Two, when a larger portion of the tank and infantry strength must be kept in division reserve to provide flexibility for the attack and ensure retention of the initiative; he can: Keep one battalion intact as part of the Division Reserve; attach the second battalion, less a company, to one assault infantry regiment; and attach the remaining tank company to the other assault regiment.

Three, in preparation for an exploitation or pursuit, with a basis for a split reserve if desired, he can: Keep one battalion reinforced a part of the Division Reserve; draw the necessary tank support for the assault regiments from the second battalion; and make the remaining tank battalion, less any detachments, also a part of the Division Reserve, thereby providing the basis for organization of two task forces if needed.

ORGANIZATION FOR COMBAT

Defensive Operations

The principles of defensive combat and the technique of either position defense or defense on a wide front which are pertinent to the employment of the tank battalion with the infantry division are equally applicable to the tank battalions with the airborne division. The tank battalions, or smaller included units, must be assigned defensive missions in which they can use their mobility and shock action to the greatest possible extent. Such missions would include adding strength to the counterattack, adding depth to the antitank defense, and acting as a covering force or outpost for the division. Again, however, as in the offensive, any tendency to continually break up the same battalion in making attachments to the regiments must be resisted firmly. It is equally essential to have flexibility of command in the defense; and therefore both battalions must be trained and called upon to perform either small or large unit defense missions.

U.S. Army

The new Walker Bulldog light tank combines light weight and proper size for air transport with the hitting power to exploit airhead operations.

In the airborne division, utilizing the added flexibility derived from the existence of two tank battalions, and again avoiding the imposition of one tank element upon another, there are at least three possibilities for the employment of armor in this type division in the defense. Along with their general purposes, these are:

One, to increase the counterattack strength of the division in order to strike and destroy any enemy which may penetrate the battle position; the Division Commander can: Attach one company of the first tank battalion to each of the three regiments; put this battalion, minus, under division control; and attach the second battalion intact to the Division Reserve.

Two, to increase the antitank capabilities of one regiment and concurrently to maintain a strong counterattack force under Division, he can: Attach the first battalion less one company to the regiment having the most difficult sector to defend; attach the remaining company of this battalion to the other regiment on the MLR; and make the second tank battalion a part of the Division Reserve.

Three, for a defense on a wide front against any expected large-scale enemy armored attack; he can: Attach one tank company from one battalion to each of the three regiments; put this battalion, minus, under division control; and designate the second tank battalion, reinforced, the Division Reserve.

It is evident in these task organizations both offensive and defensive that no tank unit has been superimposed on another. Thus, tactical command channels have been maintained and responsibility for logistical support, to include particularly maintenance, is fixed. No parallel channels are necessary as would be the case when two tank units are involved in the support of the same infantry element.

Airborne Tanks

In any discussion of the airborne division there is an inherent obligation to answer the question regarding the development of heavy aircraft for the transport of tanks and the contemplated employment of the battalions, or elements thereof, in a purely airborne operation. This question is under study now and can only be answered by discussion. Present airborne doctrine contemplates four general categories of operations. These are:

The Airhead Operation, which is conceived as being staged in hostile territory, and involves the *seizure* of an airhead from which further ground, air, or naval operations may be launched. Forces involved will be in the airhead for an extended period of time, with logistic support being supplied entirely by air.

The Seizure and Link-up Operation, which is conceived as a delivery of airborne units into an area in the rear or to the flanks of enemy positions after seizure of initial objectives, and a planned ground link-up is effected between the airborne units and other friendly forces. The majority of airborne operations in the immediate future will be of this type.

Raid-type Operations, wherein airborne units are delivered into hostile territory for the purpose of destroying or neutralizing enemy forces, installations, facilities, or headquarters. A withdrawal is carefully planned and executed upon completion of the mission.

Special Operations, which encompasses those not properly included by the three types named above.

Of the various type operations discussed, the writer feels that consideration should be given to developing some means, either cargo or assault aircraft, for the transport, in necessary quantities, of a standard tank of medium classification in the *Airhead Operation.* The logistical cost versus the tactical value would no doubt make such an operation the exception and infrequently used. However, the availability of the medium tank in an airhead of this type is considered essential to provide the necessary offensive strength needed to support further ground, air, or naval operations.

If a suitable lightweight self-propelled antitank gun is made available, the development of suitable cargo aircraft solely for transport of tanks in the *Seizure and Link-up Operation,* is not considered essential.

Conclusion

In the airborne division, therefore, although there are two separate tank battalions, the principles for the offensive and defensive employment of these battalions in ground action are identical with those applicable to the one tank battalion, and regimental tank companies, found in the infantry division. However, the flexibility provided by the existence of the two battalions and the added antitank strength found in the airborne division, if fully exploited in both training and operations, will greatly facilitate the implementation of these principles, and permit the armor to be employed more extensively in its primary role.

Finally, any consideration given to the development of heavy cargo aircraft for the transport of medium type tanks into an airhead, even on an exceptional and infrequent basis, is justified in that the presence of such support may be, at a critical time, most essential to the success of a certain mission.

Tank Defense Against Atomic Attack

by MAJOR GARTH STEVENS

WHAT will happen to tank units if attacked with atomic explosives? Will the tank be discarded as a weapon if an enemy starts using atomic bombs tactically? As atomic weapons become more plentiful, answers to these questions become increasingly important. The tank is probably the least vulnerable of ground weapons to atomic explosions, and slight changes in matériel, organization, tactics and techniques can greatly increase the effectiveness of the tank under atomic attack.

The publication of *The Effects of Atomic Weapons* by the Department of Defense and the Atomic Energy Commission has provided an authoritative reference available for analyzing the effects of atomic weapons on ground warfare. The following is a brief discussion of the effects of atomic explosions when used against tanks and tank units. An atomic weapon with an explosive equivalent of 20,000 tons of TNT is assumed.

Effects of an Atomic Explosion

An atomic explosion destroys in three ways: (1) by blast, in the same manner as any high explosive, (2) by thermal radiation or heat, and (3) by nuclear radiations. Each of these effects is deadly by itself. However, to obtain maximum over-all destructive effect against troops in the field, an enemy would probably explode the bomb about 2,000 feet above the center of the target area; the following discussion assumes such an air burst.

The blast from an atomic bomb only differs from that of other military high explosives in that it is stronger and lasts longer. Although a properly placed atomic bomb can crush any man-made structure, an enemy who would explode an atomic bomb to destroy one or a few tanks would be as foolish as the enemy who would use a TNT blockbuster to destroy a cracker box. Since the best protection against blast is armor plate, in a large area under an atomic explosion, although buildings would be knocked down, wooded areas would be leveled, and debris would be thrown for miles, still a tank close to the ground center would have a chance of survival. Not only would the tank's armor plate protect against the initial blast, but, more important, it would protect against flying debris.

A tank next to an atomic explosion would be vaporized by the intense heat. Thermal radiation or heat would cause more casualties among unprotected personnel in a cleared area than blast and nuclear radiations combined. Yet a tank directly under the explosion would probably survive this hazard, assuming all tank hatches were closed at the time of the explosion. A tank commander with his head out of the turret would pull back a charred stub, and the crew would be killed instantly by blast and heat with the hatches open.

Nuclear radiation hazards are of two kinds; those which are nearly instantaneous, and those which are delayed and are called lingering radiations. Lingering hazards result from radioactive materials being deposited upon the tank or onto areas in which the tank must operate. An explosion 2,000 feet above the target would cause negligible lingering radiation hazards. Units could move into the area under the explosion immediately after the explosion with assurance that crews would not suffer from radiation hazards. However, no tank built carries sufficient armor plate to protect the crew from instantaneous nuclear radiation from an atomic explosion 2,000 feet away. The tank's armor plate will, however, reduce instantaneous nuclear radiation by at least half, thus giving the tank crew some protection.

The discussion so far has assumed a high altitude burst. Such a burst will normally cause greatest over-all damage, but an enemy might well burst an atomic projectile on the ground, or allow the projectile to penetrate the earth before exploding if the target is a tank unit. While blast and heat hazards from such bursts would be greatly reduced, the lingering radiation hazard would be increased. Tanks might not only be contaminated with radioactive dust, but might be forced to move through highly contaminated areas to perform assigned missions. An underground or surface burst could thus create a substantial roadblock which would need no attendance.

Tactical Use of Atomic Weapons

An atomic weapon, like any other supporting weapon, would normally be used to best further the assigned mission of the unit. Thus, an attacking enemy would be expected to burst atomic weapons to best further the attack, and in the attack the atomic weapon would be a powerful weapon. Assume defending units to be occupying strongly fortified positions which would force the attacker through a well fortified line. Penetration of a heavily defended and mined area would require the massing of artillery at the proposed point of penetration, the use of Engineer troops to clear or mark mined areas, the use of heavy infantry attacks to open and maintain a breach, the massing of supplies, and the selection of terrain favorable for both tanks and infantry. However, with atomic weapons available, the equivalent of hours of intense artillery and air bombardment can be accomplished in a few seconds. The height of the atomic explosion can be varied so that the effects emphasized would be to clear mine fields, to level wooded areas, to remove tank barriers, and to destroy personnel over a large area.

To briefly recapitulate, let us list some of the advantages of an attack

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There has been increasing attention on the subject of tactical use of atomic weapons. The battlefield implications with respect to armor are interesting. How would the tank fare in this kind of warfare?

supported with atomic weapons.

a. The possibility of surprise is increased. No artillery preparation is necessary. Less massing of troops for the attack is required.

b. Detonation by atomic explosion of antitank mines in limited areas greatly simplifies the mine clearing job.

c. Substantial destruction of defending personnel in critical areas greatly simplifies what remains of mine clearing and obstacle removing jobs.

Warfare in which atomic weapons would be extensively used would probably require high mobile dispersed units such as could be created from existing types of armored units. In such warfare, the tank would be of increasing importance both for offensive and defensive actions.

Protection Against Atomic Attack

Atomic warfare will require greater dispersion of units. The circular type bivouac often used during World War II would be an ideal target for an atomic bomb. However, the communications systems of armor units permit them to operate in dispersed formations, and their mobility permits rapid assembly at critical points for either defensive or offensive action.

Atomic warfare will require decentralization of supply and maintenance functions. Large units with large headquarters are tempting targets. Possibly ordnance, quartermaster, signal and medical functions now performed on the division level should to a larger extent be performed by battalions and companies. Such decentralization might result in decreased combat efficiency because of small units performing functions that can best be performed by larger better equipped units, but this loss in efficiency is nothing to that which would result if an entire division headquarters were suddenly destroyed, or an ordnance or quartermaster battalion were wiped out.

Atomic warfare will require modifications in tactics and techniques. As an atomic explosion might result in the sudden removal of defending personnel, mines and other obstacles, an attacking unit might be expected to use routes of attack not normally considered favorable for tanks. Camouflage will be more important. Air warning systems will be very important, as one plane can now carry the destructive load formerly carried by dozens, or even hundreds, of airplanes. Use of defilade will be important. A hill is ideal protection against an atomic explosion.

Summary

Extensive use of atomic weapons against tactical units may greatly increase the importance of the tank and armored units. It is therefore important that tankers understand the advantages of the tank in this type warfare, and that the greatest effort practicable be made to develop tactics and techniques which will fully exploit these advantages. It is well to remember that although an atomic explosion is a tremendous thing, it will not kill a person any deader than a .30 caliber bullet, and the hazards of atomic explosions are to be reduced by good training, proper use of equipment, and use of mobility, cover and concealment, just as other battlefield hazards have been reduced by similar procedures.

Army to Order to Active Service 12,650 Company Grade Officers

The Department of the Army has announced that 12,650 company grade Organized Reserve and National Guard officers will be ordered into active military service by June 29, 1951, bringing the total number of captains and lieutenants ordered to duty to approximately 40,000.

Included in the order to active duty are 300 Medical Service Corps officers, 150 Women's Army Corps officers, 150 company grade chaplains, and 50 Army Field Artillery aviators in the rank of lieutenant.

The order affects 3,444 captains and 9,206 second and first lieutenants. They will report for duty between May 23 and June 29, 1951.

National Guard officers will be ordered into active service as individuals only on a voluntary basis, the Army said. No members of the Inactive Reserve will be ordered to active service under this program unless they volunteer.

The Army expects that many of these company grade officers will enter active duty voluntarily in the present emergency. Company grade Reserve officers should submit their applications direct to the Chief of the Military District in which they live. National Guard officers should submit applications through National Guard channels to the State Adjutant General concerned.

All officers will be ordered into the active military service for a period of 21 consecutive months, or such other period as may be authorized by law, unless sooner relieved. Officers will be given at least 30 days in which to close out their personal and business affairs prior to reporting, unless they desire to report at an earlier date.

Officers selected for orders into military service by Army commanders will be in the following priority:

Priority I: Qualified volunteers of the Organized Reserve Corps, and of the National Guard of the United States.

Priority II: Members of the Active Reserve only of the Organized Reserve Corps commissioned from the ROTC who were deferred from Selective Service under an ROTC deferment agreement and have had less than two years' prior active Federal service as officers.

Priority III: Members of the Active Reserve only of the Organized Reserve Corps commissioned from the ROTC who did not execute an ROTC deferment agreement and who have had less than two years' prior active federal service as officers, warrant officers, or enlisted men.

Priority IV: Members of the Volunteer Reserve.

TRAINING PUBLICATIONS AND AIDS

by LIEUTENANT COLONEL WALLACE L. CLEMENT

HOW do we get three-dimensional training aids?" "Where can I find out about the latest Armor field manuals?" Such questions as these are asked time and again, principally by officers from newly activated Armor units, who are now faced with an enormous training problem. The Armored School appreciates this problem and is endeavoring to assist in all possible ways—by resident courses, by extension courses, by providing packets of material, by providing selected units of instruction for sale through the Book Store, and by giving information on availability of training aids and publications, which is the subject matter of this article.

The first thing the new unit should know about is its training program. Training programs for all Armor units were forwarded to Army Field Forces from The Armored School last fall. Although these have not been published as Department of the Army training programs as yet, they have been reproduced by Field Forces and distributed to newly activated Armor units. These cover a 38-week period of training, including basic and advanced individual training, basic and advanced unit training, combined unit training, and field exercise and maneuver training. The programs were written for each T/O&E Armor unit—for example, the tank battalion has three programs: one for the tank battalion as a whole, one for headquarters and service company, and one for the tank company.

In addition to the unit programs, two were written for tank and reconnaissance crewmen replacement training. Each program covers 14 weeks of training: 6 weeks basic individual (found in ATP 21-11ON), and 8 weeks advanced. These programs are being used by training divisions charged with turning out Armor replacements.

Subject schedules were prepared at the School to supplement the 8 weeks advanced individual replacement training. Although designed for replacements, it is felt that these subject schedules can also be used to advantage by units. In fact the School has taken steps to insure that these schedules are received by Armor units through its newly initiated packet program.

The packet program is designed as an information service for newly activated or Federalized Armor units. As soon as the School learns of a new unit, a packet is assembled and mailed free of charge. The packet includes a set of the latest Armor manuals, a set of special texts, the subject schedules for tank and reconnaissance crewmen, a book store catalog, and several other publications having training value.

Of course, there are many Army Regulations and Special Regulations which have to do with training. In fact, there are so many that sometimes an important one is missed. There are two which are especially valuable in training any unit:

SR 110-1-1, Index on Army Motion Pictures and Film Strips—this regulation lists current training films and is revised periodically to bring it up to date.

SR 310-20-3, Index of Army Training Publications—this regulation lists field manuals, graphic training aids, and Army training programs among other things. These graphic aids are available by requisition through adjutant general channels. When the training programs described earlier have been printed by Department of the Army they will be listed in this regulation.

Service school book store catalogs are a valuable reference for a unit to have. These are generally available on request. Some schools include slides and charts, as well as instructional material, and The Armored School falls in this group. Service school graphic aids supplement those Department of the Army aids that are available on requisition and usually must be purchased.

Many new field manuals are now being written and many old ones are being, or have been revised. Each service school is charged with the responsibility for writing or revising manuals within their field, under direction of Army Field Forces. While a manual is being revised or written for the first time, a special text is normally used at the school as an interim publication. Units are encouraged to inquire about the field manual program and to find out the status of the texts they need; for example, whether special texts are available at the book store in lieu of a certain field manual. Book store catalogs are difficult to keep current and more material is generally available for sale than is listed in the catalog.

The present Armor manual program is nearing completion. The publishing of FM 17-12, *Tank Gunnery*, in November 1950, made a total of 10 manuals printed of 14 which were assigned to be

The Executive of the Training Literature and Reproduction Department of the Armored School answers some of your questions.

revised or rewritten two years ago. Of the four remaining, 17-35, *Reconnaissance Battalion, Armored Division,* and 17-50, *Logistics, Armored Division,* are now being printed; 17-95, *The Armored Cavalry Regiment (Light) and The Armored Cavalry Reconnaissance Battalion,* has been forwarded to Army Field Forces for final review prior to publication, and 17-30, *Intelligence and Reconnaissance in Armored Units,* is still being written, work on it having been suspended pending publication of FM 30-5. FM 30-40, *Recognition Pictorial Manual on Armored Vehicles,* has recently been assigned to the School for revision, and it is hoped that the manuscript of this manual will be forwarded in June 1951.

Many units inquire about purchasing maps for their map reading courses. The Armored School Book Store does not have maps in stock, but information on the availability of these items can be obtained from Department of the Army Map Service, Washington 25, D. C.

Information on construction of mock-ups and models, and recommended devices is contained in FM 21-8, *Military Training Aids,* September 1950. The manual gives suggestions for construction of all types of three-dimensional aids. For procurement of three-dimensional aids, units should go through channels to contact their training aids centers. These centers, established in each Army area on 1 July 1950, have included in their mission the receiving, storing, issuing or distributing on a loan basis of all approved training devices. They may also stock training films and graphic training aids. Each center generally has three of four subcenters or workshops located at various installations in the army area.

The Army training film program has achieved greater importance in the past few months. SR 110-1-1 lists current training films; each school can give the latest information on new films being produced. Eleven Armor films are now in production. The first three to be released will probably be *Conduct of Fire, Part I—HE; Conduct of Fire, Part II—Shot;* and *Conduct of Fire, Part III—Advanced Gunnery.* When obtaining films from their regional film libraries, units should also inquire about the instructor's film references. These are pamphlets which are written for each film—giving the scope and recommended questions and answers for the instructor to ask when the film is over.

Veterans of Korean Combat Training Army's New Soldiers

More than 600 combat hardened enlisted men, Army veterans of the Korean campaign, are already assisting in training new units in the United States or are being trained as instructors for this purpose.

The program is in line with Army policy to make maximum use of the Korean combat experience of enlisted men who are qualified as trainers and instructors. More than 150 combat veterans have completed courses in instructor training and are now sharing their battlefield lessons with soldiers in training.

In effect since November, the program provides that enlisted combat casualties, former prisoners of war, and men returned from the Korean combat zone for other reasons be screened and the best qualified selected as trainers and instructors.

Men are selected on the basis of these requirements:

1. Have 20 or more days of battle or nonbattle experience in the Korean combat zone.

2. Be in the grade of corporal or higher.

3. Have a score of 100 or higher in specified aptitude tests, or have a high school education or its equivalent.

4. Have the necessary qualities of instructors and trainers.

The hand-picked men are sent to Army service schools for an orientation course to prepare them for their new assignment. Upon completion of the course they are retained at the school as instructors or are sent, as trainers, to a unit undergoing training.

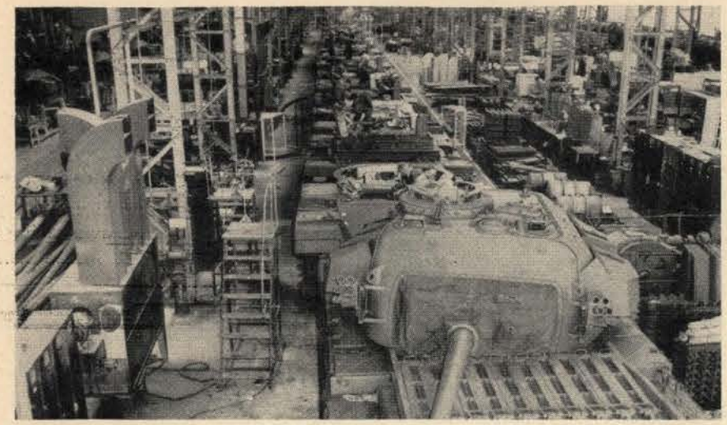
The Infantry School, Fort Benning, Georgia, has received the largest number of combat veterans so far. More than 400 men are taking or have taken the course, while 153 combat-wise graduates are now assisting in the training of Infantry units.

Army plans call for the use of many more Korean veterans in instruction capacities as they return from the combat zone.

THE BRITISH CENTURION TANK

A part of the armor story in Korea is being written by the new British Centurion tank. In the hands of the King's Royal Irish Hussars, these tanks covered the United Nations withdrawal from the Pyongyang area in December. The Centurion is a 50-ton amphibian tank. It is powered by a 635 horsepower adaptation of the Rolls Royce Meteor aircraft engine. It mounts an 85mm gun. On these pages are some pictures of the King's Royal Irish Hussars and their Centurions in action in support of U.N. operations.

Photos by U. S. Army, Acme and Wide World



A Centurion assembly line at a Royal Tank Factory somewhere in Great Britain.

A Centurion is loaded onto a transporter at Britain's Royal Ordnance Factory.

Atank dozer prepares positions for Centurions on the south bank of the Han.

The amphibian qualities of the Centurion are tested in action in the Han area.

Moving into position in the Han River area to give backbone to U.N. operations.

British tankers take time out for chow in the bitter Korean midwinter action.

Two sets of six launchers fire phosphorus grenades for close-in protection.

Centurion tanks cover the movements of a United Nations convoy at the front.

A Survey of Soviet Armor

What is not fully understood is not possessed.—**Goethe.**

by LIEUTENANT COLONEL MICHAEL S. DAVISON

I. Introduction

WHEN Hitler's armies lunged across the borders of the Soviet Union in the summer of 1941, the Red Army became the center of hopeful world attention. It has remained so ever since with the rather significant exception that hope has been replaced by apprehension.

The remarkable performance of the Red Army in sustaining the initial punishing blows of the blitzkrieg, in applying its strategic concept of defense in extreme depth, in refraining from piecemeal commitment of its strategic reserves, in retaining its organizational unity despite initial wholesale surrenders and tremendous losses in men and matériel, and in turning imminent defeat into a final successful counteroffensive and victory over Germany's finest troops—all this bears evidence that the Nazi defeat in Russia is not to be explained away merely by a group of whining German generals passing the buck to Hitler's intuition. Acceptance of the German rationale might lead us to underestimate the true strength of the Soviet Army.

It must be understood that, from the early 1930's on, the Politburo took the threat of war seriously. The messianic vision of international communism entertained by the Bolsheviks demanded that Soviet Russia be armed against the inevitable capitalist attacks. Preparations for war were no less intense than they were in Nazi Germany. The five year plans developed the industrial base. Dispersal of industry was put into effect. The psychological preparation of the Soviet people was commenced through propaganda and agencies for the defense training of civilians. Increased emphasis was placed on Russian nationalism or "Soviet patriotism" to give the moral driving force to total mobilization. Marxian propaganda was subordinated to national unity and patriotic appeals. The army was increased, discipline tightened, officers corps strengthened, training improved, weapons developed. All this prepared Russia for the Nazi onslaught.

As the events of 1941-42 proved, the preparations were not complete and it was the timely intervention of General Winter plus some carefully hoarded reserves which gave the Soviet Army a much-needed period of grace. Nevertheless, the foundation had been laid and the sources of strength existed. It remained for the Soviet high command to marshal and apply the strength with proper strategy, tactics, and technique. What was achieved in the armored field is the subject of this investigation.

It is necessary first to insert a word about the sources of information used for this paper. The paucity of authoritative detailed information on the current Russian scene is well known. Since there are no Soviet Congressional Records or Drew Pearsons available for consultation, researchers without access to classified information are reduced to poring over the Russian press, propaganda publications, government releases, radio announcements, and belles lettres. Then by drawing on their extensive knowledge of past Soviet behavior, they can arrive at some sort of interpretation. These evaluations are then used by other evaluators, errors are compounded and realities become more tenuous. Most of the writing is on high level matters and eschews the worm's-eye view. This general field plus a clutch of propaganda articles written by Russian army officers during the war for foreign consumption represents the source material. I have a very definite feeling that my crystal ball is cloudy but I hope that more astute observers will endeavor to correct my errors and to elaborate the somewhat skimpy fabric of my presentation.

Lt. Col. Michael S. Davison is a graduate of the U. S. Military Academy, 1939. Until 1942 he served with the 1st Cavalry Division. In World War II he commanded an infantry battalion of the 45th Division in Italy and France. A graduate of the Command & General Staff College, he has recently returned from Puerto Rico and command of the 18th Reconnaissance Battalion, is now studying economics, government and history at Harvard University and aiming for a master's degree.

II. Tactics

A. Prewar Concepts

In 1925 Frunze succeeded Trotsky as War Commissar. Frunze was acutely aware of two fundamental facts bearing on the Soviet military strength. First, the capitalist countries enjoyed a considerable industrial head start. Until the Soviet could overcome the capitalist lead, the Red Army would be deficient in equipment at the outset of any war. Second, Russia in the vastness of her territory possessed a considerable source of strength. Space could be traded for time. But this same space afforded opportunity for maneuver on a vast

scale. There could be no static war of position because the tremendous reaches of the Russian territory would soak up troops like a sponge and still there would be room for maneuver. Thus, Frunze visualized maneuver warfare conducted by a mobile army imbued with the spirit of the offensive.[1] The new Field Service Regulations published in 1936 summed up the Russian concept as follows: "Modern technical means of reducing the defense (above all, tanks, artillery, airplanes and mechanized units, when used on a mass scale) make it possible to organize a simultaneous attack on the enemy throughout the whole depth of his position, to isolate him, to encircle him completely and finally destroy him." This was the point of departure in developing the doctrine of the various arms.

Early thinking on the employment of the tank placed it in two roles. The doctrine distinguished between tanks for support of infantry and tanks for "distant action." The latter were to be independent tank formations employed for extended maneuver and operation against the enemy's rear areas, in particular, communications centers, reserves, and artillery positions. However, tactics and technique for the "long-distance" units were not worked out in detail. In 1941 at least half of the total tank strength was in infantry support units indicating a conservative attitude towards large independent armored formations.[2] That this attitude was destined to change after the war began is reflected in a statement attributed to the future Marshal of Armored Forces Rotmistrov speaking as a colonel in 1939: "Tanks must be employed in masses. The best opportunity for a tank commander is to be in command of large groups—a brigade, a corps, an army. Those are splendid instruments in an offensive. A concentration of a thousand tanks—that is the dream of every tank commander."[3]

[1]Berchin and Ben-Horin, *The Red Army*, Norton & Co., N.Y. 1942, pp. 127-130.

[2]Corotneff, N., *Red Army Tanks in Winter*, The Cavalry Journal, Jan.-Feb. 1943.

[3]Fomichenko, *The Red Army*, Hutchinson, New York, 1945, p. 58.

B. WWII—Offense

During the course of the war a fairly consistent picture developed of Soviet employment of tanks in the assault and breakthrough of a prepared defensive position. At any rate, rather more writing has been devoted to this phase of armor in the attack than to the conduct of the "rat-race" after the breakthrough has been made.

The assault and breaching of the enemy position is a combined arms operation in which the infantry is the decisive weapon. Soviet doctrine stresses the detailed prior planning of the operation. The various units to be employed in the operation are brought together beforehand for combined training under conditions closely simulating those of the actual operation. Training is climaxed by CPX-ing the conduct of the proposed battle. Extensive reconnaissance is used to develop details of the terrain and of the enemy positions. Such information is incorporated in the training of units preparing for the attack.

The actual attack is preceded by an air and artillery preparation extending through the depth of the position. The Soviet Army delights in massive artillery preparations delivered in great weight and for a prolonged period. However, even though this is their preference, Russian military writers emphasize that the attack preparation must not be stereotyped and they offer as an alternative a rolling barrage commencing at the time of attack or an attack without preparation using artillery and air as the battle develops.[4]

Of concern to Soviet commanders is the problem of marrying-up the tanks and infantry in the initial attack position. Coordination should be such that the tanks are not held up once they arrive at the attack position. Obviously, the tanks would be the center of considerable enemy attention.

The initial wave of the attack, coming in close on the heels of the artillery preparation, consists of heavy tanks accompanied by infantry on foot. The primary mission of the heavy tanks is to destroy known AT guns, to force the disclosure of unlocated AT guns, and to deal with any enemy tanks that appear upon the scene.

The second wave, following at approximately 500 yards according to one account, is composed of medium tanks each carrying some ten infantrymen. Each team of tank and infantry has been allotted a bunker, weapon position or other objective in the enemy position. The mediums pass through the first wave when the AT opposition has been eliminated. They may assist the heavies in dealing with the AT defense.

A third wave, similar in composition to the second, attacks enemy positions in depth and is prepared to exploit the success of the second wave. Infantry on foot follows the second and third waves to consolidate their gains, thus freeing the tankborne infantry to continue with their assigned tanks.[5]

Light tanks, if employed, follow behind the mediums and are used after a breakthrough is made to secure the flanks and conduct reconnaissance.

Once the tank-supported infantry has succeeded in breaching the enemy position, armored formations are passed through and encirclement of the enemy is sought. Illustrative of this type of action is the highly publicized November offensive in 1942 at Stalingrad which resulted in the capture of Von Paulus and his army.

In this action the XXVI Tank Corps (roughly equivalent to our armored division of World War II) passed through a breach opened by a combined arms attack and moved some 75 miles through enemy territory to a juncture with a similar spearhead. The operation was characterized by the usual detailed preparations, including hours of night driving for the tank crews across the steppes learning to negotiate ravines and gullies in the dark.

The tank corps passed through the

[4]Korolev, M., *Tank-Infantry Attack*, Cavalry Journal, Sept.-Oct. 1943.

[5]Bandik, *Organization of a Tank Attack*, Cavalry Journal, March-April 1943.

infantry in two columns traveling cross country. They immediately plunged into the tremendous space of the steppe where compass navigation was required. No effort was made to maintain a line of communications to the rear. Presumably ammunition trains accompanied them and one writer specifies that German supplies were to be used for refueling.[6] No halt was made the first night and only short ones thereafter. Once well into the enemy rear they had no compunctions about using vehicular lights at night. As a matter of fact, if one can believe the Russian military writers, this is a common practice in the Soviet armored force.

The final objective was a bridge across the Don River which was to be secured intact. This was accomplished by using an advance detachment consisting of five captured German tanks and three captured trucks transporting sixty tommy-gunners. This force secured the bridge and held off the Germans until the main body of the corps arrived.

So much for the general employment of Soviet armor on the offense. However, there are some interesting details of Soviet tank technique worth noting. The observations that follow are derived either explicitly or implicitly from articles by Russian officers written for U.S. consumption and perhaps should be well salted before swallowing.

There are repeated references to tank battles with the Germans in which the Soviet tanks attack firing their cannon as they move. The Russians call it more effective than stationary fire which they don't care for because the enemy then has a standing target at which to fire. They are singularly reticent about how they obtain accuracy with the tank gun while moving, making only this rather smug comment: "Fire from moving tanks naturally requires high skill and training of crews."[7] This is, of course, a degree of proficiency only attainable under the dictatorship of the proletariat and quite beyond the reach of the decadent capitalist. In fact, the Soviet tanks on occasion carry the "charge" to the point where they are completely intermingled with the opposing tank formation. Numerous citations for decorations carry accounts of ramming German tanks in order to disable them.[8]

Another point of interest is the use of observation posts by Soviet tanks in an engagement. It would appear that the tank unit commander uses the OP as the point from which he controls the action of his units. In the early days of the war when sometimes entire battalions were without radios, control from the OP was achieved by motorcycle messenger or liaison tank. If the OP is still part of the scheme, presumably control is now by radio.

In summary, Soviet use of armor on the offense calls for a massive stroke by tank-saturated infantry followed by breakthroughs of highly mobile armored formations striving for encirclement link-ups while the mass of infantry mops up behind them. A graphic description of such an advance is given by General Manteuffel, a panzer commander in the East, when he said, "The advance of a Russian Army is something that Westerners can't imagine. Behind the tank spearheads rolls on a vast horde, largely mounted on horses. The soldier carries a sack on his back, with dry crusts of bread and raw vegetables collected on the march from fields and villages. The horses eat the straw from the house roofs—they get very little else. The Russians are accustomed to carry on for as long as three weeks in this primitive way when advancing. You can't stop them like an ordinary army, by cutting their communications, for you rarely find any supply columns to strike."[9]

C. WWII—Defense

The basic Soviet defense strategy in World War II is well known. It was essentially one of trading space for time in which to complete mobilization and the assembly of forces for a counteroffensive. It was a costly strategy because the German offensive was launched through the productive heart of prewar Russia. Some dispersal of industry had been accomplished in the five year plans prior to 1941 and transplanting of factories took place during the retreat, but the agricultural economy of the German-occupied areas suffered great loss from the scorched-earth policy of the Russians.

In implementing their defensive strategy, the Soviet Army disposed its troops in great depth. The May 1942 issue of *Fortune* speaks of a Soviet Corps being disposed, according to the situation, on a 5 to 12 mile front with a main defense zone 9 to 12 miles in depth. While these figures are somewhat ambiguous, it is clear that defense in great depth is firmly rooted in Soviet tactical doctrine.

Large armored formations are held in army or "front" reserve for use in counterattacks against successful enemy breakthroughs. In the event of breakthrough there is no general withdrawal along the line. Units adjacent to the breach refuse their flanks. Reserve units are disposed against the flanks while others attempt to contain the point of the enemy spearhead by occupying previously prepared secondary positions. If these moves are successful, the large armored units in reserve counterattack, preferably against the flank of the breakthrough.

Within the defensive position, infantry-support tanks may be employed in dug-in positions in forward areas if other antitank means are considered insufficient. However, the preferred employment is to hold them in mobile reserve. The reserve position is selected so as to place the Soviet tanks athwart the probable line of advance of the enemy armor. The tanks are placed in camouflaged positions to cover with flanking fire the obvious tank routes through the position. When the enemy attacks, the Soviet infantry allows the enemy armor to pass through their position. The Soviet infantry then engages the enemy infantry in order to separate them from their armor. Soviet tanks ambush the penetrating enemy vehicles. A mobile reserve is maintained to either exploit or reinforce the defensive battle.[10]

Soviet defensive doctrine calls for the tanks to organize for an attack from any direction and to conduct constant reconnaissance of the area surrounding the position. This is vital where the great expanse of land and the tremendous length of the fighting front make for conditions of highly fluid and mobile warfare.

[6]Rodin, A., *Tank Operations in the Enemy Rear*, Cavalry Journal, Jan.-Feb. 1943.

[7]Bandik, *Organization of a Tank Attack*, Cavalry Journal, March-April 1943.

[8]Minz, I., *The Red Army*, International, New York, 1943.

[9]Liddell Hart, *The German Generals Talk*, Morrow & Co., New York, 1948.

[10]Tretyakov, B., *Tank Ambushes*, Cavalry Journal, March-April 1943.

Armor on the defensive carefully and expertly camouflages its tanks. If the ambush system is to be used, sectors of fire and control arrangements are carefully laid out beforehand.

In the event of a daylight withdrawal, the tanks are expected to cover the extrication of the infantry. The tanks then move back by leapfrogging units to the rear. However, night withdrawals are preferred.

The underlying principle of Soviet defensive action lies in their firm conviction that a battle is never lost as long as there exists even the slightest means of resistance. By-passed units do not surrender; they fight on and, when fuel and ammunition are exhausted, the men join the guerrilla units.

D. Operations at Night

Most of the Soviet Union lies north of the 50th parallel. During the winter, major operations are handicapped by the short period of daylight. Consequently the technique of night operations became highly developed during the war, the general principle being that the infantry would penetrate the enemy defenses during the day and the tanks would pass through at night.

Such an operation requires extremely careful preparation. The Russians emphasize detailed prior planning and training by the units involved. Reconnaissance is carried out to select routes, locate obstacles, and remove mines. Drivers are taken over the selected routes at night up to the enemy positions.

For the attack moonlight nights are preferred so that the tanks and accompanying infantry can maintain their orientation. The infantry assists in keeping the tanks on course and in designating targets. Formations are echeloned in depth making movement and control easier. According to one writer, such a formation also gives the enemy an impression of much greater strength because it is more difficult to estimate at night the strength of a unit deployed in column rather than in line.[11]

Tank-infantry cooperation is even more important at night than in daytime. Under no circumstances, the Soviets feel, should the tanks and infantry become separated. Upon arriving on the objective, the infantry organizes the new position while the tanks are withdrawn to a rear assembly area.

Thus with tremendous quantities of tanks (30,000 armored vehicles per year 1943-45[12]) and by rotation of units, the Soviet Army can maintain the tempo of its offensive around the clock.

E. Operations in Winter

The Soviet Army reckons that its armor can operate effectively for 10 months out of the year in central and north Russia. There is a period of from 6 to 10 weeks at the beginning and end of winter when General Mud commands the battlefield and tank operations are extremely difficult.

Maintenance and driving seem to be the major problems in winter operation. Formations in snow must be echeloned to avoid tracks of preceding tanks. Extra wide tracks and grousers assist in negotiating deep snow. Drivers are trained to make their turns wide and smooth. Drifts and snowbanks may be broken through at high speeds.

During rest periods or when in reserve positions, special precautions must be taken to protect men and machines. Tanks are dug-in up to the base of the turret (implying the use of TNT on the frozen ground), a trench is dug between the tracks and a portable stove set up. Tanks are covered with paulins and camouflaged with snow. Engines are turned over three to four times a day to insure easy starting. The crew gets shelter and warmth under the paulin.

Tactics in winter dictate careful terrain reconnaissance to avoid snow-filled gullies, ravines, and depressions. Ski-troopers are attached to the tanks —4 to 5 skiers per tank—to carry out forward reconnaissance in difficult or unknown terrain. In the attack armored sleighs carrying 6 to 7 infantrymen are towed by the tanks. It is claimed that this scheme had definite value in reducing infantry casualties in the opening stages of the attack by carrying the infantry rapidly into close contact with the enemy.[13]

III. Organization

The Russians were extremely careful throughout the war to prevent disclosure of any organizational details of their army. Press releases and military articles were written with only rare reference to units below the army or "front" (army group) level. Although corps, brigades, and divisions might be named, details of their composition were not given. However, sufficient information has been assembled by various means to indicate the general scheme of armored organization. The fact that much of the information is contradictory in detail perhaps indicates that the Soviets were not inflexible in their organizational concepts and that throughout the war they adapted their formations to the experience they gained as the war progressed.

Major General Katukov, a Russian tank officer, has this to say on organization: "At the beginning of the war, the Red army tank troops were organized into divisions. Battle experience has shown, however, that these units were unwieldy and inconvenient for managing. The tank divisions have since been broken up into smaller units and re-formed into brigades that are more pliable on the battlefield."[14] Berchin and Ben-Horin place the strength of the tank brigade at the beginning of the war at 270 tanks. They note that during the Finnish War a heavy tank brigade consisted of three heavy tank battalions, each having 35 heavy tanks and 15 light tanks. They do not mention any infantry component in the brigade.[15] In May 1942, *Fortune* magazine also placed the brigade at 270 tanks. The Red Army was calculated to have 25 tank brigades some of which had motorized infantry *attached* to them.

General Guillaume, French Army, indicates that the tank brigade in common use during the war was composed of three battalions of 21 tanks each —again, no infantry element. In place of the armored division had appeared the armored corps. The early armored corps contained two tank brigades and one infantry brigade.[16] By

[11]Corotneff, *Tanks in Night Combat*, Cavalry Journal, July-August 1943.

[12]Speech by J. Stalin, February 6, 1946.

[13]Corotneff, *Red Army Tanks in Winter*, Cavalry Journal, Jan.-Feb. 1943.

[14]Katukov, M., *Soviet Tank Fighting*, Cavalry Journal, Jan.-Feb. 1944.

[15]Berchin and Ben-Horin, *The Red Army*, Norton, New York, 1942, p. 66.

[16]Guillaume, A., *Soviet Arms and Soviet Power*, Infantry Journal Press, Washington, 1949, p. 110.

the end of the war the normal armored corps had been increased in tank strength from two brigades to three.[17] No strength or composition is given for the infantry brigade of the corps but since, in the case of the tanks, battalions are the components of the brigade, a safe assumption would have the infantry brigade consist of three battalions. Thus for each brigade of 63 tanks there would be one motorized infantry battalion. The armored corps had a total of about 200 tanks, 100 artillery pieces, 24 antitank guns, and 28 antiaircraft artillery pieces. In 1943 self-propelled guns were furnished to large armored units. By the end of the war there was a ratio of one SP to two tanks. It is not indicated whether this was in addition to or at the expense of the tank strength.

With respect to infantry support tanks, *Fortune* of May 1942 states that normally each infantry division had attached to it a battalion of 45 tanks. In the normal three division corps there was a tank brigade of 135 tanks.

The three major tanks employed were the T-34, the KV-2, and the Stalin. The T-34 medium was considered the primary exploitation weapon. Initially it was armed with a 76mm gun but this was later raised to an 86mm weapon. This was a 30-ton vehicle. The KV-2 was a 52-ton tank mounting a 76mm gun. It was designed primarily for infantry support. In 1943 it began to be replaced by the Stalin. Guillaume describes the Stalin as a 57-ton tank armed with a 122mm gun and three .30 caliber machine guns. Its Diesel engine generated 600 horsepower and it had 3.85-inch armor. Its ground pressure of 11.6 lbs./sq. in. outclassed the German Tiger with 17.7 pounds and the Royal Tiger with 12.8 pounds.[18]

German commanders in the East were unanimous in their praise of Soviet tanks. Rundstedt said: "The Russian heavy tanks were a surprise in quality and reliability from the outset. . . . Their T-34 tank was the finest in the world." Manteuffel, who also fought both in the East and the West, felt the Stalin tank to be the best tank he saw anywhere during the war.[19]

[17] *Ibid.*, Appendix V.
[18] *Op. cit.*, p. 114.
[19] Liddell Hart, *The German Generals Talk*, Morrow, New York, 1948.

IV. Training

The Soviet citizen entering the army is not the military innocent to be found in the reception centers of our country. In the first place he is thoroughly accustomed to regimentation, having been exposed to it from the time his mother stuck him, at the age of four weeks, in the community nursery of the collective farm and went back to her allotted place behind the plow. As soon as he entered school he came under the jurisdiction of the junior affiliation of the Young Communists known as the Octobrists. He began learning how to march in formation and became acquainted with Soviet discipline. Whether he progressed from the Octobrists into the Pioneers and thence to the Komsomol (Young Communists) or failed to advance in the party auxiliary, he still would come into contact with the Osoaviakhim.

This civilian agency was designed to teach rudimentary military skills to the people such as rifle marksmanship, grenade throwing, and partisan tactics. Thus military preparedness and the art of war were to be part of the daily life of the civilians.

A second influence in the tanker's training was the MTS or Motor Tractor Stations of the collective farm system. An integral part of Russian agricultural plan is a high degree of mechanization. Tank recruits from this source had the mechanical technique and skill which is readily transformed into the specialized requirements of an armored unit.

Once in the army the individual soldier lived under a rigid training schedule based on the maxim of Catherine the Great's famous general, Alexander Suvorov—"Hard on the training ground, easy on the battlefield."[20] During the war an average day went something like this: reveille 0600 followed by physical training exercises, breakfast 0700, training 0800-1300, dinner 1300. Afternoon programs varied but one afternoon a week was devoted to political education. Supper was at 1700. The evening was devoted to discussion of the day's news by the political commissar. Occasionally entertainment programs were provided in the evening. At 2200 lights were out and the men in bed. Soldiers had approximately 30

[20] Kerr, *The Russian Army*, Infantry Journal Press, Washington, 1944, p. 5.

minutes of their own time a day.

In unit training the Soviet Army took advantage of the vast range of climate and terrain available to them in their huge territory. Conditions range from the constant cold and scanty vegetation of the far north through the more temperate area of far-reaching belts of coniferous forests to the great spread of the ocean-like steppe in the south. There are mountains and deserts, huge lakes and wide rivers, and great maneuver areas unrestricted by farms and cities.

The army takes advantage of these conditions through a device called "route training."[21] Under this system units are constantly on the move. Detailed and exact schedules are drawn up indicating the arrival time at various training areas, the training to be performed, location of bivouacs, etc. Stress is placed on precise adherence to the time schedule. Variation of terrain and climate enhance the training. Separation from barracks life hardens the men. Tank crews learn to operate under a great variety of conditions, particularly those of difficult driving.

In the forward areas of the combat zone rigorous training continues unabated for reserve units. Conduct of special operations is emphasized—attack of fortified positions, raids, river crossings, etc.

The Russians were quick to correct their mistakes of the early period of the war. They improved and intensified their training based on the experience they had gained. General Kleist, CG 1st Panzer Army, had this to say of the Russian soldier: "The men were first-rate fighters from the start. . . . They became first-rate *soldiers* with experience. They fought most toughly, had amazing endurance, and could carry on without most of the things other armies regarded as necessities. The staff were quick to learn from their early defeats, and soon became highly efficient."[22]

V. The Soviet Soldier

Who is the man who mans the tanks of the Soviet Army? In the camp of the most extreme Red-baiters, he is depicted as a brutish lout, a fatalistic Asiatic barbarian, raping, looting, and swilling his way across the Eurasian continent under the cynical guise of "liberator." Less than ten years ago we were calling him a noble ally, a valiant patriot standing defiant before the Nazi scourge, fighting for his home, his family, and his country. The Kremlin says he is the superior product of a superior system, more intelligent, more efficient, and more cultured than the slaves of the capitalist warmongers—in essence, the Soviet Patriot.

Disregarding the extremes of judgment, it is evident on the record that he is a capable soldier. His very way of life has made him hardy and used to adversity. This is good because it enables him to fight without Coca-Cola, USO shows, food-service inspectors, and rear-area empires. He is accustomed to harsh discipline although it does not necessarily follow that he is always amenable to it or incapable of breaches of discipline —after all, there is a revolutionary tradition in Russia. He is young—the Soviet population has a high proportion of young people. He loves his country and his land and, as for his government, well, it may be a hard life under the dictatorship of the proletariat but the sacrifices of today will bring the perfect society of tomorrow. And even if he believes that tomorrow may be beyond his reach, it is still better to be a Soviet citizen, however grim life might be, than it is to be a capitalist slave.

In any event, in the new Soviet social hierarchy, the soldier occupies a favored spot. The Bolsheviks have made many concessions to insure that the army remains a loyal political instrument. While many of the privileges and benefits of higher social status are reserved for the officers, the soldier is not ignored. We might not think his position very enviable but relative comparisons are dangerous. What is famine to us may be a feast to someone else.

With regard to the technological skill of the average Soviet inductee, the evidence indicates that the army suffers by comparison with the West. This can be understood in terms of the industrial time-lag in Russia. General Deane noted the surprise of Russian soldiers observing the unloading of special purpose trucks at an American shuttle-bombing base when it became evident that *any* American selected at random could drive any of the vehicles. A Russian would require

[21] Fomichenko, *The Red Army,* Hutchinson, New York, 1945, p. 42.

[22] Liddell Hart, *The German Generals Talk,* Morrow, New York, 1948, p. 220.

special instruction to be able to drive more than one type.[23] However, this gap is being closed under the influence of forced-draft industrialization and intensive mechanization of agriculture.

In Soviet Russia, in order to maintain its people at mobilization pitch and to extract maximum effort from them, the state deliberately creates and fosters an atmosphere which is designed to make each citizen feel that he is personally building the socialist state. For the Soviet soldier this means the defense of the fatherland. Daily the danger of capitalist encirclement and attack is pointed out to him in which the United States is the main antagonist. This same line was used during the war to inspire Soviet hatred of the Nazis. Added to the natural Russian love of home and land, it resulted in a battlefield performance grudgingly admired even by the Germans. The *Voelkischer Beobachter* of July 1, 1941 stated: "The Red Army men are fighting like madmen, to the point of absolute exhaustion." And again on July 4, the paper wrote: "Our army has this time met an enemy who is defending himself with persistent obduracy, regardless of losses, and who does not give up one foothold of land without an exasperating fight."[24]

Ah yes, we say, he may fight like a bearcat but he is the product of a system which crushes initiative, penalizes independent thinking, and vitiates the power of decision. Such a line of reasoning seems logical and there is some evidence to support it, particularly in the middle grades of the officer ranks. However, the Soviet Army early recognized the need for developing noncommissioned and junior officers. Voroshilov stated, prior to the war: "Junior commanders will play the foremost and the most influential role in the next war."[25] Appropriate training was carried out vigorously and accounts of small unit actions during the war testify to its effectiveness. At the other end of the scale it is generally recognized that, during the war at any rate, the Soviet Army High Command encompassed such huge responsibilities and played such a vital role that its major commanders enjoyed considerable freedom of action. According to Guillaume the commanders of the various fronts were men of considerable talent "for in the Red Army, as elsewhere in the USSR, advancement depends, apart from unswerving devotion to the regime, solely on the ability to get results."[26]

VI. Conclusions

Several points appear to stand out as a result of this brief survey.

a. Early thinking on the employment of armor tended to neglect its exploitation role in independent formations in favor of its infantry-support role. During the war the trend was in the opposite direction with increased use of large armored commands.

b. Offensive operations of Soviet armor are characterized by deliberation. Emphasis is placed on detailed planning and careful rehearsals.

c. The motivating factor of the offense is the massive infantry assault, saturated with tanks and given violent artillery and air support.

d. The continuity of the attack is maintained by around-the-clock operations.

e. The conduct of the defense is marked by great tenacity and by the employment of reserves in a coordinated counterattack rather than in piecemeal commitment.

f. Organization appears to be flexible, adapted to the mission assigned and the material available.

g. Training is intensively and realistically conducted with an eye on the great variety of terrain and climatic conditions to be found in the Soviet Union.

h. The Soviet soldier is a very capable fighting man with strong patriotic motivations.

i. The gigantic space and sweep of the Soviet lands have had a fundamental effect on the development of Soviet strategy, tactics, and military technique.

j. Armor is an essential component of the Soviet combined arms team. Its employment is tactically sound and its material is of a high order. Postwar improvements can be expected to advance its performance.

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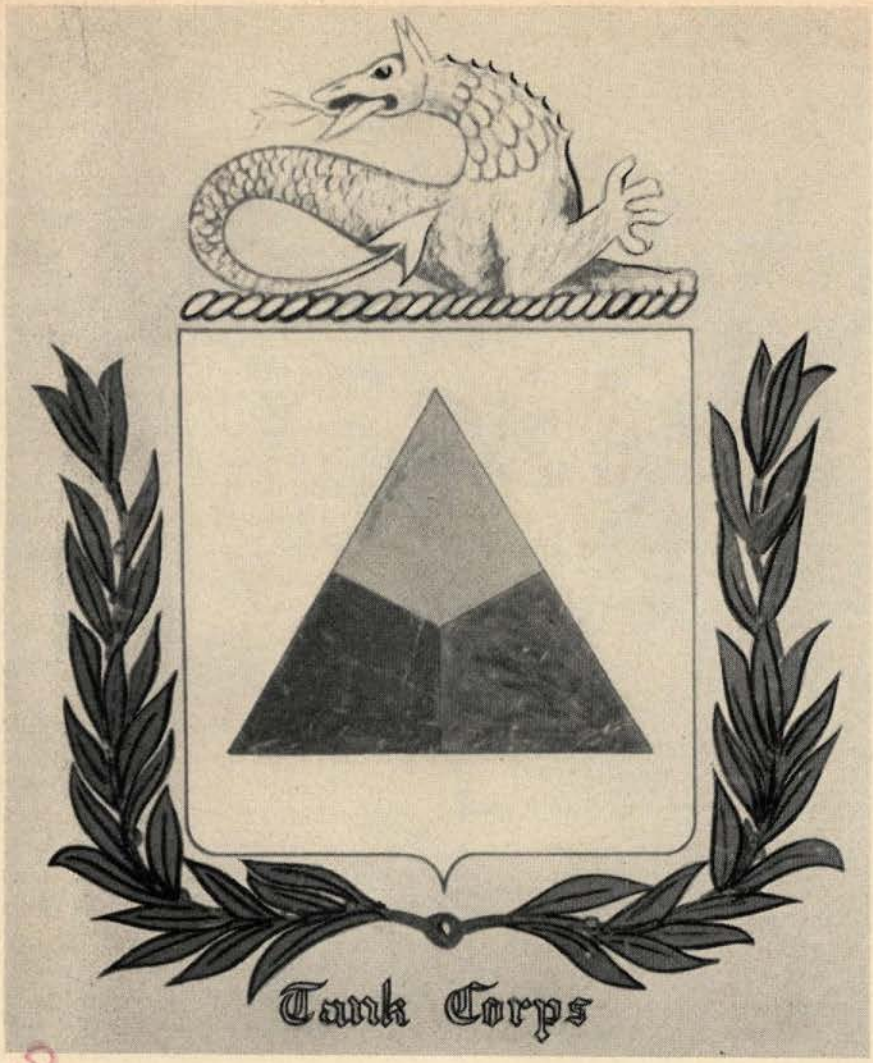
[23] Deane, J. R., *The Strange Alliance*, Viking, New York, 1947, p. 210.

[24] Berchin and Ben-Horin, *The Red Army*, Norton, New York, 1942, p. 171.

[25] White, D. F., *The Growth of the Red Army*, Princeton University Press, Princeton, 1944, p. 365.

[26] Guillaume, *Soviet Arms and Soviet Power*, Infantry Journal Press, Washington, 1948, p. 105.



The Symbol of Armor

by LIEUTENANT COLONEL FRANK K. BRITTON

Behaving like Mark Twain's generation on the topic of weather, tankers for decades have only talked about Armor's distinctive shoulder patch. This author has departed from custom in reducing to writing some of the interesting highlights of the subject. Those with additional information may address the author at The Armored School.

TO be a good patch, a shoulder sleeve insignia has to have eye appeal and must be a symbol. The Armor patch qualifies in both respects.

Not only does it have the necessary eye appeal, it has a variety of symbolic meanings full of significance. It has a specialized significance that appeals to a student of heraldry; it contains a variety of meanings for the historian; and it has especial significance for the exponents of a doctrine of combined arms.

Almost any soldier who wears the familiar three-colored, triangular patch with the symbols superimposed can tell you what it means. The colors are blue for infantry, red for artillery, and yellow for the cavalry—the three basic components of Armor. The superimposed figures have symbolic meanings that convey the characteristics of Armor. The tank track represents mobility and armor protection, the gun, fire power, and the lightning bolt, shock action. *Mobility, fire power, shock action;* these are the tank's triple role embodied in the striking power of Armor.

These are the immediate and striking meanings of the triangular shoulder patch. What is the heraldic significance? Heraldry is a science that grew up with the trappings of knighthood. It dealt then and deals now with *armorial bearings*, the elements of a coat of arms. Originally a coat of arms inscribed on a shield identified the knight who bore the shield. Later, the knight's descendants adopted the shield and its bearings, with perhaps minor modifications, as a kind of family mark. They put it on family belongings, hung it over fireplaces, posted it over entrances to estates. Hundreds of shields, all different, came to be the identifying marks of numerous families. The member of a noble household or retinue who was most intimately acquainted with the meaning of armored bearings was the herald—the one who made it a business to know a knight by his shield. Thus the name *heraldry* to denote the science.

At one time, no doubt, a shield identified nobility. But the use of identifying emblems is now wide-

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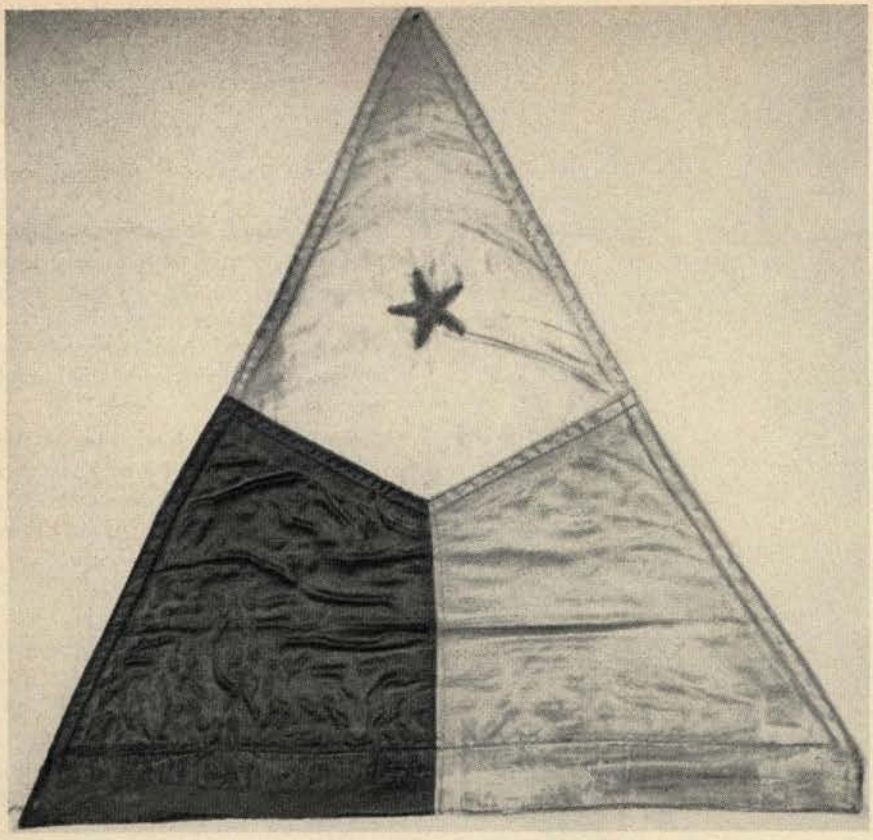
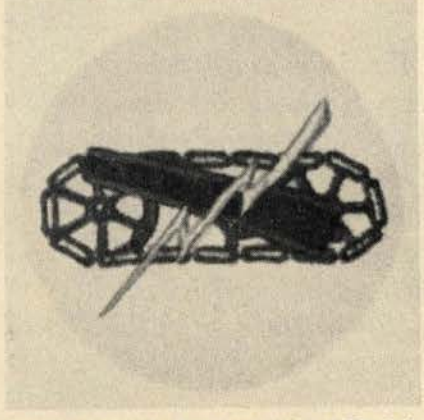


Original Tank Corps insignia was designed and fabricated at Nancy, France, in WWI, and used in St. Mihiel Campaign. As yellow was predominant, insignia was revised to equalize yellow, blue and red fields. Story has it that revision (above) was worked up in a cafe at Nancy and sewn by waitresses.

spread. The original purpose of differentiating and identifying has added to it now the purposes of decorating or of characterizing, and no field or activity is closed to the impulse to claim a distinctive mark. We see and recognize now symbols ranging from the universally recognized three balls suspended over the pawnshop entrance to so different a symbol as the cross of Christianity—from the carriage identifying a Fisher Brothers' product to the eagle on the Great Seal of the United States. You can think of innumerable others—the emblems and symbols on banners, those on trade marks of business and industry, and those on state and country seals and flags.

The main prerequisite of a seal or coat of arms is that it be decorative and that it somehow both identify and characterize what it stands for. Take as an example the cross. Its once infamous meaning to ancient people was elevated to an immortal significance by Christ's crucifixion. Now, wherever it is found, it is a symbol of the religious or humaritarian impulse. Witness the symbol of the *Red Cross*. But the significance of other symbols is not so easily discovered, even though they may have been identified for long periods of time with certain activities or institutions. We recognize a pawnshop by its symbol; but what do the three balls mean? What is their historical significance? How did they come to be associated with the activity of a pawnshop? Or, what is there especially appropriate about the eagle to the United States; the bear to the Soviet Union—or the hammer and sickle? Or, more to the point, what is the especial significance of the Armor patch with its three colors and the three symbols superimposed?



Shoulder patch, 7th Cav. Brig. (Mech.).

It was in January 1918 that the Tank Corps of the United States Army was created, with General S. D. Rockenbach its chief. At his direction not long after, Lieutenant Wharton designed the original coat of arms which hangs now in Patton Museum at Fort Knox (see figure 1). Notice that the design of the original coat of arms of the Tank Corps followed an old armorial method, a *shield* (silver) bearing a *charge* (the three-colored triangle), and a *crest* (the dragon in silver). What significance did the elements of the coat of arms have? To say that the three colors in the triangle were symbolic of the basic components of the Tank Corps is to speak with the advantage of hindsight. It is perhaps more likely that the colors stood for the Arms which *made use* of tanks or exploited them as a new weapon.

It was almost habitual for tanks to precede the infantry, after a heavy artillery barrage, in order to demolish strong points. If the tanks and infantry were successful, the cavalry would exploit the initial penetration. Thus we see cavalry, artillery, and infantry combining their efforts, using tanks as a kind of extra weapon. We might say that at this time the only element of Armor tactics made use of was that of surprise or shock action. There was no such thing as an *Armored Force* with a *tactic*, and Lieutenant Wharton's original triangle was merely singularly and fortunately prophetic of the powerful combined arms fighting team as we now know it.

There is additional evidence in this initial design, however, that Lieutenant Wharton was setting forth symbolically the belief of a few farsighted men. The triangle itself is an old heraldic element of armorial design known as a *pile*—the head of a spear. Tanks were actually the spearhead element in the engagements in which they took part in World War I, though their inherent force was vitiated, for the most part, by their employment in long, thin, and scattered lines. And the dragon at the crest of the design was also the *charge* on the coat of arms for the 1st Cavalry. The 1st Cavalry was organized during the Black Hawk War as *The Regiment of Dragoons*, and the dragoon is clearly a pun on the word dragon. Is the *dragon* on the crest of Lieutenant

Wharton's design indicative of the dominant role cavalry would later play in the Armored Force, or suggestive of the mobility of cavalry passing over into armor?

The birth of armor on the battlefield of World War I was, however, an abortive one. Though tanks helped break the inertia of trench warfare, another sort of inertia, suggestive of the "Maginot complex," settled for more than two decades over the thinking of military and political minds—except for those of a handful of men who saw the possibilities of armor resident in a tactic of combined arms. The names of Van Voorhis, Chaffee, and Patton are numbered among these. And the three-colored triangle that General Rockenbach had had made into a pennant to be carried on his personal vehicle was seen only occasionally in a tank park or motor pool (see figure 2). The relatively poor showing of tanks during the first world war is about the only excuse that influential but shortsighted men had for not developing armor to the fullest. This poor showing was due not to any inherent fault of the tanks but to their misemployment.

In the meantime the Germans, under Hitler, had also seen the possibilities in armor, developed a doctrine around it, and had put it into practice with devastating effect in Poland and France. While the Germans had been experimenting with tanks, armored forces, and doctrine (using Spain as a proving ground), the United States Tank Corps had been dissolved and the development of tanks given over to the Chief of Infantry, and experiment with mechanized theory assigned to the Cavalry. Training and practice in armor, utilizing a theory of combined arms, was effectively halted.

However, the events in Europe in 1939 and 1940 finally brought to a head the hitherto all but futile urgings of a few men like General Van Voorhis and General Chaffee; and an Armored Force was belatedly created on 10 July 1940, just fifteen days after France fell, with General Chaffee commanding at Fort Knox. It was at Fort Knox also that the 1st Armored Division was stationed, formed with the 7th Cavalry Brigade (Mechanized) as a nucleus, the 6th Infantry, and elements of artillery, engineer, signal, air, quartermaster, and medical units added. This represented the first time that all the elements (though not yet in sufficient quantity) had been assembled and united under one command to form a force qualified to train and practice in an armor doctrine centered in a combined-arms tactic. The time was right for an appropriate patch signalling this new union.

It was the 7th Cavalry Brigade (Mechanized) that contributed the other part of the present Armor shoulder patch. This unit had been formed in 1933 out of the 1st Cavalry Regiment (led from Marfa, Texas, in 1931 by General Van Voorhis, then a Cavalry colonel) and about 150 men from Fort Eustis, Virginia. This brigade, later joined by the 13th Cavalry and the 68th Field Artillery, was organized expressly for training in mechanized warfare. In the shoulder patch of the 7th Cavalry Brigade (Mechanized) (see figure 3), one can see the development, even under suppression, of a doctrine of armor. Designed and drawn by Lieutenant Colonel Linthwaite (then Private First Class) in collaboration with Major General Robert W. Grow (then Major), the patch was designated the official brigade insignia by General Van Voorhis, despite the War Department's indifference to repeated requests to have it designated. In a letter of 3 June 1940, General Van Voorhis explains his theory at that time of a mechanized force:

> . . . one possessing fire power, mobility, and shock. Mobility was contained in the Cavalry element, which was then equipped with light, armored vehicles; fire power was obtained in the Artillery elements; and shock was represented by the combined efforts of the command, more particularly the power of tanks, represented by the Infantry.

The patch symbolizes this theory with its three figures, the track, gun, and bolt of lightning on a yellow, oval background. Thus the patch served not only a decorative purpose but definitely characterized the unit which wore it.

After the formation of the Armored Force in 1940 under General Chaffee, the triangle of the old World War I Tank Corps and that of the 7th Cavalry Brigade were put together, thus giving the Armored Force patch an historical significance—definitely linking its origin with the Tank Corps and the coat of arms designed for it by Lieutenant Wharton in 1918. The function of the shield which once bore the Tank Corps *charge* was now taken over by the *charge* itself; and the triangle became the field upon which are borne the symbolic figures characterizing the mission of the Armored Force. Thus the present-day patch, designated official in November 1940 by the War Department, represents a stage in the development of combined arms theory just as surely as does Armor doctrine itself. Any of its wearers should be conscious of the continuous history its design represents, and proud of the thinking and doctrine it characterizes. It is a union of separate arms which yet preserves the integrity of those units in a new and vital *esprit de corps*.

New Edition of Cullum's Biographical Register of the Officers and Graduates of the U.S. Military Academy

Volume IX (Supplement 1940-1950) of *Gen. Cullum's Biographical Register of the Officers and Graduates of the United States Military Academy* is now under preparation at West Point. This volume will include the records of all those graduated since 1940, to include the Class of 1950, and will continue the records of all other graduates. Since this ten-year period, 1941-1950, includes World War II and the war service of the thousands of graduates who served therein, Volume IX of the *Register* will be by far one of the most important editions yet undertaken.

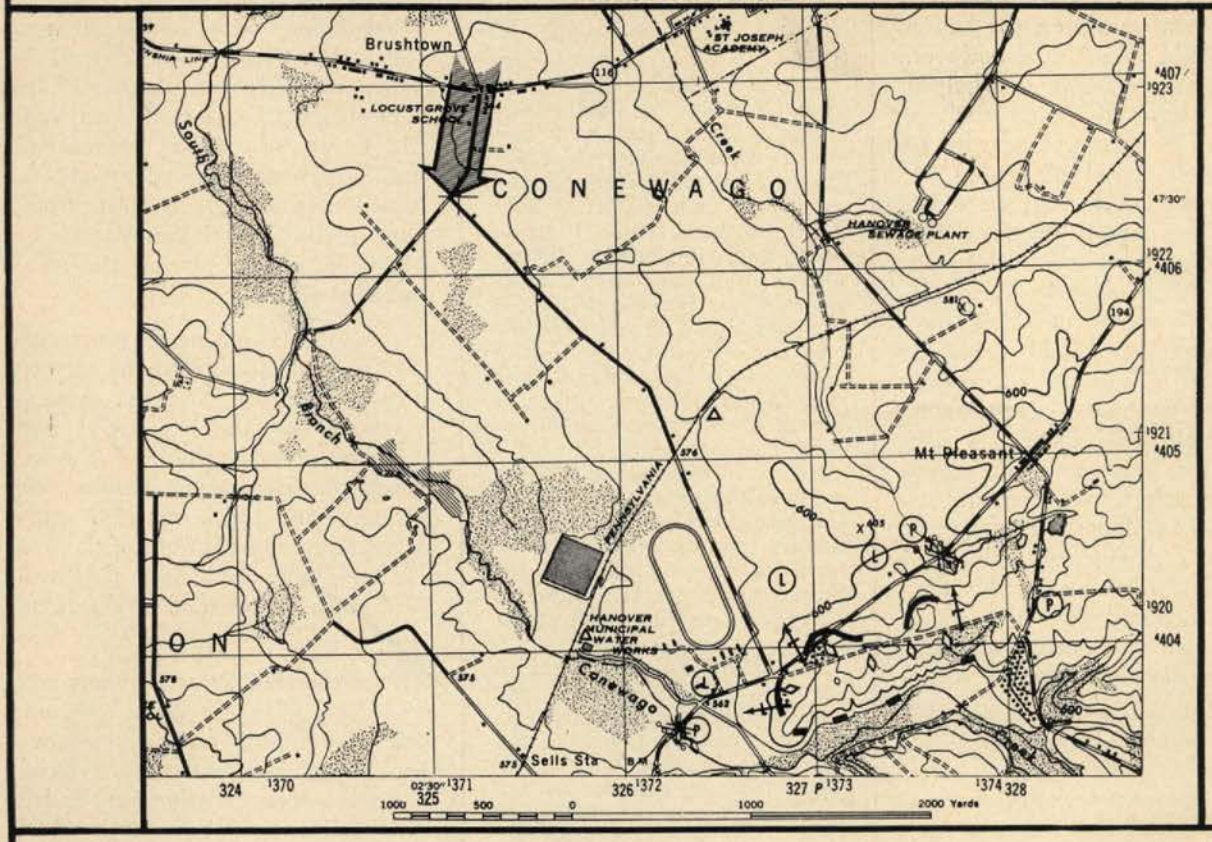
Since the best source of information about a graduate's record is the graduate himself, a comprehensive form to obtain this information was mailed last fall by the Superintendent, U.S.M.A. to every graduate whose address was then known at West Point.

But in these times of sudden changes in the addresses of many officers, the Superintendent's request has probably failed to reach a substantial number of graduates whose records are needed to complete the book. A note stating his present mailing address, from any West Point graduate who has not yet received the Superintendent's request, to *The Editor, Cullum's Biographical Register, West Point, N. Y.*, will bring a form to him by return mail.

HOW WOULD YOU DO IT?

Continued from January-February, 1951, Issue

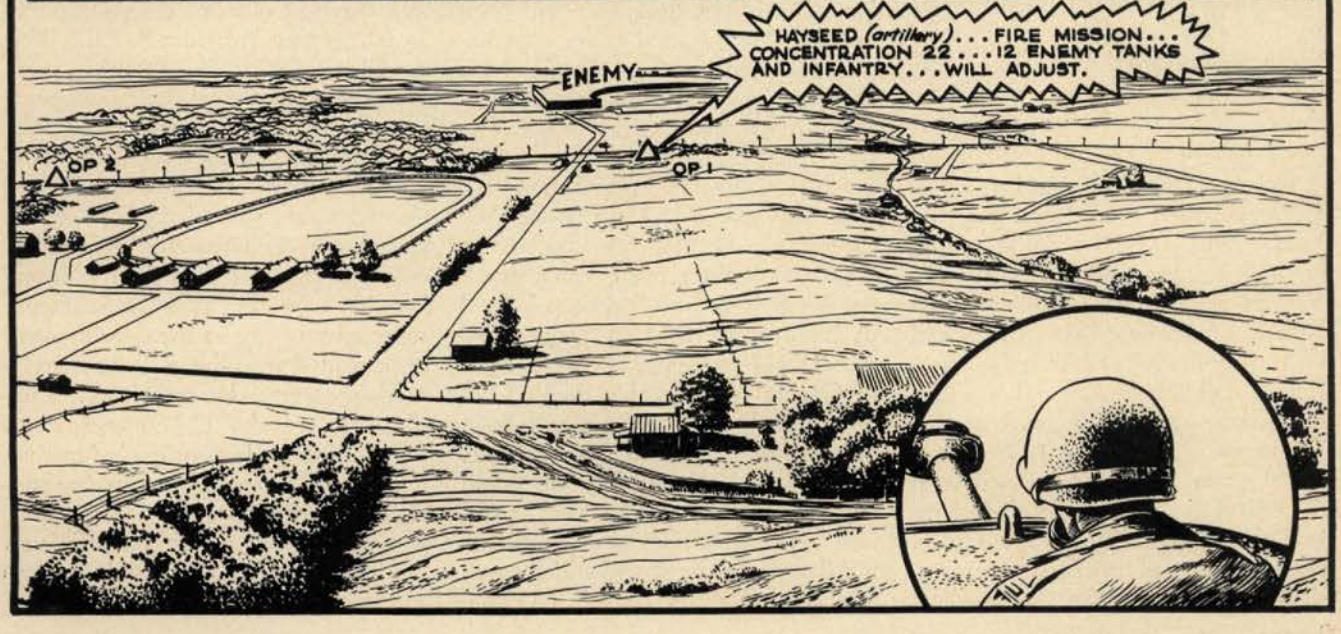
AN ARMORED SCHOOL PRESENTATION — AUTHOR: MAJ. V. J. FENILI — ARTIST: M SGT W. M. CONN



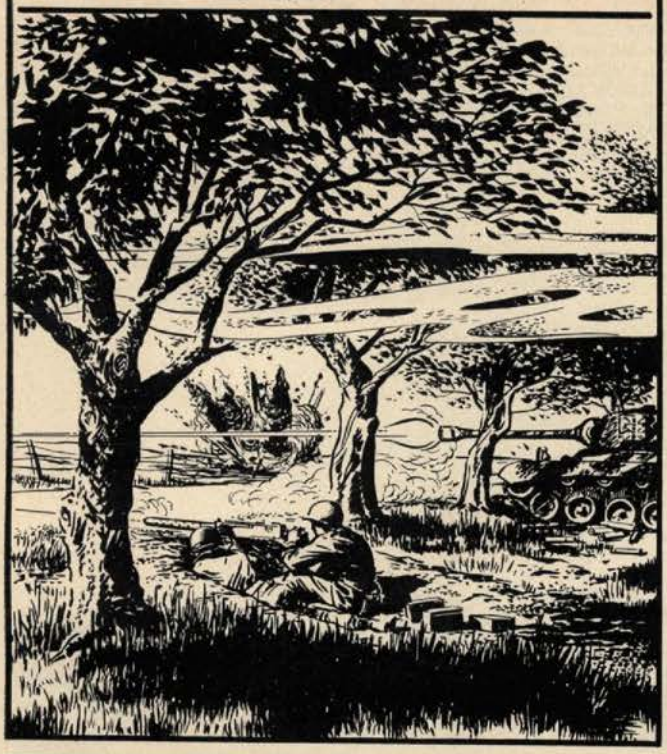
SITUATION:

YOU ARE THE PLATOON LEADER, 2D PLAT, CO A, 21ST M TK BN (REINF), PART OF CCB. YOUR PLATOON, REINFORCED WITH THE 2D PLAT, CO A, 111TH ARMD INF BN, IS DISPOSED AS SHOWN ON THE ABOVE MAP TO DEFEND THE ASSIGNED STRONG POINT WITHIN THE COMPANY SECTOR. TACTICAL AIR RECONNAISSANCE HAS REPORTED THE MOVEMENT OF ENEMY FORCES FROM THE NORTHWEST TOWARD THIS AREA. SUDDENLY PLATOON OBSERVATION POST NR 1, IN VICINITY RAILROAD CROSSING 576, COORDINATES 263050, REPORTS THAT AN ENEMY FORCE OF APPROXIMATELY 12 TANKS AND A COMPANY OF INFANTRY IS ADVANCING SOUTH FROM VICINITY LOCUST GROVE SCHOOL 253069. THE HEAD OF THE ENEMY COLUMN IS AT RJ 252064.

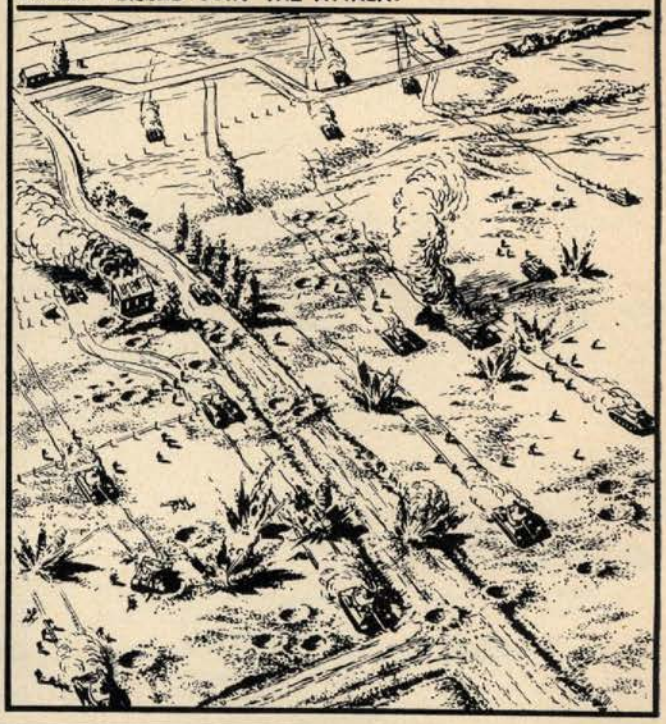
YOU IMMEDIATELY ORDER THE OBSERVATION POST TO REQUEST AND ADJUST ARTILLERY AND ASSAULT-GUN FIRE ON THE ADVANCING ENEMY FORCE. YOU ALERT YOUR REINFORCED PLATOON FOR ACTION IN THE GENERAL DIRECTION OF THE ENEMY THREAT. THEN YOU REPORT THE PRESENCE OF THE ENEMY TO YOUR COMPANY COMMANDER.



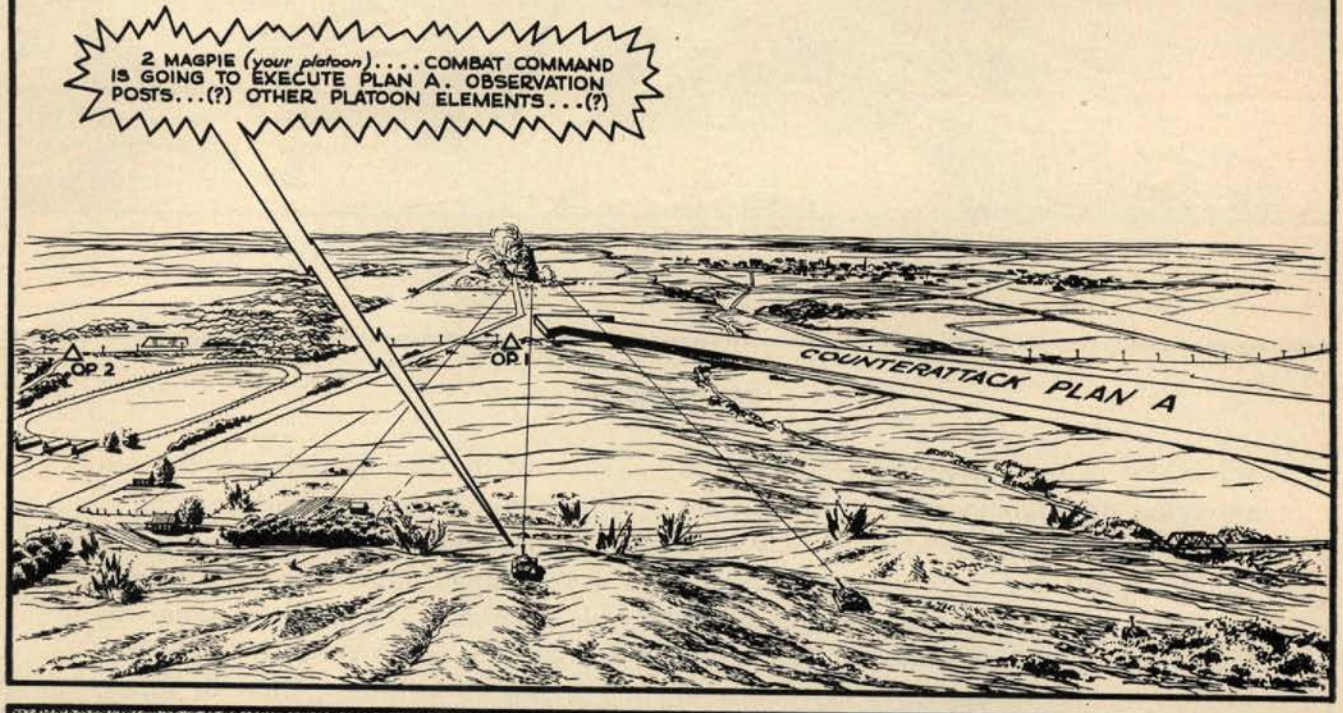
YOUR PLATOON DIRECTS AN INCREASING VOLUME OF FIRE ON THE APPROACHING ENEMY.

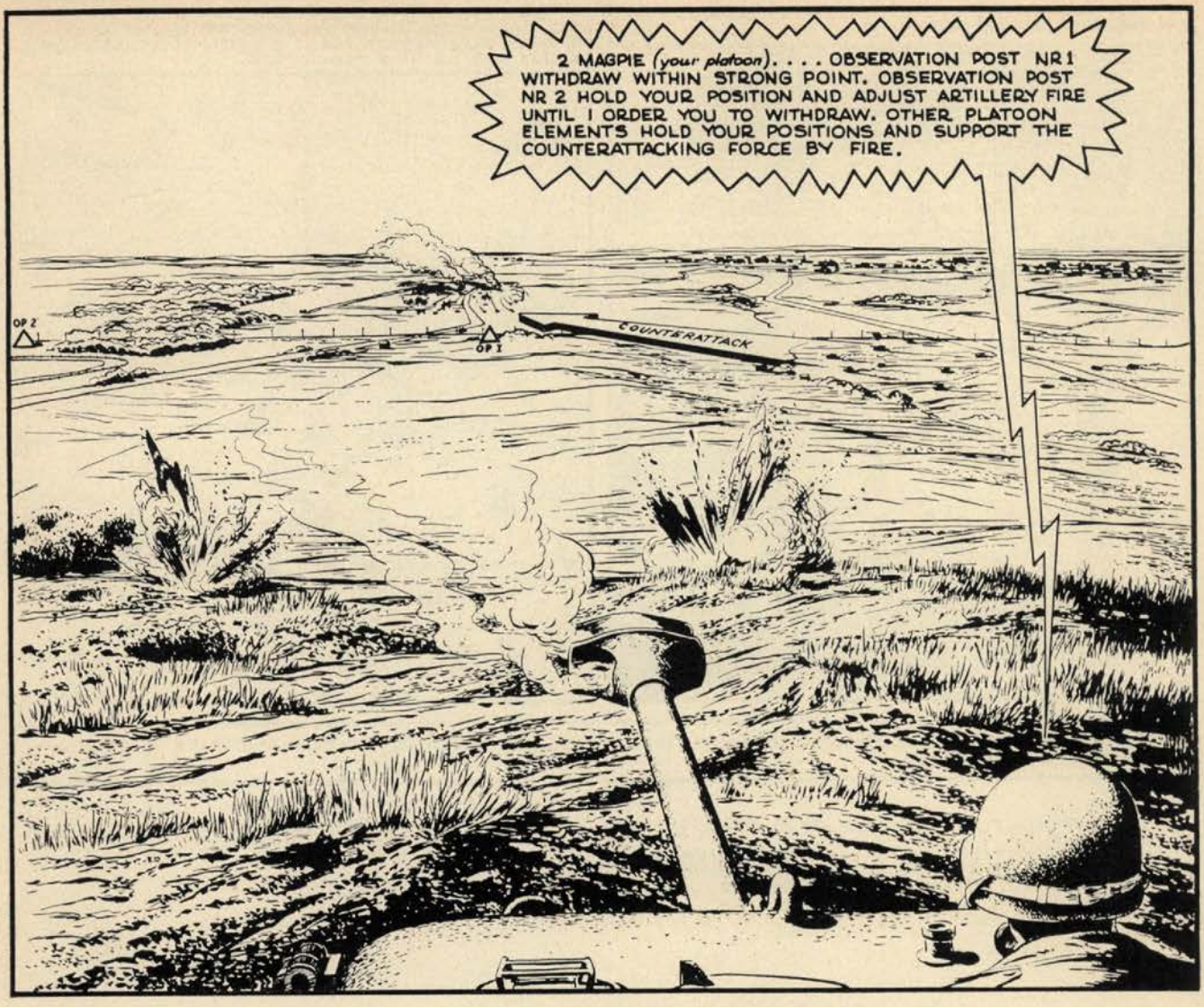


OTHER COMPANY, BATTALION, AND SUPPORTING ELEMENTS ADD THEIR FIRES TO THE DEFENSE. THE ENEMY ADVANCE IS SLOWED CONSIDERABLY BUT IS NOT STOPPED. ADDITIONAL ENEMY FORCES JOIN THE ATTACK.



THE COMBAT COMMAND COMMANDER REALIZES THAT IT WILL BE NECESSARY TO COUNTERATTACK THE ENEMY FORCE WITH HIS RESERVE.





DISCUSSION

When the enemy approaches the outpost system of the mobile defense, the observation or listening posts give warning and maintain observation of the enemy, falling back to the strong point only on order of the platoon leader. The platoon leader reports the approach of the enemy to his company commander, calls for prearranged supporting fire as needed, and holds his position. The position under attack exerts every possible effort to delay the enemy force, to cause it to deploy, to stop it, and to destroy it by subjecting the enemy to increasing fires of tanks, small arms and supporting elements. Natural and artificial obstacles previously established play an important part in repulsing the enemy. The strong point holds its position until forced to withdraw, and then withdraws only on order of the next higher commander. In the event that the mobile reserve of the combat command is employed to counterattack the enemy force, the strong points support the attack by continuing to fire on the enemy.

FROM THESE PAGES

60 Years Ago

In mountain fighting, which includes Indian warfare, the cannon is but the means whereby a certain amount of destructive energy is hurled into the immediate vicinity of an enemy who is detained only by the nature of the ground, who constructs no earthworks and makes no stand for longer than a few minutes during the action. The useful energy is not that of impact, as in larger cannon, but that which is contained in the explosive shell. Were the destructive effects of impact alone intended, we have all that can be desired in the efficient small arms and machine guns of the service, and the transportation of cannon would be useless and inconvenient. Hence it is the energy of the projectile itself that we must use, and its effective distribution which we must seek by all means to secure. This distribution can be improved by—

1. Increasing the mass of the projectile.
2. Increasing the strength of the bursting charge.
3. So shaping and proportioning the interior of the shell that the energy of the bursting charge will send it into as great a number of dangerous fragments as its size will permit.

Mountain Cannon

ALVIN H. SYDENHAM
2d Lt., Eighth Cavalry

◇ ◇ ◇

20 Years Ago

Discussions of tank actions or defense against tanks should be based on certain assumed characteristics of the future tank; for the purpose of the present discussion they are:

a. Invulnerability to anything but a direct hit by artillery.

b. A maneuvering speed of from 10 to 60 miles an hour on any terrain over which the tank can operate at all.

c. A radius of action and a freedom from mechanical faults equal to those of the present automobile.

To anyone who has followed the recent developments of the track-laying or the combination wheel and track vehicle, both in this country and abroad, it will be evident that these assumptions are by no means visionary and that there will be tanks with these characteristics or with characteristics closely approaching them in our next war. It is high time for us to develop some ideas for their tactical use in both offense and defense.

In another paper the conclusion is reached that a mechanized force, as a separate arm, is a weapon of the army commander and that he will use it in attack in the direction of the main blow of his army, and against objectives well in rear of the objectives of his infantry divisions. In considering the defensive it is necessary to realize that fast tanks will also be present in the attacking divisions and corps and that defensive measures must be taken along the whole front of an army position, as well as on any exposed flank, excepting only on those portions which the terrain makes obviously impracticable for tank maneuver.

Defense Against Tanks

K. B. EDMUNDS
Lieut. Col., Cavalry

40 Years Ago

The strategical and tactical training of the division is necessary and important, but in our service it can only be attempted at maneuvers, and not always then. Although nominally brigades of two regiments are formed at the maneuvers, the cavalry is usually split up and assigned to the opposing sides. Therefore no attempt is here made to suggest a scheme for this training. Should brigade or division be formed for any maneuver camp, the officer to command it ought to be given ample notice of his assignment in order that he may work out a plan which will insure the maximum amount of instruction in the two important subjects of strategical reconnaissance and the use of cavalry masses on the battlefield.

The relative importance of training in mounted and dismounted work has not been touched upon. It is sufficient to say that the men must be well instructed in both. In our service, as is well known, we have heretofore paid too much attention relatively to dismounted training and foreign services have neglected it (except perhaps the Russian). Now, however, the indications are that we are paying more attention to mounted training while not slighting dismounted training, and that the foreign services, especially the English and German, are realizing the value of the latter and lay special stress on it in their drill regulations. So, in case of war with foreign troops, we may expect to find them well trained in dismounted action as well as mounted. As we can more than hold our own dismounted, it behooves us to put more time on mounted work, that we may be able to meet any emergency.

Instruction for Cavalry Command

T. Q. DONALDSON, JR.
Captain, Eighth Cavalry

◇ ◇ ◇

10 Years Ago

"The armored force is the assembly under a single head of all mechanized troops in the United States Army, and combines the infantry tanks with the mechanized cavalry. In modern warfare it is the heavy cavalry of a motorized and mechanized army.

"The form of action of the armored divisions is offensive and aggressive. It sustains surprise by the speed and drive of its tactical movement. It uses its mobility to choose the most favorable directions of attack to reach vital enemy rear areas.

"Its defense is elastic and mobile and characterized by the counterattack. It does not seek to attack the strong place of the enemy. It places its strength in the weakest place in order to break through and penetrate the rear areas of the enemy.

"Once into these rear areas it fans out to cut communications and supply, and then, by dual development, drive the enemy up into the holding force of the infantry. In this maneuver the enemy has no alternative to save him from destruction.

"The only course left to him is to retreat, yet, in so doing he leaves his flanks unprotected and subsequently his forces vulnerable to destruction."

War Department Official Language

EDITORIAL

Of wars, soldiers, militaristics and such in the Seventeenth Century

Some Pilgrim Contemporaries

by DR. ROGER SHAW

I

THE GREAT ELECTOR

IN the same year that the Pilgrim Fathers landed at Plymouth Rock, 1620, the greatest of all the Hohenzollerns was born. He was the eleventh of his family to become Elector of Brandenburg, and his name was Frederick William.

Unlike the first Hohenzollern Elector, Frederick, Frederick William liked his little Brandenburg. He was by nature a builder, and a subtle schemer as well. But above all, it was under his direction that that omnipotent juggernaut, the Prussian Army, was founded. His was the first great victory in Prussian military history: the forerunner of all the Zorndorfs, Waterloos, Sedans and Tannenbergs that were to follow in regular succession. Also, this extraordinary figure founded the Prussian Navy, and in the World War a German warship was to bear his name. It is barely possible (according to the gossips) that Frederick William was not a Hohenzollern. His mother was a delightful, erring princess from the Palatinate. For that matter, the sainted Franz Joseph Hapsburg (who died in 1916) may (gossips whisper) not have been a Hapsburg, but instead the grandson of Bonaparte, via *L'Aiglon*.

Frederick William was a slow, melancholy youngster. But he spent four formative years in radically "modern" Holland, and acquired a keen interest in soldiering and tactics. He liked to wear armor, and be painted in it. He was on bad terms with his father, who never gave him enough money, and even believed on occasion that his father's Electoral ministers had served him with poisoned tarts. But despite such morbid imaginings, he learned statesmanship and other things in the Netherlands, as subsequently did Peter the Great of Russia.

At twenty Frederick William came to the little Electoral throne, with its half-million boorish subjects. The Thirty Years War was coming to a close, two-thirds of the population of Brandenburg had perished, along with their flocks and herds, and the already desolate country had been wasted by fire and sword. Berlin (population today, 4 million) was a village of a few thousand unhappy people. The "army" consisted of mercenary bands of free-companions, and groups of discontented feudal levies.

The Swedes on Top

Victorious Swedes, self-appointed champions of German Protestantism in the Thirty Years War, were everywhere—and the Swedish military machine at that time was the most powerful instrument of conquest in the world, while the Baltic Sea was a Swedish lake. Frederick William never loved the Swedes, the so-called "lions of the north." Further, like his Electoral predecessors, he had to do homage to the King of Poland for the feudal tenure of East Prussia, making a humiliating trip all the way to Warsaw for that "loyal" purpose. He tried to marry a Swedish princess, daughter of the great Gustavus Adolphus, but she turned him down. So he married a Dutch girl with French Protestant relatives. This marriage was to bear political fruit of the first basket.

Nobody in Brandenburg and its East Prussian dependency wanted a strong standing army. The feudal Junkers feared its centralizing power, while the city burghers objected to a crushing taxation devoted to military purposes. But the young Elector clamped on excise duties with a vim, tortured and executed recalcitrant Junkers, and kept his weather eye on the splendid Swedish model, the last word in Seventeenth-Century armies.

He needed an organizer, one skilled in the Swedish ways and means, and he found him. In 1938 the Prussian army overran Austria, and this army was founded by an Austrian: Baron George Derfflinger. Frederick William was lucky to get Derfflinger. Born in 1606 within the Hapsburgs' hereditary domain, he was a determined Protestant. Putting religion before nationality, the baron served with the Swedes in the Thirty Years War and rose to a colonelcy. Six years after the close of the war, he entered the service of Brandenburg and Frederick William. He became to the Elector what Steuben was to Washington: tactician and drillmaster extraordinary. Cavalry was his specialty, and he rose to become a Brandenburg field-marshal. He lived till 1695.

Another of the Elector's high generals was Frederick Schomberg, born in Heidelberg of an English mother. During his varied career, Schomberg was a field-marshal, general, or important officer in the Dutch, Swedish, French, Portuguese, and Brandenburg armies, in all of which he served with great success. Like brave old Derfflinger, he was a man of high character and constant scruples. Brandenburg loaned him to William of Orange for the invasion of England, and he was killed at the Irish battle of the Boyne, in command of an army of English, Irish, French, Finns, Danes, Dutch, and Brandenburgers. This was in 1690. He is buried in Dublin.

With the help of the Swedes, Frederick William embarked on a war with Poland in order to shake off his feudal obligations to that hectic country in the matter of East Prussia. Swedes and Brandenburgers captured

Warsaw, though they watched one another with mutual suspicion. Then he quarreled with Louis XIV of France, and aided his old friends, the Dutch, against the Sun King. Austria also came to the help of the Dutch, instructed to "run in double harness with Brandenburg like a well-behaved quiet horse beside an unbroken colt." Hohenzollerns and Hapsburgs were on the same side.

A First Victory

Louis turned the Swedes loose against the Brandenburg Elector, but as they marched on Berlin, Derfflinger and the Elector defeated them in the first victory of the first Prussian army. This was in 1675, a holy day in Prussian history. We shall examine it in some later paragraphs, this battle of Fehrbellin described by Prussian historians as a struggle of Titans against Gods. But by the peace settlements which followed, European in scope, the defeated Swedes were reinstated in North Germany, to the disgust of the Elector and his Brandenburg.

Thereafter, the Elector—called the "Great Elector" after Fehrbellin field—played off Swedes against Poles and Poles against Swedes; Louis against the Holy Roman Emperor and the Emperor against Louis. Internationally, he was consumed with bitterness. He allowed Louis to take much of Alsace-Lorraine, those provinces which one of his Hohenzollern heirs was to recapture, and another was to lose again. The French Sun King had bribed, apparently, half the population of Brandenburg in order to accomplish it. And this included the Elector and Electress. The Elector was paid 100,000 livres annually, and got several raises. He could not forgive the Emperor and his allies for letting him down after Fehrbellin.

The Great Elector tried to look like Louis XIV, as did all the petty despots of the day. He wore armor, which was going out of use, and long black curls, and posed with a tall staff in the best Sun King manner. On his face was a "grand" expression, and his feet were inclined to strut gracefully. Louis called him his "dearest friend." And when Louis' other friends, the Turks, swarmed up out of the Balkans to the very gates of Vienna (as Penn was founding Pennsylvania) the Elector gave no help to the beleaguered Holy Roman Empire. So John Sobieski, the Polish King, came to the rescue with his knightly winged lancers, saved the day, and *Kultur* triumphed over Koran. The Turks retired, leaving behind them to the Viennese cafés and lilacs. Their Janissary shock-troops mutinied, and the Sultan abdicated. Woe to Islam.

But at one important point Frederick William crossed Louis. When the Sun King expelled his thrifty and industrious Protestant subjects after severe persecution (by revocation of the Edict of Nantes), the Elector countered with the Edict of Potsdam. This was in 1685. All the French refugees were formally invited to Brandenburg. Some 20,000 Frenchmen came at once, bringing with them those arts and crafts in which sandy Brandenburg was so singularly lacking. Berlin became almost a French town, and to this sad day many prominent Brandenburg families have French names. The first World War's No. 1 U-boat commander was named Arnauld de la Periere. He was one of many.

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Some of the French Protestants were military men, and their services proved invaluable in building up the Prussian army. They were mainly of the upper and middle classes. Frederick William also imported thousands of Dutchmen and Flemings as simple farmers. Adept at working with dykes, they helped to drain the Brandenburg marshes and cultivate the sandy soil. They swelled the scanty Brandenburg population, and tended to outbreed the notable Slavic strain in the areas around Berlin.

But the Great Elector was not satisfied by mere colonizing at home with French and Dutch immigrants. He became interested in Africa. Everyone else was at it, so why not he? He acquired a small patch of Guinea, on the African west coast, which he fortified. It was called "Grossfriedrichsberg." Some Negroes were brought to Berlin, where they were greatly admired, but the colony was not productive. Frederick William's merchants at home were not eager to back his venture into imperialism, and he decided to enter the slave trade, from the Guinea coast to the American West Indies. But he could not hope to undersell the Portuguese and Dutch, adepts at the ghastly business, and "black ivory" was not long to be associated with the black-and-white flag of Brandenburg. The little colony gradually declined, and the Great Elector's successors sold it to the Dutch—*cheap*. The second Hohenzollern colonial empire of a million square miles was to be lost at the close of the 1914 World War. It was but little more profitable than that of the Great Elector.

With Colonies—A Navy

With colonies go navies, as the exiled Woodchopper of Doorn (William II) always maintained. The Great Elector agreed with this theory. But he needed an organizer, just as he had for his army. For the army he had procured an Austrian baron. For the navy he obtained a Dutch Jew.

This was a bankrupt shipowner named Benjamin Raule, a man of resource and a Seventeenth-Century go-getter. The Elector "legalized" Raule as a privateer, and in no time at all the seagoing Hebrew had seized a score of Swedish ships. This naval contraband, plus a few boats rented from the Dutch, became the Prussian navy, *pro tem*. Unlike the Prussian army, the navy did not last very long. Jutland battle in 1916 was to revive its memory. Magnificent soldiers, North Germans are by no means landlubbers.

Nor was the militaristic Frederick William totally blind to the fine arts

and sciences. He followed the example of the current Emperor, Leopold, a most unattractive fellow with a horrible lower lip, by assembling a library of not insignificant dimensions. At the instigation of his Dutch wife, he collected Netherlands pictures and painters at Berlin. He hobnobbed with Leibnitz, the philosopher and mathematician from Leipzig. This was saying a good deal, for Leibnitz was "eminent in history, divinity, philosophy, political studies, experimental science, mathematics, mining engineering, and even *belles-lettres.*" Leibnitz liked to talk about monads; he was that sort. He became first president of the Academy of Sciences of Berlin; but when he planned an invasion of Egypt for Louis XIV (in order to distract the Sun King from his vicious schemes against the Empire) Frederick William was cold to the plan. He rebuffed Leibnitz in the matter, although long afterward Bonaparte carried out the Leibnitz scheme. Bismarck, after 1870, was always delighted to keep the French happy and occupied in North Africa. In this he was brighter than the Great Elector.

The Bulwarks First!

The Elector had a terrible temper. His numerous sons were afraid of him; the courageous Leibnitz did not like him. When a burgomaster tried to show him a beautiful cathedral and a splendid, new, wide street, he shouted for "The bulwarks first!" His primary interest, like that of most of the Hohenzollerns and unlike the breeding Hapsburgs, was in military matters, fortifications and drills and new weapons.

He died of heart-disease at 68, on the job till two days before the end. Unlike Louis XIV who surrounded himself with capable experts in all fields, the Great Elector preferred to act as his own cabinet. He disliked Ministers in general, and was impatient of their ditherings. At the time of his death he was dominated almost completely by a second wife, who was quite capable of standing up to him.

This second wife, Dorothea, had seven children in eight years without a murmur. She was fond of drinking, fighting, and baptizing. She went into the real estate business north of Berlin —and made money at it. She planted the first tree in *Unter den Linden.*

She was the none too kindly great-grand-stepmother of the "first" King of Prussia, Frederick the Great!

U.S. Army

Reminiscent of frontier warfare in the Old West, a unit of M46 Pattons form a protective corral prior to moving out in the attack in Korea.

II

FEHRBELLIN

Since it was in the Great Elector's long reign that the Prussian army was organized under an Austrian, and with the active cooperation of the Elector himself, it may be of some interest to examine the military manners of the period. For the epoch saw the dawn of modern warfare, without a doubt.

In a sense, Gustavus Adolphus, the Swedish Snow King who did not melt in hot South Germany, was the founding father of the new militaristics. He had plunged into the Thirty Years War to aid the German Protestants and rebellious feudal princes at the head of a highly trained and disciplined little army, supplemented by German and British mercenary bands. This Swedish army was considered the last word, and it so proved itself upon the German battlefields. It won repeated victories over the Emperor's armies and auxiliaries, notably at Breitenfeld against Tilly, and at Lutzen (1632) against Wallenstein. Gustavus was killed in the latter battle, but his military machine, aided by France, rolled on for sixteen years more.

This Swedish army was a national army, recruited by conscription and inspired by a novel sentiment called "patriotism." It was rigidly drilled and disciplined, behaved itself on campaign, at least in theory, and was the property of the national monarch. It was not nearly as religious as is commonly supposed, and its German and Scotch auxiliaries did not always add to its good reputation. The men were paid regularly, had a high *esprit de corps,* and employed novel weapons and tactics. They wore uniforms, and their rape-rate (considering the Thirty Years War) was quite low. In short, Sweden was the Prussia of the time, and the Prussians learned from Sweden.

This "regular" Swedish army, which rather resembled His Majesty's red-coats in the American Revolution, took the place of two kinds of army. One of these was the outdated feudal militia levy: a motley crew of embattled barons and their retainers, willing to serve for perhaps forty days per year. These noblemen were accustomed to fight in Homeric fashion, could not be properly disciplined, and were always ready to stab their monarch or general in the back. Even as heavy cavalry, they were none too efficient. Piece by piece, their armor was being discarded. Their decline had set in two centuries earlier. They

were dull fellows who considered gunpowder ungentlemanly and gunners as scum fit to be hanged.

Free Companies

These feudalists, for the most part, had yielded place to the so-called "free-companies" by the time of the Thirty Years War, and in fact long before. A free-company was a capitalist venture in which the captain was organizer, quartermaster, armorer, and super-salesman. He gathered his troop together from every quarter and hired it out to the highest bidder, regardless of place or race. The French liked to hire Swiss ("no gold, no Swiss"), the Italian cities employed English or German *condottieri,* the Dutch used Germans, and as far back as Agincourt (1415) the English probably had with them some German artillery, which got stuck in the mud. The Germans themselves employed free-companions of any creed or color, and these active "internationalists" killed off perhaps three-quarters of Germany's total population during the Thirty Years.

The habits of the free-companies have been thus described: "At their approach, the peasants seized scythe and snaphance fowling-piece and drove their womenfolk and livestock to the woods. If they could catch a straggler or two of the soldiers, it was some satisfaction to bind them to a baulk of timber, and saw through wood and man together. If those soldiers caught them, they might expect to be roasted in the oven, have their finger-tips crushed, or their head corded, have a horsehair worked up and down through the tongue, or a goat set to lick the soles of feet first flayed and then smeared with rock-salt. Surely they would scream where their last coin was hidden before they were shot or stabbed and the thatch fired over them. Wherever the hosts of Tilly and Wallenstein marched in the service of their Imperial master, was left only a smoking horror. Where the army of Gustavus Adolphus encamped was a happy security, with a sternly enforced death penalty for the soldier who so much as stole an egg."

In short, the Swedish regulars were much preferable to the Emperor's free-companionships.

The unhappy Holy Roman Emperor had to depend on feudal levies or free-companies because he had no standing army. A free-company might consist of 100 men, or 100,000. The supreme military capitalist was Wallenstein; moody, rapt in astrology, greedy for gain, a "Protestant" leader of "Catholics." There was nobody quite like Wallenstein. He was the greatest *condottiere* of all time. He rented the Emperor 100,000 free-companions for 2 million crowns. The captains raised the companies, the colonels raised the regiments, and Wallenstein raised the whole. He loaned them money for equipment, while they were his creditors for current expenses. It was an army of speculators, great and small. Wallenstein himself made the equivalent of perhaps $12,000,000. He became so powerful that he began to "own" the Empire. It is probable that the Emperor had him murdered. And, typically enough, the job was done by foreigners, Scotchmen and Irishmen, mercenaries who belonged to the Emperor instead of to Wallenstein.

The free-companies fought none too efficiently. They formed a dense square, a veritable human fortress. Sometimes it was 50 men wide and 50 men deep, packed solid. Long pikemen would be in the front ranks to resist cavalry. Behind them were short swordsmen ready for offensive "infiltration" work. They were prepared to duck under the enemy's pikes and stab at close quarters. At each corner of the square was a clump of musketeers who would file to the rear to reload. In battle array, several of these massive squares would be arranged checkerboard fashion. The whole set-up was extremely unwieldy.

No Shock

The "free" Imperial cavalry had learned to use pistols. They would trot up within range, shoot their guns, and trot back to reload. They had discarded the feudal lance, and avoided shock tactics. They wanted to live to fight another day. Pappenheim and Piccolomini were their greatest leaders in the Thirty Years. It was Pappenheim's troopers that killed Gustavus Adolphus. They wore black armor, and are supposed to have evolved into the "cornerstone" of the later Austrian Army.

The progressive Swedish cavalry, on the other hand, had been trained to charge straight in, with the sword, instead of playing with pistols. This was much more effective, as the Imperial armies were forced to admit. Again, the Swedish artillery was light and mobile and could be pushed into the very front line. Some of the pieces were 4-pounders, while others were made of leather, cheap to manufacture and good for a few quick shots. The bulky "Big Berthas" of the Wallen-

U.S. Army

Adding tonnage. Typical Task Force formation with tanks playing role as personnel carriers in UN thrusts in Korea. Blessed is air superiority.

stein Co. were hard to move and easy to capture. The Swedish guns, too, were cast in standard sizes, while the Imperial guns were hit-or-miss, each a lone masterpiece in itself.

To counter the Emperor's bovine infantry squares, the Swedes developed a flexible "T" formation, with the leg of the T jutting out toward the enemy. The T leg was to break up hostile charges, pikemen at the tip, musketeers behind them to deliver a lateral fire either way. The head of the T was composed of alternating groups of muskets and pikes. The T head was long, the T leg comparatively short. The Swedes employed a far higher percentage of muskets than the Imperial forces, which were more inclined to depend on push of pike. The bayonet was not to come into general use until 1700, although the French got it (to invade Holland) somewhat earlier.

The Roman legion had overwhelmed the Macedonian phalanx in the Second Century B.C. because it was more flexibly mobile. So did the Swedes, in all arms of the service, outclass the slow and static Imperial forces. But the "speedy" Swedes shot their wheel-lock muskets in the following quick way:

They bit off the end of the paper cartridge; poured the powder down the barrel; rammed the bullet home with a wooden rod; wound up the spring of the firing-wheel with a spanner; filled the priming-pan with powder; took aim; pulled the trigger which released the spring and made a notched wheel ignite iron pyrites in the cock. The sparks from this exploded the charge. Then the wheel-lock fired. Every musketeer needed at least one pikeman to defend him while he loaded.

The Imperial cavalry utilized wheel-lock pistols. Just how they loaded these in the saddle, clad as they were in considerable armor, remains one of the mysteries of history. It was simply another phase of the whole Imperial system of turtle tactics. Old Father Tilly, "Bavarian" field-marshal from Belgium and Wallenstein's Imperial rival, was especially reactionary in military matters, having been born as far back as 1559, and having seen early service with the fixed and changeless Spaniards against the equally fixed and changeless Turks.

Grenadiers were also coming into vogue at the end of the Thirty Years, and after. These grenadiers, like those of the World Wars, did not merely stand and look tall. Their function was to throw hand-grenades, which they did with considerable effect.

Some Dutch grenadiers, pride of William of Orange, were described as follows: "Their uniform was of piebald yellow and red; over this they wore a furred headgear with a pointed crown, rather like that favored by the Turkish soldier."

Such were the war lessons that Baron George Derfflinger learned in the Swedish service: that regular standing armies, carefully disciplined, are infinitely superior to "free" hirelings and capitalist bands; that hard-hitting mobility can defeat massive stagnation; that personal dynastic loyalty and patriotism are better assets than greed for gain. He applied these precepts to good effect. They led direct to the triumph at Fehrbellin.

French exiles were a great help to him. Between this Austrian veteran and the Gallic refugees, the Prussian army was got going. Frenchmen manned most of the artillery, constituted several regiments of infantry, and made up the gentlemen's bodyguard of the Elector. General Frederick Schomberg, the Protestant Marshal ousted by Louis XIV, was a leader of Berlin's French colony, military and otherwise.

* * *

You would think, to hear about the celebrated battle of Fehrbellin, that it was a Waterloo, or Verdun, or Armageddon. As a matter of fact, it was little more than a skirmish. But then, so were Lexington and Concord, whose shots were heard (they say) around the world.

In 1675 Frederick William and Louis were on bad terms, for they had been on opposite sides in the Dutch War. Sweden was the traditional ally of France, and Brandenburg's rival in the lower Baltic region, especially in Pomerania where the tall grenadiers grow. Sweden was then politically a Great Power that had humbled the Holy Roman Empire. Her army was the model and the terror of Europe. These things we know.

Under a veteran called Wrangel, the Swedes drove at Berlin from their Baltic Pomeranian bases. Wrangel was in poor health. In the past, Derfflinger of Brandenburg had served with him. The Great Elector, then in winter quarters down south, not far from the Nuremberg home of his Hohenzollern ancestors, rushed up across the river Elbe by a series of forced cavalry marches. He met the Swedes at the hamlet of Fehrbellin, forty miles northwest of Berlin. Fehrbellin today has a population of 2,000

U.S. Army

Ordnance carries on at the scene. At Tokyo Ordnance Center an M4A3 VVSS medium tank with modified 76mm cannon M1.

Acme

Expediency through experience. A tanker decorates the turret of his M4A3 with a string of pineapples (that go BOOM!) for handy use in case!

simple souls who make wooden shoes.

The Swedes had invaded Brandenburg with 30,000 men, but only 10,000 of them were present at the battle, under their ailing field-marshal. The Brandenburg force numbered 8,000—inferior numbers—and so great was the rush in coming up from Franconia that 6,500 of the 8,000 were cavalry. These horsemen, carefully trained in the Swedish manner, were Derfflinger's special protégés. The Swedes had with them some belated German free-companies. It was June 18, '75.

A page named Froben begged Frederick William to let him ride his Electoral white horse, a famous beast and well known, in the battle. Froben's thought was to distract hostile shots from the Elector's person. In this he succeeded amply. He was hit, seated on the white steed, by a cannon ball aimed at the Elector. It was a fatal piece of early camouflage that worked none the less.

The Swedes were as good as ever, of course, but their German mercenaries were an inferior breed of trooper. The battle was decided by a cavalry charge. Old Derfflinger, then age 69, led all 6,500 of his new, home-made cavalry in a furious charge against the Swedes. The invaders cracked, and were driven from the Brandenburg dominions. The Elector pursued them into Pomerania, and occupied it, although the disappointing peace treaties forced him to relinquish it again. It was after the victory of Fehrbellin that the little Elector became the "Great" Elector. The august title originated in a contemporary folk ballad printed at Strassburg in Alsace-Lorraine. Unhappy, patriotic Strassburg was then soon to belong to Louis XIV—with the concurrence of the newly Great Elector.

So much for the first classic win of the Prussian army, which graduated from school on June 18, 1675. As one expert summarized it:

"The Great Elector died in May, 1688. In 1640 the greater part of his territory was occupied by strangers and devastated by war. Brandenburg was merely an appendage of the Holy Roman Empire. Its army was useless; its soil was poor; its revenue was insignificant. At his death the state of Brandenburg-Prussia was inferior to Austria alone among the states of the Empire; it was regarded as the head of German Protestantism; while the fact that one-third of its territory lay outside the Empire (East Prussia) added to its importance. Its area had been increased to over 40,000 square miles; its revenue had multiplied seven-fold; and its small army was unsurpassed for efficiency. The Elector had overthrown Sweden and inherited her position on the Baltic."

* * *

So much for the origins of the ageless Prussian army, mail-clad at its inception; to be mail-clad again today in steel helmets, tanks, planes and armored cars? Austria as usual tagged along behind. This was true in the Seventeenth Century, and also in the first World War. It was true in 1938, and is so in 1951.

Free-companies of infantry called *Landsknecht,* mostly sturdy Swabian pikeman, were the mainstay of the Imperial armies in the 1500's. They were tough, and looked very picturesque in their Elizabethan costumes. They liked to sing songs about themselves. Also, there were heavy feudal cavalry in cuirasses called *Kyrisser.* These early birds were in no sense regulars of the later Swedish type.

By 1600, there are supposed to have been a few Austrian regulars under Emperor Rudolph Hapsburg. But the Thirty Years War had to be fought out with feudal levies, uncertain Electoral allies, free-companies, Spaniards, and the traveling circus of Contractor Albert Wallenstein, as described earlier in the paper. The needy and bigoted Emperor Ferdinand Hapsburg had no Austrian or Imperial army he could really call his own.

After the death of Wallenstein, the last great *condottiere,* military units began gradually to belong to the Emperor instead of to their captains, colonels, or generals. Even in Austria, the days of free-companionships were waning. At the close of the Thirty Years in 1648, there were nineteen Austrian infantry regiments, six cuirassier regiments, and one of dragoons, probably Czechs. But this array, impressive on paper only, can in no way be compared to the right little, tight little army of the Great Elector.

Austria was always to be kept busy, for centuries to come, by the Turks or French or Prussians. Between 1495 and 1895—four centuries—the Austrian army fought 7,000 actions: an average of 17½ fights per year. Most of these, with true Hapsburg sloppiness, they lost in the most gentlemanly way imaginable. Frederick the Great was to do it in seven years; Bismarck in seven weeks. Frederick in 1760 had new iron ramrods; Bismarck in 1860 had new needle-guns. The Austrians on both occasions, as usual, had nothing new.

The armored division isn't all tanks.

It takes a lot of backing in support of the striking elements.

The system of control that keeps the supplies with the spearheads is important.

DSCP

by CAPTAIN JEOFFREY FORSYTHE

ARMOR has added another "for short" to the many military abbreviations. It's Dog Sugar Charlie Peter or DSCP, an abbreviation of considerable importance to everyone who serves in an armored division. The "for long" of DSCP is the Division Supply Control Point. There are many "points" used in the armored division such as initial points, water supply points, regulating points and release points; but none which can be used to greater advantage than the Division Supply Control Point. The DSCP is the "point of points."

Modern war, as armor knows it, demands expeditious procedures in all activities, procedures which must be simple and effective to aid and continue the advance of the combat battalions. The DSCP was designed for that specific purpose and tests have proven its value.

Not A New Idea

The DSCP is not a new idea. During the First World War and the Second World War several divisions established facilities similar to the DSCP of today's armored division. After World War II The Armored School expanded the idea and now the establishment of a DSCP is included in the logistical doctrine of the armored division.

As the name implies the division supply control point is concerned primarily with supply. Its principal function is to facilitate and expedite the flow of supplies to the front. Tanks, guns, and men need gasoline, ammunition, and rations every day. The DSCP is geared to assist the combat elements of the division in procuring these essential supplies twenty-four hours a day.

Under G4

The DSCP is an installation which operates under the direct control of the division G4 who is in constant radio contact with the installation through the division administrative net (forward). Personnel required to man the DSCP can be provided by the division quartermaster battalion. An officer and four or five enlisted men should be sufficient to operate the facility twenty-four hours a day. A quarter-ton truck and a cargo truck will satisfy the transportation requirement for the installation. For communications the DSCP must have two radio sets with operators, a medium power set for operating in the division administrative net (forward) and a high powered set for operation in the division administrative net (rear). (See figure 1 for stations in the administrative nets.) With the personnel and equipment indicated above, the DSCP is ready to set up and commence functioning for the benefit of the combat elements.

The division G4 will indicate the location of the DSCP. In offensive operations this location will be on the main supply route (MSR) of the division in rear of a point where the road net permits a convergence of the axes of supply and evacuation of the major commands. Another consideration involved in selecting the location of the DSCP is that it is usually positioned just in rear of the division headquarters forward echelon (division command post). This places the DSCP well forward, ahead of division trains, and convenient to all commands and combat battalions of the division (see figure 2). During defensive situations, division trains elements are consolidated and the DSCP will be located in the forward portion of the division trains area on the division MSR (see figure 3). These locations position the DSCP forward of division logistical installations during both offensive and defensive operations.

Funnel Point

Supply convoys of the commands and combat battalions will be coming from the forward areas to the rear for gasoline, ammunition and rations day and night. The commanders of these convoys precede their convoys and will be required to stop and report in at the DSCP. Here the supply convoy commanders can learn many things. The DSCP can inform them of the location of the division mobile Class III supply point and the amount of gasoline on hand, location of the division ammunition office (DAO), the division Class I distributing point, location of division technical service elements and their activities in division trains, and the location of army supply points and technical service installations in the event the division supply points and technical services cannot provide the supplies or services desired.

Another service that the DSCP can render is the relay of unit information to convoy commanders. For example:

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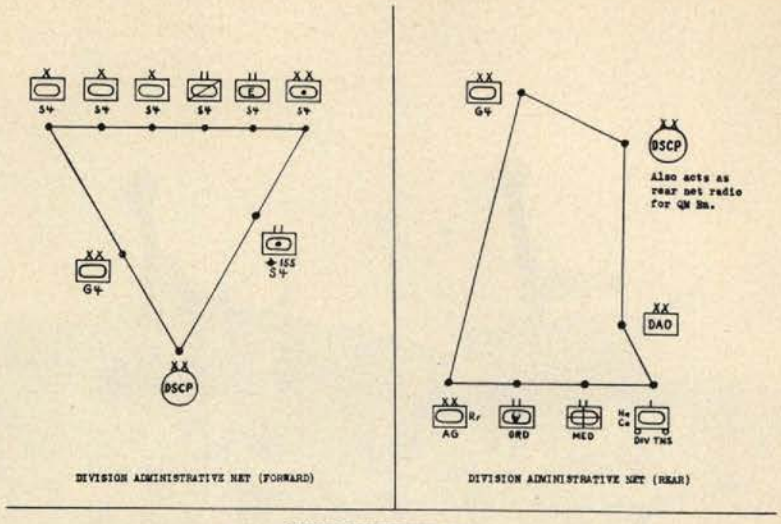
A unit dispatches an ammunition convoy to the rear for refill and discovers that the amount of ammunition requested is not sufficient to fill the unit basic load. It is a simple matter for the unit to have the DSCP contacted over the division administrative net (forward) and informed of the necessary correction. When the convoy commander reports in, the DSCP will inform him accordingly.

The DSCP works as well in reverse. When supply convoys or other logistical traffic have completed their missions in the rear and are returning to the front, they will be required to report in to the DSCP. If in the meantime, combat and other forward units have moved or are moving to new locations, the DSCP will have been informed and can pass this information on to the returning vehicles. In this way lost supply convoys can be avoided and there can be more assurance that the combat troops will receive their supplies when and where needed.

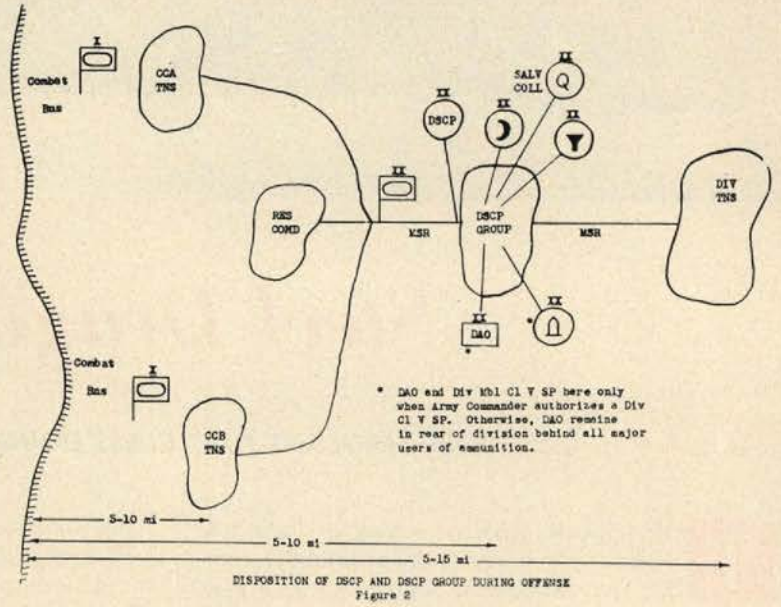
Figure 2 illustrating the disposition of the DSCP in offensive situations shows other installations in the immediate vicinity of the DSCP. The DSCP and the logistical installations in its immediate vicinity are known as the DSCP Group. During the offense the division quartermaster will operate his Class I and Class III supply points and the division salvage collecting point near the DSCP. If the field army commander authorizes the armored division to carry extra ammunition, the DAO and the division mobile Class V supply point will be established and included in the DSCP Group.

Such is the DSCP as taught and advocated by The Armored School today. It is an expansion of an idea designed to expedite logistical support for the fighting battalions of the armored division, a facility which can be used to many obvious advantages. It is, in effect, a type facility which we use every day, that is, a central information office, booth or window. The DSCP can to a great extent eliminate the necessity for a division administrative order. The necessary current instructions and information are immediately available at the DSCP. If a unit knows what it wants and the location of the DSCP, its logistical problems in combat are reduced considerably.



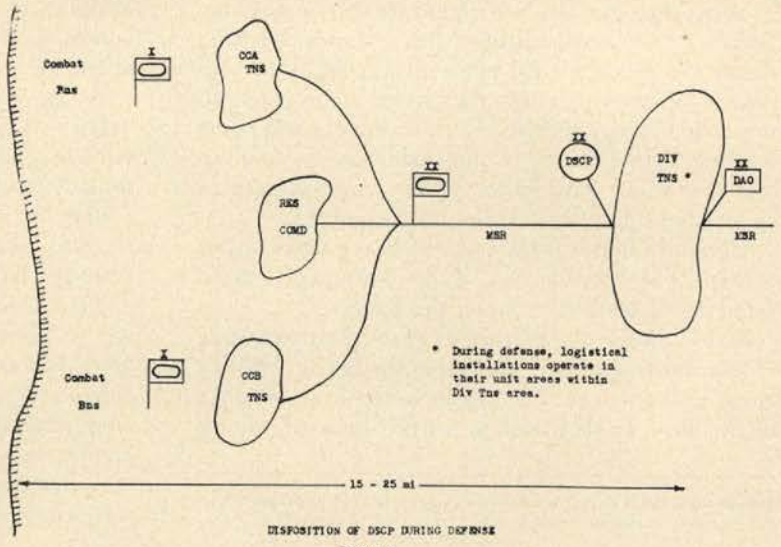
DIVISION ADMINISTRATIVE NETS

Figure 1.



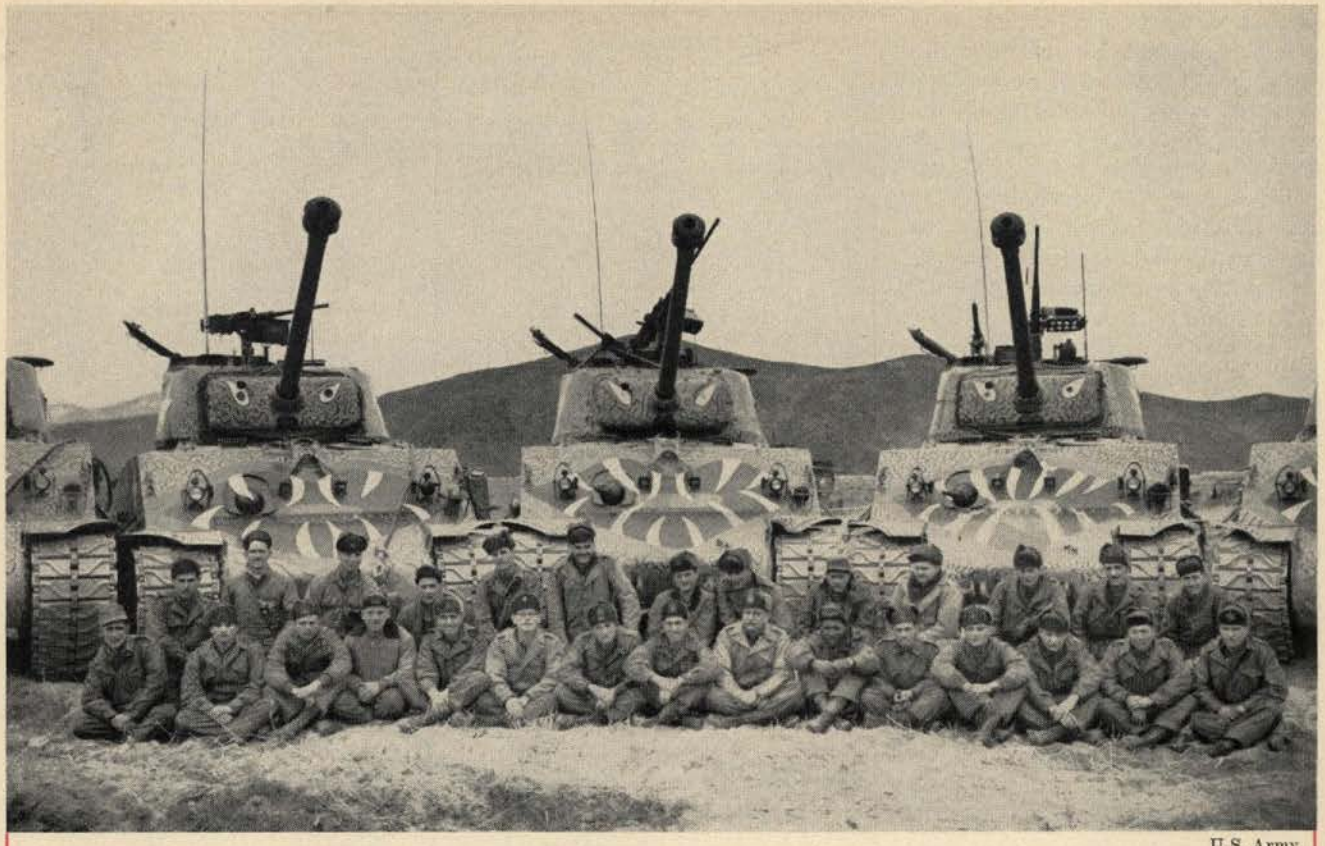
DISPOSITION OF DSCP AND DSCP GROUP DURING OFFENSE

Figure 2



DISPOSITION OF DSCP DURING DEFENSE

Figure 3.



U.S. Army

Steel Dragons

by SERGEANT FIRST CLASS DOUG DUBOIS

THE Chinese Reds crouching in their foxholes listened to an ominous rumbling coming from around the bend below their positions. It was the sound of tanks.

What they saw lumber around the curve moments later was not a reassuring sight. Already laboring under the psychological tension induced by the approach of enemy tanks, they were ill-prepared to meet the leering, distorted faces of dragons and tigers bulking before them. Contorted faces bobbed up and down and long horns in the center seemed to spout smoke and flame as they advanced.

Certainly that was the noise of heavy tanks . . . or was it? The horrible face, those glaring eyes, those tremendous teeth, the noise, the firing. . . .

Red soldiers looked about, were swept up in a wave of fear, broke and ran! Ran from the devils clanking along in their rear. The devils, in the form of tanks of the 89th Tank Battalion, surged forward, taking full advantage of an enemy in his moment of psychological disadvantage.

The dragon face scheme was a part of the U.N. program of psychological warfare. Lieutenant Fred Wilkins, tank commander in the 89th, who helped design the leering faces, attests to the effectiveness of the idea, and adds that "it puts us in the running with the Air Force boys with their painted plane noses." And Sergeant Joe McCoy, stepping back with his paintbrush to admire his handiwork, murmured, "it even scares me."

One or two skeptics in the battalion thought that the tank and its crew in original form was enough to scare the Red soldier.

Tank company commander Captain Clifford Rice whose namesake, Task Force Rice, became well known to the enemy during the February drive up Korea's West coast, believes that the dressing up along lines of ugliness of the tanks has a definite effect on the overly-superstitious Chinese, although he feels that they have good reason for respecting American armor and its record on the field in Korea.

SFC Doug Dubois is a *Stars & Stripes* correspondent attached to the 24th Infantry Division in Korea.

Morale, esprit, teamwork and combat effectiveness spring from unit names. Our author feels we could enhance these prime considerations by calling upon our rich history for inspirational names for units

Let's Name Our Close Combat Units

by COLONEL CHARLES W. RAYMOND, 2ND

THIS country possesses an asset, stemming from a rich historical and geographical heritage, which for the purposes of instilling high *esprit* in our military units and enhancing their public prestige, has barely been touched. I refer to the multitude of names, of stirring implication, that lend color to our history and grandeur to our land. What an opportunity, to apply some of these names to units of our Army!

Sadly enough, this has rarely been done. What young recruit from Colorado, or from Utah, or Idaho, or New Mexico, would not feel instant pride upon being assigned to a unit known as, for example, the "4th Battalion, Rocky Mountain Rifles"? Let us suppose that this same unit were a part of a regiment, let us say, the "20th Infantry Regiment," which might also contain the "2nd Battalion, Jefferson Rifles" and the "7th Battalion, Yosemite Rangers." Now, the "20th Infantry Regiment" already has its fine record of past deeds, and its parent unit, the 6th Infantry Division, also possesses great traditions, all of which the recruit will absorb as he develops into a trained soldier and member of the team. But, at the outset, he has a distinguished *name*, rather than a number or a slangy sobriquet, upon which to affix his loyalty; and this new home of his with the resounding appellation is yet small enough that he can feel from the beginning that he is truly a part of it. It is of such size that he can consider the outfit really his own team, that he can soon come to know personally most of his fellow soldiers and his immediate leaders, all proud of the same distinctive name.

The Navy has always taken great advantage of names. Each vessel is numbered, and each type designated by letters, yet most naval vessels also have names: of the states, of our cities, of bays and sounds, of distinguished American naval men, of famous battles, and so on throughout a broad field. Submarines which in earlier days simply were numbered, are now named after species of fish.

Even the Marines, who have long been satisfied to be known simply as "Marines," had a specially named unit in World War II in the Pacific in "Carlson's Raiders."

The Air Force has used names to some extent, for among its various types of aircraft have been such strikingly named planes as "Lightning," "Thunderbolt," "Liberator," and "Shooting Star." Individual aircraft, also, have often received names, like surface ships.

Col. Charles W. Raymond, 2d, graduate of the Military Academy in 1931, is an artilleryman who served in that capacity with the 34th Infantry Division in Africa and Italy and with the 423d FA Group of II Corps in Italy. He is now assigned to the Field Artillery and Army Aviation Branch, Combined Arms Training Division, G-3 Section of Army Field Forces at Fort Monroe.

In the United States Army certain units have occasionally, to a very limited extent, received or acquired names. The fame of the "Rough Riders" of the Spanish-American War still persists. World War II saw the employment of "Merrill's Marauders" as raiders in Burma. Following generally the pattern of the British "Commandos," several American separate infantry battalions of specially trained men were formed and called "Ranger" battalions, after the traditional manner of certain American forces of early days. Here, by the way, is a name, "Ranger," that is worthy of perpetuation in our Army on a grander scale than is now the case. In both World Wars, most of our divisions acquired nicknames, some of which have changed with the times. Army custom has for many years perpetuated the memory of outstanding soldiers, in the naming of posts, camps, and general hospitals. However, these often are names not well known to the nation at large, and although this is a practice that should certainly continue, it has little real bearing upon the present discussion. A soldier may develop great affection for a particular military post, but this is distinct from the loyalty he feels for his unit.

About the time of the Civil War, it was common usage to call artillery batteries by the name of the battery commander. This practice was often extended to brigades and divisions,

which in those days were of a less permanent nature than they have since become. Use of commanders' names, however, has the great disadvantage of instability, and is probably best employed only as a casual and unofficial method of designation, or for identifying a temporary task force.

In combat there seems to be a natural inclination of individuals to use names in lieu of numbers for tactical units. The most fruitful source for such names has usually been the list of telephone exchange code names. Within a division it was common practice in World War II to refer informally to "Winner" or "Wisdom," rather than the "135th Infantry" or "175th F. A. Battalion." Regimental commanders conversed quite intelligibly with their subordinates about "Red" or "Blue," rather than "1st Battalion" or "3rd Battalion." This of course was a security measure.

The use of names in the British services is a famous practice. The Royal Air Force called it, not a "P-40," but a "Tomahawk." They have had their "Spitfires," "Mosquitoes," "Lancasters," and their "Vampire" jet planes. The Royal Navy has a galaxy of names for its ships. We recall easily that it was the "Exeter," the "Ajax," and the "Achilles" that ran the German "Graf Spee" to death. Who would remember the names of the victorious British ships had they been known only as the "CA-81," the "CL-173," or the "CL-something-else"? But the really remarkable roster of names is that which lists the regiments of the British Infantry, and some of the old cavalry regiments now in the Royal Armoured Corps.

The British system of regimental names grew up as British history unfolded, and tradition piled upon tradition. The present-day result is certainly not without its drawbacks. The names take a confusingly wide variety of forms: There are "Grenadiers," "Fusiliers," "Guards," "Light Infantry," and many others. Some are "Royal," some "King's Own," some bear the name of the county, like "King's Own Yorkshire Light Infantry"; others are named for some distinguished peer or general, as the "Duke of Wellington's Regiment." One regiment in particular would strike a responsive chord even in the American who has read of Robin Hood: the "Sherwood Foresters." A British order of battle, especially if the units' names are abbreviated or designated only by initials, is at first nothing short of a riddle for an American soldier, although of course a Britisher can unscramble it for him. But it takes only relatively short acquaintance to learn "Who's Who" in a particular area of operations.

A serious difficulty for the British has run parallel to one that we ourselves have encountered in our militia units of earlier wars, and later in the National Guard. This was the adverse effect of sending replacements from diverse parts of the country to a unit with a restrictive geographical name. To place a Yorkshireman in a regiment of Scottish Highlanders was as hard on English morale as, for us, to assign a Rhode Island Yankee to an all-Minnesota or all-North Carolina regiment of volunteers. It took World War I to get New York and Alabama National Guard regiments together, even in the same division, so intense have sometimes been our State loyalties. It is easy to understand that when combat assessed heavy casualties at one time against a unit composed of men all from the same political subdivision or district, the home morale received a staggering blow. This has happened as recently as World War II. The British solved this problem partially by scattering the battalions of their old traditional regiments, and brigading them with battalions of other regiments. In this way, the Coldstream Guards, for example, might have battalions engaged in several theaters or on home duty, all at the same time. Some battalions might be regular units while others of the same regiment might come from the civilian components. The regiment thus became a ceremonial and traditional association of proud soldiers, rather than a tactical formation; but precisely herein lies the great and continuing value of these ancient British regiments, a value upon which we have so far failed to capitalize.

One might say that the British system, the growth of so many generations, has become inadaptable and inflexible, hence outmoded and detrimental. This is not so, however, since the British as a result of lessons learned in World War II have made innovations in their practices, designed to retain traditional *esprit* while at the same time adapting the system to modern problems of assignment of replacements. The ceremonial British Infantry Regiments have been grouped into some fourteen non-tactical "named" brigades. Some of these are: The Brigade of Guards, The Lowland Brigade, The Home Counties Brigade, The Yorkshire and Northumberland Brigade, The Midland Brigade, The Welsh Brigade, The Irish Brigade, The Highland Brigade, and The Green Jackets Brigade. By this device, the British expect to have sufficient replacements available to any Regiment in war. The individual soldier would have as much chance as before of serving in his own Regiment. Unless the emergency is exceptional, the individual would at least serve within his own brigade, with men from the same general home area and with the same attitudes as himself. The broad regional aspect of the foregoing names is apparent. It approaches the concept that appears logical and desirable for us, if we were to start naming units in our Service.

In this country, we have dealt with the problem in the past by abandoning state designations of units in our federalized Guard, and by paying slight official attention to the fact that the personnel of a unit came from any particular State. To the citizens of a State, however, its National Guard units continued to belong to that State, and the units' accomplishments were portrayed with pride in the local press. For instance, one who read any Ohio newspaper during World War II could infer that the war was being waged practically singlehandedly by the 37th Division. The fact that long before war's end there were thousands of non-Ohioans in the 37th Division, made no difference to the people in Ohio. In Minnesota, the papers often referred to the 34th Division as "Minnesota's Own," while in Iowa, which originally furnished a large portion of the Division, it was called "Iowa's Own." But the fact is that by 1943, practically every State in the Union was represented in the 34th Division; while attached to it, fighting with it, and wearing its shoulder patch was a special unit of Nisei, mostly native of Hawaii.

A few years ago, Texans were happy to receive the veteran battleship "Texas" as a gift to the State, although the famous vessel had been by no means an exclusively Texan enter-

prise, in money, materials, or manpower. It appears that there is a genuine urge in the residents of our various regions to feel possessive pride in some military unit. This is good and healthy and ought to be encouraged, so long as the strict State loyalties, sometimes detrimental if pressed too far, can be merged and blended into an *esprit* that transcends State boundaries and reflects affections of National scope. An indication of the popularity of such an ideal is the quick prestige acquired by the 42nd Division in World War I. It was nicknamed "The Rainbow Division," since it was a composite of National Guard units from different sections of the United States, and because its shoulder patch was, symbolically, the many-hued rainbow. The implication was understood at once by the public, and the unit was held in high regard.

Names for federal units should avoid coincidence with a State name, with a possible exception: "Washington." State names would continue to receive recognition by the Navy and by the National Guards of the States, and State loyalties would continue to serve purposes valuable to enterprises other than this proposal. Primarily, names should be selected that possess broad regional application, such as names of rivers. Unfortunately for this purpose, some of our important rivers have given their names to States, but many, like Columbia, Rio Grande, Allegheny, Hudson, Yukon and Susquehanna, might be chosen.

There are many other sources of appropriate names, such as great American statesmen: Washington, Jefferson, Franklin. There are famous soldiers: Robert E. Lee, Pershing, Winfield Scott, Miles Standish. Our history provides the names of other personages: Nathan Hale, Daniel Boone, Kit Carson, Kamehameha. Our geography gives us names of mountains: Blue Ridge, Bitter Root, Appalachian, Cascade. There are American trees: Redwood, Sequoia, Hickory. There are place names, some of them from Indian tribes, such as Huron, Modoc, Ontario, Mohawk, Narragansett, Shenandoah, Cape Cod, Hatteras, Niagara, Taconic, Barnegat; a stirring roster of names that spell "America." There are so many possibilities that it is futile to attempt to list them further.

It is obvious that, if a policy of naming units were adopted, there would be a great rash of proposed names, suggested by a large number of persons. Many names so suggested would be inappropriate, for any of several reasons. Some would be purely nicknames, some lacking in general cognizance, some would be cumbersome. Others would be lacking in dignity or have unfortunate implications. For example, although Dakotans might feel at home in a "Bad Lands Battalion," rival units would no doubt short-title them "The Bad-Landers." Not too good, if it were an airborne unit.

A carefully devised set of rules would have to be established so that only the most fitting, euphonious, and concise names would be adopted. The process would resemble the adoption of distinctive insignia. Each proposed name would have to be decided upon its own merits. It might be desirable to allow a degree of opportunity for members of a unit to propose the name they would like to bear, but the chief object would be to build up a list of distinguished names to endure for many years, rather than to cater to the immediate members of units. A well-chosen name would meet with general acceptance and in a short time would become a respected part of the battalion's traditions.

Certainly the present informal practice of nicknaming units shouldn't be interfered with. The 15th Infantry Regiment would undoubtedy continue to be known as the "Can Do," and the 3rd Infantry Division as the "Marne Division," until such time as usage might alter or drop such names. The present proposal simply places emphasis upon unit *esprit* at battalion level, where it can be implanted and stressed early in the recruit's service, and can be maintained as the unit progresses through its training and goes to take its place in the larger team, that is, the regiment and the division.

No proposal is worthwhile without some recommendations and a plan for putting it into effect. Thus . . .

a. Select names, of distinctly American connotation, and apply these to series of battalions of Infantry and Armor. If experience shows it to be advisable to extend this practice to other arms, such action could be considered later. These series of battalions might be called "brigades," since that term is no longer generally used in the Infantry or Armor. In any event, a tactical brigade would have a number, whereas, the traditional "brigade" would be named, *e.g.*, "The Mojave Ranger Brigade." The list of names so selected should be held to a rather limited total figure, say about fifty.

b. Select one or more descriptive terms, which when coupled with the brigade name and battalion number, will constitute the battalion's official designation. The term "Rifles" is suggested as especially appropriate, since this is a term of historically American usage, is euphonious, and especially is emphatic upon the basic weapon of the soldier, the rifle. Other desirable terms, for units from certain regions, are "Rangers" and "Scouts." "Grenadiers" is also suggested, although this has more of a European flavor than other terms of this nature.

c. Allot each name to all compo-

profile

U.S. Army

Here is the designer of the new insignia for the Army's Armor Branch. He's Sgt. Roy E. McGaffic of the Troop Literature and Reproduction plant of The Armored School, Fort Knox, Ky. Sgt. McGaffic started designing the new insignia about six months ago. It was approved by the Department of the Army shortly after the first of the year. The insignia shows a front view of the M26 tank superimposed on crossed cavalry sabers. Sgt. McGaffic, a native of New Castle, Pa., wears the old Armor insignia in the above photo. It will be used until present supplies are exhausted.

nents, cutting squarely across Regular —National Guard—ORC lines, and number the battalions of identical name serially from "First," using no numeral of more than two digits. If more designations are needed, the roster of names should be increased, in preference to using numerals of over two digits.

d. Assign names by redesignating existing battalions, each battalion retaining its present battle honors. Confer the accumulated battle honors upon the named brigade, as a whole, by simple reference to the war in which each honor was gained. In the future, battle honors when earned by a battalion, should generally be conferred on all battalions of the same name, just as the achievements of any Marine Corps unit shed renown on all future Marines. Upon activation of a new battalion within a brigade, the new unit would then be endowed at the start, by virtue of its "family name," with at least some of the tradition established by the rest of the brigade.

e. Request to have the present "Distinguished Unit Citation" established as a Presidential recognition, similar to the Navy's. If this step is approved, authorize the word "Presidential" to be included as an official and permanent part of a unit's designation. This should apply to all units so honored, including those of Arms and Services not authorized to name their units.

It is to be expected that some difficulties might arise in the adoption of such a system. However, such problems ought not to be insurmountable. For instance, there are the difficulties of assignment of replacements, already mentioned. Under any system of assignment this will always be a matter requiring intelligent struggle toward sound application of personnel policies.

Any sort of proposal can usually arouse objections. One objection to this proposal might be the possibility of decreasing the cohesion between battalions. In the armored division, the separate status of battalions and absence of any regimental framework does not seem to impair the fighting "cohesion" of the units, once they know each other, through training and association, as competent colleagues. There was no lack of cohesion as a fighting regiment in the case of the 133rd Infantry, for example, while the 100th Separate Infantry Battalion, the famous Nisei outfit, served in lieu of the absent 2nd Battalion, even using the 2nd Battalion's telephone code name of "Wisecrack White." Rather, the friendly competition and mutual respect resulting from differences of designation were beneficial. The presence of two "Company A's," two "B's," etc., confused no one, for they could be called "Red Able," "White Able," "White Charlie," "Red Baker" and so on.

Some of the most notable objections might be the following:

a. "Why restrict the naming of units to the Infantry and Armor? Other branches will want the same privilege." The answer lies partly in past experience of the British. In their service, it is only in the principal arms that regimental names are used. Among supporting arms and services, take as an example the Artillery: The traditional name of that arm is "The Royal Regiment of Artillery." In other words, *Esprit de Corps* considers the supporting arm as a whole to be a single traditional "regiment." The name is based upon the military specialty. No other names seem necessary in the Royal Artillery, except that the portion that corresponds to our armored field artillery is called the "Royal Horse Artillery"—again "military specialty." The situation is analogous in the Royal Engineers, The Royal Army Ordnance Corps, the Royal Corps of Signals, and other services. Another reason for not naming units of supporting arms or services is that in military historical writings, the progress of an action is narrated in terms of the operations of the principal arms engaged. The identities of the various supporting units are usually recorded in some form of appendix, such as a troop list, and for simplicity's sake do not appear in the main narrative. This is merely a manifestation of the fact that it is the primary arms who come to close grips, bear the impact of personal conflict, and therefore earn the distinction of specific attention by the historian. Names would serve to focus this attention.

b. "Naming of units complicates the order of battle." At first glance, perhaps so. But the designations of some of our present types of service units are "mouthfillers." It may be said that the smaller the detachment and the more limited its specialized scope, the more initials it has, and the fewer the people who understand their meaning. The fact is that the interested people quickly learn the meaning of a unit's designation. Americans are quite adept at concocting and understanding suitable abbreviations for names. Therefore, American order of battle should suffer no real complication from the use of names for units of battalion size, but rather should gain tremendously in the appeal to the *esprit* of soldier and civilian alike.

c. "The names won't mean anything; the system is not spontaneous, and will therefore be poorly received." Names will mean something if properly selected. "Grand Canyon" and "Yellowstone" mean something to every informed American. Any system of designation is synthetic; if it is begun entirely spontaneously, it will probably result in a hodge-podge, rather than a system. But it must have a beginning at some time if it is to exist at all. There was a time before any of the British units had yet been named; there was a later period when their names were quite new, not yet old enough to be "ancient traditions." The British simply started their practice and developed it to suit changing times. Whatever colorful customs of naming may have once had their beginnings in our Army, they have generally been laid aside, rather than adjusted to new conditions. A unit name need not be years old to incite pride. The new German Army that arose under the Nazis had many newly named organizations such as the elite "Hermann Goering" units, in which the members' *esprit* was exceedingly high.

An enduring unit name must simply be meaningful, be popularly appealing, and have a degree of immutability which "Sherwood Forest" and "Rocky Mountain" possess, and which "Hermann Goering" did not possess. A system of carefully selected names based upon such attributes could be successfully begun in our Army. If the beginning were made judiciously and with restraint, it is probable that the innovation would be eagerly accepted by the troops and the people, and would continue to develop as an honored and useful tradition in our Service.

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GENERAL GEORGE B. McCLELLAN AND THE ARMY OF THE POTOMAC

MR. LINCOLN'S ARMY. By Bruce Catton. Doubleday & Co., Garden City, L. I. 372 pp. $3.75.

Reviewed by

ROBERT SELF HENRY

The army referred to in the title as "Mr. Lincoln's" is the Army of the Potomac. The period covered is that of its command by General McClellan. The story told is that of the Army and its General and the bond of understanding between them, in contrast with the relations between the General and political forces which he did not understand but which, in the end, wrecked his career as commander.

The story begins with the arrival of McClellan from the Peninsula, and the magical effect of his presence upon officers and men of the army which, under John Pope, had just been defeated at Second Bull Run. Having thus begun at the dramatic moment when the administration at Washington was compelled to recall McClellan to command of the army he had created, the work reaches back into the past, somewhat in the fashion of a Joseph Conrad story, to pick up the beginnings and then to work forward to the end of McClellan's period of command.

General McClellan had the misfortune to come too early to high command. In Mr. Catton's phrase, "He found himself at the top of the ladder almost before he started to climb. One day he was leading a diminutive army of volunteers in an obscure campaign far back in the wild mountains; the next day—almost literally, the next day—he was the savior of his country, with President and Congress piling a prodigious load on his shoulders, and with every imaginable problem arising from the most confusing and pressing of wars seemingly coming straight to him, and to him alone, for solution."

The extraordinary thing is that this 35-year-old general-in-chief successfully solved the first part of his problem. From the medley of disorganized units about Washington, after First Bull Run, and from the other regiments which came in later, he created a great, finely tempered weapon—the Army of the Potomac. Running all through Mr. Catton's work is the picture of that army and its life, especially as revealed in what he refers to as "the rich mine of material" in the innumerable regimental histories, as well as the works of the better known memoirists. These regimental histories, Mr. Catton says—and the life and color of his book bear him out—"provide the flavor of the young army as nothing else could do, giving the homely and often almost incredible little touches which make those far-off soldiers suddenly come alive."

Between General McClellan and the army which he created, and which might with justice be called his rather than Mr. Lincoln's, there was a rare intensity of devotion. The General "was trusted to the death by one hundred thousand fighting men," Mr. Catton says, "but he himself always had his lurking doubts" when it came to making all-out fighting use of his army.

This "buried sense of personal inadequacy" is one of the reasons

The Author

Bruce Catton began writing as a reporter. After serving various newspapers he became special writer and Washington correspondent of NEA. He was Associate Director and Director of Information for WPB from 1942 to 1945 and for the Department of Commerce in 1946. In 1948 he became Special Assistant to the Secretary of Commerce. He is now Information Specialist in Department of Interior.

The Reviewer

Robert Self Henry is Vice-President in charge of Public Relations of the Association of American Railroads. In railroad service for the past twenty-six years, he has written a number of books on transportation. A recognized historian, his four works on history are *The Story of the Confederacy, The Story of Reconstruction, 'First with the Most' Forrest,* and most recently, *The Story of the Mexican War.*

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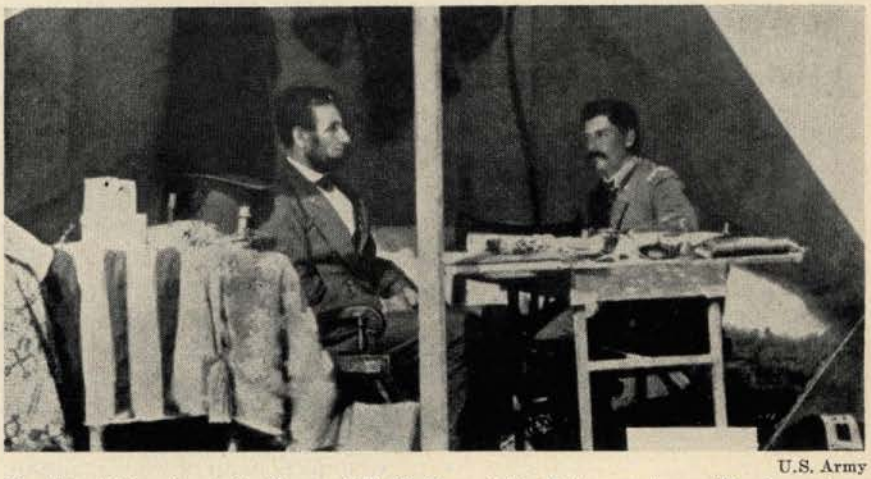
ascribed for the young General's comparative failure in the use of the army.

The other and more consequential reason, developed throughout the book, was that "General McClellan never quite understood" that he "was not merely the commander of an army in a nation at war" but was actually the central figure in "working out, under fire, the relationships that must exist between a popular government and its soldiers at a time when the popular government is fighting for its existence."

In working out these relationships, Mr. Catton says, there was lamentable failure. As early as the autumn and winter of 1861-1862, the evidences of this failure were accumulating. McClellan's antecedents and attitude led the radically inclined Republicans to look upon him as one not simon-pure in the faith and so not having his heart in the war. As against this gnawing suspicion, the General had little patience with the political point of view and finally developed, on his own part, suspicion of the good faith and wish to win the war of some of those who were nagging at him. With the poison of mutual suspicion at work on both sides, the marvel is that the army under McClellan did as well as it did, and finally won the tactically drawn battle but strategic victory of the Antietam.

In the light of the attitude of the more radical—using the word in its Civil War sense—of the Union politicians, Mr. Catton makes the interesting observation that among the "list of Union officers who were in the key positions when the war was finally won—Grant, Sherman, Sheridan, Thomas, Meade—there was not an abolitionist in the lot, not a man who began the war with any particular animus against slavery." For that matter, a similar observation might be made as to the majority of the more successful Confederate commanders, few of whom were outstanding and original secessionists.

One more fatal difficulty in McClellan's path was the ineptitude of the intelligence service of his army and his own temperamental tendency to rely on its reports. "So to all the other handicaps that beset him—distrust at the War Department, troops withheld, strategic plans countermanded—McClellan had this final ruinous handicap to contend with: heavily outnumbering his opponent, he was led to believe that his opponent heavily outnumbered him," is the way Mr. Catton sums it up.



U.S. Army

President Lincoln visits General McClellan at his Potomac Army Headquarters.

But with it all, in the author's opinion, inability to work with the civil authorities was the most serious of McClellan's handicaps. "A capacity for getting along with the civil authorities is just as essential a part of the equipment of the general in command as is his ability to plan campaigns and win battles. . . . Lee had this capacity to his very finger tips." The time came with McClellan, on the other hand, when "it was almost a question whether he was fighting the Confederates or the authorities at Washington," who, he was convinced, were determined to get rid of him at any cost, even to losing battles and perhaps the war.

And get rid of him they did, for a

U.S. Army
General George B. McClellan.

time at least, during which time General Pope led the Union forces to defeat at Second Bull Run. It is into the backwash of this defeat that McClellan rides as the book opens, to be welcomed with ecstatic shouts by the retreating soldiery. At a time when there was "enough ill will and all-round distrust afloat in Washington to lose any war" the harried President took "his political life in his hands by reinstating McClellan in command."

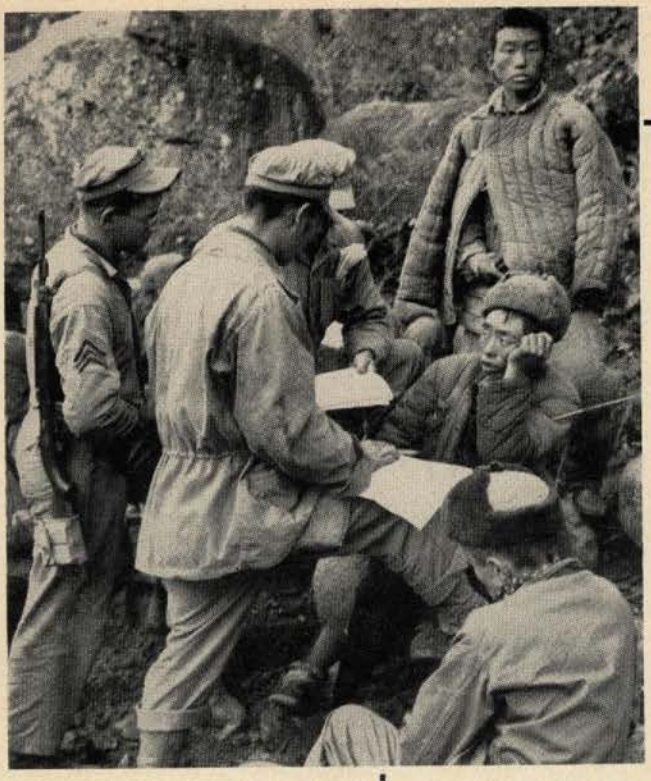
"The Union cause had reached low-water mark for the war," Mr. Catton observes, as he launches into a brilliant treatment of McClellan's achievement in pulling the army together and moving out in pursuit of Lee in Maryland. The campaign which brought the two armies face to face across the valley of Antietam Creek, and the bloody battle fought across that stream and about the village of Sharpsburg—the bloodiest single day of the whole war—are presented vividly and clearly. The analysis of the far-reaching effects of the victory which no one at the time quite recognized as a victory, but which at least was not a defeat, is penetrating.

Without the victory at the Antietam it would have been politically impossible to issue the already prepared Emancipation Proclamation. Without that proclamation, converting the war from one for the mere maintenance of the Union to a crusade against slavery, there would probably have been the European intervention which the Confederacy sought. And with such intervention, as Mr. Catton analyzes the situation, the chances of maintaining the Union unbroken would have been small indeed.

"Indecisive tactically, the battle shaped all the rest of the war," Mr. Catton writes, and "meant, at the very least, that the war must now be fought to a finish. There could no longer be a hope for a peace without victory. The great issues that created the war were going to be settled, at no matter what terrible cost. This fight was decisive."

Mr. Lincoln's Army covers the events of a little more than a year leading up to this turning point of the war. Its focus is on events in the Eastern theater of war, with slight attention to the less dramatic but likewise decisive events west of the Appalachians. Partly because it is so focused, the work successfully combines dramatic narrative qualities with colorful characterization, sharply etched pictures of army life in the 'sixties, and perceptive insight into the politico-military problems of high command in time of internal division.

U.S. Army
Battle fog at Antietam.



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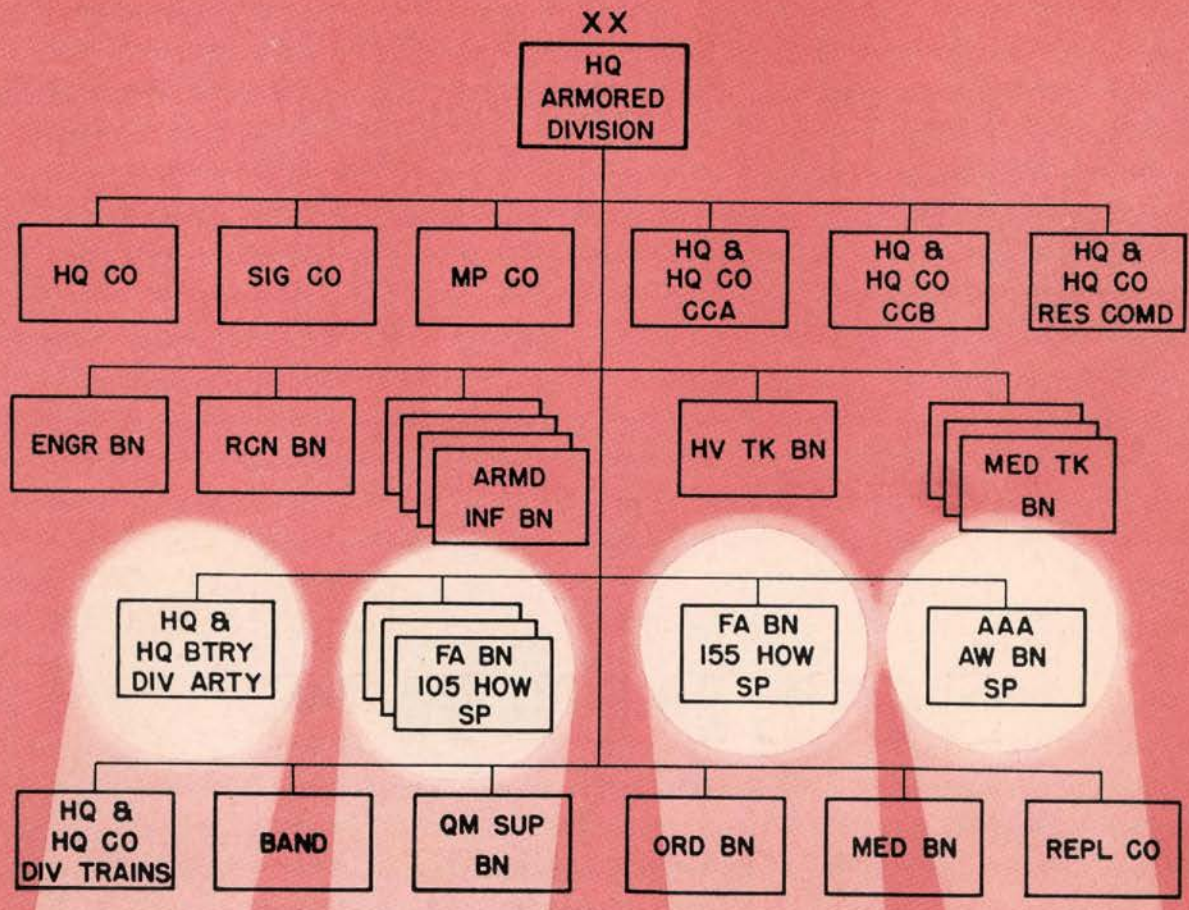

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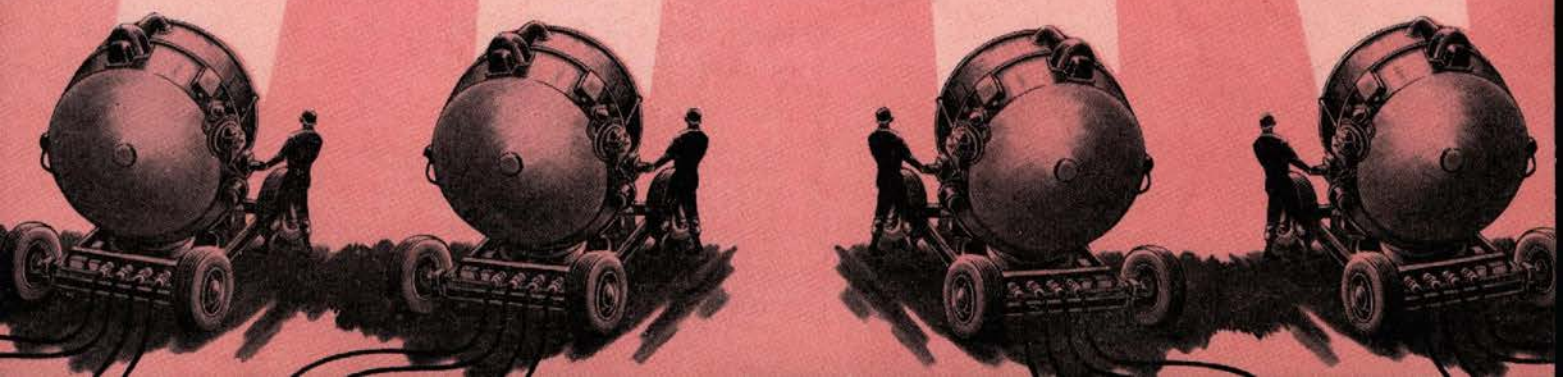
Artillery is the mainstay, the support of ground operations. Within the support field, a transition from the dismounted-emplaced-towed basis to the mounted-mobile-self propelled character serves to fit Artillery into the Armor picture. There are five battalions of artillery in the armored division (see above). If you're an Artilleryman you're a part of Armor. Keep up with the punch! Subscribe to ARMOR!



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[See Page 32]

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CONTENTS

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LETTERS to the EDITOR

Balanced Ground Forces

Dear Sir:

Your editorial on page 13 of the January-February issue strikes a responsive chord in the heart of this reader who from his OP (which may be more aptly described as an observation slit) in Moscow, is far out of touch with developments on the free side of the Curtain, but thanks to ARMOR gets a picture of the trend. Therefore please accept a pat on the back for your splendid publication and the following comments from an armored devotee since the days when a cavalryman not astride a four-legged horse was a heretic.

If we eliminate political, psychological and economic factors, the history of land warfare on both Eurasian and American continental mainlands (World War II in the Pacific was magnificent but special) shows success attending armies properly balanced between the less mobile but larger powerful mass (Infantry units) and the more mobile but generally smaller striking force (Cavalry—now Armor—units). Proper balance varies with situation, terrain, armament and other factors. The all-important element of leadership which understands how to coordinate these two forces and get the maximum from both is indispensable.

World War I witnessed both the death of horse cavalry in the tragic stalemate of the Western Front and the birth—unrecognized until after the war—of mechanized cavalry (recently redesignated Armor). But the principles referred to above were once again amply proven in a secondary theater in Palestine by the magnificent campaigns of Allenby. He was a master of grand tactics who in spite of modern war's almost prohibitive odds against the horse on the battlefield, masterfully combined the massive but less mobile weight of infantry with the more mobile striking power of cavalry.

Thanks to the invention of the iron horse and the foresightedness of our more mobile-minded leaders, we were prepared in World War II with a balanced force with whose success all are familiar. This is the more noteworthy in that success was attained in the same theater that saw the failure of the unbalanced armies of World War I.

Careful analysis, far beyond the scope of this letter, will show that successful application of the principles of mobility demands an organization in which both the less mobile (infantry) and more mobile (armor) elements are in divisional strength when the whole force is a corps or larger. Further analysis shows that an "all-purpose" division is tactically unsound. The so-called mechanized division is analogous to the old term "mounted infantry." It has strategical advantages and logistical disadvantages. There is no cheap substitute for the armored division organized and trained to fight mounted and capable of fighting dismounted.

As long as warfare is conducted on the earth's surface it is safe to predict that there will be a need for these two basic elements. It matters not whether either or both reach the battlefield by water, air or land. What does matter is how they fight.

Armored support, chiefly in the form of tanks, is an essential element of the infantry division. As such it supports the infantry action, it may and should increase the infantry's mobility, but in the end it is and must remain infantry. The armored division on the other hand

Major General R. W. Grow.

predicates its tactics on the mobility of the tank which here is the basic element and all other elements are organized, equipped and trained to support mounted action. Armored infantry, artillery and engineers require iron horses capable of modern battlefield maneuverability. Parenthetically: I agree with the caption under the title "Armored Infantry is Different" on page 40 of the January-February issue but I fear the author has missed the real "difference." Armored infantry must be trained to FIGHT mounted. Opportunities to do so will not be often but they will be decisive. I found them to be surprisingly frequent in Europe and found the tempo of the entire operation depended upon the skill and spirit with which the small infantry unit attacked mounted, firing "from the hip," and the alacrity with which all or part of the armored infantry could switch from mounted to dismounted to mounted action. This inherent ability coupled with the fact that in armor it is the tank, not the infantryman, which sets the pace, is what differentiates between the two basic combat elements. Difficult to put in words and impossible to understand unless developed by long training is the "difference."

Other conditions being equal the army with the better balance between infantry and armored divisions will win. Under present conditions in Europe not less than one-half of the divisions should be armored. The U. S. is best able to furnish (and certainly second to none in ability to employ) the armored-division component of any combined force.

The current emphasis on small armored units which your editorial very properly found so disturbing is doubtless due to the peculiar conditions of the Korean war. It is to be hoped that the lessons of large scale land operations in Europe are not forgotten and that the balance of the army is sufficiently weighted with armored divisions to insure the army commander mobility and freedom of maneuver in combat. There is no substitute for battlefield mobility, by which the commander can retain the initiative and overcome a stronger but less mobile enemy. Conversely there is no means so effective to counter a highly mobile enemy. Modern weapons and equipment both dictate a higher ratio of armored to infantry divisions than World War II.

MAJ. GEN. R. W. GROW
Army Attaché
Moscow, Russia

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Rates: See bottom of contents page.

The Working Level

Dear Sir:

May I pass along the comment that I believe ARMOR is an outstanding publication. I appreciate the freshness of its appearance and the value of the content.

However, and I know this will be familiar to you, I would like to see more articles down on the company-battalion level. After all, the only way for younger officers to learn from the experience or knowledge of the older, wiser ones is to read or hear of them. And since their reticence is well established, our only hope lies with ARMOR.

Lt. John Ferguson
4th Reconnaissance Battalion
APO 174

● *We'll put our trust in this very issue to carry out the wishes of Lieutenant Ferguson. May we add one thought. An article signed by a senior officer is liable to be chock full of a career of experience gained in all the grades, experience that supplies some good groundwork for junior personnel.*—Ed.

More On Russian Tanks

Dear Sir:

Referring to Generalmajor H. B. Mueller-Hillebran's letter in your Jan-Feb '51 issue on The Use of Soviet Tanks by the Germans, and the "poor quality" opinion of Mr. Garrett Underhill which occasioned his letter, the following German opinions on Russian tanks quoted from *The Other Side of the Hill* by Liddell Hart are of particular interest:

"Russian equipment was very good, even in 1941, especially the tanks. . . . Their T34 was the finest in the world."

F. M. Von Kleist.

"The Russians maintained their advantage in tank design; the 'Stalin' tank, which appeared in 1944, was the best tank that was seen in battle, anywhere, up to the end of the war."

Gen. Von Manteuffel.

Capt. C. L. Proudfoot
Editor
Indian Armoured Corps Journal
Ahmednagar, India

How Are Things In Korea?

Dear Sir:

I receive your informative and artistic magazine indirectly every two months and read it with interest. However, getting down to business, I have two things to discuss with you.

The first one is—have there been any figures on our tank losses in Korea since the first M24s went into action? If so, I wish you would inform me of the figures.

Next, I consider the M4A3E8 a good tank but still slightly inferior to the T-34 considering that the T-34 with its *old* gun (76) was good enough to set a Mark V back on its bogies. The new version of the T-34 has an effective 85mm gun. Now, an M4 was some-

An M4A3E8 at work in Korea.

what inferior to the Mark V and it took a good M4 tankman to put a Mark V out of commission. If the T-34 was better than the Mark V and the M4A3E8 inferior to it, how would things go in Korea?

I think we've been lucky to have our splendid tankmen in those grease traps. If I were the Supreme Commander I'd put more M46s in there. I have no faith in any other tank.

Robert Graham
Morristown, New York

● *Master Robert Graham, 12-year-old son of an Armor Reserve Officer, has advanced some sound comment. What may be said on our tank losses was set forth by Col. Withers, Armor Officer, Eighth Army, in his letter and article of last issue. We recall his remark that "the M4A3E8 has not failed to demonstrate its superiority over the T-34," and "M4A3E8 crews like their tanks."*—Ed.

Mounted Service Museum

Dear Sir:

The Association plan to join in sponsoring a museum of the mounted service is most worthwhile.

I have several items which I am desirous of contributing when the moment for assembling the historical items arrives, including two lances, once carried by Bengal Lancers.

In earlier days at Fort Riley I donated a number of items of historical worth to the Cavalry School collection. Some of this I more recently have heard has disappeared. I hope that the Cavalry library and other items may be secured for the museum.

Lt. Col. Leon K. Kurland
3d Armored Division
Fort Knox, Ky.

Dear Sir:

As a former Cavalry Reserve Officer who was fortunate enough to attend the Cavalry School, I think your idea of a Mounted Service Museum is excellent.

Many former horse Cavalrymen might like to belong to an organization sponsoring the museum.

I have a collection of Cavalry and Army songs on records in which I am missing the famous Garry Owen song. I wonder if any of your readers can give me a lead on where to secure it?

Alex B. McDonell
Lt. Col. CE USAR
Dallas, Texas

● *Those with information pertaining to the museum project may address Colonel Geoffrey Galwey, chairman of the Association committee concerned with the details, in care of the Headquarters.*—Ed.

From Here to E . . . Where?

Dear Sir:

I regret my inability to submit a review of *From Here to Eternity* as you requested.

The review copy is being returned to you after careful reading to try to find something worthy of publication.

There is nothing even remotely approaching literature in this compilation of 800 pages of filth; the Army is used as the carrier for acquainting the reader with words, expressions and scenes heretofore considered below the level of any standard of decency respected by American publishers.

This book has been well merchandised and no doubt the market will be expanded to reach *all* teen-agers. A low priced paper back edition will no doubt appear soon.

I would not have been surprised to find a notice on the back flap, "Send 50 cents for a complete set of GEN-U-WINE postcards."

Herbert H. Frost
Colonel, USAR
Washington, D. C.

● *With Colonel Frost's permission ARMOR passes along his reaction to the recent and much-discussed novel.*—Ed.

THE COVER

Many of the leading exponents of mobile warfare have decried the fact that we have never attained mobility in the true sense in our armored divisions. Pointing to the tremendous excess with which the division is burdened, and to the large number of wheeled vehicles which keep it roadbound, they advocate a paring down and a switch to full tracks throughout. The T18E2 armored personnel carrier is a step toward the greater mobility that has been advocated.

editorial

A ROLE, NOT A WEAPON

The Army has just announced the alerting of the Second Armored Division at Fort Hood, Texas, for shipment overseas, to become the 12th division of General Eisenhower's building forces for the defense of Western Europe.

The famous "Hell on Wheels" division joins the U. S. Constabulary (considered roughly equivalent to an armored division), France's Fifth Armored Division, and Britain's Seventh and Eleventh Armored Divisions, in providing armor backbone and mobility which draw additional strength from a separate British armored brigade and the organic tank units of the infantry divisions which are a part of the NATO forces.

Thus the Western World prepares the strength to meet any aggression. It is gratifying to see the proportion devoted to the major mobile unit, the armored division; and particularly so when considered against the history of war on the Continent.

It seems that another step in the right direction might well be the reorganization of the Constabulary into a true armored division. Its background of organization, in which figured the First and Fourth Armored Divisions, and its fine record in foreign service under such distinguished commanders as Generals Harmon and White, provide an appropriate backdrop for its reconstitution as, for example, the Fourth Armored Division.

The armored division is a combined arms team requiring considerable time to organize, train and equip. For that reason, an acceptable proportion of operational-type divisions must be in readiness to meet the immediate requirements of any emergency.

The assignment of the Second Armored Division to the NATO forces; the reactivation of the First Armored Division; the purposeful tank program; the fast action on the T-41; the development of the new personnel carrier; all of these things join in pointing up the recognition of the requirement for mobility in modern war, a requirement that has its ultimate and timely confirmation on the field in Korea.

The major instrument of mobile warfare today, the tank, has been widely discussed, by experts and others. Much of the criticism goes to such great lengths to list the many measures of defense against the tank that, in sum, it serves to establish a strong case on behalf of the weapon that is effective enough to require all of these countermeasures. And few of the critics come forward with proposals as to what will take the place of the tank in providing tactical and strategical mobility on the battlefield.

Natural and man-made obstacles, mines, antitank weapons and airplanes have not stopped armor any more than the rifle and artillery have stopped the foot soldier.

In the light of the present, ground warfare requires a team. That team consists of armor, artillery, infantry and tactical air. Armor's job in that team is to provide it with mobility, fire power and shock. Armor's major tools for accomplishing that job are the armored division and the medium tank.

ARMOR, as the focal point of professional interest in mobile warfare, would call attention to the basic fact that the point of overriding importance is not a weapon, but a role.

Award of the Medal of Honor

President Truman and Medal of Honor recipients at the White House ceremony on Armed Forces Day. L. to R., Lt. Dodd, Sgt. Pittman and Sgt. Kouma.

President Truman, in a special ceremony at the White House on Armed Forces Day, May 19, pinned the Medal of Honor, the nation's highest award, on three Army veterans of the Korean campaign. The citation accompanying each award follows:

"First Lieutenant Dodd (then Second Lieutenant), Company E, 5th Infantry Regiment, distinguished himself by conspicuous gallantry and intrepidity above and beyond the call of duty in action against the enemy near Subuk, Korea, on 30 and 31 January, 1951. Lieutenant Dodd, given the responsibility of spearheading an attack to capture Hill 256, a key terrain feature defended by a well-armed, crafty foe who had withstood several previous assaults, led his platoon forward over hazardous terrain under hostile small-arms, mortar, and artillery fire from well-camouflaged enemy emplacements, which reached such intensity that his men faltered. With utter disregard for his own safety, Lieutenant Dodd moved among his men, reorganized and encouraged them, and then singlehandedly charged the first hostile machine-gun nest, killing or wounding all its occupants. Inspired by his incredible courage, his platoon responded magnificently and, fixing bayonets and throwing grenades, closed on the enemy and wiped out every hostile position as it moved relentlessly onward to its initial objective. Securing the first series of enemy positions, Lieutenant Dodd again reorganized his platoon and led them across a narrow ridge and onto Hill 256. Firing his rifle and throwing grenades, he advanced at the head of his platoon despite the intense, concentrated hostile fire which was brought to bear on their narrow avenue of approach. When his platoon was still 200 yards from the objective he moved ahead and with his last grenade destroyed an enemy mortar, killing the crew. Darkness then halted the advance but at daybreak Lieutenant Dodd, again boldly advancing ahead of his unit, led the platoon through a dense fog against the remaining hostile positions. With bayonet and grenades, he continued to set the pace, without regard for the danger to his own life, until he and his troops had eliminated the last of the defenders and had secured the final objective. Lieutenant Dodd's superb leadership and extraordinary heroism inspired his men to overcome this strong enemy defense, reflecting the highest credit upon himself and upholding the esteemed traditions of the military service."

• • •

"Sergeant Pittman, 2nd Platoon, Company C, 23rd Infantry Regiment, distinguished himself by conspicuous gallantry and intrepidity above and beyond the call of duty in action against the enemy near Kujang-dong, Korea, on November 26, 1950. He volunteered to lead his squad in a counterattack to regain commanding terrain lost in an earlier engagement. Moving aggressively forward in the face of intense artillery, mortar and small-arms fire, he was wounded by mortar fragments. Disregarding his wounds, he continued to lead and direct his men in a bold advance against the hostile strong point. During this daring action, an enemy grenade was thrown in the midst of his squad endangering the lives of his comrades. Without hesitation, Sergeant Pittman threw himself on the grenade and absorbed its burst with his body. When a medical aid man reached him, his first request was to be informed as to how many of his men were hurt. This intrepid and selfless act saved several of his men from death or serious injury and was an inspiration to the entire command. Sergeant Pittman's extraordinary heroism reflects the highest credit upon himself and is in keeping with the esteemed traditions of the military service."

• • •

"Master Sergeant Kouma [at right in photo] (then Sergeant First Class), a tank commander in Company A, 72d Tank Battalion, distinguished himself by conspicuous gallantry and intrepidity at the risk of his life above and beyond the call of duty in action against the enemy in the vicinity of Agok, Korea, on 31 August and 1 September 1950. His unit was engaged in supporting infantry elements on the Naktong River front. Near midnight on 31 August a hostile force estimated at five hundred crossed the river and launched a fierce attack against the infantry positions inflicting heavy casualties. A withdrawal was ordered and his armored unit was given the mission of covering the movement until a secondary position could be established. The enemy assault overran two tanks, destroyed one and forced another to withdraw. Suddenly Sergeant Kouma discovered that his tank was the only obstacle in the path of the hostile onslaught. Holding his ground he gave fire orders to his crew and remained in position throughout the night fighting off repeated enemy attacks. During one fierce assault the enemy surrounded his tank and he leaped from the armored turret exposing himself to a hail of hostile fire, manned the .50 caliber machine gun mounted on the rear deck and delivered point-blank fire into the fanatical foe. His machine gun emptied, he fired his pistol and threw grenades to keep the enemy from his tank. After more than nine hours of constant combat and close-in fighting, he withdrew his vehicle to friendly lines. During the withdrawal through eight miles of hostile territory, Sergeant Kouma continued to inflict casualties upon the enemy and exhausted his ammunition in destroying three hostile machine-gun positions. During this action Sergeant Kouma killed an estimated two hundred fifty enemy soldiers. His magnificent stand allowed the infantry sufficient time to re-establish defensive positions. Rejoining his company, although suffering intensely from his wounds, he attempted to resupply his tank and return to the battle area. While being evacuated for medical treatment his courage was again displayed when he requested to return to the front. Sergeant Kouma's superb leadership, heroism and intense devotion to duty reflect the highest credit upon himself and uphold the esteemed traditions of the Army of the United States."

training

the Armored Infantry Platoon Leader *REINFORCED*

On the training field—the framework for tank-infantry teamwork at platoon level

by CAPTAIN CHARLES W. KOBURGER, JR.

LORD, what do I do *now*? . . . This silent prayer is offered up many times during every platoon leader's service. For the beginnings of an answer he must go to the Field Manuals, which give the general rules; and to those who have worked out solutions to similar problems (and have lived to tell about them). Here are a few of the tips and rules of thumb, some borrowed from the Field Manuals, some not, and all of which have proved useful to platoon leaders who have gone before.

To begin, your armored infantry rifle platoon consists of three rifle squads and one light machine gun squad (two M-1919A6s), and your platoon sergeant and you. Each squad has an armored personnel carrier (APC): you ride in one of these and the platoon sergeant usually rides in another. Your attached tank platoon consists of five tanks; two sections of two tanks each, and the platoon leader's tank. The platoon leader usually commands the first section (giving it in effect three tanks), and the platoon sergeant commands the second section.

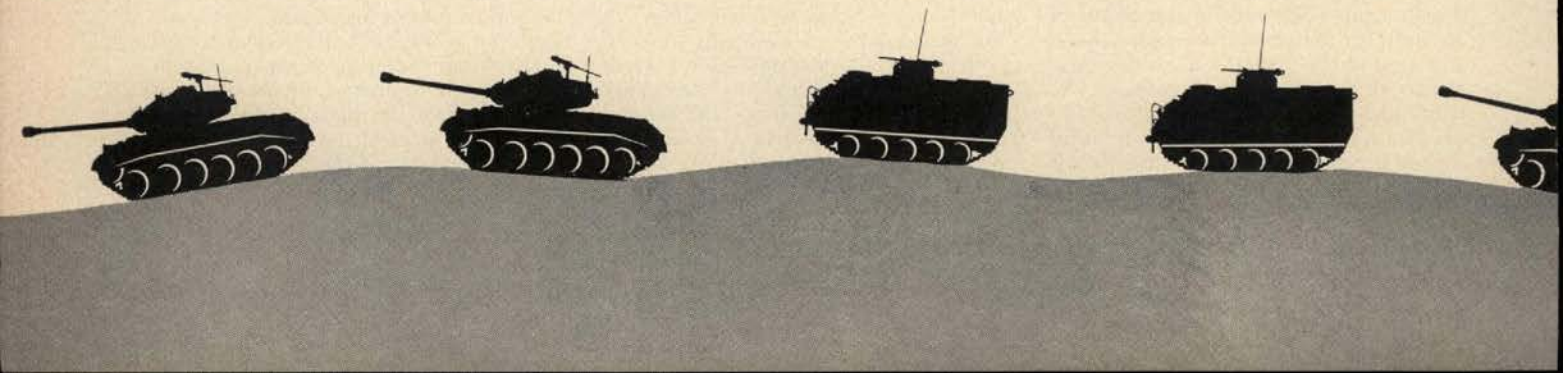
The armored infantry platoon leader whose mission reinforces him with a platoon of tanks should be guided by two general principles. He should have read the manuals, which give him the framework of basic knowledge on his special subject, and he should use SOPs. The latter minimize confusion in combat. They save time when time really counts. They give impetus to solution of unusual problems. The British, for example, have had great success with their battle drill; it shows every man where he fits, what he is to do, when he is to do it.

FIRE POWER—you have it . . . use it! Your attached tank platoon should liberally hose down every likely clump of bushes with bow and coaxial machine guns. The personnel carriers should do the same with their weapons. Against such fire, very few enemy doughs are going to try to fire a rocket launcher.

MOBILITY—you have it . . . use it! Everyone can ride, and should ride where it is possible. Keep moving! This decreases the time of exposure to enemy fire and makes you a difficult target for enemy guns. It also assists you in attaining tactical surprise.

SHOCK—if you apply your fire power and mobility properly you will have shock. Beat the enemy over the head with everything you can bring to bear—guns, small arms, artillery, air—and in the attack of counterattack, overrun him before he can recover. Hit fast and hard. The manuals are right.

Captain Charles W. Koburger, Jr., served with the 11th Armored Infantry Battalion of the 1st Armored Division in the Italian Campaign. A graduate of Infantry OCS in 1943, he is now Communications Officer of the 67th Medium Tank Battalion, 2d Armored Division, Fort Hood, Texas.



Some SOP's

Working with tanks—infantry dismounted:

good observation and fields of fire—tanks lead 100 to 200 yards.

poor observation and fields of fire—tanks and infantry move together.

no observation or fields of fire—infantry leads by 50 to 100 yards.

Working with tanks—infantry mounted:

tanks *always* lead.

Some Formations

Two good standard formations for a reinforced infantry platoon acting as leading element in mounted approach march:

1. Infantry in carriers (preferred).

2. Infantry on tanks (sometimes necessary).*

1st & 2d tanks: no riders

3d tank: infantry squad leader & rifle squad

4th tank: rifle squad

5th tank: rifle squad

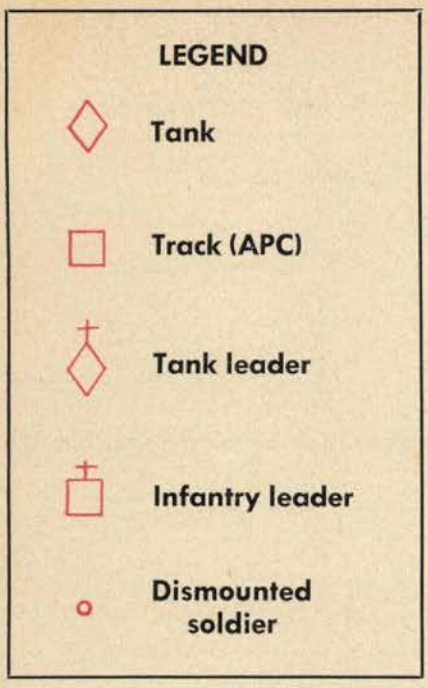
6th tank: ½ light machine gun squad

7th tank: ½ light machine gun squad & infantry platoon

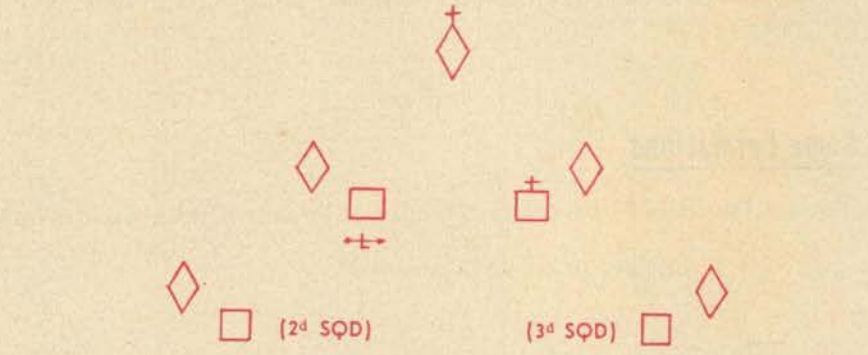
A good formation for an infantry platoon reinforced with a platoon of tanks and acting as leading element with point dismounted:

When you are halted during a march, are not in the lead and not engaged, coil your platoon. Form your perimeter well off the road. Your tanks cover the most likely avenues of approach, your tracks the others, in order of priority as far as they will go. Dismount and send out local security (not more than 50 to 100 yards). Keep well dispersed and use available concealment to the maximum.

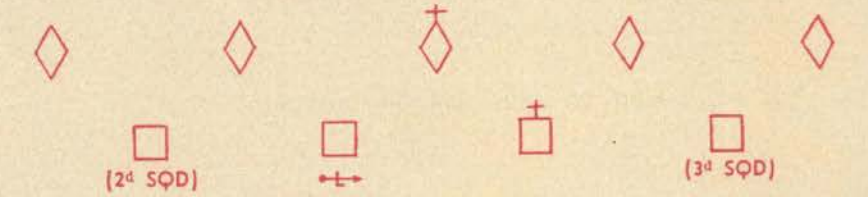
*Never mount infantry on first two tanks; use two tanks for point and mount the infantry platoon on remaining five tanks.



The next formation is offered with some reservation, since any tactical movement across country—contact imminent—should flow through the low ground, making maximum use of available cover and concealment, and several formations may be used. It is, however, one much used by a reinforced platoon for mounted attack in open country:



And here is a good formation for a reinforced platoon in the assault with APCs (infantry dismounted): ⟶



Now for some action SOP's. From an approach march formation, when contact is made:

Plan A. Point forms base, main body of platoon flanks to right.

B. Point forms base, main body flanks to left.

C. Hold at position of (point) (main body), leading squad left, next right, 3rd left; light machine gun squad initially in reserve.*

D. Hold at position of (point) (main body), leading squad right, next left, etc.

A word here. Your platoon is essentially a jabbing unit. Flanking movements with part of your force should be confined to short hooks well within supporting distance (400 yards).

A few last recommendations. In the approach march it often pays to put a man on the tank's .50 cal. machine gun. The extra fire power counts in that first fight for fire superiority. When you do hit something, get off the road, bring the enemy under fire, and REPORT.

In the attack ride your infantry as far as you can, but always dismount your infantry for the assault.

In the defense dismount at least your heavy 30's. Site all your weapons carefully, and clear your fields of fire. Make range cards for all guns and automatic weapons. Lay mines—as soon and as many as possible. Preplan your defense—defend the clock.

Any time, use your APC's. They may be used in sections to form or supplement your base of fire or to protect your flanks and rear. Put the tracks in hull defilade. Leave a gunner for the 50 cal. (as well as a driver). Put your platoon sergeant in charge.

You be with the decisive element (not necessarily the largest). The tank platoon leader is your expert in the use of tanks—use him as your second in command.

NEVER be caught with your fire power down. Our enemies specialize in the use of massed infantry. You must *always* be ready to stop whatever appears, dead in its tracks, and then destroy it.

A final word. This is just the beginning. These are suggestions based on experience. There will be those who disagree. You are going to have to learn those general rules—read the Field Manuals—and then decide on specific solutions to your problems. When you find a good one, if appropriate, make it SOP.

"All right, you know the situation. We'll try Plan A on my order, using that wooded draw there on the right. Be sure to keep those guns hot, and keep moving. On the objective, carriers cover from 4 to 8 o'clock; the rest of you act accordingly. Any questions? Let's go!"

*Squad leader places his squad in a covered position, and reports to the platoon leader for orders.

The Tank-Infantry Team at Work

by LIEUTENANT THEODORE R. PICKETT, JR.

From the field in Korea a junior leader describes an operation involving tank-infantry teamwork; more of the moment-of-occurrence reporting so helpful in our training program.

LIKE any team, the tank-infantry combination, for best results, requires mutual cooperation, confidence, training and hard work.

This article covers an eight-day period of combat in Korea and I think exemplifies the best use of the tank-infantry team in terrain such as that in Korea.

Our tank company was alerted to move to the support of the – Infantry Battalion in a series of limited objective attacks. We moved out with 13 tanks (M4A3E8's) and contacted the infantry at the assembly area (see map) at 1100, and were ordered to find a route to positions to support Item Company going up on Hill 339. The road had been cratered in five places (air report received earlier) and therefore the tank platoon would have to follow the river bed. This was accomplished and the tanks were in position by 1400 hours. The AN-VRC3 radio had been netted with the infantry company commander and contact between him and the tank platoon leader was maintained through their march to and subsequent taking of the objective, Hill 339. General support fire was called for as the mortars and artillery were displacing, and the tank platoon (4 tanks) laid down the preparatory barrage and subsequent support. The hill was secured without enemy contact by 1630, and a perimeter set for the night.

Some minor difficulties were encountered. The tankers had no maps available, the infantry and tank leaders had not met before starting off. A favorable factor was the lack of enemy contact. *It enabled the team to get acquainted!*

That evening, maps (1/50,000) were brought up and, at the suggestion of this platoon leader, targets were designated by number (*i.e.*, hills, houses and road junctions were numbered 1 through 80 for quick target designation). The tank company commander had an SCR 508 radio and maintained contact with the infantry battalion commander, and targets were cleared through or called for by the tank company commander.

The morning of the second day the jump off time was set up one hour to 0700. As a result, the tankers missed

Lt. Theodore R. Pickett, Jr., a Finance Corps Officer on a two-year troop duty tour with Armor, served with the Marine Corps during World War II as a pilot in VMB 443 in the Pacific. He joined the 72d Tank Battalion early in 1950 and has served with it in Korea as a combat tank platoon leader.

chow, an item corrected at succeeding mealtimes. The mission was to secure the pass between Hills 339 and 221 and exploit the valley to the north and west.

The engineers were ordered to precede the tanks down the road and clear it for them. The terrain of the pass made it mandatory that the tanks use the road. As the infantry held the high ground to the north (Hill 339) and was moving to the right there was no infantry down on the road. The road was cleared almost to the pass when the engineers found booby traps made with 60mm and 81mm mortar and 105mm howitzer rounds. Almost at the crest of the pass a wooden box mine was found on the left side of the road. An immediate search was conducted on the right side of the road for a sister mine but none could be found. The lead tank proceeded up the road. Upon reaching the spot where the mine had been found this tank hit a mine on the right side of the road. The crew immediately got out of the tank, something which should not be done if circumstances will permit remaining inside. Until the crew has ascertained whether the field is covered with enemy small arms and mortar fire, they should remain in their tank. In this case the infantry held the pass so it was of no serious consequence.

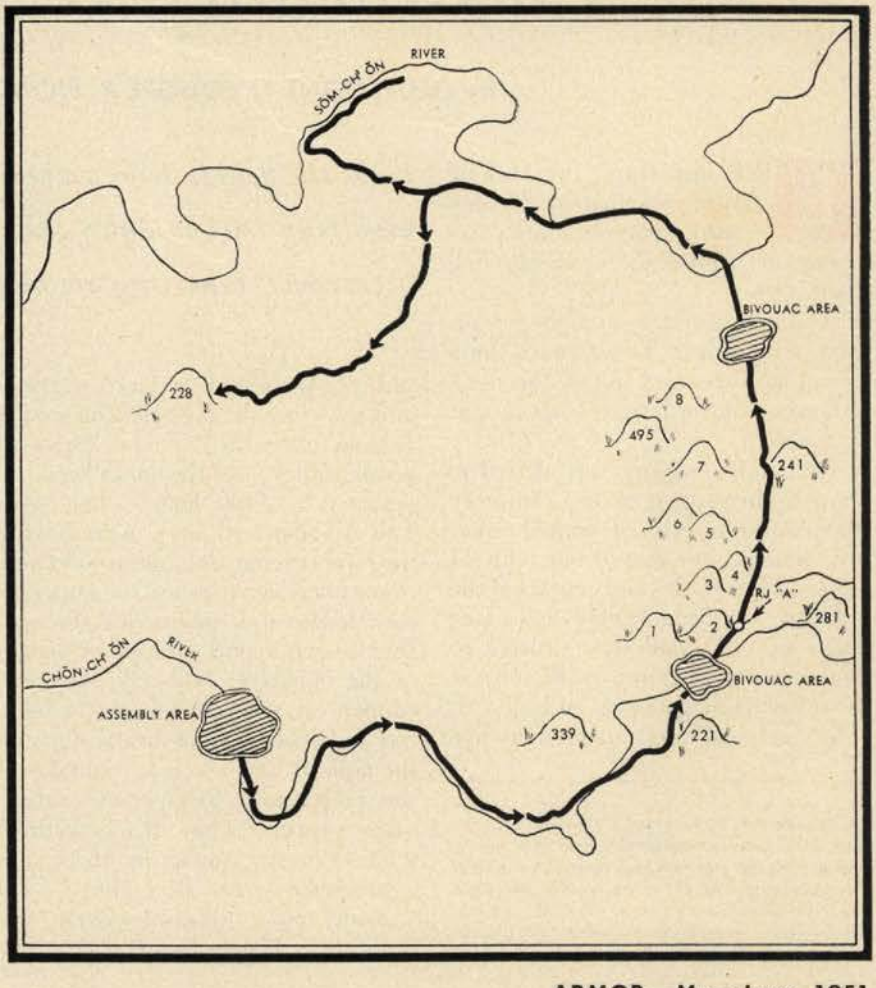
By the time the road was again open it was 1600 and the attack was halted with the infantry holding Hills 339 and 221. The tank company returned to a bivouac area at Takpokkol, where they could perimeter and also support by fire the infantry battalion on the two hills.

The third day the plan called for a platoon of tanks to shove through the pass and hit designated targets while the right flank battalion moved up on line. This was done very nicely, much to the satisfaction of the division commander, who observed the operation. The tankers hit each target the first time (well trained gunners) and received many compliments on the excellent gunnery.

On the fourth day the right flank battalion was to seize Hill 281, and if possible the high ground to the north. The Infantry Battalion was to seize Hill 495 and hold. The AN-VRC3 radios were netted the evening before, and checked. The tank company was to advance by platoons, leapfrogging down the valley, with the infantry following. An artillery and mortar preparation got under way at 0700 and the attack jumped off at 0800. The tanks progressed nicely, silencing some machine-gun nests, and secured the road junction ("A"). Four tanks were damaged by mines, even though they operated off the roads. One tank commander, who failed to follow his platoon leader's track across a road, hit a mine (even after he had been told to follow the tracks). The other tanks hit mines when they crossed the road. Every attempt is made to stay off the roads, even though the terrain is rough. That rough ride will keep more tanks and tankers rolling.

After securing the road junction, one platoon took blocking positions to the north, one to the northwest, and one to the west, along the three roads. At this time a platoon of the regimental tank company pulled in, and we had 17 tanks around the road junction, too many for adequate control, and the fact that they were from different organizations made control that much more difficult. To make the situation a little more fouled up, we were trying to support the two infantry battalions, and there was not enough prior planning with the right flank battalion: initiative by the tank platoon leader produced contact with the right flank infantry battalion, and assisted the battalion to their objectives by close support direct fire.

The left flank infantry battalion found well-entrenched enemy on Hills 3 and 4, and requested one platoon of tanks to support their attack. One section of two tanks went into the cut between Hills 1 and 3, while the other two tanks went up the road north to outflank the enemy. The platoon leader remained at the junction for proper control of his platoon, and to insure that radio contact was maintained. The infantry company commander directed the tank fire via 300 radio and under its barrage started up on Hill 4, but the enemy hit them with quite a bit of fire, and they pulled back. Artillery was then called for and VT and WP pulled the enemy out of their holes. The three tanks then had quite a field day with approximately an enemy platoon routed and killed (either going up



over 4 or coming off the reverse side). The infantry then secured the hill and the attack halted at 1730. The tanks were perimetered behind Hills 1 and 2 (south) for the night.

The fifth day was a slight repetition, as the infantry battalion was again ordered to secure Hill 495. With one company as a base of fire on Hill 6, and with the tank section of two tanks again in the draw behind Hill 3 where they could see Hill 495, and the other section and tank platoon up along the road to the right flank of Hill 495, the attack started with very close tank support, and progressed rapidly. One platoon leader did insist on fighting his own tank for a while (the platoon leader should bring the maximum amount of fire power to bear by using the whole platoon rather than by trying to do it all by himself). As soon as the lead company reached the peak the reserve company jumped through them to continue the attack. The infantry company commander of the lead company at this time turned the tanks over to the reserve company commander (via the 300—AN-VRC3 radios) for his support. It worked very smoothly and in conjunction with the mortars managed to send what enemy were alive scurrying off to the north. As it was 1630 we dug in and held 495. The tanks withdrew to the positions held previously behind Hills 1 and 2 in the river bed to bivouac for the night. (Always pick positions back far enough, if possible, where you can support the infantry by fire. Prearranged range cards are of course a necessity and one of the first things we do each evening before dark is to make one for each tank.)

An afterthought on this day's work. We fired quite a bit of ammunition and almost constantly had two tanks at the river bed being re-ammoed; we shuttled them so as to have constant fire power against the enemy. This could not be done by platoons, as we had only nine tanks, but it could easily have been done by platoons if more tanks had been available.

The sixth morning our objective was to secure the Somchon River ford and this was taken with little enemy resistance. The tank platoon leader, reaching the top of the pass between Hills 495 and 241, could see the enemy digging in on the hills above Muchon. He immediately called the infantry battalion commander on his AN-VRC3 and, giving the coordinates and the azimuth, brought artillery and mortars in on the positions and made corrections as necessary.

The seventh day a patrol was sent to Hill 228 to contact the Marines; and a tank platoon, an infantry company and a squad from the regimental A and P platoon took this patrol. No enemy contact was made, but the demolitions team found booby-trapped mines (with 3 to 6 hand grenades) and double mines (one, and then another under the first, with a light dirt covering between the two).

By the eighth day another patrol of three tanks, an infantry company and the A and P squad went to Ford "E" to contact the Marines again. There were only three operational tanks by this time, due to constant usage with little maintenance.

The little time after chow was used to re-ammo and refuel and do some first echelon maintenance, but eight days is a little long for the best operation of the tank company. With only six hours of maintenance we had nine operational tanks once again.

In tank-infantry operations the pace of the attack is set by the tankers and tanks. The weapons and equipment must be used to full advantage.

Tankers must remember that they have the *aggressive weapon* and consequently *must use that weapon aggressively!*

Languages in Preparedness: Link or Obstacle?

In supporting America's role of world leadership the responsibilities of our Armed Forces hinge increasingly upon languages. A leading educator discusses our language problems and offers some solutions.

by L. E. DOSTERT

THE activation of an integrated international force on land, at sea, and in the air, under a supreme international commander, is without precedent in history. In the field of military planning, organization and operation, it constitutes a challenge to the ingenuity and creativeness of our own world's best military minds. The countries that are now united in the Atlantic Pact have readily made available to the supreme command some of their most competent men. These are being welded at the present time into an effective staff organization under the leadership of a proven Supreme Commander.

Oddly enough, when it comes to one of the basic requirements for the efficient functioning of the new forces —that of language—the thinking, planning and actions to date, in so far as they are known, have followed the pattern of World War II, if not indeed of World War I,—which is like saying that there is hardly any pattern at all. In this field much seems to be left to future improvisations.

In many areas of defense preparedness, including such relative newcomers as psychological warfare, for example, there is evidence of awareness and up-to-dateness, while in the case of the language problem—one which is certainly without precedent—the pattern of action seems to be marked with an obsolescent approach. This writer believes that unless the problem of multilingualism inherent in the creation of an integrated international force is recognized, properly defined and analyzed, and practical action taken to meet it squarely, we shall fall way short of our potential effectiveness in this important field.

L. E. Dostert has had extensive experience in the language field, both as a civilian educator and as a military officer. From 1926 to 1941 he served on the faculty of Georgetown University. Following a tour in 1942 with the O.S.S., he entered upon active duty with the U. S. Army for a four-year period in which he rose from major to colonel, filling such key posts as liaison officer to General Giraud; interpreter to General Eisenhower; and Chief of the Language Division of the Nuremberg Trials. In 1946-47 Mr. Dostert served as director of the Simultaneous Interpretation Division of the United Nations; in 1948-49 as administrative counselor to the International Telecommunication Union at Geneva, Switzerland, and also as secretary general of the International High Frequency Broadcast Conference. Since 1949 he has been director of Georgetown University's Institute of Languages and Linguistics.

Coordinated military action rests basically on the accurate formulation, transmission and reception of ideas, and language is the normal vehicle for the communication of ideas. Unless timely measures are taken to insure that language does remain an effective means for the communication of ideas —a link rather than a barrier—then many a phase of the activities of the Atlantic Pact forces will labor under serious handicap. Nor is it an answer to point to the fact that so far, during the early planning phases, there have been no serious language difficulties. The tasks ahead, in this area as in many others, are much more arduous than the encouraging but still inchoate accomplishments of the early months.

It is probably unfortunate that language, like religion and politics, is a subject about which nearly everyone considers himself endowed with certain innate wisdom and competence. It would be belaboring the point to insist that as a people we Americans have been largely unaware of the importance and value of skill in foreign languages. Even in those areas, both military and civilian, where language proficiency is important, our record is not particularly brilliant. A native American really skilled in the use of a foreign idiom is still a rarity. This ingrained attitude probably accounts for the casualness with which the complex problem of language in the NATO has so far been regarded.

But the heavy hand of the past

weighs in other ways. Heretofore, military forces of different nationalities, united in a common objective, were only coalitions of independent and self-contained national contingents. A "liaison" at the top level in World War I was really the only measure of integration achieved—and even then only two languages were involved: English and French. In World War II, the only true integration achieved at the staff and field levels was between the Americans and the British—with no language problem, except perhaps now and then in peculiar semantic idiosyncrasies at staff level. The forces that were later placed under a single command in the Mediterranean area in particular were of several idioms and nationalities: American, British, French, Polish, Yugoslav, Italian, South African, Palestinian—but except for the Americans and British, they were not military forces of recognized and co-equal sovereign governments,—they were the salvaged and brave fighting legions of countries under the yoke of the enemy. The Brazilian forces did not fall into this pattern, and the language problem they created was a source of complications.

This time we are not dealing with the forces of occupied allied or friendly countries, but rather with the freely contributed contingents of co-equal sovereign governments. Their languages, so far, are English, French, Dutch, Danish, Norwegian, Italian, Portuguese, possibly Icelandic. It is conceivable that Turkish, Greek, German, Serbo-Croatian and Spanish may later be added to the list.

Gen. Eisenhower confers with the Standing Group, North Atlantic Treaty. NATO now has twelve nations posing a language problem at all levels.

"Other reforms in the Assembly's procedure are recommended . . . it is essential that the system of simultaneous translation which was used successfully in one committee room during the past session, be extended for use in all plenary sessions and in committees. It will be difficult, not merely because of the expense, but because personnel with the necessary experience are hard to find, but they must be found."—**Paul-Henri Spaak, President of the United Nations General Assembly 1946-47.**

There does exist one rather arbitrary way of attempting to solve the problem of multilingualism in an integrated international force: it is to decree purely and simply that English and French are to be accepted as the "working" languages for all purposes. Let everyone come prepared to use these "international" tongues. So far these two languages have been the working languages of NATO. This simple, though arbitrary, solution has been tried before and found wanting, if only in the case of the old League of Nations, and during the early period of the United Nations. In effect, this solution in regard to NATO amounts to relegating the non-French or non-English speaking countries to the status of linguistic satellites.

Even if the deep psychological disadvantages flowing from such an arbitrary procedure are overlooked there is still a graver difficulty. The two-language solution would in effect subordinate technical competence to language skill. Assume, by way of example, that a meeting is called between the Surgeons General of the integrated forces to examine a common problem. If French and English are imposed as the only languages of the meeting, it might well mean that subordinates would be designated as representatives *ad referendum* for sev-

Language problems are increasing as nations of the world are in closer contact. Here Turkish infantrymen are teamed with U.S. tankers in U.N. action in Korea.

eral countries. What this entails is quite obvious. And this situation might well exist in many other fields where adequate coordination, if not complete integration, is called for.

The language problem will have to be resolved at the staff, field and troop levels, both for the spoken and written forms. Obviously, the extent of the difficulties will vary in accordance to the requirements of specific fields and different levels. In any case, one cannot avoid the recognition of the magnitude of the problem and of the necessity of taking reasoned and timely steps to insure a practical solution. This means that a solid and effective training program with precise objectives should be instituted and carried out competently.

> "I could cite many . . . cases in the United States Supreme Court —that have taken . . . much longer to try [than the Nuremberg cases].
>
> "In this connection it should be noted that we decided to install facilities for simultaneous interpretation of the proceedings into four languages. This was done against the advice of professional interpreters of the old school that it 'would not work.' It does work and without it the trial could not have been accomplished in this time if at all. To have had three successive translations of each question, and then three of each answer, and to have had each speech redelivered three times in different languages after the first delivery finished, would have been an intolerable waste of time. The system we used makes one almost unaware of the language barrier, so rapidly is every word made available in each language."—**Excerpt from the Text of Justice Jackson's Report to the President on the Nuremberg Trial.**

Let us look for a moment at the needs in respect to spoken language. On two occasions in the recent past a similar problem was solved in a relatively simple and practical way. When, in keeping with our proclaimed war aims, the Nazi war criminals were to be tried in Nuremberg, the language question came up. The directives stated plainly that the trials must be conducted expeditiously, and at the same time that all parties to the proceedings, *i.e.*, the Bench and the Prosecution (English, French, Russian), and the Defense (German), were to have complete equality of access to the proceedings, whether in respect to the spoken language or to the documentation. To conduct a trial as complex and historically significant in four languages did constitute a challenge. An answer was found, and the same method was later to be used in the United Nations and many international conferences: that is, simultaneous interpretation. Elsewhere in these pages the words of Justice Jackson's report to President Truman are quoted in regard to the effectiveness of the solution.

The same routine-like approach now prevailing in respect to the military language problem was an obstacle to even the experimental use of the system at the United Nations. Today it is not an exaggeration to state that the United Nations' business, independently of any other considerations, would be greatly handicapped were it to return to the system used in 1945-46, and which is precisely that which is now in use in the NATO.

Here again it is perhaps best to refer the reader to the opinions of the users of the system rather than to the views of its advocate in respect to its effectiveness. The reader will find on these pages the text of a recommendation by the Secretary-General of the United Nations for speeding up the work of the organization, and also the words of one of the former presidents of the United Nations General Assembly, Belgian ex-Premier Paul Henri Spaak.

Many other references could be cited concerning the effectiveness of these modern techniques in solving the problem of multilingualism in international life, both in respect to the spoken form of the language and to documents. The cases referred to are sufficiently eloquent to dispense with this.

It is quite conceivable that with energetic and imaginative action, taken in time, the problem of language in an integrated force using eight, ten, or twelve languages, far from remaining a barrier could in fact become a link. It takes no great imagination to conceive a situation in which ten languages are used on a basis of complete equality, and in which the deliberations would be conducted with the ease and effectiveness of a monolingual conference. Here again, the practical and psychological advantages are obvious.

What is needed is in fact very little: a study of the anticipated language requirements, the planning of a training program designed to meet the language needs for oral interpretation at formal meetings or other levels, as well as the processing of documents in various languages; the recruiting of qualified military and civilian personnel for specialized training from the various member countries (and let no shibboleth of proportional national representation take precedence over good results); the creation of a training center adequately staffed—and the language problem is on the way to a solution.

> "The immense volume of work which seems likely to face the General Assembly year by year renders it necessary to consider carefully possible measures by which that work may be accomplished as expeditiously as possible. The problem is not merely how to economize time . . . but to be in a position to take final action . . . and thus avoid the cumulative effect of postponement of idioms to later sessions.
>
> "Should the system of simultaneous interpretation be found satisfactory by the General Assembly, it is suggested that the facilities should be extended so that this form of interpretation may be used for the general debates at plenary meetings and for general debates in all main committees."
> —**Trygve Lie, Secretary General United Nations.**

Nor should the importance of a simple language program at the troop level be overlooked. There is no barrier so great among men as that of silence. There is no handicap so great to effective effort as misconception and misunderstanding. There is no boon so strong for morale as ability to communicate. This applies not only to staff and field operations. It applies also to troops of various nationalities located in a given sector, as well as to the relationships of troops speaking one idiom with the population of a friendly area speaking another language.

In this field, as in many others, adequate steps taken in time can well transform a handicap into an asset.

U.S. Army

U.S.M.A. Cadets Taking Instruction in Armor. Tanks are numbered from left to right—Cadets are listed from left to right on each tank:

Tank Number 1
Phillips, C. D.
Schwarz, R. A.
Allen, R. C.
Brown, N. J.
Dorton, J. J.

Tank Number 2
Steiger, W. C.
Woodley, T. R.
Orlikoff, R.
Ritter, J. J.
Hilty, P. R.
Winner, F. L.

Tank Number 3
McLean, R. P.
Robertson, B. H.
Sheridan, S. R.
Phillips, J. H.
Vetort, H. J.
Martin, L. B.

Tank Number 4
Irving, F. F.
Haumerson, J. P.
Clarke, J. W.
Duke, I. E.
Ashley, F. L.
Fleming, J. V.

Tank Number 5
Janssen, R. P.
Check, J. A.
Charney, T. J.
Buckstead, J. W.
Tausch, R. D.

Not Present
Lynch, P. H.
Horgan, T. B.
Byers, J. R.
Beczkiewicz, P. A.
Knapp, H. J.
Brett, J. S.
Foster, T. G.
Tague, D. R.

West Point: Class of 1951 Armor Graduates

Of the 475 Cadets who will be graduated from the Military Academy in June, 36 have selected Armor as their basic branch. Department of the Army policy this year has prescribed that the graduates who select the field forces be commissioned initially in a combat arms branch.

Lieut. Colonel Andrew R. Cheek, of the Armor Section, Combat Arms Detachment, 1802nd Special Regiment at West Point, is charged with the training in armor presented to the Cadets. He is presently conducting a special course for those Cadets who have selected this branch for their commissioned service. The following is a breakdown of the branches which the Cadets have chosen and the number being commissioned in each case:

Air Force	119	Engineers	50
Infantry	156	Armor	36
Artillery 53 (FA), 36 (AAA)		Signal Corps	25

These are the only branches which it was possible for the Cadets to choose.

A practical illustration of the engineer assistance available to the combat command commander in carrying out his mission.

CCB Gets Engineer Support

by MAJOR JOHN W. BARNES

COLONEL C. C. BAKER began to pace back and forth beside the field table on which were laid several map sheets.

"Major Three!" he bellowed.

"Yes, sir!" Major S. Three's prompt response preceded him as he dove into Colonel Baker's blacked-out tent.

"As you know," said the colonel, "we're jumping off day after tomorrow. This combat command has the mission of penetrating the enemy defenses in the vicinity of Leesboro and Effietown, seizing the important road junction at Ednieville, and continuing on over the West River near Steeleton. Our objective, seventy miles from here, is the high ground west of Hewittsburg, which we are to seize and hold until Corps can launch a coordinated attack on Hewittsburg. We've finally contained the Aggressor forces. Capturing his major supply center of Hewittsburg should prove his downfall, at least in this area. Kind of a rough assignment for a new combat command commander who hasn't been with the outfit a whole day yet."

"Yes, sir. Have you gone over the plans yet?"

"Yes. They look pretty good. But I'm worried about all those obstacles we've got to get through before we hit the wide open spaces beyond Ednieville. And if the enemy blows the Steeleton bridge over the West River, we'll be in for a lot more trouble. Who's the engineer expert on this staff, Three?"

"Captain Castle, sir. He commands Company A of the armored engineer battalion. His company is attached to us for this operation."

"He's a company commander? You mean to tell me he's a staff man, too?"

"Yes, sir. That's the way the engineers operate. The senior engineer officer attached to the combat command not only commands all the engineers; he's the combat command staff engineer, too. Usually we get only one armored engineer company and a bridge platoon from the engineer battalion's bridge company. That means the company commander really has his hands full. He's got both staff and command responsibilities."

Major John W. Barnes is a 1942 graduate of the Military Academy. During World War II he served as company commander and held several staff positions in the 51st Engineer Combat Battalion in the ETO. After the war he received his Master's Degree at Cal Tech, served as Chief of the Demolitions Branch at the Engineer Research and Development Laboratories, attended the Engineer Officers Advanced Course, and commanded the Engineer Test Detachment at Fort Churchill, Manitoba, Canada. He is presently an engineer instructor at The Armored School.

"What happens when we have more engineers attached?"

"Well, sir, the armored engineer battalion sends us one of their majors, either the exec or the S-3, to be our staff engineer. That leaves the engineer company commanders free to supervise all the engineer work we need done. We don't get a major, though, unless there's an awful lot of engineer work anticipated, or unless we get two or more engineer companies attached."

"Where is Captain Castle now?"

"I can get him right away, sir. His company has just closed in its assembly area."

"Send for him. And tell him to wear his staff hat."

"Yes, sir." Major Three saluted and left.

Colonel Baker reviewed the plans that Three had prepared. The combat command would initially attack with battalions abreast, using the Leesboro-Effietown road as the line of departure. Boundaries for the attack would be the line Leesboro-Ednieville, both inclusive, on the north, and Effietown-swamp on the south. Boundary between battalions would be the south fringe of the forest between Leesboro and Ednieville. 101st Armored Infantry Battalion (reinforced) to attack through the forest toward RJ 468, 11th Medium Tank Battalion (reinforced) to attack east on the Effietown-Ednieville road. Upon seizure of RJ 468, the attack to change to column of battalions, 11th Medium Tank Battalion (reinforced) leading.

Not the most ideal terrain for armor, Colonel Baker thought. What beautiful sites for enemy obstacles . . .

"Sir, Captain Castle reports as ordered." Colonel Baker looked up to see the engineer captain standing at the entrance to the tent.

"Glad to see you, Castle. I was just worrying about obstacles. Are you acquainted with the plan for our next operation?"

"Yes, sir. Major Three went over it for me on the way here."

"Good. Now, let me see. You have three platoons in your company, plus a bridge platoon from battalion. Right?"

"Right, sir. And each of my platoons has three squads."

"Well, Castle, suppose we attach a

platoon to each attacking battalion. Then they'll each . . ."

"Begging your pardon, sir," Castle interrupted, "but I believe it would be better to place those platoons in close support. Attaching an engineer platoon to a reinforced battalion is placing an unnecessary administrative burden on the battalion commander. I can easily control and support those platoons, and they'll do the same job whether they're attached or in support. We believe it's best to attach engineers to supported units *only* when the situation is such that the parent engineer unit cannot provide effective operational control and logistical support."

"Good enough. But I'm relying on you for adequate engineer support for my attacking battalions. Now, between here and Ednieville we have quite a defile to attack through. Chances are there'll be a mine field or two, and I don't expect we'll find the bridge near RJ 468 in very good shape. Looks like a lot of engineer work. Think I should ask for one of the other three companies in the armored engineer battalion?"

"No, sir. Each of my platoons can gap the mine fields for the battalion it supports. I'll still have enough engineers left to widen the gaps to permit more rapid passage for the remainder of the combat command.

"As far as the bridge is concerned, if leading elements of the 11th can't find a ford, my engineer platoon supporting it will be able to put across a bridge without too much trouble. You see, sir, I'll send a fixed bridge section, of which there are two in the bridge platoon, along with that engineer platoon. The fixed bridge section has three bridge trucks and a bolster truck. Each bridge truck carries 24 feet of bridge, and the bolster truck carries two intermediate supports. If the crossing is wider than 34 feet, which is the longest span of bridge that will support the medium tanks, they'll use one or two intermediate supports to construct a fixed bridge up to 72 feet in length.

"If you have a chance, sir, perhaps you can advise Lieutenant Colonel Tank of the 11th to have his supporting engineers near the head of his column, maybe even behind his leading reinforced company. If he finds the bridge out, he won't want to waste time waiting for the bridge trucks to double his column, especially since the road is narrow and in a defile."

"Right, Castle. Thanks for the hint. That takes us up to RJ 468. Now," Colonel Baker continued, "our air force people have been shooting up enemy troop and supply columns between RJ 468 and Ednieville. That stretch of road will probably be cluttered up with disabled vehicles. What have you got to help the 11th out when it starts to lead the combat command in column beyond RJ 468?"

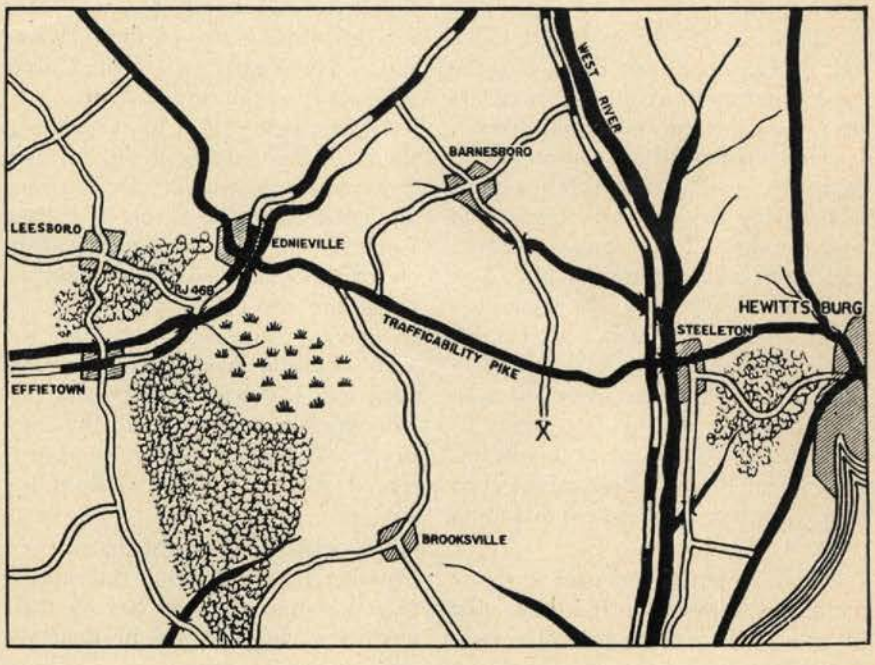
"My supporting engineer platoon has a tank dozer, Colonel, and each medium tank company in the 11th has two of them. I'm sure they'll all be able to take care of removing disabled enemy vehicles from the road, under fire, if necessary."

"Well, I'm glad to hear each engineer platoon has a tank dozer. That makes a total of twelve in the armored engineer battalion. I transferred to armor back in '47, Castle, but I haven't been with troops since. When I had my regiment, there was a change in the mill to give the infantry division's engineer battalion five of those tank dozers. They were all to be pooled in one platoon in the engineer H&S Company. While we're on the subject, are there any other major differences between the armored engineer battalion and the battalion with the infantry division?"

"Yes, sir. The bridge company of the armored engineer battalion has two bridge platoons. In the infantry division there is only one of these bridge platoons, and it is an organic part of the H&S Company. The platoon itself, however, is identical to the bridge platoon we have in the armored division. So you see, sir, there are two basic differences in the organization —concerning the tank dozers and the bridge platoons.

"There are also two basic differences in employment. First, as an infantry regimental commander, you probably hardly ever had engineers attached to you, unless you were operating on a separate task force basis. As a combat command commander you will find that your supporting engineers are almost always attached, except when the whole armored division is employed on a defensive mission. In the defense, the engineer effort is normally integrated under the supervision of the division engineer, who is also, as you know, the armored engineer battalion commander.

"Second, as an infantry regimental commander, you probably always had the same engineer company supporting you. Now, as a combat command commander, you can expect any of the armored engineer battalion's four companies to be attached to you. The reason for it is this. If each combat command always had the same engineer company attached to it, only two of the engineer companies would be used in the normal supporting engineer role, there being only two combat commands. And these two engineer companies would be called on continually to do most of the great



amount of engineer work necessary to keep armor rolling."

"Very good, Castle. Now, let's get back to the operation at hand. I expect that critical intersection in Ednieville will be a shambles by the time the 11th gets there, what with our air force pounding it and the enemy messing it up too. But those tank dozers'll take care of it, won't they?"

"No, sir, I don't believe so. Filling large craters and removing large amounts of rubble is too difficult a job for the tank dozers to handle. But in my company headquarters I have a D7 angledozer which is ideal for a big job like that. As soon as it's needed, I'll have it taken to Ednieville on its special 20-ton trailer. It will clear that intersection in jig time."

"The last obstacle I can foresee before we get into that good tank country the other side of Ednieville is that Ednieville bridge. Will we have enough treadway bridging to take care of that crossing?" asked Colonel Baker.

"Yes, sir, we'll have plenty to take care of it. But if we're lucky, maybe the enemy won't be able to demolish that bridge completely. If they just damage it, we'll be able to repair it, and thus save as much of our treadway equipment as possible. We might need all of that treadway we have, and more, when we get to the West River."

"I don't want to waste any time in Ednieville, Castle. How fast can your engineers repair a bridge? And where will you get the construction materials you'll need?"

"If we can get the materials, Colonel, we can repair any damage to the superstructure in a couple of hours, at least enough to get traffic rolling on it. I have a motorized air compressor in company headquarters that's a great labor-saving device when it comes to fixing bridges. It has saws, hammers, and drills, all operated by air. And each of my platoons has a gasoline power chain saw that is a big help in cutting bridge timbers to size.

"As far as the materials are concerned, there should be plenty in Ednieville; such things as floorbeams used in buildings. There might even be a sawmill or lumber yard in a town that size."

"Well, go ahead and plan to repair the bridge, Castle, but if it looks like it's going to be a time-consuming task, don't hesitate to use the treadway equipment."

"Right, sir."

"Once we get on to Trafficability Pike, we should have clear sailing until we get to the West River. With luck, the 11th might capture that bridge intact. But we've got to be prepared for the worst. If we lose that bridge, Castle, what can you do about it?"

"I have one bridge platoon, Colonel. That gives us 288 feet of floating bridge, less whatever treads we use up on the way. We'll need more bridging from my battalion if we're to put across a floating bridge. I understand the river is nearly 250 feet wide at Steeleton. Could you request the whole bridge company for this operation? That would give us two bridge platoons, and we're likely to need them, especially if we lose any equipment in the crossing."

"I'll put in a request for it, Castle. But if we get to the West River before the remainder of the bridge company catches up to us, what can we do about it?"

"We can't do much at all against a determined enemy, Colonel. But if our crossing is unopposed, we should get a bridgehead on the other side without too much trouble. It'll be touch and go, and until we get some tanks across to support the infantry, we'll be especially vulnerable to counterattack. With little or no enemy opposition to the crossing, we can get armored infantry across in the 21 assault boats organic to the bridge platoon. As soon as possible, we'll start ferrying tanks across on the treadway rafts. These rafts can be used later on as part of the bridge itself."

"Better figure on a hasty crossing, then, Castle. I doubt if the enemy'll show much opposition. By the time we get to the West River, we'll have Aggressor on the run. As soon as we clear Ednieville, have two of your platoons and the bridge platoon march in column immediately behind the 11th Medium Tank Battalion. The 11th will still have its engineer platoon in close support, so all the engineers except your headquarters personnel will be well forward in the column."

"I'm glad you brought that up, sir. Usually, I have a rough time trying to sell commanders on having their engineers well forward in their exploiting column. They don't seem to realize that obstacles are encountered by the head of the column, and that it's money in the bank to have the engineers close at hand to overcome the obstacles. Most commanders think engineer vehicles, especially bridge trucks, are too slow and cumbersome. But on a road they have no difficulty keeping up with tanks."

"By the way, Castle, how many trucks are there in the bridge platoon?"

"Twenty-five, sir. One jeep, one ¾-ton, three 2½-tons, 18 bridge trucks, and two bolster trucks."

"And how about your platoons?"

"Each platoon has a jeep, a tank dozer, two 2½-tons, and three armored personnel carriers."

"That doesn't sound very cumbersome. And if the enemy blows that bridge, we're going to need engineer equipment for the crossing as soon as possible. During the initial crossing phases, before we can build up in strength on the far bank, I'll mass all the fire I can get on the near bank to give the infantry and engineers maximum protection.

"As soon as we seize that high ground west of Hewittsburg, Castle, we'll have to take up the mobile defense until we get enough people and supplies to launch an all-out attack on Hewittsburg. Any ideas on organizing that hill for defense?"

"Well, Colonel, from the map it looks like that secondary road across the top of the hill should have some likely spots for road craters and abatis. We can also . . ."

"Hold your fire, Castle. What's an abatis?"

"Oh, sorry, sir. An abatis is an obstacle made by felling trees across a road. The most effective abatis is one with antitank and antipersonnel mines strewn through it. Makes it a messy operation for the enemy to breach it."

"Roger. Now what else can you do up there on that hill?"

"We can lay a mine field or two across the main Hewittsburg-Steeleton road. Doesn't look like there are many natural obstacles to tie them into, but as long as they are covered well by fire, the mine fields will be pretty effective as obstacles to enemy advance. And, of course, I'll keep my angledozer busy digging hull-defilade positions for tanks, if there aren't more

urgent tasks for it to do."

"One thing you didn't mention, Castle. If the going gets rough on that hill, I'll probably call on you to perform as infantry. Your people are trained for that, aren't they?"

"Yes, sir. But I hope you won't use us as infantry unless there's no other way out. You see, sir, engineers are trained specialists and are very hard to replace. It takes many months to train an engineer unit, and it's almost always more economical in the long run to assign only engineer tasks to the engineers supporting you. However, if you *have* to use your engineers as infantry, Colonel Baker, it would be well to remember that they can't be assigned frontages as wide as those assigned infantry units comparable in size. The engineer company reorganized for combat as infantry has far fewer personnel and less fire power than the infantry company."

"I'll remember that, Castle." Colonel Baker thought a moment. "Well, that about covers everything. You've relieved my worries about overcoming all the obstacles I'm expecting the enemy to throw in our way. I didn't realize that an armored engineer company and a bridge platoon had so many capabilities. Doesn't look like we'll need any extra engineers from your battalion, except that other bridge platoon. Guess we'll be keeping you pretty busy, won't we?"

"Yes, sir. And we'll be doing a couple of other things for you as we go along. I have a water supply section attached to me from our H&S Company, and we'll be supplying all your people with water during the entire operation. Also, we'll be conducting engineer reconnaissance. That's a continuing function with all engineer troops. We're always on the lookout for engineer materials, and we report all items of engineer interest back through our own channels.

"As an example, I intend to send a party into that quarry west of Steeleton to see if there's anything we can use. We may find some rock stockpiled there that might come in handy for building approaches to a floating bridge over the West River.

"All in all, Colonel, we'll be discharging all our responsibilities in this operation: stream crossing, road opening, obstacle removal, defensive works, engineer intelligence, and engineer supply."

Maj. Gen. William M. Grimes, who died on 2 April at San Antonio, Texas. General Grimes was commissioned in Cavalry in 1911. Following Cavalry assignments in the States and the Philippines, he went overseas in early 1918 to join the 13th Machine Gun Battalion, with which he saw action in the Anould and St. Die sectors and the St. Mihiel and Meuse-Argonne offensives. Back in the States he taught at the Infantry and Cavalry Schools and served in troop and staff positions as well as attending leading service schools. In 1940 General Grimes was assigned to the 1st Armored Regiment at Fort Knox, and in 1941 to the 4th Armored Division at Pine Camp, N. Y. In the spring of 1942 he became CG of the 8th Armored Division at Knox. Prior to retirement he was in command of the Cavalry School. Burial was at Ft. Sam Houston.

Maj. Gen. Hugh T. Hoffman, who died on 2 April while undergoing a serious operation. General Hoffman was a graduate of the Military Academy, Class of 1918. In 1919 he made a tour of the European battle fronts, following which he returned to the States for assignments in troop duty with various Cavalry units, and as student at service schools. In early 1942 he assumed command of the 5th Cavalry Regiment, took it to Australia in 1943 and led it through the New Guinea and Admiralty Campaigns. In August of 1944 he took command of the Second Cavalry Brigade for the Leyte-Samar Campaigns and the dash to Manila. Following a period in command of the First Cavalry Division, General Hoffman resumed command of the Second Brigade for the occupation tour in Japan, returning to the States in 1949 to become Chief of Staff of the Fourth Army.

Lt. Gen. James A. Van Fleet, assigned recently to command of the Eighth Army in Korea. General Van Fleet is a 1915 graduate of the Military Academy. Commissioned in Infantry, he served overseas in World War I, and was wounded while commanding the 17th Machine Gun Battalion. Between the wars he served career officer tours in troop and staff duty and as service school and ROTC instructor. In mid-1941 he assumed command of the 8th Infantry Regiment, which he later led onto the Normandy Beaches with the 4th Division. He later commanded the 4th and 90th Divisions and III Corps in the ETO Campaign. In the postwar period he was director of the Joint U.S. Military Advisory and Planning Group in Greece, next commanding Second Army before assuming command in Korea.

Maj. Gen. William C. Chase, just assigned to command the U. S. Military Advisory Group to the Chinese Nationalist Government on Formosa. General Chase was commissioned in Cavalry in 1916, and following several assignments with troops in the States, went on to France for service with the 11th Machine Gun Battalion in the Aisne-Marne, St. Mihiel and Meuse-Argonne offensives. Following the war he served regular career assignments in troop, staff and instructional duties, and as student at top service schools. In command of the First Cavalry Brigade he led the force that landed on Los Negros Island in the Admiralties, later took his brigade into Leyte and Luzon, and led the Flying Squadrons into Manila. From 1945 to 1949 he was CG of First Cav Div in Japan, then C of S, Third Army.

The Mothballed Tanks

BERLIN.—This strange city is
n island of freedom amid the
rrounding slavery of the So-
et zone of Germany. It is a
ace where millions of simple
ople bravely carry on in the
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has several other personali-
and aspects. But for the
veler, Berlin is, above all, a
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ough which much can be seen
is not visible from Washing-
or Paris or London.
rhaps the best symbol of the
thing one sees through this
k is a moth-balled tank.
rather recently, a large fac-
of Western observers had
encouraged by the belief
the Soviets possessed no
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True, there were at

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parallel before running out of am-
munition and pulling back.
Since their 20-mile break-
through Monday and

riding in armored half-tracks,
killed an estimated 750 Reds in
the Central

front, b

New Light Tank Joins the Army

Cleveland, March 27 (U.P.)—
Walker Bulldogs, light tanks cap-
able of doing 40 miles an hour,
rolled off assembly lines today to
become the first such armaments
produced by a civilian company
since World War II.
Produced by the Cadillac divi-
sion of General Motors, the
drew from Army Secreta
Pace Jr. the assertion
"outfight, outgu
anything of

New U. S. Tanks Pack Speed, Hitting

By Relman Morin
Associated Press Special Correspondent

In Italy during the last war I
ened to the questioning of a
d German officer, who said
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ilitary analyst, speaking
adio Berlin, told his lis-
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known is the J. S. (for Joseph
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None has been seen in Korea.
Why don't we build
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Newest Tank Model Due Off Line Today

By the United Press.
WASHINGTON, March 27.—
The first production model of th
Army's newest tank, the light T
"Walker Bulldog," rolled off
three months ahea
Secretary F

SOME NOTES ON ARMOR

The Army has just announced that the famous 2d Armored "Hell On Wheels" Division has been alerted for overseas movement to Europe, where they will become a part of Gen. Eisenhower's North Atlantic Pact forces. They join hands with the U. S. Constabulary, which comprises the rough equivalent of an armored division; the French 5th Armored Division; and the British 7th and 11th Armored Divisions, plus one armored brigade; this will lend backbone to the regional defense forces in Western Europe.

* * *

Cold rubber, which has high resistance to abrasion, will be used in the production of a $9,000,000 order of replacement tracks for U. S. Army tanks, it was recently announced by the B. F. Goodrich Company. Its application is expected to increase the limited life of tank tracks.

This tough American rubber, which Goodrich discovered early in 1941, now is used in all passenger tire treads with a resultant 15 to 25 per cent increase in mileage. Cold rubber also is used in the manufacture of some conveyor belts.

In addition to the replacement tracks for Sherman, Pershing and Patton tanks, the company is producing cold rubber tracks for high speed cargo carriers and motorized gun carriages.

* * *

Lt. Gen. Willis D. Crittenberger, Commanding General of First Army and President of the U. S. Armor Association, speaking at a luncheon in New York City recently, had this to say: "Since war is a national effort, we Americans must capitalize on our industrial advantage in the fields of manufacturing, assembly lines and production capacity. Since it is in this technological sphere that we stand unchallenged, it is on this level that we should meet the enemy—a level where the advantages are ours.

"That is why we are so intent in training our American soldier up to his responsibilities in the utilization of these great technological advantages which are his.

"All of which is another way of saying that the American Army is just as good as the individual man who makes it up—no better and no worse."

* * *

The British have announced that production of the Centurion tank is being rapidly increased. Production of

probably we are seeing the the central front. At some points the central front
the the enemy has been
solid line of infantry, stretching large units a

Tanks Plunge Over 38th, Da Back Safely

EARNEST HOBERECHT,
nited Press Staff Writer.
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KYO, March 31.—A
American tank
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U. N. TANK PATROL CROSSES PARALLEL IN CENTRAL KORE

Move Over Border Is the
of Kind Since Commur
Began Recent Offens

2 U. S. Tank Columns Drive Over Parallel; One Later Withdraws

Force North of Uinjongbu
Beats Off Reds' Attack
In Stay of 3½ Hours

By the Associated Press

TOKYO, Mar. 31.—Two Ameri-
can tank columns stabbed across
the Red Korean border today in
a daring challenge to a Chinese
offensive buildup.
column str

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Tokyo, Thursday,
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The Armored thrust sent
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U. N. TANKS PURSUE REDS FALLING BACK TOWARD PARALLEL

Slight Resistance
Patrols

Tanks Probing North of Seoul Meet Only Small Enemy Groups—Action in East

By LINDESAY PARROTT
Special to The New York Times.

TOKYO, Thursday, May 3—Unit-
ed Nations armored task forces
pushed out far ahead of Allied
lines in western Korea
as the lull in

U. N. Tanks a Reds, Stopp

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a new and even more formidable tank is also being increased. In addition, a comprehensive range of new anti-tank weapons is being developed, including recoilless guns, while other weapons are being modified.

* * *

"The T-41 Walker Bulldog is the first completely new tank to be built by the Army since World War II," said Secretary of the Army Frank Pace recently, marking the occasion of the first production model to roll off the assembly line at the Cleveland Tank Plant of Cadillac. "It is a fast, maneuverable vehicle, classed as light because of its 26-ton over-all weight, and its cavalry and reconnaissance mission. Its punch is in a new high muzzle velocity 76mm gun. On the basis of present knowledge we think it will outfight, outgun and outmaneuver anything of its class in the world, and its armor provides maximum crew protection for vehicles of this class."

* * *

And Under Secretary of the Army Archibald Alexander, speaking at the Cleveland plant at the ceremonies marking the delivery of the first tank three months ahead of schedule: "there are certain conclusions to be drawn from this event today . . . first . . . we do have an excellent new light tank . . . Second is the fact that our country has been able to get these into production in such a short time. Third, and most important is the fact that both the resolution to have this new tank and the ability to produce it indicate the frame of mind of this country."

* * *

On May 4th the 6th Armored Cavalry Regiment celebrated its 90th birthday as it carried along its years of service with its current assignment as a part of our occupation forces in Germany. Formed in 1861, the 6th boasts a record of thirty-two major campaigns and service in a dozen foreign countries.

* * *

Another unit celebrating its birthday is the famous 3d Cavalry, now designated the 3d Armored Cavalry Regiment. It is 105 years since the original unit, a regiment of Mounted Riflemen, was formed to open and protect a route to the Pacific Northwest. The Third is now stationed at Fort George G. Meade in Maryland, where it carries on its long service as one of our military's top mobile units.

Sum & Substance

A regular feature in ARMOR, where you may express your views in approximately 500 choice words—the effective medium between the letter and the article. This section is open to all on any subject within the bounds of propriety. Name and address must accompany all submissions. Name will be withheld upon request. No pseudonyms.

Day by day, ground arms personnel along the red line of battle in Korea are molding the experience in combined arms teamwork that is so essential to success in warfare. Much of the story centers on tank-infantry operations. ARMOR turns to the junior leader for a view of his horizon of war, proudly presents this roundup by tank platoon leaders.—ED.

The writer of the following served as an enlisted man in World War II, in Alaska and the ETO. He participated in the Normandy, Northern France, Ardennes-Alsace and Rhineland campaigns as a Field Artilleryman. Graduating in 1949 from the Officer Candidate Course at the Ground General School, he attended the Basic Course at The Armored School and was assigned to the 72nd Tank Battalion at Fort Lewis, Washington, moving to Korea with that unit, where he has served since last August as a combat tank platoon leader and tank company executive officer.

Although the nature of the terrain and the type of opposition make the Korean action essentially an infantryman's war, much of the action hinges on tank-infantry operations. In this respect, more often than not tankers find themselves in the unenviable position of being an attachment. As command responsibility then lies with the infantry commander, the tanker becomes the supporting element, with little voice in the planning phase as against a major burden in the execution.

Ordinarily, for tactical employment, one company of the tank battalion is attached to each infantry regiment. This is the start of a farming out process which tankers feel is wrong. One platoon of the tank company is next attached to each infantry battalion in the regiment, and the battalion commander then passes it down to an infantry company. If the infantry company commander feels he can break it down further he may assign the second squad to work with the tanks. All of this is based on the infantry commanders' lack of familiarity with employment of tanks.

Too often the tank platoon is assigned the job of taking the infantry regimental objective, with only such accompanying infantry as can ride the tanks, and without reaching answers to such questions as "What will the rest of the regiment be doing? Will artillery fire be coordinated to hit likely areas of enemy defense? How will organic weapons assist the tanks in accomplishing their mission?"

Lieutenant Harper.

Such offhand Georgie Patton action doesn't work in Korea and at this operating level, for very good reasons. At the first burst of fire from a well-entrenched enemy, the infantry will be compelled to dismount from the tanks and seek cover; the obvious approach will be the most heavily defended. The road will be mined every ten yards. In actual execution the plan will be somewhat less bold than envisaged. The armored thrust to the road junction will be less spectacular than the broad sweeping arrows in the field manuals may have led one to expect. The infantry, assisted by tank fire, will be compelled to occupy the high ground, in order that the engineers can clear the mines, and all will move into the town at a snail's pace. Meantime, the infantry commander will be jumping up and down screaming, "Why don't the tanks get moving?"

You are possibly wondering what has happened to the tank platoon leader. I have often wondered the same thing. You may ask, "Why doesn't the tanker advise the regimental commander on the proper employment of his tanks?" He never has the opportunity. A tank platoon leader working with the second squad of Item Company is never aware of an impending operation until some frantic PFC arrives gasping out his story of how he has been looking for you every place except at the tanks and that the battalion commander says for you to get yourself down there as fast as you can. You have been summoned to *receive* orders, not to *question* them. You have one alternative, the easiest, to attempt to execute the plan as presented to you.

Quite recently, for example, during the defense of Wonju, I was attached to a battalion of the 187th RCT which had the mission of guarding a wide valley leading straight into the city. The battalion commander had already chosen positions for me prior to my arrival. He sent his executive officer down to show me where to go. We walked down the road past the MLR and 400 yards in front of the OPLR. In this particular area the road had been filled and the embankment was approximately 6 feet higher than the valley. The executive officer pointed down into the ruins of a partially destroyed village and said "The battalion commander said for you to put your tanks down there tonight." I asked how much infantry the CO intended to assign for local security.

"One squad," was the reply.

I contacted the battalion commander and explained that a tank does not have to occupy ground to control it. Because of the range of their weapons, they can dominate an area by fire power alone. I explained that the enemy ordinarily will not attack a tank unit, but will maneuver around the tanks and hit the position from a direction which restricts the use of tank fire. "If I go into position down there the road embankment will completely mask my BOG and will render my coaxial machine gun and tank cannon ineffective at ranges nearer than 800 yards. If we are attacked, the situation will be sufficiently confused without adding the additional noise and psychological effect of tanks repositioning themselves—an operation which will mean that during the early phases of the action, just when you need fire the most desperately, the tanks will not be able to support you. We need a position from which, if the need should arise, we can send a shell flying down this valley 1000 yards before it detonates and cover the intermediate area with our machine guns—a position from which, if you are chased off of a hill, we, without moving, can deny the area to the enemy and at the same time cover your withdrawal." The Colonel, in a voice rumbling with conviction, said: "Lieutenant, if you are not willing to take the same risks my men are taking, I don't think you should be in my battalion." That answer epitomizes our greatest problem in Korea.

I recommend that when a tank company is attached to an infantry regiment the entire company be attached to the infantry battalion operating in the terrain most favorable for tank employment. The tank company organic to the infantry regiment should also be attached to a battalion and utilized in armored missions. Far too frequently the regimental tank company is at the mercy of infantry officers and receives assignments such as escorting engineers 20 miles from the front. The infantry relies on tanks to perform missions which they themselves could perform more satisfactorily. I have in mind road blocks. Quite often a platooon of tanks is detailed to set up a road block to screen refugees, a job which could be handled quite adequately by one machine gun and two guards.

The tank company commander should participate as a staff member in all operational conferences concerning the employment of armor in any capacity.

Since ordinarily the objectives assigned to infantry elements are hill masses offering a vertical target, it is logical to assume that overhead tank fire would constitute a routine phase in the coordinated fire plan. But this is not the case. The infantry commanders will not agree to the use of overhead assault fire by tanks. Although during the initial preparatory fire I have often demonstrated to them the accuracy and devastating effect of the coaxial machine guns used in conjunction with the tank cannon, only on one occasion have I been permitted to employ tank fire in this manner. I recommend that this type assault fire be employed during training of all infantry units.

The most difficult problem yet to be solved in infantry support is the development of a system of individual target designation. We have found that the involved method of designation by radio is both inaccurate and time consuming. On one occasion, when operating with a platoon of infantry, we collected all the tracer ammunition in the platoon and reserved it exclusively for use of the infantry platoon leader and squad leaders to designate point targets for tank fire. This is impractical when operating with larger units. Perhaps a green tracer is a partial answer, to be issued to selected individuals and reserved for coordination of tank fire.

I have found that an effective method of employing tank fire to support advance of infantry is to set up a base of fire with one platoon about 800 to 1,000 yards from the objective. At this distance the tank commanders are relatively immune from enemy fire and are free to use their binoculars and to add the deadly fire of their .50 caliber machine guns. Then with the remaining platoons available, move forward, firing, searching for more advantageous positions, reconnoitering for by-passes, discovering areas from which you can bring tank fire to bear on every side of the enemy positions.

Movement is a vital part of the psychological effect of tank fire and should always be employed whenever possible. By following this principle, we have often caused the enemy to abandon strongly fortified positions and allowed the infantry to walk forward, unopposed, to occupy assigned objectives.

1ST LT. ROBERT S. HARPER

The writer of the following is a 1950 graduate of the United States Military Academy. Following a brief assignment as reconnaissance platoon leader in the 3d Armored Cavalry Regiment at Fort Meade, Maryland, he was transferred to Korea for an initial assignment as combat platoon leader in the 8th Cavalry Regiment. In recent months he has been a combat tank platoon leader with the 70th Heavy Tank Battalion.

Once again the war in Korea has proven the value of the tank-infantry team. Just as the tanks provide essential, accurate, direct fire support for the doughboys, so does the infantry provide close-in protection for the tanks.

Our field manuals are sound on this doctrine, but it has taken the hard bite of experience to impress these facts on commanders in the field. Too many of our tanks were overrun by enemy night attacks because the tanks were on or outside defensive perimeters, or had insufficient infantry dug in around them.

In addition, armored patrols often have had to pass through defiles or very rugged areas without enough infantry to protect them against enemy antitank weapons. Three tanks in my company were hit by enemy bazooka fire (captured United States 2.36's and 3.5's) at ranges of 25-100 yards. One hit was on the flat left sponson of an M4A3E8, which wounded all the crew and set the machine-gun ammunition on fire; quick work by another tank crew put out the fire before it became serious. During the same action, another 2.36 bazooka round, fired from the right front, hit my tank at forty-five degree angle on the front slope; however, the round detonated on some five-gallon water cans we were carrying on the front slope, and the shaped charge jet barely penetrated the fighting compartment. Infantry support on these

patrols would probably have flushed out the bazooka teams before they could have scored on the tanks.

Close infantry support of tanks has greatly improved since the campaign against the Chinese began, but the lessons learned by costly experience should have been learned in training.

In regard to the technical aspects of our tanks (the 70th Tank Battalion has used M4A3E8's throughout the Chinese campaign) we would like to see improved radios to provide more accessible sets and a single set for tank-to-tank and tank-infantry communication. We want a .50 or .30 caliber machine gun on a skate swivel mount for use by the tank commander or loader against ground and air targets. Also, a .50 caliber coaxial machine gun would give the long-range, accurate fire which is necessary; the .30 caliber tracer burns out at 800-900 yards, making accurate coaxial fire at greater ranges impossible.

In conclusion, our tankers and doughboys have learned in combat the tactics that should have been learned in training, the principles stated in the Army's Field Manuals.

1st Lt. John R. Hendry

The writer of the following graduated from the United States Military Academy in June, 1950. He served briefly as a reconnaissance platoon leader with the 3d Armored Cavalry Regiment at Fort Meade, Maryland, and arrived in Korea in November, 1950. He spent four months as combat tank platoon leader, a short period as assault gun platoon leader, and is now serving as Assistant Battalion S-3, of the 89th Medium Tank Battalion.

The Korean War has brought to light a facet of tank warfare that is relatively new to the United States Army—the defensive use of armor as part of the holding garrison along the main line of resistance. In accordance with the nature of the typical Communist offensive which has been encountered in Korea, the mission of armor used in this manner is direct support against the attack of massed manpower, especially at night. This use of tanks has been dictated in Korea more by the tactical necessity of substituting firepower for manpower than by any qualification the tank may possess as a night-fighting weapon. There are many drawbacks to the employment of tanks at night: the difficulty of discerning targets at a distance; the relative blindness of the crew at close ranges; and the possibility of running into obstacles or friendly positions in the dark while maneuvering the tank. Despite these drawbacks, it has been demonstrated in Korea that, given ample maneuver room and sufficient infantry for outposts and close-in protection, the tank unit is a potent weapon against mass night attacks.

It was demonstrated in World War II that the tank platoon is most effective when employed as a mutually supporting unit; in Korea, it has been shown that this method of employment is doubly essential at night when the unit is positioned on the MLR. Despite the fact that the enemy's offensive antitank weapons, particularly since the Chinese Communist intervention, have consisted almost entirely of weapons which require the user to move in close and therefore expose himself to fire, experience has shown that a single tank is unable to protect itself satisfactorily against mass attacks. On the other hand, in instances where a tank platoon was employed as a unit, overwhelming numbers of the enemy have been repulsed with heavy casualties, even though individual enemy soldiers penetrated between the tanks.

Lieutenant Tilson.

The tank-infantry team, as in all operations involving armor, is extremely effective at night when employed in a planned defensive situation. Infantry provides early warning of the attacks, increases firepower, keeps off tank-hunters, prevents infiltration, and protects the position from flanking movements. The tank unit can generally protect itself by fire and maneuver, but the assistance of infantry is vital in order to hold a terrain feature or to prevent infiltration.

In operations at night constant vigilance must be maintained. Enemy attacks in Korea generally come so swiftly and with so little warning that positions not properly outposted or sufficiently alert may be overrun before firepower can be brought to bear on the enemy. Early warning of attacks is particularly vital to the tank unit, due to the fact that a certain time interval is necessary to allow all crew members to get in their positions, establish communication, and be prepared to exert maximum firepower on the target.

Artificial illumination has proved to be invaluable in night defensive operations. Antiaircraft searchlights and artillery flares have been used extensively to illuminate critical terrain. Trip flares, which may be carried and set out by the tank unit itself, provide in addition an excellent warning system. Houses and haystacks, or cans of gasoline placed in front of the lines, may be set on fire by tracer or by white phosphorus shells to provide additional illumination. The use of one or a combination of these methods vastly improves the effectiveness of tank fire, and also takes advantage of the marked enemy disinclination to silhouette himself against a lighted area.

The principles of the use of armor have remained unchanged in Korea, and it must be emphasized that the techniques of tank warfare in Korea do not have universal application. However, the methods of utilizing tanks in defensive operations at night and against a massed, fanatical assault deserve close attention. The situation we face now in Korea we will undoubtedly face again in guerrilla-infested areas, and well may face again in battle against an enemy who makes unstinted use of great supplies of manpower.

1st Lt. George P. Tilson.

The writer of the following enlisted in the Air Force in mid-1943 as an Aviation Cadet. He entered the United States Military Academy in 1946, graduating with the Class of 1950. Following an initial duty assignment with the 2d Armored Division, he was transferred to Korea, where, since the Fall of 1950, he has been a combat tank platoon leader with the 64th Heavy Tank Battalion.

With more and more emphasis being placed on tank-infantry operations in our Army, some attention must be placed on such operations with friendly foreign troops. A fine current example is the operation of American tank units with elements of the ROK Army in Korea.

As may be expected, the language barrier is the greatest single bar to effective coordination. In March, 1951, the First Platoon, Company "C," 64th Heavy Tank Battalion, was operating with the 15th ROK Regiment in the area north of Seoul. On this particular mission the tank platoon, with one company of ROK infantry and a platoon of ROK engineers, supported by artillery, was assigned to attack a hill just to the right of the MSR, held by an estimated company of North Korean troops.

The ROK company commander understood a little English, but to be on the safe side an ROK interpreter carrying an SCR 300 was assigned to go with the infantry in order to maintain better contact with the tanks.

The Task Force crossed the LD with infantry mounted, the ROK company commander and interpreter with the tank platoon leader on the lead tank. The engineers had gone out several hours earlier to double-check the clearing of mines from the MSR. The column advanced rapidly for about 4,000 yards until it caught up with the engineers. The ROK Regimental I & R Platoon had set up an outpost line on the last hills before contact with the enemy was expected and according to the interpreter had located generally most of the enemy positions.

The infantry were dismounted; two platoons were to assault the hill from the front, with the weapons platoon as a base of fire. One infantry platoon and the engineers would continue forward with the tanks to fire on the hill from the flank. The terrain at this position restricted the tanks to the road and the area just off the road to the right. No movement on the enemy position was observed and no fire was being received at this time.

The tanks moved out with the infantry screen on the flanks and the engineers in front. No enemy fire was received for approximately two hundred yards after the column was exposed. At that point, small-arms, automatic weapons, and mortar fire fell about the three leading tanks. Four engineers were casualties in the first few seconds. The enemy positions revealed by their fire were immediately taken under heavy tank, machine-gun and mortar fire. As the enemy fire did not slacken at once, artillery was called down on the crest and reverse slope of the objective. In a few minutes, enemy fire had dropped to occasional rifle shots. Now, by prearrangement, was the time for the assault. When no infantry moved

Lieutenant Eek.

forward, the tank platoon leader called the interpreter on the SCR-300. No answer; the interpreter's radio was damaged and out of action. He tried for radio contact with the ROK company commander, with no luck. Finally, the tanker tried passing written notes to the interpreter through a near-by ROK soldier. Still no results. About this time radio orders were received to disengage the task force and return to bivouac areas with the mission unaccomplished.

This operation shows how lack of effective coordination and communication can cause the failure of an otherwise well-planned operation.

1st Lt. Lauris M. Eek, Jr.

The writer of the following joined the Army as an enlisted man in 1940, and was assigned to the 7th Cavalry Brigade when it became a part of 1st Armored Division. He was both student and instructor at The Armored Force School and also served in the 5th, 8th and 20th Armored Divisions. He went overseas with the 97th Infantry Division as a platoon sergeant, went to OCS in France and was commissioned in Infantry in 1945. Successfully completing a competitive tour in 1949, he went on to Korea in August of 1950 where he has been a combat tank platoon leader with the 70th Heavy Tank Battalion.

The use of tanks in Korea has been talked and written about many times. It makes a very good subject because it was said they couldn't be used in Korea. They aren't always used the way the book says, but still they are being used successfully.

I believe the best way to describe their use, and the problems encountered, is to describe one day with a tank platoon in action.

It was in mid-August in the Pusan perimeter; we were waiting and expecting a breakout, but not sure which way it would be, North or South. The infantry were short of personnel. We were able to assist both by bolstering morale and accounting for a number of enemy.

My platoon had been assigned an area and we had been working in it for three or four days. We were to help the infantry take and hold a hill. It was just a small hill surrounded on three sides by larger ones. The use of tanks was limited by the terrain. Only on one side was there any place for them to maneuver. We had our choice on this side—either in a stream bed or on a narrow trail across rice paddies. We had not used the trail for fear of falling off into the rice paddies when we backed out, for there was no turn-around.

The day before we had assisted an infantry company in getting the hill. Today we were to cover them and draw fire while they gave up the hill for the third time. The enemy fire from the surrounding hills was so intense they were not able to hold it.

I had planned to send three tanks up the stream bed and two across the trail through the rice paddies. This would give us better firing positions

and we could better help the infantry. I would have to move the platoon about three miles up the stream bed in order to get to my new position. From the time we started we would be under heavy mortar fire. The enemy would just wait for us to start up our engines and they would commence firing. Most of the rounds would be 120mm mortar, but occasionally it would be smaller stuff.

After briefing the platoon we started out. We had moved only a few hundred yards when one of the tanks had clutch trouble. As we found out later, it was a connecting pin sheared off in the linkage. Nothing to do but have the tank returned to maintenance. That left two for the stream bed and two for the rice-paddy trail. On the way up the mortars seemed heavier than the day before. Several periscope heads were broken by close rounds. One round landed on the back deck of one of the tanks. The only damage done was a broken tail light and a dent in the armor. During the next three hours we drew at least one hundred rounds without being hit once. We had to keep moving forward or backward a few yards all the time.

We had plenty of targets to shoot at that day. The small arms fire and .51 cal. antitank fire was very heavy. We fired a basic load of ammo per tank. As we found out later, the infantry walked off the hill without losing a single man. I was in communication with the infantry company commander by 300 radio until my antennas were shot off and then the platoon sergeant took over. My antennas had been shot off before; this was nothing new. The tank commander behind me saw them fall off and knew exactly what to do. When I saw the other tanks start to pull back I knew the infantry had cleared the hill and it was time to move out. As I started to back out of the rice paddies, which was about three hundred yards, my driver called to tell me that an oil line in the transmission was broken and oil was all over the floor. At that point the engine should have been stopped and we should have towed the tank to maintenance. However, the enemy fire was so intense it would have been suicide to try to hook up with the other tank. We continued to back out under our own power until we could move out of small arms range. As soon as we were clear I had the tank stopped. I still had no communication with any of the other tanks and I was the last one out. As soon as the tank in front saw I was stopped he came back and pulled me in.

At the CP we checked the damage to our tanks. One tank had been hit twenty-seven times by .51 caliber antitank rounds. None penetrated the tank. A .50 caliber machine gun had been hit in the receiver and had to be replaced. One tow cable was cut. A telescope was hit by small arms fire just as we were pulling back. Several vision blocks in the tank commander's cupola had to be replaced. All equipment stowed on the outside of the tank was shot full of holes. (When possible our tanks are stripped before any action.)

Our big guns caused no trouble that day. We had found previously that when firing the 76 we would have trouble loading after firing several rounds. The reason for this was that large flakes of unburned powder would stick in the breech thereby preventing rounds from seating fully. We always carried little swabs and after firing each round would wipe out the breech. We've never had trouble since then.

The communication worked very well except when my antennas were shot off. Of course we were never more than a thousand yards from the infantry.

Since that day tanks have been used many different ways and for many things. We have been used to transport men and equipment when trucks were not available, haul wounded to the aid stations, escort supply trucks, and pull vehicles and guns out of the mud. All of these are not in a book, but tanks have been used in Korea.

1st Lt. Thomas W. Kelley.

The writer of the following served as an enlisted man in the Marine Corps from 1943 to 1946. Upon release from service he attended North Dakota Agricultural College, to be commissioned in the Regular Army upon graduation in 1950. Since the Fall of the year he has served as combat tank platoon leader in the 70th Heavy Tank Battalion.

The men of the 70th Tank Battalion along with tankers in other armored units committed in the Korean Campaign, have, through the use of their native intelligence and imagination, proven that the only things that tanks can't do are fly and float.

At the beginning of the conflict, armor was considered to be out of its element in the rugged mountains, soft rice paddies and poor roads of Korea. These obstacles, along with the adverse weather conditions, were considered to be of great magnitude; it was thought that the role of armor in the campaign would be one of long-range support, or of stationary road blocks—the only exception would be in the more favorable regions in the west and west central sectors, where armored units would be able to give direct support to the infantry in offensive action, and then exploit the success of the attack with patrols deep behind the enemy's lines.

Time and tankers have changed all this; tanks have been used to ferry troops and badly needed supplies across rivers which were over the fording depth limits; this was done simply by moving through the water rapidly enough to give a tidal wave effect in front, causing a reduction in the depth around the exhausts and the engine compartment. Fordings of close to four and one-half feet in depth have been made successfully in this manner.

The muddy rice paddies offered one obstacle that was hard to surmount; in most cases only extensive engineer work would have made passage possible. The tankers had to find a quicker means of getting through. The answer was found in the regimental S-2 section, in the careful study of the maps of the area, and in some cases a personal reconnaissance into "Indian Territory." The route found around the paddy area was often a winding path along the fingers leading down from the main ridge lines, or up the rocky stream beds, sometimes going miles out of the way to bring the tanks into the area where they were needed for support. The infantry has found that the tanks will be there when needed; if the terrain is impossible to get through it will take just a little longer.

The coming of cold weather elimi-

nated the paddy hazard, but brought with it other problems more difficult to overcome. In almost all operations the crews were working under weather conditions so severe that only constant movement, or riding in their sleeping bags when possible, kept down cases of frostbite to a minimum. The ice and snow on narrow mountain roads also caused considerable trouble; it was found that straw mats, which most tanks carried, offered excellent traction when placed on a particularly slippery mountain road where one slip could mean the loss of a tank with its crew.

The coming of warmer weather has brought with it the most favorable weather for tanks in the entire year. The ground is fairly dry and the paddies are capable of carrying tanks if a little care is taken in choosing a route to cross them.

The rainy season scheduled to start in the next six or eight weeks will be the beginning of the second cycle of adverse conditions for armor operations. The change will not be anticipated with pleasure; war is never pleasant, but it will be met with confidence by tankers, who know they have overcome all obstacles offered by the enemy, weather, and terrain, so far with success, and are capable of doing any job required to bring the conflict to a successful completion.

1st Lt. Robert L. Brown

The writer of the following is a graduate of West Point, Class of 1950. A brief tour at Fort Riley, Kansas, was followed by transfer to the Far East Command, where he was first assigned to the 8th Cavalry Regiment. One month later he moved to his present post of combat tank platoon leader of the 70th Heavy Tank Battalion.

As a combat tank platoon leader you are appallingly aware of how small a segment of the whole war you see. You wonder—ponder—how are things on the left? the right? You curse your lack of information of the "big picture" and then thank God you are not a gunner with only a sight and periscope to look through.

But you learn—of necessity at an accelerated rate; not always the school solution, but a solution, just the same.

Inevitably any discussion of Korea leads to terrain. At the start of the action, it was often said that tanks could not be successfully used over the Korean terrain, and when first I saw the Korean hills from a ship in Pusan Harbor, I was about to add a vociferous "amen." This misconception has long been dispelled by the exploits of armor in Korea, and daily battle accounts testify to the pre-eminently successful use of armor against the Communist forces over all types of terrain and, I might add, in all types of weather.

Terrain has greatly influenced the manner in which tanks are utilized, but certainly has not made their use impractical. That fire power, maneuverability and shock action is still there.

Except during the cold winter months when they are frozen, the boggy Korean rice paddies are in virtually all instances impassable. Furthermore, even with the paddies themselves frozen, maneuverability was limited by the extensive system of irrigation ditches common to Korean agriculture, which were effective antitank ditches; and by high paddy dikes which the tanks were unable to climb.

The Korean hills are abrupt and rugged, so that tanks are usually limited to the lower ground. Tank routes, then, are generally roads and river beds.

Fortunately, in most Korean valleys of appreciable size, there usually exists a creek or river, the bed of which affords the optimum of "tankable country" by Korean standards. In such a location, a platoon may occasionally be used in a "spread" formation as a "wedge" or "echelon"; but usually terrain restricts the formation to a column while the unit is moving. Of course, within an area, the platoon leader can usually maneuver his tanks into another formation.

The versatility of armor has never been more clearly demonstrated. Tanks have added speed and vigor to United Nations attacks, and have bolstered the defense when initiative has passed on occasion to the enemy. Of necessity we've hauled bedding rolls, and in sorrow, evacuated the wounded when no other means could be used. We've often played "fire man," too, and many times have extricated infantry contact patrols from "embarrassing situations" in which the patrol has found itself pinned down upon contacting the enemy. Covering fire from the tanks has made a safe withdrawal from such precarious situations possible.

Infantry unit commanders have learned the value of tank-led patrols to range into enemy territory to ferret out enemy positions and to shoot up installations and supplies with the resulting disruption and disorganization of the enemy. They have also come to admire the highly flexible and dependable communications net indigenous to armor. Often, when action is beyond the effective range of the less powerful infantry radios, tanks have helped to keep infantry battalion and regimental commanders abreast of the situation by radioing reports to a radio-equipped liaison jeep stationed at the infantry Command Post. The tank radios also net with artillery channels so that the platoon leader may call for and adjust artillery fire upon opportune targets. The aerial observer, also available by radio call, has proven of inestimable value in giving tankers a "bird's-eye view" of the situation ahead and in actually directing the fire of tanks upon targets.

We still sweat out task forces, remembering our dash to the beleaguered, heroic 23rd Regiment at Chipyong. There we learned close-in protection against tank killer teams, armed with bazooka and charges, lying in wait in ditches and culverts. We've become wary on elevated roads, bridge by-passes and approaches.

We feel our greatest contribution to United Nations successes in Korea has been the close and effective fire support of our attacking infantry. The tank-infantry team has never been more fully utilized than in Korea, where tanks have reduced enemy strong points, and routed or destroyed communists in foxholes and bunkers from which they direct their fire upon friendly troops. Teamwork has never been better, and a close kinship has developed.

The doughboys have come to appreciate the support of their comrades in the ground team—the tankers and their tanks.

1st Lt. Thomas W. Boydston

The writer of the following attended Oklahoma Military Academy, and entered the Army in 1943. In 1949 he attended the Officers Associate Basic Course at The Armored School. Since last August he has been a combat tank platoon leader with the 6th Medium Tank Battalion in Korea.

At 0900 hours, 2 November 1950, the 21st Regimental Combat Team reinforced with Company "A," 6th Medium Tank Battalion, kicked off on its third morning of attack toward the Yalu River town of Sinuiju on the west coast of Korea. Company "A," 6th Medium Tank Battalion, commanded by Captain Jack G. Moss, was the leading element, with my platoon, the second, on the point.

The column moved ahead aggressively. Sfc Ralph Lightcap, a veteran tanker of two wars, commanded the lead vehicle. He was well acquainted with the enemy capabilities and had instructions to move as rapidly as possible so we could treat possible obstacles with proper respect, when we came to them.

About fourteen miles east of Sinuiju, we entered a small valley terminating in a narrow pass. Sgt. Lightcap observed and fired upon a camouflaged T-34, 400 yards ahead on the left of the road. His fire was returned by a terrific volume of fire from both sides of the road, and at a greater range up the pass.

The leading three tanks were unable to get off the road, for our infantry, riding on our rear decks, had taken cover in the ditches. The second section, plus the entire third platoon (1st Lt. Bernard D. Fahey, commanding) were able to get in hull defilade behind a rise of ground to our right flank. One section of the first platoon, under M/Sgt Clarence Allison occupied a reserve position, to the rear.

Lieutenant Wilcox.

Sgt. Lightcap's second shot destroyed one T-34. The enemy's camouflage was perfect and my tank fired three rounds at a muzzle flash before that enemy tank was destroyed. My gunner spotted another flash in his sight and made a one-shot kill. Sgt. Lightcap nailed the fourth tank on that side. In the meantime, two more were destroyed by tanks commanded by Sfc James Hoback and Leonard Baker. Two more and one SP were hit, but who destroyed them hasn't been determined.

The enemy's initial volley knocked off my muffler, broke Sgt. Lightcap's track and set a fire on his tank. My bow gunner, Pfc Elmer Witch, without regard for his safety, ran forward and extinguished the blaze. On his return, his jacket sleeve was twice ripped by small-arms fire.

The battle ended as suddenly as it started. Our doughboys mopped up the enemy infantry in short order and we took count of losses. The enemy losses consisted of eight tanks, one SP and an unknown number of men.

1st Lt. Robert D. Wilcox

ARMY ADOPTS NEW ALL-TEMPERATURE GREASE AFTER EXTENSIVE TESTING

A new grease which performs equally as well in tropic heat or Arctic cold has been adopted for use on all Army vehicles and artillery pieces, the Department of the Army announced recently.

The all-temperature lubricant, developed by the Army Ordnance Corps, is expected to simplify the Army's supply problem by replacing at least six different greases. It is the result of extensive tests, conducted over the past three years, which started with "Operation Greaseball." The operation involved a convoy of twelve 2½-ton Army trucks which left Aberdeen Proving Ground, Maryland, in August, 1948 and covered 20,000 miles of driving in varying climates.

Previous experience had shown the Army that ordinary lubricants suitable for use at high temperatures solidify or become too viscous for use at extremely low temperatures. Consequently, such lubricants must be removed from both automotive and artillery items and Arctic lubricants applied prior to shipment from one temperature zone to another.

Approximately 30 man-hours were required to convert to cold climate operation a vehicle that had been lubricated with ordinary warm weather greases. This included disassembly of transmissions, differentials, wheel bearings and other lubrication points, followed by a complete washing out, and then reassembly with cold weather grease.

The Army-developed all-temperature grease eliminates such involved operations. Equipped with this grease, the vehicle is made readily available for shipment to Arctic weather regions after engine oils and gear lubricants are drained and refilled.

The new lubricant is suitable over the temperature range of minus 65 degrees Fahrenheit to plus 125 degrees Fahrenheit.

Logistics and Trains in the Armored Division

by CAPTAIN JEOFFREY FORSYTHE

THIS article was prepared to present a brief and concise picture of logistics and trains within the armored division. We are prone to regard logistics as a subject of minor inportance and are inclined to take the matter for granted. It is conceded that there is very little color or glamour attached to logistics. Tactical and intelligence activities offer far more opportunities for glory and expression of daring and combat ability. It is further conceded that logistics is geared to support combat but it is emphatically denied that logistics is a subject of minor importance or a matter to be taken for granted. It is an obvious and fundamental truth that without logistical sufficiency or adequacy there will be no tactical success.

Logistics embraces many fields of activity but in this discussion only the most important essentials will be considered. Those essentials are the provision of supplies, matériel maintenance and evacuation, and personnel casualty evacuation for the armored division. The units, elements, vehicles and personnel who perform these functions constitute the trains of the units and of the armored division.

Every field of military activity is based upon logic and sound established principles. Logistics is no exception. The first principle of logistics, one that should never be forgotten, is that THE RESPONSIBILITY FOR THE PROVISION OF SUPPLIES, MAINTENANCE, AND EVACUATION RESTS WITH THE UNIT COMMANDER. Commanders are provided assistants to accomplish these functions but it is the unit commander who will answer to higher echelons for any logistical inadequacy in the unit. Another principle, one for logistical personnel to constantly keep in mind, is that THE IMPETUS OF SUPPLY AND SERVICE IS FROM THE REAR TO THE FRONT. Supplies and services must be pushed forward and made conveniently available to combat troops. Logistical agencies have only one reason for existence and that is to support the combat soldier. The third principle, ADVANCE PLANNING IS ESSENTIAL, is rather obvious and basic, yet extremely important. Plans must be formulated well in advance to insure that supplies and services are provided when needed and where needed. The last principle, PRESCRIBED RESERVES OF SUPPLY MUST BE MAINTAINED IN ALL ECHELONS, provides insurance. There will be inevitable delays and interruptions in the delivery of supplies. If supply reserves such as spare parts and extra rations are maintained in a unit, the supply delivery delays will not seriously affect the unit. A logistical program based on the above principles will assist any unit in accomplishing its mission.

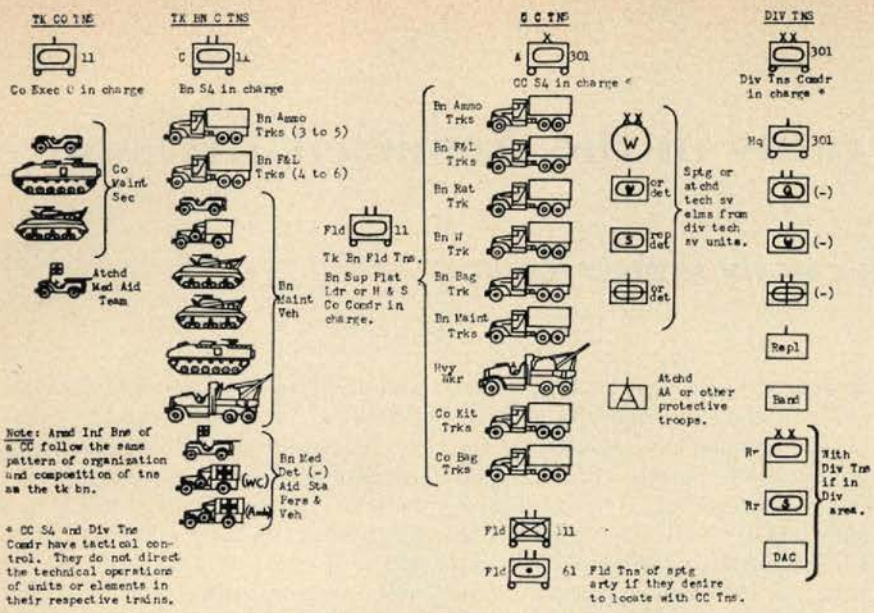
To clearly understand the logistics of the armored division it is necessary to have some idea of the use and composition of trains in the division. *Figures 1* and 2 illustrate the organization and disposition of trains when the division is engaged in offensive combat. The different trains establish the chain of logistical support within the division.

The most forward trains are those logistical vehicles and personnel with the companies. Company trains consist of the company maintenance sections and attached medical personnel and vehicle. In combat company kitchen and supply or baggage trucks usually remain farther to the rear with battalion logistical elements.

Battalion trains consist of the battalion supply, maintenance, and medical elements plus company kitchen and supply or baggage trucks left with battalion. These vehicles and personnel constitute a sizable group, obviously too large to accompany the battalion in combat. However, when engaged in combat, the fighting units of the battalion will require immediately available logistical support. Such support is provided by the formation of battalion combat trains consisting of battalion supply trucks loaded with gasoline and ammunition, a portion of battalion maintenance, and the remainder of the battalion medical elements. The battalion combat trains are controlled by the battalion S4 and will locate and move in the vicinity of the battalion headquarters. The number of supply trucks and maintenance vehicles in the battalion combat trains will vary according to requirements and availability of road space. Those vehicles and personnel of battalion trains which are not required forward for immediate support will be grouped into what is called battalion field trains. The battalion field trains will include the remainder of the battalion supply trucks carrying gasoline, ammunition, water, rations, and miscellaneous impedimenta; what is left of battalion maintenance; and the company kitchen and supply or baggage trucks. The field trains of a battalion will remain well to rear with the battalion supply platoon leader or headquarters and service company commander in charge.

In order to provide coordinated protection and movement control for all battalion field trains in the combat command, they are grouped and formed into an intermediate trains formation between the battalions and division. This group of battalion field trains is called combat command trains. There will also be elements of the division technical services supporting the combat command. These supporting technical service elements will accompany a committed combat com-

Captain Jeoffrey Forsythe is a member of the Command and Staff Department of the Armored School, Fort Knox, Kentucky.



ORGANIZATION AND COMPOSITION OF TRAINS IN THE ARMORED DIVISION
Figure 1.

mand and will be considered as part of the combat command trains. (See *Figure 1* for normal composition of combat command trains.) The combat command S4 is not charged with the technical operations of the battalion field trains and the supporting technical service elements. His function is to coordinate the movement and security measures for the combat command trains as a whole.

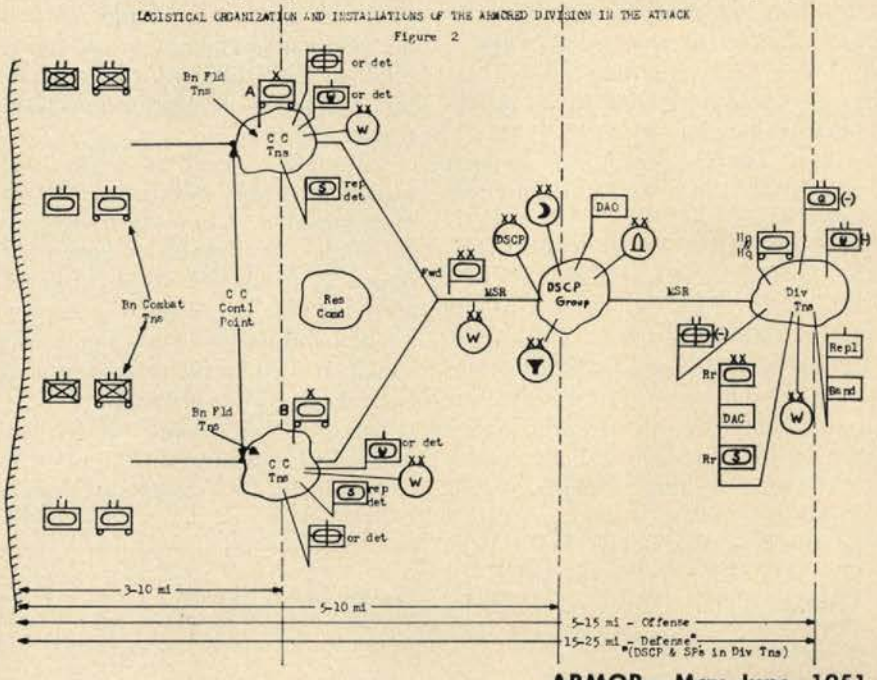
Behind the major commands will be found division trains consisting of headquarters company of division trains, the ordnance maintenance battalion minus the ordnance companies or detachments supporting the combat command; the armored medical battalion minus those elements supporting the combat command; the quartermaster battalion minus forward supply installations; the replacement company, and the division band. The division headquarters rear echelon, a rear signal detachment, and the division administrative center (DAC) may also be located in the division trains area.

Forward of division trains and behind combat command trains, the quartermaster will operate the Division Supply Control Point (DSCP) and his Class I (rations) distributing point and Class III (fuels and lubricants) supply point. These installations will be mobile. The DSCP acts as an information center for logistical traffic. Current information concerning the location and status of supplies and services of all the division and supporting army logistical installations is immediately available. All supply traffic from the forward units will be required to report to the DSCP for information and instructions. Frequently the armored division will be authorized to carry ammunition in excess of the division basic load. When such is the case, division quartermaster truck platoon transportation will be utilized to mobilize a division Class V (ammunition) supply point. This mobile Class V supply point will locate near the quartermaster's Class I distributing point and Class III supply point in the vicinity of the DSCP. These installations and the Division Ammunition Office (DAO) will comprise the Division Supply Control Point Group. This group is situated well forward on the division MSR in order to expedite the flow of gasoline, ammunition and rations to the front.

The logistical picture within the division is completed but there remains the question of the sources of supply for the division as a whole. Army supports the divisions of the corps by providing supply points and services for each corps in the army. These supply points and service installations are operated by army troops but are located in the corps area. To the division, the most important of the army supply points in the corps area are the army Class I supply point, the army Class III supply point and the army Class V supply point. It is here that the divisions of the corps draw their rations, fuels and lubricants, and ammunition.

Knowing the logistical organization and composition of trains within the armored division it is possible to trace the flow of supplies to the front. The flow of Class I supply (rations) is reasonably automatic and is systematized on a daily basis. Rations for the division are drawn daily by the division quartermaster from the army Class I supply point in the corps area. The rations are then broken down into battalion and separate company lots at the division Class I distributing point and prepared for distribution to units. Unit ration trucks pick up their rations on a prearranged schedule. Battalion ration trucks then return to their respective field trains and the rations are broken down into company lots for distribution to company kitch-

LOGISTICAL ORGANIZATION AND INSTALLATIONS OF THE ARMORED DIVISION IN THE ATTACK
Figure 2



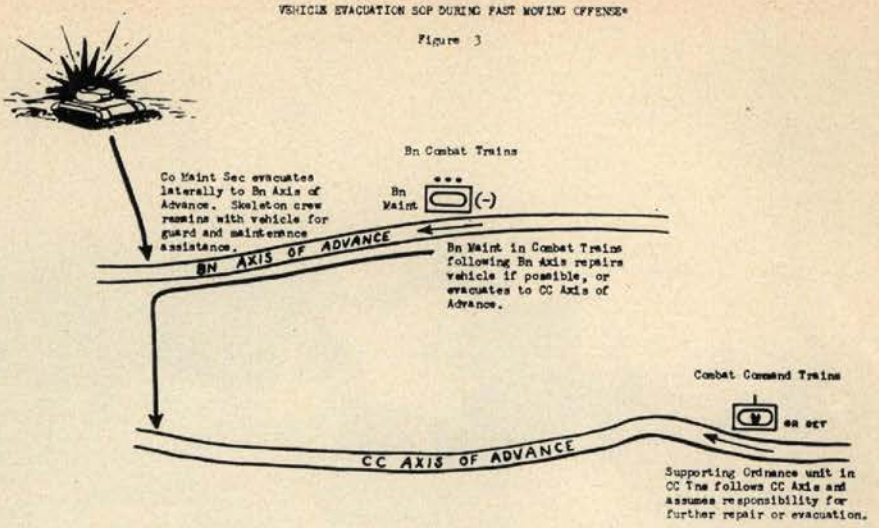
en trucks. If "C" rations or "5-in-1" rations are drawn they must be distributed to the individual or vehicle-crew consumers.

Procurement and distribution of Class III supplies (fuel and lubricants) do not pose any particularly difficult problems. Gasoline for companies of a battalion is immediately available and on call in the battalion combat trains. During a lull in fighting or during darkness, gasoline trucks will be dispatched to companies whenever called for. These trucks will attempt delivery to each individual tank or other vehicle in the company. After completely refueling the company, the truck or trucks will collect empty drums and return to battalion field trains. In the meantime, the battalion S4 will have maintained the level of gasoline in the battalion combat trains by directing that a gasoline truck or trucks come forward from the field trains and join the combat trains. After trucks loaded with empty gasoline drums have been assembled in the battalion field trains they are dispatched to the DSCP. Personnel of the DSCP will direct the convoy to the division Class III supply point if sufficient gasoline is available, otherwise to the army Class III supply point in the corps area. At either supply point, gasoline will be provided on an empty-drum for full-drum exchange basis. Refilled trucks then return to their battalion field trains and await call to join the battalion combat trains. This completes the cycle, a simple and expeditious procedure.

The procedure for the procurement and distribution of Class V supply (ammunition) parallels closely that of Class III supply. Ammunition will be sent forward from the battalion combat trains to the companies when called for, usually in conjunction with refueling activities. Briefly, the process is as follows: Empty ammunition trucks are assembled in the battalion field trains; the battalion munitions officer prepares a Transportation Order (request for ammunition) and dispatches the convoy to the DSCP after clearance is obtained from the combat command S4 at the combat command control point. The DSCP directs the convoy to the DAO where unit Transportation Orders are authenticated. When unit Transportation Orders are authenticated they are

VEHICLE EVACUATION SOP DURING FAST MOVING OFFENSE*

Figure 3



* In slow moving, static, or retrograde situations, maintenance elements evacuate disabled vehicles to the next higher maintenance installation.

then valid requisitions for ammunition and may be presented at the division mobile Class V supply point, if the division has been authorized ammunition in excess of the basic load, or the army Class V supply point in the corps area for replenishment of ammunition. Refilled unit ammunition trucks then return to their respective field trains and loads are adjusted and prepared according to the anticipated requirements of the combat companies.

Class II (prescribed allowance equipment such as T/O&E) and Class IV (generally construction and fortification materials) supplies are not so readily available as are Class I, III, and V supplies. The procurement of Class II and IV supplies is a matter of requisitioning or directly exchanging unserviceable items "over the counter" for serviceable items. Unit requirements for these supplies will be satisfied when the technical services of the division obtain the supplies and make them available.

The division engineers provide water with engineer water point detachments for the major commands. When a combat command is committed, a water point detachment will accompany combat command trains. Water trailers towed by company kitchen trucks and the water cans carried by a battalion supply truck may be filled there. Water is usually distributed with rations.

Supply activities within an armored division are only a part of the logistical effort involved. Maintenance of equipment and evacuation of damaged and unserviceable matériel are included in the logistical program of the division. Engines, wheels, and tracks must turn. Those which cannot turn must be repaired or evacuated to a maintenance facility which can perform the necessary repair. Companies and battalions have organic maintenance elements which should perform all maintenance and repairs that time, available tools, and skill of personnel will permit (organizational maintenance). Repairs beyond unit capabilities will be accomplished by division or army ordnance units (field and depot maintenance). *See Figure 3.*

Evacuation is not confined to matériel. Casualties must receive prompt attention and be processed through the medical chain of evacuation as rapidly as possible. Companies of the combat battalions are provided one or more company aidmen and a ¼-ton ambulance (litter jeep) with driver from the organic medical detachment of the battalion. These small medical aid teams with the companies evacuate casualties from the battlefield to the battalion aid station. Ambulances from the medical company supporting the combat command evacuate the casualties from the battalion aid stations to the division clearing station, either a small one in the combat command trains area or a large consolidated clearing station in the division trains area. This medical evacuation SOP remains the same for both offensive and defensive operations.

The logistical program presented in this discussion is as advocated by The Armored School.

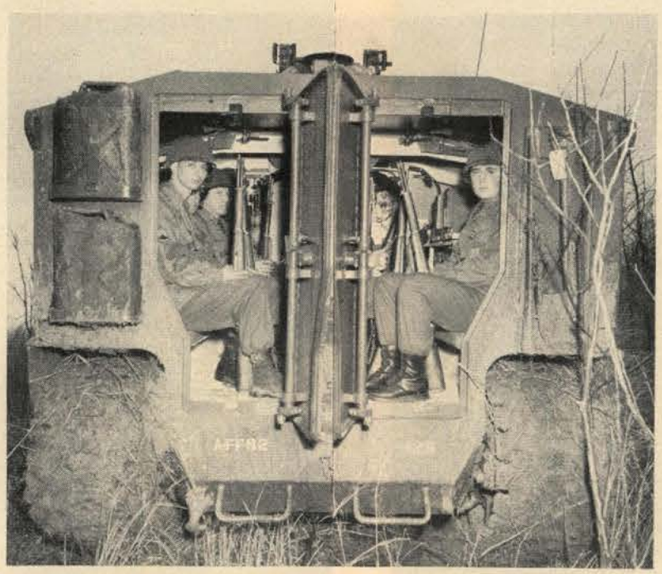
Fresh armored infantry deploy into dismounted action following an approach in which the losses from small arms and artillery have been reduced by mobility and armor protection.

A NEW ARMORED RSONNEL CARRIER

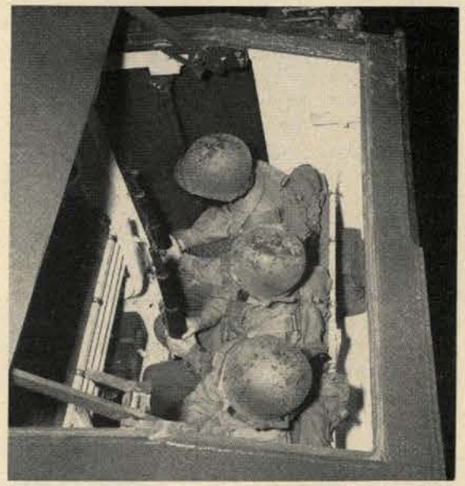
The Army has just released infotion on a new vehicle for Armor —the T18E2 Armored Personnarrier. A squad-size carrier with a crew of one, the driver, the T1 will provide all-over protection for its occupants against small is and shrapnel, and will carry them over the same terrain on th the tanks it accompanies can operate, thus putting fresh men e the objective when the moment arrives for dismounted action. e new vehicle is powered by a six-cylinder Continental engined has the Allison cross drive transmission. On improved rc it will travel at a sustained speed in excess of 35 mph. Iounts one .50 caliber machine gun and will be produced by ernational Harvester Company.

A full track vehicle, the new personnel carrier will traverse the same terrain as the tanks, putting infantry with the spearheads, creating the team to meet enemy opposition.

Armored infantrymen dismount from their carrier to come to grips with the enemy on the objective.



Infantrymen dismount from the squcompartment through double doors.



Side ports may be opened or put in semi-closed position and used by riflemen for close-in protection.

The half-track had limitations, yet did a big job in World War II.

The tank has groaned under its additional load.

Se
oe
Foreners

U.S. Aphotos

The M39 lacked important overhead protection.

The platoon size M44 armored utility vehicle proved unwieldy.

There has been increasing attention to the subject of armor in a variety of sources, evidence of the importance attached to it in the ground warfare picture. ARMOR receives so much deserving original material that it is not necessary to draw on other media for its coverage. However, the big play elsewhere has produced such a number of provocative presentations on our

Have Armoured Forces A Future?

by B. H. LIDDELL HART

THE weight of the main types of tank in use has approximately trebled in the last ten years—as a result of continuous efforts to mount a bigger gun and thicker armour. At the same time the number of tanks in what is called "armoured divisions" has decreased. It is now a matter of common remark that the progressive effort to thicken armour has reached the limit of what is practicable and compatible with mobility. But the penetrative power of guns and projectiles has continued to grow. As a natural consequence there is a growing tendency among soldiers to argue that the penetrative power of the tank itself in operations has been curbed. It is even asserted that the tank has met its master in the antitank projectile, and that its military value is on the wane.

The argument would be more convincing if it had not been *so* often repeated, and *as* often refuted by experience. By tracing the sequence of "ups-and-downs" through the past thirty years we can get a better light on the recurrent argument, and on the reasons why it has carried more weight than events have justified, That will also help to show how far we are from having reached the limit of what is operationally possible for armoured forces. Until we have tried to fulfill requirements which were apparent to clear-sighted thinkers thirty years ago it is foolish to conclude that the tank has "had its day."

I remember hearing such a conclusion expressed in November, 1919, by a distinguished soldier in a lecture on the "Possibilities of the Next War." His verdict seemed the more weighty because he had been concerned with the original production of the tank after the First World War had developed into a static war of trenches. Despite all the tank had contributed, and achieved, in breaking the deadlock in the last year of the war, he could see no further prospect for it. In his survey of future warfare he dismissed it in three sentences—"The tank proper was a freak. The circumstances which called it into existence were exceptional and are not likely to recur. If they do, they can be dealt with by other means."

His death sentence on the tank was applauded by most of the generals who were present. Only a small band of believers, mainly younger men, took a different view—and had a new vision of the potentialities of the tank.

Soon afterwards the first type of fast tank, capable of a speed of over 20 m.p.h., was successfully produced in England—carrying the practical

The article presented herewith is a complete chapter from the author's recent book DEFENSE OF THE WEST, and is reprinted here with the kind permission of Captain Liddell Hart and his publishers, William Morrow and Company, Inc., of New York.

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B. H. Liddell Hart is an internationally recognized military analyst. Following World War I service with the British Army, he retired in 1927 to devote full time to a writing career. He has been a military correspondent for several leading English newspapers, and Military Editor of the *Encyclopaedia Britannica*. He is the originator of many new ideas and methods adopted in various armies, and has been a pioneer in mechanized warfare concepts. He is author of *The German Generals Talk*.

special subject that ARMOR has set aside a solid chunk of space in this issue to round up some of the best for your consideration. This material by no means follows the same line. Each treatment is original within itself. The reader will not find the following block of pages a condensed, highly illustrated and easy-to-take dose. This is serious reading. Sit down and dig in.—THE EDITOR.

promise of fulfilling the new vision. Yet, curiously, many soldiers who hoped to revive mobility and "open" warfare were antagonistic to the new means that might make such a revival possible.

That was particularly common among ardent cavalrymen, who still cherished the hope and faith that the reign of the horse would continue. Almost every time I met one of their ablest leaders, who then (in the mid-1920s) held the chief command in the British Army, he gleefully assured me that the tank was doomed because of impending improvements in antitank weapons. Such a view, and attitude, persisted in high quarters throughout the twenty years betwen the wars. Every demonstration of the potentialities of mobile armoured warfare was followed by a disparaging reaction.

The great pioneer, General Swinton, who in 1914 had seen the "armoured caterpillar" vehicle as a solution for the trench-deadlock, concluded his story of the much-resisted development of the tank in World War I by philosophically quoting the Persian proverb: "the dogs bark, but the caravan passes on." Once again he proved a true prophet.

For in spite of much doubt and obstruction, the tank and the conception of its use continued to progress in England during the years immediately following that war. That was due above all to Colonel Fuller, who had been chief staff officer of the wartime Tank Corps. He preached the idea of "sea warfare on land" conducted by completely mechanized forces—an idea which another member of its staff, Major Martel, had originally suggested as far back as November, 1916, in a paper entitled "A Tank Army"—and by his vivid presentation of the case brought it into the realm of practical discussion. Moreover, in his proposed "Plan 1919" and postwar writings, Fuller evolved the idea of a deep tactical penetration—driving right through to the enemy's divisional, corps, and army headquarters, paralyzing the enemy's command system and spreading confusion in the immediate rear of his armies. Then, in considering the possibilities of tanks with much higher speed and longer radius than the 1918 type, I evolved the further idea that fast armoured forces could carry out a deep strategic penetration—an independent long-range drive to cut the enemy's communications far back, where his main arteries of supply could be severed. I illustrated it by a treatise on the lightning campaigns of Genghis Khan, drawing the conclusion that fully mechanized forces should be capable of a performance comparable to that of the all-mobile forces of the Mongols. This idea particularly appealed to Lindsay, who became Chief Instructor of the Central Schools on the formation of the Royal Tank Corps in 1923 as a permanent arm of the Army. The previous year, with the British armoured cars in Iraq, he had initiated the first trials of an embryo mechanized force.

Early Experimentation

In 1927 the British General Staff decided to create an Experimental Mechanized Force on Salisbury Plain for practical test of the new theories. It comprised one battalion of tanks, one battalion of armoured cars and "tankettes" (the forerunner of the light tank), one battalion of machine-gunners mounted in six-wheeled or half-track vehicles, a brigade (regiment) of tractor-drawn field artillery (with one self-propelled battery), and a motorized field company of engineers. Much of the value of the experiment was lost because of the cautious and cramped way in which the force was handled by the infantryman who was placed in charge of it. Nevertheless, the "fast group" under Pile (who became the C-in-C of Britain's A.A. Defence in the next war) provided a striking foretaste of what might be achieved by rapidity of movement and mind—above all in exploiting "unexpectedness." At the same time the Chief of the Imperial General Staff was persuaded to define a policy of training for the force—and future "armoured visions"—on modernized Mongol lines. Unfortunately, a prolonged reaction followed this spurt of progress. The force was disbanded in the autumn of 1928 after its second season of trials—partly as a way of getting rid of the slow-moving infantryman who had been appointed to command the force, and was cramping its potentialities. But the formation of a fresh force, a true armoured force, was deferred longer than had been hoped.

The British Mechanized Force of 1927 attracted the attention of the military world, and progressive soldiers in other countries were keen to try its possibilities. The next country to do so was America. Dwight Davis, the U.S. Secretary of War, attended one of the trials on a visit to England, and when he returned home gave instructions for the formation of a similar force in the United States Army. To soothe the fears of the older arms the announcement emphasized that the new type of force "would not displace" infantry or cavalry. The force itself had an even shorter life than its British forerunner—it was constituted in July, 1928, and disbanded in September. In the years that followed, the United States Army lagged behind the pace of developments in Europe—contrary to natural expectations. Colonel Chaffee, the leading spirit of the new school in America, had a heart-breaking struggle in his efforts to achieve

an advance. General MacArthur was one of the few senior soldiers who had a vision of what mechanized mobility might achieve, but during his time as Chief of Staff he was hampered by opposition from static-minded contemporaries while handicapped by lack of financial resources. In Congress, Ross Collins was a lone voice crying in the wilderness when he constantly argued that mechanized forces would be decisive in a future war.

In America, armoured development was retarded because after World War I the heads of the Army, instead of maintaining a separate Tank Corps as the British did, had followed the example of the French Army in treating tanks as a part of the infantry arm and keeping them subordinate. For France that proved a fatal policy. It can be traced to the complacency that was fostered by victory in 1918. The new school of thought gained some adherence in France, but for all their ardour they made little impression. They were borne down by the weight of superior authority, which rested on old doctrine. The heads of the French Army were supremely convinced that they knew more about war than any other army in the world and were apt to despise all others except the Germans as amateurs. Although not "too proud to fight" they were too proud to learn new ways of fighting.

The main current of mechanized development thus remained in Britain —so long as Germany was disarmed. It moved more slowly than ideas, but in 1931 a complete armoured formation, the 1st Tank Brigade, was at last formed for trial. One of the new school, Brigadier Broad, was this time put in charge of it. He worked out a force of battle drill training in tactics of indirect approach and variable aim. He also systematized the methods of control, laying a good foundation for a longer advance.

Deep Strategic Penetration

But another regrettable interval occurred before this first tank brigade was permanently constituted in 1934. Hobart, who was given command of it, not only developed the tactical methods and wireless control required for fast-moving operations, but set out to practise the method of deep strategic penetration—by an armoured force operating independently of the Main Army.

These trials helped to confirm one's earlier theoretical exposition of its potentialities. But most of the senior generals were by no means convinced by the demonstration. They remained distrustful of the possibility of such long-range strokes, preferring to keep the armoured forces tied more closely to the main body of the Army, and to what they called "the main battle." As a result Hobart's opportunities to continue such practice of tank *strategy* were curtailed during the next two seasons' training.

The revolutionary possibilities of the new idea were more fully grasped in Germany—especially by Guderian, who was training the tank units which Hitler had just begun to build. For over ten years Guderian, as he has related, had been following British ideas with the keenest interest, and he now enthusiastically seized the chance to put them into practice himself. After the summer of 1935 had been devoted to practice in handling an experimental armoured division, three such divisions were formed in October that year. Each embodied four battalions of tanks and two mechanized "light infantry" battalions, together with artillery, engineers, a motorcyclist unit, and a reconnaissance unit. (By 1939 the number of armoured divisions had been doubled, and by 1940 increased to ten.)

> "I was one of Captain Liddell Hart's disciples in tank affairs." "Captain Liddell Hart—my first teacher in tank tactics and strategy."
>
> —General Guderian
>
> (The creator and trainer of Germany's armoured forces, who made the break-through at Sedan and led the drive to the Channel in 1940.)

More significantly still, Guderian directed and trained these new-style forces to carry out the idea of deep strategic penetration—operating independently and driving on far ahead of the main mass of the army. The older German generals were almost as horrified as the British generals had been at the unorthodoxy of the idea, as well as its hazards. They wanted to tie the armoured divisions down to the service of the infantry mass. But when war came, opportunity came—to cut loose from their cautious restraints. The campaign in Poland demonstrated the value of the new idea and diminished the Higher Command's tendency to impose checks upon it. When the campaign in the West was launched, Guderian seized the bit in his teeth and bolted with the reins —his unchecked gallop from Sedan to the sea cut off the whole left wing of the opposing armies. The Belgians collapsed, the British barely escaped by sea, and a large part of the French Army was put in the bag. The armoured forces were then quickly switched south and east for a fresh stroke. After the new French front on the Aisne had been pierced, Guderian's sweep eastward to the Swiss frontier cut off the right wing of the French Army, and led to the fall of France. In each case the break-through itself only opened the way for a solution of the problem; the rapid and deep exploitation was the decisive part.

Blitzkrieg Method

Guderian has epitomized the *blitzkrieg* method as "Mobility, Velocity, Indirect Approach." In a fuller definition of it—with which Guderian expressed emphatic agreement—I set it forth thus:

The secret lies partly in the tactical combination of tanks and aircraft, partly in the unexpectedness of the stroke in direction and time, but *above all* in the *follow-through*—the exploitation of a break-through (the tactical penetration of a front) into a *deep strategic penetration*, carried out by armoured forces racing on ahead of the main army, and operating *independently*.

The pace of such forces promises a decisively deep penetration *so long as* it can be kept up. It is kept up by a torrent-like process of advance, either swerving round resistance or piercing it at a weakened spot—in which case the tank-torrent contracts in pouring through a narrow breach, and then expands again to its original breadth.

It is the *persistent pace*, coupled with the *variability of* the thrust-point, that paralyzes the opponent. For at every stage, after the original break-through, the flexible drive of the armoured forces carries simultaneously several *alternative* threats, while the threat that actually develops into a thrust takes place too quickly for the

enemy's reserves to reach the spot in time to stiffen the resistance there before it collapses. In effect, *both tactical and strategical* surprise are maintained from start to finish. It is a high-speed "indirect approach" to the enemy's rear areas—where his vital but vulnerable organs of control and supply are located.*

The points of this definition are worth keeping in mind when examining the course of operations throughout the war—those which brought quickly decisive results and those which did not.

These points, too, form a guide for the future—showing the conditions that will have to be fulfilled if armoured forces are to play a part in the future comparable to what they did in the immediate past. The improvements of counter-methods and counter-means are bound to make the conditions harder to fulfil, as they did in the last war after 1940, but this *blitzkrieg* method may again prove effective if the means for it are developed on the lines that reason long ago suggested. The armoured forces that triumphed in 1940 were of primitive composition—as Guderian himself and his fellow tankmen quite realized. They were limited by the means then available and their model was far short of the design that the original British exponents of armoured warfare had set forth in the 1920s. But it sufficed to dislocate the opposing armies because the heads of these armies had not really begun to understand the new method of warfare.

The startling success of the German armoured forces in overrunning France aroused Britain's leaders to the practical value of the new theory that had been born there but neglected by them. Further armoured divisions were hurriedly formed to expand the small number then existing. A similar effect was produced in America. But in Germany, which had profited so much from the adoption of the theory, victory brought an increase of confidence rather than an urge to further development. Complacency has usually been an accompaniment of victory.

Before launching the invasion of Russia in 1941, Hitler wanted to double the number of his armoured divisions, for moral effect, but as the output of tanks was insufficient he chose the dangerous way of doing it by dilution—reducing the number of tanks in each division from a scale of 300 to 180. That reduction was contrary to the advice of the armoured warfare experts, some of whom considered that the pre-war establishment of 400 was the desirable figure—one company out of four in each tank battalion had been left behind on mobilization, to provide drafts. Moreover, no substantial improvement had been made in the mechanization of the other elements in the division. The ill-effect of those deficiencies was not very apparent in the opening phase of the campaign, since the Russian Command then was no better than the French in handling its own tanks or in applying suitable counter-measures. But as the Germans advanced deeper the inadequate mechanization of their so-called armoured divisions became an increasing handicap—Russia's poor roads proved a greater obstacle, especially in bad weather, than her tank forces. And as the German divisions shrank, through battle and mechanical casualties, the shrinkage became disproportionately crippling to their punch because their initial strength in tanks had been so limited. In the later stages of the campaign they often entered battle with less than a hundred tanks. It was hardly surprising that their attacks became decreasingly effective in results—even apart from the development of more efficient methods of anti-tank defence and the growth of Russia's armoured forces, equipped with new and better tanks. It was hardly surprising that their attacks became decreasingly effective in results—even apart from the development of more efficient methods of anti-tank defence and the growth of Russia's armoured forces, equipped with new and better tanks.

> "The military author who made the greatest impression on Field Marshal Rommel, and who highly influenced his tactical and strategical conception . . . Rommel could be called Liddell Hart's 'pupil' in many respects."
>
> —General Bayerlein (Chief of Staff to Rommel in Africa).

It is also to be noted that, in the invasion of Russia, Hitler and the German military chiefs had agreed in putting a check on Guderian's desire to carry out the same kind of deep strategic thrust as he had done in France so decisively. He and the other "panzer-group" commanders were halted in their stride, when there was little to stop them. This top-level check was imposed on grounds of caution, coupled with an orthodox preference for completing the "classical" battle of encirclement. As so often in history, a predominant concern for security brought insecurity that might well have been avoided by audacity. In reflection, many more of the more orthodox German generals came to recognize that the German Army had forfeited its best chance of decisive victory by the veto on Guderian's scheme of driving deep through to Moscow before the defence could rally.

Ironically, the British Army copied the errors of the German in the belief that it was applying the secrets of the latter's success. It would have done better to carry on the logical development of the organized British conception that the Germans had adopted.

Organization Pains

At the outbreak of the war, the British armoured division had comprised six tank units and one motorized infantry battalion—which was too small a foot-fighting element. By the autumn of 1940 this had been increased to three battalions, with six of tanks—a better proportion, though the value of the infantry element was diminished because it was mounted in unarmoured wheeled vehicles. But later the British Army swung too far the other way, under a mistaken imitative impulse. For in 1942, following the Germans' supposed lead, it changed to an organization for the

*Since Guderian described himself as my "disciple" in the field of tank warfare it may be of some historical interest to mention that the *concept* of this deep strategic penetration by armoured forces developed in my mind initially from the study of the long-sustained drives carried out by Genghis Khan's all-mobile forces in the Mongol campaigns of the 13th century, while its application against modern mass armies dependent upon railways for supply was made clear in an analysis of Sherman's "marches" and Forrest's dislocating "raids" in the 1864-5 campaigns of the American Civil War. The conclusions were strengthened in a study of the effects that could have been produced by such forces in 1914 if they had then existed. As for the *method*, this was simply a strategic adaptation for armoured forces of the tactical "expanding torrent" attack which I had worked out earlier, at the end of the 1914-18 war.

armoured division similar to that which the Germans had adopted—to their cost—in 1941: reducing the tank units to three while increasing the infantry units to four. This served to ensure that the British armoured divisions would suffer a diminished effectiveness of punch similar to the Germans'. And as the infantry element was not mounted in tracked and armour-protected vehicles, capable of keeping up with the tanks on difficult ground and under fire, the power of the "follow-through" was also handicapped.

Faulty Concepts

The faults of this composition were accentuated by faulty tactics and a mistaken aim, dictated by leaders who had grown up in the old style of warfare. The latter faults had already been manifested in the 1941 campaign in North Africa—then Britain's only field of military action. After the frustration there suffered, criticism concentrated on the deficiency of the British tanks in gunpower compared with the German. While the criticism was justified, it was too narrow. For it tended to ignore the way that the consequences of a deficiency in gunpower had been magnified by a tactical policy of directing the British tanks to seek out and destroy the enemy's tanks—rather than taking his unarmoured troops or exposed communications as their targets. This tactical policy, on traditional lines, played into the hands of Rommel, who, using his 88mm. guns in skilful combination with his tanks, laid traps for the attacking tanks on the lines I had advocated in pre-war years when urging the development of a new technique of defence. Rommel thereby cancelled out the numerical superiority of the British in tanks, and was able to deliver startling ripostes that turned their advances into retreats. (His repeated success with these defensive-offensive trapping tactics, even in the open desert, demonstrated how the Franco-British forces might have countered the German drive in 1940, and averted the disaster that overtook them.)

Even in 1941 the British had a superiority of force in North Africa sufficient to take the offensive with good prospects of success. But by concentrating primarily on the destruction of the enemy's tanks they not only made the worst of the main defect in their tanks but missed their offensive opportunity. The same mistake was repeated later. It was a legacy from old doctrine—a doctrine of "pitched battle" which hindered soldiers from realizing that the new mobility offered the means of fulfilling the true ideal of strategy: that of deciding the issue without a serious fight. The mistake was also a legacy from the habits of peacetime exercises wherein commanders of the old school had often begun by trying to cancel out one another's tanks so that they could proceed to conduct their battle on the lines with which they were familiar. Criticizing such a habit, one had pointed out long before the war that "to throw away such a potent piece as a tank force in fighting the enemy tank force is as foolish as for a chessplayer to begin by swopping queens."

When the policy was followed on the battlefields of North Africa in 1941 and 1942, the results shook the troops' confidence in their leaders and tactics—the phrase "doing a Rommel" became a common way among them of describing a good performance of any kind. The tactical faults magnified the technical disadvantages of British tank design. A change of policy came late in 1942, when Montgomery took over command. As he wrote: "It had been generally accepted that the plan in a modern battle should aim first at destroying the enemy's armour . . . I decided to reverse this concept and to destroy first the unarmoured formations." This proved fruitful, but its significance was partly obscured by the way that his offensive at El Alamein was confined to frontal attack by lack of an open flank.

> "The British would have been able to prevent the greatest part of their defeats if they had paid more attention to the modern theories expounded by Liddell Hart." (1942)
>
> —Field Marshal Rommel

Complaint of British tanks diminished with the advent of new tanks in 1942, particularly the American-designed "Sherman," but was followed in 1943 by a renewed depreciation of the tank arm and its place in warfare. This trend of opinion had developed, curiously, after Montgomery's victory at El Alamein. The fact that the infantry divisions were there employed to break into the enemy's position, and open the way for the armoured divisions, was seized on as a text to "boost" the infantry, and as a pretext to disparage the tanks. The heavy losses which the tanks suffered in slogging tactics following the frontal penetration, and the subsequent failure of the armoured divisions to cut off the remnants of Rommel's army, provided additional arguments for the disparagers of armoured mobility.

During the months that followed, many military voices were again heard crying that the heyday of the tank was past, and that it had declined from a primary to a secondary instrument of warfare. Few paused to consider the question whether the armoured forces had been used to the best advantage. Rommel's own diary comment on his good luck in escaping is more to the point: "As always the British High Command showed its customary caution and little forceful decision. For instance, they attacked again and again with separate bodies of tanks and did not, as might be expected, throw into the battle the 900 tanks which they could, without risk to themselves, have employed in the northern part of the front, thereby using their vast superiority to gain a rapid decision with the minimum casualties."

The Anti-tank Chorus

The "anti-tank" chorus was momentarily silenced by the dramatic collapse of German-Italian resistance in Tunisia following the break-through of the 6th and 7th Armoured Divisions, and the decisive stroke of the former in cutting through the neck of the Cape Bon peninsula, thus cutting off the enemy's last bolt-hole. In that drive, riflemen were carried on the top of the tanks, so that they could come into action quickly in clearing obstacles. It was an improvisation that saved much time in bringing up lorried infantry, who would have had to dismount several miles back—but it was a reflection on the continued omission to provide armoured cross-country vehicles for the infantry element in an armoured division—a need one had urged for twenty years.

The slow, slogging advance through

mountainous Sicily and the funnel-like length of Italy revived the chorus. Missed opportunities when the going was favourable forfeited repeated chances of quicker progress, but were not taken into account when the chance came to decry the future of armoured mobility. Moreover, too many believers in it lost faith by the time that the invasion of Normandy was launched. Churchill himself underwent one of his periodical reactions, and in February declared: "We have too much armour—tanks are finished." His doubts were deepened by his military advisers.

The Slow Motion Complex

On a tour of the American forces in England early in 1944, one of the few ardent believers in armoured mobility I met was General Wood, commanding the 4th Armoured Division. But I found him very disturbed—after a high-level conference which had been addressed by Field-Marshal Sir Alan Brooke, Chief of the Imperial General Staff. A keynote of it had been that warfare was "back to 1918," and that lightning drives of the 1940 kind were no longer possible. Wood felt that the American High Command had been infected by this slow-motion view. While pinning his hopes to Patton, who had just arrived in England to take command of the U.S. Third Army, Wood feared that even he might be led to swallow the majority conclusion.

At his urgent desire I went to see Patton. While the latter's obvious dynamism was most refreshing, I was rather disconcerted to find him saying that when the Allied armies invaded France they would not be able to repeat armoured drives like that of 1940, but would have "to go back to 1918 methods." While questioning this, I felt it best to put the contrary arguments in the form of an "indirect approach." He had told me that before the war he had spent a long vacation studying Sherman's campaigns on the ground in Georgia and the Carolinas, with the aid of my book. So I talked of the possibilities of applying "Sherman methods" in modern warfare—moving stripped of impedimenta to quicken the pace, cutting loose from communications if necessary, and swerving past opposition, instead of getting hung up in trying to overcome it by direct attack. It seemed to me that by the development and exploitation of such Sherman methods, on a greater scale, it would be possible to reach the enemy's rear and unhinge his position—as the Germans had already done in 1940.

This argument seemed to appeal to him—it fitted in with his own mobile instincts better than did the arguments in higher quarters to which he had momentarily acceded. At any rate, when I visited him again in June, just before his army went over to Normandy, he no longer talked about 1918 methods, but on bolder lines. After the break-out from the bridgehead, his army drove from Normandy to the German frontier in super-Sherman style. Wood, with the 4th Armoured Division, was the spearhead of that drive; on reaching the Seine he wrote to tell me how successfully such methods had worked. But soon after that the momentum of the drive was checked—partly through excess of top-level planning and partly from deficiency of supply due to lack of preparation that was due, in turn, to lack of vision beforehand. Later, Wood wrote: "I feel that we could have done the job more quickly if our High Command had possessed an equal appreciation of the indirect approach." Referring to the Avranches break-through, he remarked: "There was no conception of far-reaching directions for armour in the minds of our people . . . nor of supplying such thrusts."

> "Liddell Hart—the creator of modern tank strategy."
>
> **—General von Manteuffel**
>
> (Panzer Army commander who achieved the Ardennes break-through in 1944).

Here we may fittingly conclude the survey of the past that has been made to obtain a projection into the future. What it conveys is that armoured forces have not "had their day"—because, in the real sense, *they have not yet been tried.*

That may seem strange in view of the way that a handful of German panzer divisions overran Poland, France and much of Russia. But the German panzer divisions were not *armoured* forces. Nor were the so-called "armoured divisions" which the Allies used later in the war. The "armour" in an "armoured division" was a small pebble in a large sling. As the war went on the pebble became smaller, but not the sling. While the pebble comprised barely 200 tanks, the sling consisted of about 15,000 men and over 3,000 vehicles other than tanks. The tank regiments accounted for barely one sixth of the total manpower employed in the division. Since the war, the number of tank units has been increased from three to four, both in the British and in the United States Army, bringing the number of tanks up to 280 in the British armoured division and 300 in the American. That increase shows some recognition of a basic lesson of the war. But the sling remains as large as ever.

What is called the "armoured division" today may well be considered a much better striking weapon than the old-style infantry division—but it is not in any true sense of the word an *armoured* division. That name confuses the issue, and fosters a delusion. It would have been as reasonable, in the Middle Ages, to describe as an "armoured knight" one who had jumped out of bed in his nightshirt and merely pulled a gauntlet on his swordhand.

The disadvantage is all the greater because the so-called "armoured division" has its legs shackled. Some nine-tenths of its vehicles still consist of wheeled transport, more or less road-bound. That has been a growing handicap as the scope of air attack increased, and is likely to become worse. There has also been a multiplication of obstruction from the mining of roads. We have to reckon with the probability that any defence will be based on turning all the road-centres into formidable centres of resistance, so that any possibility of rapid and deep advance depends on our mobile forces being able to by-pass these "hedgehogs." If they have to pause while each of these obstacles is overcome in turn, they will hardly get anywhere before the enemy has assembled his reserves.

The small striking head of an armoured division can leave the road and dart round an obstacle, but the wheel-borne tail cannot. And what an immensely long tail it is! If the division is confined to a single road this means that, at the customary spacing, it would stretch out some 200 miles.

To put it more vividly, if the division was operating on the Continent, the tail would still be near Paris when the head was approaching Antwerp. Where an army is advancing, it is often impossible to allot more than one road to a division—especially in many parts of the Continent where roads are not numerous. Thus a division which is mainly wheel-borne finds its manœuvring power as restricted as that of a snake wriggling down a drainpipe.

Its present composition also has the effect of limiting the combined striking power of the army. All experience has shown—as theory pointed out long ago—that the best chance of delivering a decisive blow lies in the sudden concentration of a mass of tanks at a weak spot, so that the defence is assailed simultaneously by too many for his anti-tank guns to cope with. That is the method of the *Schwerpunkt*, which the German panzer divisions so effectively exploited in 1940. But they were lucky to find opponents who were very weak in anti-tank guns and had not grasped modern methods of defence.

Heavier Punch Needed

Now the problem is much harder —as later war-experience on all sides showed. The punch must be much heavier if it is to succeed. But with the so-called armoured divisions of the present type it is almost impossible for the concentration to be either massive enough or sudden enough. Each division forms such a bulky coil that even when it is coiled up close there is not room to concentrate many tank-fangs in one sector. Nor can they be concentrated quickly.

If we are to develop adequate striking power we must construct our "mechanical snake" on a clearly thought-out design—reducing the length of the tail and increasing the strength of the head. If we are to give it the power of penetrating deep we must so design it that the tail does not get stuck in a road rut.

Up to now the composition of an armoured division has been based on ideas that were more like a cookery recipe than a scientific design—"take a handful of tanks, mix with a pound of infantry, pour in a pint of artillery, and add a dash of armoured cars." We have even provided several different kinds of artillery unit—as if we were drawing up the menu at a luxury hotel—instead of trying to design one that would be adaptable to dealing with hostile infantry, tanks, or aircraft. We add something to protect an element that is only auxiliary, and are then led on to add something else to protect the protector—at each step multiplying transport, numbers, supply needs, and hence transport again.

Armor-Air Partnership

Nearly thirty years ago I wrote a treatise on future mechanized warfare and the "Development of a New Model Army," which suggested how this might be achieved in two phases —the first "evolutionary," and the second "revolutionary." In the first phase, the new model divisions would be a blend of tanks with motorized infantry and artillery. In the second, the tank would swallow the older arms, and become the ground-partner of the aeroplane. The mobile divisions would become all-armoured, with the artillery on self-propelled armoured mountings and a smaller number of more skilled infantry carried as "tank-marines" in armoured vehicles. The treatise aroused much interest and discussion abroad, particularly in the German Army, which was then in the melting pot after defeat in World War I. Guderian and others have borne witness to its influence. But there is more significance in what was left undone than in what was done.

For it can be seen that even the Germans never went further than the first phase of that design. That sufficed for the defeat of France. It did not suffice for the defeat of Russia. And as the war went on, "armoured" forces of the existing type became increasingly checked by forces of similar mobility, while finding fewer opportunities of making rings round unprotected foot-marching forces which they could immobilize. That was natural and far less remarkable than the fact that the "evolutionary" phase of the new model had been sufficient to revolutionize warfare to the extent it did in the earlier period of the war. Yet the Anglo-American armies of the later period, when the tide turned, made no serious effort to develop a newer model—despite much superior industrial resources. They were content to batter their way to victory, by sheer weight, along the old-new lines.

There we remain. Armies and their armoured forces have got into the rut of a fresh orthodoxy. Except for improvements in detail, they are simply carrying on an operational convention that developed from a tentative and partial reorganization which, at the outset of World War II, happened to have a much more striking effect than could reasonably be expected. Armies must get out of this rut if they are to have any important influence in the future—otherwise they are likely to be both paralyzed and supplanted by airpower.

In order to give "armour" a fair chance we have to solve two problems —the break-through and the follow-through. The first is intrinsically the harder. The difficulties of the second are largely due to faulty organization under the influence of conventional thinking.

The Saturation Principle

There are various possible ways still open to us for renewing the break-through power of tanks. Apart from new technical means of paralyzing anti-tank defence which it is undesirable to discuss publicly, we have by no means exhausted the tactical means. Since armoured forces were first introduced into war their more convinced exponents have always insisted that their value essentially depended on their being employed "in swarms—to swamp the defence." It is the principle of saturation—of confronting the defence with many more separate assailants than he can cope with. That principle was fulfilled in the German break-through at Sedan in 1940, where Guderian's corps of 900 tanks concentrated on a frontage of less than five miles in smashing through the successive French positions behind the Meuse. After a penetration of 15 miles in two days against considerable resistance, it was through into open country and the advance became a gallop. Similar saturation tactics were applied on the Aisne in the second break-through, where the follow-through produced the general collapse of the French armies. But the principle was rarely fulfilled in tank attacks later in the war—although its value was freshly attested in air attacks, beginning with the "thousand-bomber raids." The principle should be revived in designing future ar-

moured forces if they are to have any chance of carrying out strokes of the Guderian type, either in the offensive or in the counter-offensive.

The possibility depends partly on the development of tank design and partly on the organizational design of armoured forces. It would be wise to recognize that the present trend of mechanical design towards bigger tanks, and thus fewer of them, is unfavourable to the fulfilment of the principle. We might gain much by a fresh effort to develop a lighter and cheaper type of tank, provided that the importance of obstacle-crossing capacity is kept in mind. That requires length of chassis, but not necessarily bulk or weight in proportion. Such tanks might mount rockets rather than a large-calibre gun—the Germans were going to concentrate on the production of rocket-tanks weighing under 20 tons if the war had continued.

Manoeuvrability Counts

Superior hitting power counts for much in the design of a tank, and even for self-protection is relatively of more value than thick armour; but the power of a body of tanks shrinks rapidly through casualties (battle or breakdown), and the smaller the number of tanks the more severe relatively the shrinkage becomes. Moreover, a superior gun can to a surprising extent be discounted by superior manœuvrability, especially in a fight between tank formations. A most striking example was the defeat of the Russian drive for the Ploesti oilfields in May, 1944, when the Stalin tanks made their first appearance in battle and gave the Germans an initial shock by opening fire at over 3,000 yards range with their 122mm. guns. Yet, when this battle of Targul Frumos ended, Manteuffel's division of 160 tanks (of which only 40 were Tigers, with as much as an 88mm. gun) had destroyed 350 of the attacker's tanks while losing only ten of its own. Even the small Panzer IVs managed to knock out a number of the opposing "Goliaths," by manœuvring swiftly under cover of ground to reach their rear, and closing the range—to 1,000 yards.

Although it was the German Army which took the lead in mounting powerful guns in tanks, its most experienced tank leaders emphasize, in the light of their war experience as a whole, that manœuvrability is even more important—for quickness in changing fire-positions and shortening the range, for more effective fire. Speed is an essential element in manœuvrability, but only one element. Cross-country mobility matters more than speed on the road; it might be defined as "loco-mobility," or agility. It depends not only on the performance of the tank itself, but on the tactical ground-sense of the crew and the wider tactical skill of tank unit commanders. When those who have tanks of superior speed and agility dwell on their inferiority in gunpower, the tendency recalls the proverb: "it is the poor workman who blames his tools." The complaint may be justified only where the weapon-inferiority is extreme or the terrain very unsuitable for manœuvre.

A superiority in gunpower, though desirable, can be purchased at too heavy a price where it results in a loss of manœuvrability *and* a reduced number of tanks. Both these handicaps are difficult to avoid with the growing size of tanks—which, in turn, is apt to be favoured by those who find it easier to follow a sedentary style of warfare. The very name of the post-war British "Centurion" tank is reminiscent of the pedestrian and over-laden Roman legionary rather than of the reborn Mongol cavalry idea that gave rise to the lightning style of operations ten years ago. It is time for a reversal of the elephantine trend in tank design, and a move towards the revival of tank-torrent tactics. The development of a new form of motive power for tanks, as well as a new and lighter form of hard-hitting weapon, would increase the prospects.

Tank of the Future

The tank of the future will have to be fitted with night-driving vision and probably with radar, as well as with wireless. It should be able to pass safely through a radioactive belt of country. If we try to combine all these requirements with a powerful weapon *and* provide over-all armoured protection of adequate thickness, the tank is bound to become an increasingly clumsy monster. The design must be simplified, to produce a mechanical David instead of a Goliath. That may be achieved by external mounting of the main armament—a rocket-launcher or recoilless type of gun—which should be sighted, fired and fed with ammunition mechanically. The armoured body could then be quite small—a cabin to house the directing apparatus with a crew of no more than three. A new kind of power unit would also help to diminish excessive bulk in the chassis.

Another possibility is the development of remote-control tanks for the spearhead. With crewless tanks there would be no spreading deterrent effect from heavy losses in swarm attacks. It would not matter that a high proportion were knocked out if an effective fraction penetrated the whole depth of the defence—then, the exploitation of the break-through could get going, and might better be carried out by manned tanks, for finer manœuvring, until another barrier-position was reached.

Amphibious Tank

When such barriers are based on a river, mobile infantry are needed to achieve the crossing. But the scale of foot-fighters actually required is apt to be overestimated, and can often be reduced when and where skilful manœuvring creates a favourable opening. That was demonstrated in Guderian's forcing of the Meuse at Sedan, where two mobile infantry regiments sufficed to gain a crossing adequate for the passage of the whole panzer corps—although most of the higher commanders had argued that it would have to wait until the backing-up infantry divisions arrived. But the need could be further diminished by the development of new forms of tank-bridging and tank flotation. A vital difference could be made by the advent of a non-specialized amphibious tank, capable of swimming rivers without sacrifice of its general tactical value; and this problem calls for a fresh effort in research.

It can thus be seen that, in the sphere of tank design, there are many possibilities still undeveloped by which the powers of a tank break-through may be renewed. Beyond these are the latest potentialities in the sphere of organization. As pointed out earlier, the chances of swamping opposition are much handicapped because the excessive size of present "armoured" divisions hampers a quick and ample convergence of real ar-

moured striking power at the point of aim. It is difficult to concentrate the tank components of several such divisions on a narrow sector, and produce sufficient intensity of punch at short notice. To make it more possible, it is essential to cut down the other components in the division, thus raising the tank ratio.

As Manteuffel put it—in referring to Hitler's fatal decision on the further dilution of the German armoured divisions prior to the invasion of Russia—"The armoured division thus lost the impetus and penetrative force of its tank core, whereas everything should have been done to strengthen it. The pace of an armoured division's attack and much else depended now on the *infantry*—which was wrong. . . . An *armoured* division can only be strengthened by reinforcing the *tank core* . . . for it is that which invests it with the impetus necessary for attack." "On the basis of my long experience in practical service with troops in the war I fully agree with your opinion that the tank core *can never have too many tanks,* and that this is possible without rendering the 'tail' too heavy or unwieldy. I would warn everyone of the fatal disproportion between the number of vehicles in the combat echelons and the supply vehicles."

Fighting Mounted the Thing!

The "armoured division" has become more of a misnomer since the title was adopted in 1938 in place of "mobile division." Indeed, it is only a mobile division in the strategic sense, not in the tactical sense. The essential tactical idea of such a division is that of *fighting mounted*—to retain its impetus—as the cavalry did in the days when they played the decisive role on the battlefield. While the inclusion of men who can fight on foot is a tactical necessity—for dislodging enemy troops under cover behind obstacles, and for various defensive duties—it is a fundamental mistake of organization if the proportion of such "mounted infantry," dismounting to fight, exceeds or even equals the proportion that fights mounted, manning tanks and self-propelled guns (on tank chassis). "Armoured fighting men" should be preponderant in an "armoured division" if this is to justify its name and fulfil its proper purpose.

At the same time the foot-fighting element ought to be entirely carried in tracked vehicles, armour-protected, so that they have a cross-country mobility and manœuvrability equal to the armoured fighting units. That is essential in order that they can back up the tanks closely and come into action immediately they are required, to clear defended obstacles in the path of the tanks. Moreover, the quicker they can intervene, the fewer of them will be required—that is a matter of common experience in warfare. A company of such true "tank-marines" could often brush away opposition that a whole lorried battalion or more could not overcome an hour later, when the defending infantry have been reinforced by local reserves. The time-factor rules warfare.

A further reduction in the size of the foot-fighting element in the division might be obtained by the use of airborne troops, especially if the means of using these is improved and developed. In discussing the Ardennes offensive of December, 1944, Manteuffel emphatically agreed with what I had written at the time about the way that airborne troops could have been used to seize the awkward defiles in the Ardennes ahead of the tank advance. He considered that they might have made a decisive difference to the prospects of an early break-through and "unlocked the door." In his reflections on the lessons of the war he has advocated that airborne troops should form part of all large armoured formations.

This brings us to the problem of the follow-through—which is, by comparison, simpler than the problem of the break-through. The basic conditions of a solution were epitomized in the definition of *blitzkrieg* set forth earlier in the chapter. *Pace with variability is the secret of mobility, and sustained momentum, in the follow-through.* But much depends on the development of technical means and the elimination of superfluities.

In the Sherman Spirit

Armoured forces must move light, be able to operate self-contained, and develop more capacity to cut loose from communications—in the Sherman spirit—if they are to attain the degree of offensive mobility required for a decisive follow-through. The Germans went a good way towards this strategic ideal in 1940, but were greatly helped by the fact that the Allied armies were easily paralyzed as well as too rigidly rail-bound. It is no longer possible, for us at any rate, to count in future upon having opponents so susceptible to paralysis. And if we cannot cripple them in this way we shall run the risk of breaking our arms in striking—unless we can kick off our clogs and slip round their guard. Air transport offers one means towards greater freedom of movement and manœuvre. Cross-country transport offers another. The drastic reduction of impedimenta is a third. All these potentialities should be more fully explored and exploited.

The "armoured division" today is too much like an inverted turtle—with a small armour-clad head popping out of a huge soft-skinned body. This is so unwieldy and such an inviting target for air attack that its mobility is too easily turned into immobilized vulnerability. The unarmoured elements should be cut down to a minimum. So should the road vehicles. The maximum possible proportion of the infantry should be airborne. What is moved on the ground should be track-borne rather than wheel-borne. Supply *to* such mobile forces should be as far as possible by air transport rather than by land transport.

DON'T JUMP TO TANKS

by LIEUTENANT COLONEL WILLIAM R. KINTNER

DURING the first critical summer days of the Korean war, marked by the long retreat back to the Pusan bridgehead, the Soviet-made T34 tanks used by the North Koreans were a formidable menace. The impressive gains made by the North Korean tanks inspired considerable criticism of our Army's armor. Now that this particular "tank crisis" has passed we are in danger of not weighing these enemy successes with balanced judgment and concluding that this country's security requires tanks—tanks out of all proportion to their value to us. We like a simple answer to our military problems, and we know that American industry can turn out a lot of tanks. But let's not jump to simple conclusions or too many tanks. The first waves of Red tanks which rumbled across the 38th parallel had a heyday. None of armor's archenemies was available to the defense at the time these Red tanks chalked up their big gains. But once these enemies made their appearance, the invading tanks lost their effectiveness on the battlefield and their space in American headlines. The natural enemies of the tank form an air-ground weapons system comprising the land mine, the bazooka (with the shaped-charge warhead), artillery, the rocket-firing aircraft, and engineer units equipped to neutralize or destroy paths suitable for tank travel. This system developed with surprising speed in Korea and once it became effective, the T34 lost most of its potency.

Exploiting surprise, the North Korean Reds routed the poorly armed Republic of Korea forces. The chaos and disorganization of retreat left no time to sow minefields, demolish bridges or devise tank traps. U.S. units hastily thrown into action were not fully prepared to withstand the armored attack. There were obvious deficiencies in training and equipment.

None of the elements of an effective antitank weapons system was initially present and the rolling hills of central Korea became tank highways rather than tank traps.

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In the resentment against our repeated losses, the significance of our tankless forces in the field struck the American people and a hue and cry arose for tanks and more tanks. Many of the Army's armor advocates led the swing with the axiomatic statement that the best antitank weapon is a tank. Even if the matter were limited to the issue of stopping a single tank, this appears highly questionable. The outcome of a tank duel would to a large degree depend on who fired first. It could depend on the tactical situation as well. A tank on the defense, in a dug-in position, for example, has an advantage over an attacking tank that must silhouette itself against the skyline as it seeks out its opponent. This same advantage accrues to the more mobile and less expensive bazooka, utilizing cover and concealment to balance its lack of armor.

We are less concerned, however, with the variety of means available to stop a single enemy tank than with the place of armor in the American military machine. How much of our defense appropriations should be earmarked for armor in view of our strategic commitments abroad? What is the future of armor in the years immediately ahead?

Are tanks the new cure-all for American security that they might have first appeared as we looked over our shoulder at Korea? Before reaching a conclusion, let us briefly examine tank warfare in World War II and then analyze our strategic position in the present unstable world of today.

In France, General Patton's tanks wrote some glorious pages in the history of mobile warfare. Their magnificent dashes electrified the whole world, but these end-runs did not take place until after the German front had been shattered. In July 1944, Patton's sweeps began when enemy aircraft had been almost entirely driven from the skies and enemy artillery, thinly spread over two massive fronts, was constantly under attack by our Thunderbolt fighters. The breakthrough opened rout conditions which permitted no time for German mining or demolitions. Further, the terrain of northern France was tank country; in fact, it was the birthplace of the tank.

The spinning wheel of war succes-

sively brings varying combinations of fire power, armor and mobility to ascendancy. In the brief history of the tank, which has followed this cyclic pattern, Patton's epic brought the tank to the top of the wheel.

Earlier in World War II, German tanks had previously been highly effective against the Allies in France and the Low Countries. But the lessons of the German penetration of the hinge of the Maginot Line was eventually digested by the world. Guderian's blitz was concocted of a balanced combination of tanks and aircraft ideally designed to exploit the transient technical advantage then possessed by armor over fire power.

Against the Soviets, on the other hand, the German armor did not fare as well, especially after the force of the opening aggressive thrusts had been exhausted. It is true, of course, that the panzer divisions made important advances before the Soviets developed matériel and antitank tactics to cope with them. Eventually the Soviets deployed their armies in depth on a massive scale forming the land-island defense system, each island strongpoint almost an army in itself and self-contained. As the Soviet defenses and armor improved, the power of the panzer divisions declined. German armor was able to thrash around in the never-never land between these islands, but was subject to repeated losses all out of proportion to the damage inflicted on the Red forces.

Tanks in the desert played a crucial role. Yet estimates of their value changed almost as rapidly as shifts in the desert war's fortunes between the Afrika Korps and the Allies.

"Tanks Are Finished"

As a general rule tanks used in the jungle and in mountainous terrain were a relatively unsuccessful and unimportant factor. In fact, Churchill summed up their poor showing in Italy with the flat assertion, "Tanks are finished." This verdict seemed borne out in the subsequent Normandy battle by the failure of British armor to make ground at Caen. Then came the breakthrough and Patton's dash across France. Armor had made good. The misfortunes suffered during the ensuing winter might have erased this opinion had not the final campaign in Germany been so brilliantly sparked by U.S. armored divisions.

Three facts stand out in assaying the triumphs of U.S. tanks in World War II. They generally were superior in mobility and control but inferior to German tanks in armor plate and guns. Secondly, our tank gains were always made under the protecting umbrella of decisive superiority in tactical air, which often overwhelmed enemy tank defenses. Finally, opposing infantrymen did not possess bazookas or weapons firing shaped-charge shells. Nor were those weapons featured in the defense of France in 1940 or in the seesaw tank battles of the desert. The role they might have played in these battles and against us in our victorious march across France and into Germany cannot be assessed.

Stopping the Tide

Against this survey, let us measure America's requirements for tanks at the present. We're not a nation dedicated to making aggression, but a country dedicated to a world-wide defense against it. We are not planning a surprise attack of hostile lines through which to release hordes of rampaging tanks. If total war replaces limited war, what we will need on land is a means of stopping the tide, the huge Red tide of armor and infantry which may move against us. We must hold this tide from engulfing many peoples all over the world who are not only our friends but our essential allies, all of them needed if we are to win the great struggle. This calls for weapons which can meet the requirements of an initial defense against the vast infantry-tank forces of the enemy. Thousands of relatively inexpensive and highly mobile weapons will be needed to meet this vast world-wide demand. Whatever their individual design, they must collectively comprise an effective antitank weapons system.

Let us look at how such a weapons system might operate. Larger bazookas using the latest ammunition—rockets with shaped charges—are lethal at short ranges. In the hands of experienced soldiers with the ability and daring to close the range, these bazookas will make it unprofitable for tanks to forage alone where they cannot be protected by cross-fire of their brother tanks, or through overgrown country where the bazooka can lurk behind trees, hedgerows or hillocks.

When massed in open country to protect themselves from the depredations of the bazooka, enemy tanks will fall prey to flexible artillery concentrations and flights of heavily armored, rocket-firing aircraft. If the battle terrain makes them road-bound, they will be stopped by demolitions, mines, and tank traps.

Will this combination of weapons hold armor at bay? It looked for a time as though the T34 type tanks of the North Koreans were impervious to the bazooka, but the 3.5-inch model quickly exploded this fallacy. The dramatic rush of these weapons to the field only emphasizes the fact that we cannot be lax in forging more effective weapons for the system needed to keep armor chained.

The shaped-charge shell is a nightmare to the world's designers of armor. It can be delivered not only by bazooka, but by artillery and rocket-firing aircraft as well. This effective refinement in the design of the projectile concentrates the force of the explosion in the desired direction, rather than having it expended in all directions equally. It represents a threat to armor which can only be met by much heavier armor plate than any now employed. While the effect of even this projectile can be lessened by inclining the surface of the armor to effect a glancing impact, such inclined surfaces cannot be presented to all projectiles fired frontally, from a flank or from the air. Improved resistance to the penetration of these projectiles might be made by expensive processes which harden the steel surfaces, but at this stage of technical development, the race between explosives and armor seems one-sided. The methods of delivering the explosive forces that man has created have already far surpassed the protection that can easily be afforded by armor plate.

The Foreseeable Future

From this we must conclude that in the foreseeable future, tanks will either be extremely heavy, expensive, road-bound, and slow or not really tanks at all but virtually personnel- and weapons-carriers, providing protection only against small-arms fire.

Fortunately, the weapons system we have briefly described fits the global requirements imposed by a strategy of initial defense. Land mines and demolition equipment are relatively inex-

pensive and simple to emplace. They are easily transported overseas and can be stockpiled near where they are likely to be used. In contrast to the tank, weapons such as these, if captured by an enemy overrunning our position, could not be transformed into a two-edged sword and used effectively against us while we are on the defensive. The more expensive items in this system such as self-propelled artillery are highly mobile and can be kept in reserve to meet major threats as they develop. Because of their high mobility, unarmored artillery pieces are less susceptible to capture. These are the type of ground defensive weapons that we need now and should concentrate on obtaining in quantities.

Tactical Air

The nature of America's armor program must be considered in conjunction with our over-all requirements in tactical air. If we are ever to meet the massed manpower of the Communist empire on anything approaching an equal basis we will need to develop tactical air power far in excess of that available to our forces in Korea. For the initial defensive phase of any future conflict the Army's weapons must be designed to contain the enemy's armor tide on the ground while tactical air delivers the Sunday punch from the sky.

Command of the air is still an essential prerequisite of victory for our forces. (It should be obvious by now that the ratio of our divisions to those of the enemy must also be greatly improved.) Without a guaranteed command of the air, our entire military position will crumble. Yet we cannot simultaneously support a large tank program and a vast tactical air development program. At this critical moment, we should accelerate the production of rocket-armed aircraft capable both of fighting for mastery of the skies and of blasting enemy tank columns before they reach the line of contact. Assigning a relatively low priority to armor is the other side of the tactical air coin.

The expensive tank (in terms of labor and matériel) must wait until our operations are more nearly ready to use them. Then they can be of the latest style, less vulnerable to the weapons that are lying in wait for them, and specifically designed for the locale where they are to be used.

We do, of course, need tanks today for infantry divisions and armored units already in existence or proposed for early mobilization. These units are designed to use tanks which give them the balanced power needed for tactical flexibility in the defense. But the vast numbers of tanks we may find necessary for a great land offensive should not be bought today. Ample time to manufacture these does not exist. Time can be found for the protracted build-up (a necessary prerequisite to the launching of such an offensive) only if we find means to stabilize the initial defensive line. To build vast numbers of tanks now would be to deny our allies the defensive weapons they so sorely need, and to perpetuate our present critical shortages of tactical aircraft and artillery and bazookas.

American industry has the capability of turning out a lot of armor, but the manufacture of a large number of tanks, particularly with industry not geared for full-scale war production, would deprive us of more urgently needed munitions. For every unnecessary tank and its crew we should substitute a rocket-firing aircraft and pilot.

To match the 40,000-odd tanks marshalled by Communists would require hundreds of thousands of men to man them and more to support their effort. Even if we tried to make the tanks and recruit the tankers we would not be able to use them without putting a lot more coal on the fire. Tanks are not flown across oceans as are tactical aircraft; they are not loaded as easily as artillery and bazookas. They have to be deck-loaded on most vessels, which can carry only a few. Their large-scale employment would step up our bridging requirements. It would require a great effort to place them where they could be used. They would also necessitate a very sizable effort to resupply them for they expend great quantities of POL and ammunition.

Cut Away His Strength

In a possible war, we will be competing with an enemy who is fighting on interior lines of communication, using relatively short land hauls for resupply instead of transporting it across oceans. A large-scale armored program would result in our playing the enemy's game with the cards stacked against us. It would be an endeavor of containing him tank for tank rather than skillfully cutting away his strength.

The tank may be an ideal tool for an aggressor. With tanks the aggressor can come thundering into battle against weak forces with no warning when and where he chooses. He will employ them in that way, unless he is opposed by an antitank weapons system capable of blocking this type of power play.

Because the tank is primarily a weapon of the offense, and its use on the defense is greatly limited and extremely expensive in comparison with other weapons, tanks do not represent the same dividends for American priority-conscious defense dollars.

Tomorrow's War

But even in recognizing its value on the offense, let us also realize that the speed of offensive warfare is ever increasing and threatens to leave the tank, as we know it today, far behind in rapid attacks of the future. Airborne troops permitting the strategic encirclement and by-passing of strongpoints, may mean more than tanks in tomorrow's war. The tank and antitank requirements of airborne forces approximate those of Western armies today. Airlift to haul heavy tanks into the landing area does not exist; yet enemy tanks represent the greatest single hazard to an airborne operation. The period between the initial drop and the establishing of a solid perimeter defense is the most crucial phase of the airborne battle. This initial defense, like the initial strategic defense of the free world, must be compounded from a successful combination of rocket-armed fighters in the sky and lightly but powerfully armed soldiers on the ground. Hence, successful airborne operations may emerge from the same combination of weapons now required to safeguard the free world from Communist armor.

To summarize: A major tank development program at this time would conflict with the more essential tactical air program; would impose added burdens on overladen logistical supply lines; could not overcome the immense Soviet armor lead; would interfere with the rapid arming of our allies and run counter to the current armor-vs-fire power trend.

So let's take another look before we jump to tanks.

SOMETHING TO STOP A TANK

by COMMODORE DUDLEY W. KNOX

CURRENT experience in Korea confirms a primary lesson of World War II. Infantry must have good tank support if it is to cope with tank-led troops. According to well qualified American and British experts, the support of artillery and air is not enough, and the best, if not the only satisfactory antitank weapon is another tank.

What then is to happen if the dreaded World War III materializes? The Russians are reputed to have upwards of 100,000 tanks already existing, and to be building 1,000 per month. This may be 10 times the corresponding figures for the democracies. Can we ever catch up with the Russians and have enough of our own tanks with which to beat theirs? Obviously, not for a good many years and at enormous cost. Meanwhile does it not seem imperative that we bend serious efforts towards developing something else besides tanks with which to stop tanks?

Prior to America's entry into the last war, German tanks ran rampant through Poland, Belgium, and France, revolutionizing the pattern of land warfare. They were the decisive element in spectacular victories giving Germany complete control of Western Europe. At this stage, the present writer advanced the theory to his valued friend, Maj. Hoffman Nickerson, that, properly used, the gun was the answer to the tank; that shore artillery was not accurate against fast moving targets, because of unsuitable methods of fire control; that the naval system of fire control should be adopted ashore in order to hit moving targets at long range.

Nickerson took my casually made suggestions seriously. By his kind initiative, together we called on a colonel of high reputation who had just returned from Europe, where he had observed the new tank warfare. After several weeks of study the colonel decided against my proposals. His main reasons were that beyond 1,000 yards tanks were seldom good targets for artillery, and that at that distance, or less, the point-blank range made fire control unnecessary. My adventure in tank warfare seemed to be at an end!

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However, some corroboration of my contentions came in July, 1943, when the Navy put ashore our assault on Sicily. This was of course accompanied by the customary support with naval guns after the troops had landed, and until they were well established. During the first two days the greatest menace to the beachhead at Gela was repeated attacks by some 60 German tanks, including those of the "tiger" variety. In repelling these, naval gunfire played the decisive role.

Naval fire control first proved its worth against tanks on 10 July, and at ranges from 10,000 down to 5,000 yards. The destroyer *Shubrick* had spent the hours of darkness in firing against shore batteries, and their searchlights, while doughboys poured ashore. At dawn, with other vessels, she came under the fire of shore batteries and was also subjected to a long series of air attacks. Defensive measures, as usual, included maneuvering at high speed; that is, making frequent radical changes of course, such as circling and moving in figure-of-eight patterns. In addition, naturally, the ship was rolling and pitching. It was while subjected to such violent and irregular motion in several planes that the firing was done against rapidly moving tanks. How forsaken would the shore artillerist feel if the gun he was firing was so tossed about! What could he hit at a range of 10,000 yards, with the target also in rapid motion?

Soon after daylight, the *Shubrick's* shore fire control party reported a concentration of 25 tanks moving toward Gela, and called for indirect fire against these targets, invisible from the ship. Initially the range was close to 10,000 yards. After a few ranging shots, the destroyer opened with four-gun salvos from her five-inch guns. The procedure was to fire salvos rapidly (about 10 per minute) for several minutes; then pause for reports of error from the shore spotters; then several more minutes of rapid-fire salvos; then another pause for corrections, and so on. What was the result? Six or seven tanks ran the gauntlet to Gela, three were knocked out completely by hits, the other 15 were too damaged or too scared to continue in action. Thus about 70 per cent were put out of action. All this at ranges from 10,000 yards down to 5,000-6,000 using indirect fire, the tar-

get not being visible from the fast maneuvering ship.

During that and the succeeding day, naval vessels broke up four more tank attacks on our troops in the Gela beachhead. They were credited with destroying 12 tanks in all. The cruiser *Boise* destroyed four "tigers" with her six-inch guns. Her indirect fire at ranges up to 18,000 yards was reported by the shore fire control party as being very accurate and effective; when hit, a tank was "ripped apart," they said.

Now, a naval gun is not more accurate than an army gun. Equally, both of them are instruments of marvelous precision that can be counted on to hit what they are well aimed at, within incredibly small limits of error. For centuries shore artillery has been blessed with the simple problem of firing from a stationary position at a practically stationary target. The fire control solution is correspondingly simple. Naval fire control, on the other hand, from necessity has had to be very complicated. Two ships steaming at 35 knots directly toward each other have a rate of approach of over 80 miles per hour. Yet naval fire control methods can provide for this and keep guns hitting frequently at 30,000 yards range. Although tanks are much smaller targets, their speed in battle rarely exceeds 25 miles an hour. It should not be too difficult for a stationary shore gun to make a good score on a moving tank at 10,000 yards, and more, given a fire control system that will aim it accurately. Certainly a concentration of tanks could be hit often.

Gun Most Effective

No other antitank weapon can compare with the gun in potential effectiveness. Aircraft, using bombs or rockets, hit a small target only with great difficulty, even at low altitudes. At moving targets their inaccuracy is greatly multiplied. Land mines are weapons of pure chance. Bazookas, flame-throwers, and similar devices for employment by foot soldiers are of such short range as to be useless except as a last resort when tanks have already broken into front lines. The soldier is then at a critical disadvantage, since he must fight against the withering machine-gun fire from behind the protection of armor. Tank formations should of course be stopped if possible long before they reach close quarters with our infantry. This is the task of artillery, primarily. Nothing else seems so well suited to it.

Another Tank

The writer is aware that the foregoing is out of harmony with the current concepts of American and British tank experts. A leader among them, Gen. Devers, explains the accepted view in a recent interview in *U. S. News and World Report* (July 21 1950 issue). The basic assumption therein is that "another tank" is the best and virtually the only certain means of stopping hostile tanks. The August 25, 1950 issue of the same magazine carries an interview with the celebrated British authority, Gen. J. F. C. Fuller. He too maintains that "The best antitank weapon is another tank." But, mark well that he adds "And tanks have to be supported with self-propelled guns." Other experts have given emphasis to the need of artillery support as a secondary matter, but all seem to be unanimous in their advocacy of "another tank" as the main reliance against hostile tanks.

When the concept of stopping a tank with "another tank" is analyzed, it boils down to a matter of artillery. The idea is that the "stopper" must have a powerful enough gun to penetrate hostile armor at about 2,000 yards, and kill the enemy with gunfire. That is a cardinal predicate; the basic element is tank design around which everything else must be built.

Since potentially hostile large tanks carry a heavy front plate of armor nearly 11 inches thick, we must mount at least a 76mm gun to pierce that plate. Our own tank will similarly have heavy front armor. But neither the enemy nor ourselves can afford to put heavy armor all the way around; sides, back, and top can have but light armor, otherwise the monster would be too heavy to move; and about 35 miles speed under favorable conditions is needed. All this for the 25-ton type of tank.

In general features the result is merely a gun surrounded by armor, mounted on a self-propelled carriage, also armored. Performance in the way of loading and firing rapidly must be handicapped by restricted internal spaces. Although the gun itself is capable of great accuracy at ranges of 10,000 yards and more, it has been encumbered with heavy armor in order that it may be taken into battle ranges of 1,000 yards and less. Would it not be more logical to reduce the armor substantially and shoot from the longer ranges, and shoot faster? This of course assumes that a system of fire control will be used that takes fast moving targets into account as a cardinal consideration.

Tank specialists will object that long-range fire will not be effective enough because the 76mm gun cannot penetrate 11 inches of armor at more than 2,000 yards. Such objection is not conclusive for several reasons. The weight saved from shedding armor can be put into a bigger gun, capable of sufficient penetration at long range. But even the light gun which hits often will kill by going through the thin parts; top, sides, and sections near the ground. At long ranges the soft sides will often present a good target, since the attacker cannot always keep himself head-on when traveling through a long distance. Moreover, some of a group of laterally dispersed defending guns are bound to have a side for a target. Finally, there are several varieties of tanks that do not carry heavy armor.

Naval Fire Control

My understanding is that the principles of naval fire control against moving targets have already been applied to the self-propelled gun, which is thus prepared to serve as a tank "destroyer" at relatively long ranges. The rejection of such a gun as the best answer to the tank seems to be based on (1) the smallness of the target presented by an individual tank, and (2) the difficulty of seeing camouflaged tanks under many conditions of terrain.

Both of these objections admittedly have merit, especially as they apply to a small number of tanks. But our big problem is how to stem the onslaught of hundreds of thousands of tanks on the terrain of western Europe. Under such conditions the objections mentioned scarcely seem valid enough. At any rate the problem of overcoming them with guns should be far easier to solve than the alternative puzzle of how to create enough tanks on the European front in time to beat mainly with tanks the horde of enemy tanks. It seems to be clearly the part of wis-

dom for us to develop to the maximum the undoubtedly very great potentialities of the gun as a primary answer to the tank.

Granting the extreme accuracy of the gun itself, and assuming an excellent system of fire control to handle moving targets, there will remain the matter of spotting as the weakest link and the most difficult one to strengthen. A variety of novel devices, such as radar beacons, are already available to aid in the solution, and our amazing scientists no doubt are able to develop others, if set the task. There is also room for much improvement in the rapidity of fire of land artillery. This can be of great importance. Once shots are reported as hitting, a speed-up of shooting will be exceedingly profitable.

Destroyers vs. Tanks

During the late war, the Navy had a tremendous amount of experience in bombarding shore targets. Much of it was against inland objects not visible from the ship and consequently needing expert spotting for effectiveness. Special attention was therefore given to the training of spotters and to their close integration with the gunnery elements of the task. We have seen how naval cruisers and destroyers broke up tank attacks at Gela, Sicily, in 1943. There was no luck or magic in this. It was a pay-off of a long period of daily intensive drill prior to the operation. Each ship had its own shore fire control party with which the drills had been conducted. Provisions had also been made for spotting from airplanes, and the naval aviators similarly trained, but in the ensuing battle the small ship's planes had no fighter protection and were soon driven down. They reported the tanks but could not keep the air long enough to spot gunfire against them.

An excellent article, *Gunfire Support Lessons Learned in World War II,* Comdr. McMillian, appears in the *Naval Institute Proceedings* for August, 1948. The high importance of thoroughly well trained ground-spotters is made clear. Upon many occasions, however, the shore fire control parties were unable to direct fire because of targets being out of their sight. It was then necessary to use airborne spotters. Therefore "a trained pool of aviators qualified to control the guns of fire support ships" was regularly maintained. McMillian points out that "These naval gunfire air spotters *(pilots)* must be trained to appreciate the ground forces' problem and to recognize front lines and profitable targets. They must also be trained to appreciate the problems of fire support ships, to be familiar with their ordnance and ammunition, and to understand and use the proper spotting procedure and method of conduct of fires."

The foregoing blazes the trail for the effective use of the self-propelled gun against tanks in land warfare. In essence that trail is primarily one of integration of all the elements in the problem. The participating artillerymen, tankmen, and airmen must be much more than merely "unified"; they must be integrated under a single control. That is the Navy and Marine Corps way and no other will work efficiently. Since artillery and tanks are both a part of the Army, the establishment of single control over those parts of the team should be simple. The essential integration of the Air Force component, however, seems to pose a special difficulty because of the recently won independence of the Air Force from the Army. The writer is not prepared to suggest a method of overcoming this organizational handicap.

Integration Needed

But he is thoroughly convinced that it must be overcome if we are to be made ready to stop the overwhelming horde of Russian tanks. Self-propelled guns can be made indispensable in doing this if all the personnel connected with their use are integrated into one team, under single command both for training and operations. It seems futile to consider the alternative of relying primarily upon our own tanks to stem the Russian tide. How can we expect to get enough tanks in the field in time, even if the national economy could bear the burden?

Naturally, the self-propelled gun, even when fully integrated with ground and air spotting, should not be relied upon alone. It will need to be supported by and coordinated with antitank efforts by our own tanks, as well as by and with our own combat planes. The galaxy of all these must again be well integrated for the maximum results. "Unification" is not enough.

75th ANNIVERSARY OF LITTLE BIG HORN

June 25th will mark the 75th Anniversary of the Custer Massacre on the Little Big Horn during the campaign of 1876. The day will be marked by appropriate ceremonies on the battlefield. General of the Army George C. Marshall, Secretary of Defense, and Lt. Gen. Albert C. Wedemeyer, Commanding General of Sixth Army, are scheduled to be speakers at the observance on the historical site near the present-day town of Hardin, Montana.

At Little Big Horn, General Custer and 225 officers and men of the Seventh United States Cavalry were annihilated by some 5,000 Indians.

Custer Battlefield National Monument on the site of the battle a dozen miles south of Hardin will be the scene of a program on the morning of June 25. General Wedemeyer will deliver the major address there. General Marshall will speak at a banquet in Hardin that night.

Ansco Division, General Aniline & Film Corp.

Gen. George Armstrong Custer

DELIBERATIONS ON ARMOR

by LIEUTENANT COLONEL FRANK F. CARR

THE Korean campaign has, once again, focused the eyes of the military world on that enigma of the battlefield, the tank. The tank has been lifted from the mothballs, its plastic cocoon removed, and it is now being examined with a critical eye by both the layman and the professional. Fortunately, such scrutiny is not new in the life of this weapon and so it will, undoubtedly, survive without too much embarrassment.

The "Billy Mitchells" of the armored force are now trumpeting that the tank is the decisive ground weapon of the battlefield; that the tank dominates the battlefield; and that without it the infantry can neither advance nor defend itself against an enemy who possesses and uses this weapon. As an example, they point to Korea and say, "We were dominant on the sea; we had complete superiority in the air; terrain was favorable for defense and delay; but still the enemy advanced. Why? Because he possessed and made use of his tanks to such an extent that the hapless South Korean and United Nations' forces could not stand against him."

How much truth is there in these statements? What is the role of the tank in the ground force team?

With the tremendous increase in the number of tanks organic to the present infantry division as compared with the World War II division, and the corresponding increase in the number of tanks found in the type corps and field army, it is vital that commanders and staff officers have an understanding of the capabilities and limitations of this weapon and how it should be employed. How vulnerable is the tank to enemy gunfire? How mobile is the tank? Should it be employed in mass? Is the tank, as the early stages of the Korean campaign seemed to indicate, the decisive ground weapon of the battlefield? These and many other questions are being asked by officers, with and without armored experience, who sincerely wish to know what to expect from their tanks.

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Lt. Col. Frank F. Carr served with the 1st Armored Division during World War II, in assignments including command of the 1st Battalion, 13th Armored Regiment, and the 4th Tank Battalion. Following a period as division G-3, he returned to the States to attend the Command & General Staff College. After a brief assignment as Test Officer in the Weapons and Ammunition Section of AFF Board No. 2, he returned to the Command & General Staff College in late 1946 to take up his present assignment as instructor.

The purpose of this article, then, is to consider briefly those areas wherein the greatest amount of confusion seems to exist; to discuss a few of the capabilities and limitations of the tank; and to examine some aspects of its employment in the infantry division.

In Korea, the tank, skillfully used by the North Koreans, did prove to be the decisive weapon on the battlefield for the greater part of the campaign. It was not until the United Nations' forces obtained tanks in comparable numbers that the lines began to stabilize. Thus, the obvious conclusion can be drawn that the tank proved to be decisive, in the early stages of the Korean battle, only because one side possessed a superiority of tanks while the other side had no effective means of countering this superiority. To follow this reasoning to its logical conclusion, then, would not the same have been true if the South Korean Army had had plenty of tanks but little or no infantry, or if they had had an abundance of infantry and tanks but little or no artillery? The answer should be obvious.

Tanks, infantry, and artillery, then, are all decisive on the battlefield and must work as a co-ordinated team to achieve victory. In any given engagement, however, usually there will exist certain specialized conditions which will permit or require the dominance of one of these arms over the others to ensure the defeat of the enemy. Thus, in the deserts of Africa or on the plains of North Germany the tank may predominate; while in the mountains of Italy, infantry and artillery will have the dominant role. But no matter what the conditions may be, or which plays the leading role, the other two have vitally important supporting roles which are necessary for the success of the campaign or battle.

Now that we have placed the tank in its proper perspective with relation to the other major elements of ground combat, it might be well to digress for a moment to consider briefly the future of the tank. There are many who consider that the latest developments in scientific research are sounding the death knell of the tank in much the same fashion as was done for the horse. To date, however, no such developments have been revealed. Pending their development, it is probably safe to assume that as long as there are requirements for mobility, maneuver-

ability, and armored fire power on the battlefield, there will exist a requirement for tanks. And as long as the infantry exists, there will be requirements for such maneuverability, mobility, and fire power.

Weapons of the atomic age which may render infantry, artillery, as well as tanks obsolete conceivably may be developed in the future. Pending the arrival of such weapons, we can predict that there will be no material change in warfare as we now know it.

The Weapon Itself

Now, with the immediate future of the tank temporarily secured, we can turn to a closer examination of the weapon itself.

The use of the M46, the tank organic to the infantry division, like all tanks, is influenced by certain types of terrain which restrict or prohibit entirely armored operations. Likewise, its effectiveness is limited by certain types of enemy defensive works such as antitank (AT) ditches, obstacles, and extensive mine fields. Like all other vehicles, its effectiveness may be impaired by improper maintenance, and by a lack of logistical support, particularly fuel to run it. Finally, it is vulnerable, in varying degrees, to enemy fire both from both the air and ground. Our discussion will cover only this latter grouping—the vulnerability of the tank to enemy fire.

How vulnerable is the present M46 tank to enemy fire? In general, it can be said that the only way to stop effectively large numbers of tanks is by means of other tanks, thus giving rise to the saying that, on the battlefield, "armor attracts armor." If that is true, then what about artillery, aircraft, the AT gun, and the rocket launcher (bazooka)? The answer is that, although these weapons possess the capability of stopping tanks, they all require certain specialized conditions which are favorable for their effective use. This is not true of other tanks. Where our tanks can go, so can the tanks of the enemy.

Artillery.—What are the limitations of artillery when employed against tanks? Light artillery (105-mm), employing indirect fire techniques, generally is ineffective against even the World War II Sherman tank. This is true because of the difficulties of obtaining a direct hit against a moving target, and because of the low explosive power of the weapon's projectile which is not great enough to injure the crew or seriously damage the tank even when a direct hit is obtained. Fire from light artillery should not cause a medium tank to change its general position nor should it slow its advance. The exceptions to the above are: a direct hit through an open turret will render the crew incapable of further action; a direct hit on the outside of the tank when a member of its crew has his head out will eliminate that person; and a direct hit on the suspension system may damage it enough to compel the tank to withdraw. All of the foregoing hits, however, are rare and extremely difficult to achieve.

Artillery of 155-mm caliber and above will, if a direct hit is obtained, knock out the crew and seriously damage a medium tank of the M46 type. Here again, however, we are confronted with the difficult task of obtaining a direct hit when indirect fire methods are employed. Unless the tanks are road-bound, at a halt, caught in a defile, or bogged down in soft ground, normal forward movement or other evasive action should suffice in preventing a direct hit. This does not, however, take into account the effectiveness of massing an excessive number of battalions of artillery on a small area, but is based on the fire of the normal number of battalions likely to be encountered on the average front.

Air.—The employment of air power against tanks, although productive of effective results in both World War II and Korea, has very definite limitations. First, there must be a fair degree of air superiority. Second, there must be favorable weather to provide necessary visibility. Third, assuming that the above two conditions exist, the plane must find the target while moving at tremendous rates of speed at great heights, descend on the target which can take evasive action, ignore antiaircraft artillery in the area, and obtain a close hit with bombs or a direct hit with rockets. Once again, if our tanks are road-bound, caught in a defile, bogged in soft ground, or otherwise immobilized, and other favorable conditions exist for the use of air, then air is capable of rendering ineffective tanks so caught. When the above conditions do not exist, air attacks are not likely to stop a determined effort by tanks in mass.

AT gun.—The AT gun received a tremendous amount of publicity during World War II, with particular emphasis on the German 88-mm dual-purpose gun. This weapon attained its fame as a result of its employment by Rommel's Afrika Korps on two separate occasions. First, in the Libyan Desert against the British, and second, against the Americans at Sidi-bou-Sid in North Africa. On both occasions, the Germans achieved complete tactical surprise. They led the Allied tank forces into a trap, and then sprung it from three sides. Surprise, then, is one condition necessary for the effective use of the AT gun and, in the above-mentioned instances, mass also was present.

Under normal battle conditions, the foregoing can be avoided by, first, detailed and accurate reconnaissance; second, providing flank protection; third, the echelonment of the tank force to one or both flanks; fourth; a reconnaissance by fire of likely AT gun emplacements; and fifth, close covering fire by follow-up echelons of the tank force. The sixth, and most important method of reducing the effectiveness of AT fire results from the close co-ordination of the tank force with its supporting artillery to provide for heavy artillery preparations prior to the attack, the use of smoke to protect its flanks during the attack, and the use of forward observers to effect quick adjustments once the enemy's AT guns have fired. The AT gun is the least to be feared of all AT weapons, if the steps outlined above are adhered to carefully. During battle, when the gun is fired, its position is exposed. With its position exposed, machine gun and high explosive fire from covering tanks and artillery should dispose quickly of the gun crew since they do not have the benefit of armored protection. On the other hand, give these same AT guns the armored protection of a tank and they could, if properly employed, hold up an attack for a considerable period.

The bazooka.—Continued research and development have increased materially the effectiveness of this weapon since World War II. The new 3.5-inch bazooka, which was given its first battle tests in Korea, can knock out any known tank. When first used in Korea against the Russian-built

T34, it achieved formidable results —seven rounds fired, seven tanks knocked out. Here we have an AT weapon which can go any place an infantryman can go, and it only requires a crew of two to operate it. The natural question then is: "Is not this weapon the answer to the tank?" The answer, unfortunately, is no. While it is of extreme value to infantry and airborne troops, once again specialized conditions are required for its use. These specialized conditions are a result primarily of technical limitations in the weapon itself, namely range and accuracy.

Although the range of the 3.5-inch bazooka is more than 100 yards, anything over that distance reduces materially the accuracy of the weapon. To be sure of an effective hit, the operators must wait until a tank is well within this 100-yard range. Then, in order to fire at a tank, the weapon crew must expose themselves and, in so doing, they become vulnerable to the fire of supporting infantry, other tanks, and artillery, particularly artillery employing the variable time (VT) fuze. All this presupposes that these same crews have survived the initial artillery preparation laid down by the enemy. The ultimate in courage and intestinal fortitude is going to be required of men who will sit in their foxholes and wait for tanks to rumble into range.

Here again the bazooka, like the AT gun, finds its greatest limitation in the vulnerability of its unprotected crew. In addition, its doubtful accuracy, except at minimum ranges, is another handicap to its effective use.

Before leaving the bazooka, it should be mentioned that the shaped charge principle, used in projectiles fired by that weapon, is also employed in the projectiles of other weapons organic to the infantry division, such as the 57-mm and 75-mm recoilless rifle, and the 105-mm artillery piece. Although these latter weapons are capable of bringing a tank under fire at a much greater range than the bazooka, they do not possess the accuracy of the obsolescent AT gun and, in addition, the projectiles have technical deficiencies which are being remedied. It is possible that continued research will ultimately perfect a portable one-man weapon which will use a shaped charge projectile and which will be effective against the present-day tank at ranges of 1,000 to 2,000 yards. If this happens, the future of the tank is likely to become uncertain. It is well to bear in mind, however, that this same research may also develop a new type of armor plate which will resist effectively the shaped charge.

Mobility and Armor Protection

To link together mobility and armor protection is not as illogical as it might seem at first glance. Although it is true that one contradicts the other, at the same time they also complement each other. A decrease in armored protection, with its consequent reduction in the weight of the tank, also means an increase in tactical speed. Speed, in itself, then becomes a form of protection which will compensate, to a limited extent, for the loss of armored protection. Conversely, an increase in armored protection is a "must" when speed is no longer a factor. However, this will increase the weight of the tank and results in a loss of speed and mobility.

The resolving of the conflict between the demand for greater armored protection and that for increased mobility is a problem which has occupied the minds of the armored experts ever since the close of World War II. We mention it here since the requirements of the field forces become the basis of drawing-board designs. Infantry commanders must realize that their demands for greater armored protection, if satisfied, will reduce the mobility of the tank and limit its employment. They should weigh carefully, therefore, the advantages which will accrue from increased protection. In making such an estimate, they must also guard against too rapid an acceptance of the opposite theory which fanatically advocates greater mobility and fire power with minimum armored protection. Horse cavalry became obsolete because of the vulnerability of horse and rider to modern weapons. The towed AT gun, except in airborne units, has also been discarded because of the vulnerability of the crew manning it. The tank, too, may become a museum piece if the proponents of greater mobility and less armor go uncurbed. To one who has fought the famous German Tiger with the mobile Sherman tank and achieved victory, on the basis of a platoon of Shermans against one Tiger, the spectacle is not pleasant to contemplate. The answer to this vital question probably lies in the trite phrase of "happy medium." We must be wary of either extreme and strive for an intelligent balance between the two. Except for 7 or 8 tons too many, the M46 (Patton) tank, which is the tank organic to the infantry division, probably may be the answer.

If we acknowledge, then, that mobility as well as armored protection and great fire power is desirable, of what use is this mobility? Mobility permits the rapid concentration of great fire power at the decisive point on the battlefield. Tanks provide the infantry division with speed, fire power, and mass which, translated from the potential, means terrific shock action. Shock action ensures the rupture of the enemy position and mobility ensures rapid exploitation and pursuit. That, briefly, is armored action. This type of action is not limited to the armored division alone, for it is available to the present-day infantry division. However, it must be understood and used properly. A commander who fails to use this potential speed and power, or who uses it improperly, is failing in his responsibilities to his command.

Judgment from Experience

We have already discussed some of the technical aspects of mobility, and the ordnance expert can give you more information in terms of flotation, slopes, and horsepower-to-weight ratios. But what about the practical aspects? Where can a tank go? What are its limitations as regards terrain? The answers to these important questions cannot, unfortunately, be placed on paper. Judgment in the use of tanks comes, the same as with other weapons, from experience. True experience is gained only on the battlefield. Therefore, commanders who do not have this experience must utilize every opportunity, in peacetime training, to determine the capabilities and limitations of their tanks. If that is done, there will be less tendency to expect too much, as in the last war, or not to demand enough.

There is no question that the cross-country movement of tanks is limited by certain types of terrain. As a result, all too frequently, since the last war, the expression "That is not good tank

terrain, so we will hold the tank battalion in reserve" has been heard. Unfortunately, in the majority of instances when the foregoing statement was made, tanks could have been used to achieve decisive results—perhaps with difficulty, but they could have been used. If a commander waits for what the average officer considers good tank terrain, to commit his tanks, many a "doughboy" will die needlessly for lack of tank support. Korea was not considered good tank terrain, but the North Koreans nearly won that war with tanks. In Italy, during World War II, the armies of Kesselring had to revise their AT doctrine because the 1st Armored Division, successfully sideslipping the main roads with their strong defenses, used terrain which was considered impassable for tanks. One of the surprising features of the German campaign in Norway was the presence of tanks in the German units driving through the mountains.

Capabilities and Limitations

Deep ditches, gorges, precipitous gullies, and swamps will block the advance of tanks until some pioneer work is done. But between these terrain extremes and tablelike plains, considerable ground is found which can be negotiated by experienced "tankers," ground which was all too frequently neglected because commanders failed to learn the capabilities of their armor. A word of caution, however, is necessary. There were, also, many commanders in the last war who, through lack of experience, went too far in the opposite direction and expected the impossible from their attached tanks. They assumed that tanks could go anywhere. A graphic illustration of this is found in the battle of San Pietro in the Italian campaign. After repeated infantry attacks had been repulsed with heavy losses, it was decided to try to take the town with armor. There was one main road leading into the town from the United States lines. Once on that road, no tank could get off of it due to its precipitous shoulders. Yet down this road, in a column, was sent a supporting tank company. Only three tanks from that company came back; none ever reached the objective. If you must use a road as an axis of attack, be sure the tanks can get off the road and deploy freely on either side.

The intelligent use of tanks demands an understanding of terrain and its effect on tank mobility. Without this understanding, commanders will waste their armor or fail to use it to the maximum.

The employment of tanks with infantry or infantry with tanks is a subject worthy of much study. Of necessity, therefore, this discussion will be limited to a coverage of those aspects wherein the greatest amount of confusion seems to exist.

Reference to available military textbooks will reveal that tanks should:

1. Provide antitank defense for the infantry.
2. Provide the infantry with direct fire support.
3. Capture and hold ground for the infantry.
4. Execute counterattacks against enemy penetrations.

The foregoing fundamentals governing the general employment of tanks with infantry are sound but, like any other listing of fundamentals, they cannot all be executed simultaneously, nor can one or two of them be stressed continuously to the exclusion of the others. Early in World War II, the tendency among infantry division commanders was to stress, almost entirely, the first two of these fundamentals. Later on, as this concept developed weaknesses, there was a trend toward the adoption of the third fundamental in which the tanks were expected to do everything without any infantry support.

Questions of Employment

At the present time, some 5 years after the war, there still seems to be a general lack of agreement as to how tanks and infantry should be employed. When the new infantry division was organized, officers assumed immediately that the tank organization within the division had solved their problem. The division tank battalion was to be used to capture and hold ground, and the tanks organic to the regiment were to work in the small tank-infantry team. Such an assumption is sound and logical, but it does not provide the complete answer. Adherence to a rule which places the tank in the same continuous role means that the capabilities of the weapon are not being used to the maximum. A commander must know under what conditions to employ a particular organization. This applies whether we are speaking of tanks in the regimental tank company, or in the division and corps tank battalions.

The only tank organizations whose roles are fixed are in reconnaissance units and, in an emergency, they may be employed in other than normal roles.

The Tank-Infantry Team

The tank-infantry team grew up in the hedgerows of Normandy where neither tanks nor infantry could operate without the closely coordinated assistance of the other. Because of the terrain, and the defenses prepared by the Germans, the infantry squad or platoon with two tanks attached was the most efficient way to solve the tactical problem presented. While such conditions will be found in a future war, care must be taken that this role (for the tank) is not continued beyond the point for which it is needed.

The small tank-infantry team is appropriate under certain specialized conditions. These are the breaching of a fortified line, the attack of strongly prepared positions covered by deep mine fields, or attacks in wooded areas and towns. When we are fighting in open country and over good terrain, such a combination should be avoided. If this is not done, then the mobility and speed of the tank are lost, for it is slowed to the pace of the infantry and becomes extremely vulnerable to the fire of enemy tanks and self-propelled guns. For this reason, it is well for a division commander to anticipate such engagements, such as the attack of a fortified line, and ask for the attachment of a tank battalion from the corps tank group. These are heavy tanks which can withstand great punishment and deal more effectively with enemy pillboxes and armor. The infantry division tank battalion then can be employed more appropriately after the line has been breached, instead of being forced to dissipate its efforts in a role for which it is not best suited.

Under conditions other than those discussed in the preceding paragraph, armor should be used to lead the attack and, because of its speed, take objectives before the enemy can react, or by shock action if the enemy has already reacted. Such an action,

however, as an infantry attack, must be planned and coordinated in detail. Artillery, air, engineer, and infantry actions must be fitted into the picture. Artillery and air provide the preliminary preparation, the support during the attack, and flank protection when needed, while the infantry moves up fast to relieve the tanks on the objective so the armor can continue the attack. At the same time, infantry cannot follow the armor too closely or they will come under the artillery fire which tanks always seem to draw. Neither can they be too far back or they will have to fight by-passed and overrun enemy infantry.

The danger in the separation of tanks and infantry is not, as many officers believe, the vulnerability of tanks without infantry but the vulnerability of infantry without tanks. In relatively open country (not jungle or woods), tanks can defend themselves with little difficulty as long as daylight lasts. The problem for the infantry element, therefore, is to stay as close to the armor as is necessary for their own protection and no closer. Let the tanks do the fighting while the infantry relieves on the objective and provides a harbor at night. The latter is necessary, if tanks are to operate efficiently the next day.

Dual Role Training

Commanders of infantry regiments must remember that it is not always necessary to assign a platoon of tanks to each infantry battalion. Many times, more decisive results can be obtained by employing the tank company, in mass, as the main effort. But, in so doing, it must be realized that tanks, to work in a purely tank team, must be trained for that role. Armored troops who have been trained to work in company and battalion tank formations can, with minimum training, revert quickly to the role of supporting the infantry as part of the small tank-infantry team. Those troops, however, which have been trained to work in the small tank-infantry team cannot, without considerable training, operate with any degree of assurance in pure tank formations. Training doctrine should, therefore, stress both roles for *all* the troops assigned to tank units in the division since, in the final analysis, each has its own peculiar techniques.

Underlying any discussion on the employment of tanks with infantry must be the understanding that the tank is a powerful weapon that was made to fight. Despite the fact that its employment may be limited by obstacles, ditches, AT mines, and other tanks, most of the time it can be used where the infantry cannot go without suffering prohibitive casualties. At Anzio, the 1st Armored Division broke out of the beachhead successfully with only minimum casualties as compared with the heavy casualties sustained by adjacent infantry divisions. Therefore, whether you use the tanks in the first wave of an assault or use them as part of the tank-infantry team, be sure you use them whenever possible. They will reduce your infantry casualties.

A Powerful Reserve

Tanks are a powerful reserve and lend security to any attack, but they are of little value to anyone if the commander always keeps them in reserve or holds them back for AT defense. No matter the source of tanks under your command, look upon them *whenever possible* as a weapon to be supported, not a support weapon. If conditions do not justify tanks as the primary assault weapon, then use them in support of the assault. Return them, however, to the role of the weapon to be supported as quickly as possible.

Finally, this subject cannot be concluded without considering briefly the use of the tanks of the infantry division on the defense. Here, again, arises a conflict between those who wish to stress the close-support role of the tank (a mobile pillbox), and those who believe that tanks should be used more in the counterattack. The present organization of the infantry division lends itself nicely to the accomplishment of both of these roles. The tanks organic to the infantry regiment might be used to deepen the AT defenses of the battle position, and the division tank battalion employed in a counterattack role. It must be realized, however, that if the tanks are employed in the forward defense areas to provide AT defense, full advantage is not being taken of their mobility. Whenever possible, even at the regimental level, mine fields and obstacles should be used to provide AT protection and the tanks should be held back to provide the "punch" of the counterattacking force. While the infantry, generally, cannot move fast enough to launch a counterattack at regimental level, the tanks can.

If tanks are used in forward positions, maximum use of camouflage should be employed. If this is not done, they will be detected early and countermeasures will be taken by the attacking force. Either heavy artillery will be brought to bear on the positions, or the enemy may shift the point of his thrust to another area where the tanks are not in evidence. To avoid this possibility, the forward positions for each tank should be prepared, using dozers if available. The position should be well camouflaged, but not occupied. The tank to occupy it should stay well back under cover, concealed from observation, ready to move up into firing position at the appropriate moment. Necessary firing data—such as range cards—should be prepared ahead of time. When the enemy armor approaches within 1,000 yards of the position, that is the time to take it under fire. Earlier than that will produce no effective results and will reveal the position of your tanks to the enemy. If the enemy is employing heavy tanks, this range should be reduced to 500 yards. At night, tanks should occupy their prepared positions in the event that the enemy launches a tank-supported night attack. Once again, however, complete firing data must be prepared in advance, if effective hits are to be obtained.

Summary

It is hoped that the foregoing discussion will contribute to a better understanding of the capabilities and limitations of armor. If armor is organic to your command, use its mobility and fire power *whenever conditions permit*. It is a powerful weapon that can hand out and take punishment better than infantry. Do not expect miracles, but do not hold it back where it will rust from lack of use. Whenever possible, place the infantry in support of the tanks. However, when necessary, do not hesitate to use your tanks to support the infantry elements of your command. Finally, to achieve the maximum from your armor, employ it with intelligence and understanding, as you would your infantry and artillery.

Self-Propelled Bridges

by LIEUTENANT COLONEL ROBERT B. RIGG

WAR on the ground has really not been modernized. Machines have made easier some of the tasks, but bridging a river in battle, for example, is still a hazardous operation. An army can always safely assume that in its advancing path the bridges will be destroyed. Rebridging operations are one of the bottlenecks of battle progress and pursuit. Scientific tools have been unevenly applied to war if we note the ultramodern progress of air and anti-air combat as compared with ground warfare. Our present technique of constructing bridges under fire is little changed from that of Napoleon's era, except that a larger amount of firepower can be more accurately directed at the bridgehead by the enemy.

It is time that some imagination be applied to the problems of bridging terrain obstacles under fire. The infantryman and the tanker, not to mention the engineer, ought to be able to enjoy the battle luxury of an ultra-quickly constructed bridge, built from only one side of the river. With the instruments and equipment presently available we *can* improve the hasty bridge technique to increase the speed of construction, to lessen the casualties of a bridgehead, and to project a bridge to a bank we do not occupy.

This is not to outline any finished solutions, nor is it believed that the ideas here are as simple to apply as they are to promote on paper. But small rivers and streams *can* be spanned from the near shore without a large number of men exposing themselves to fire, if JATO* devices are employed. With development and experiment, self-propelled or rocket-launched bridges may well become realities.

Two means of launching bridges are suggested. For light bridges, the principle would be to fire a special anchor, trailing light cables, into the far bank, and, on the suspension system so created, complete a light bridge. The anchor would be propelled by a JATO-like device, and would vary in size with the type of the bridge.

For pontoon bridges, a special JATO-propelled pontoon would be fired into or onto the far shore, and subsequent pontoons similarly projected would lock into the lead one which would be trailing a cable to guide the others. The bridge would be formed by a series of joined pontoons. This would be for armored vehicles.

These spans would not result in ideal bridges, but their components could be prefabricated so as to permit final assembly of the bridge to be made with the utmost speed. Both types of bridges would be constructed almost mechanically, with the engineers working on the near shore only. Infantry and armor would cross a finished bridge to form and expand a bridgehead. Tactically it would be necessary to protect the bridge anchors on the far bank from enemy infantry and armor, but this is not an insurmountable difficulty.

For a rocket-launched footbridge, a "T" shaped anchor connected to light cables could be JATO-fired and dropped in a mortar-like trajectory on the far bank of an obstacle. This would place the suspension system across the river, but the anchor would have to be so shaped as to penetrate the ground, and it should be further equipped with an explosive head which would lock it in position where it landed. The next step would be to tighten the cables and fasten them to a base on the near bank. To provide planking, notched aluminum sections could be fitted onto the cables one at a time and, powered by a small rocket, each one would be projected across stream. The minimum requirement for a footbridge would be achieved by this process. See *Figure 1.*

For a larger rocket bridge, a large bridge-anchor of several tons could be rocketed across a river on the same principle that a weighty airplane with JATO can rise at an angle approaching the vertical. This anchor would of necessity have to be heavy in order to force it well into the earth to provide a suitable base for a heavier suspension structure. The anchor would also contain heavy pulley arrangements. With these, stronger cables could be worked across and tightened, all work being performed from the near shore of the river. The next step would be to hook on the special prefabricated bridge sections to the cables. These might be motored across the suspension, or shot across by rockets. Obviously the approaches at the far end of such a bridge would require some human labor later, but the primary purpose of this span would be to vault combat troops over the obstacle as rapidly as possible. See *Figure 2.*

A pontoon bridge might be constructed along lines similar to those just described, but special rocket-propelled pontoons not unlike speed boats would be employed and the span would be able to carry heavier loads than the suspension types.

The initial pontoon would drag a light cable after it, and the pontoon

*Jet assisted take-off.

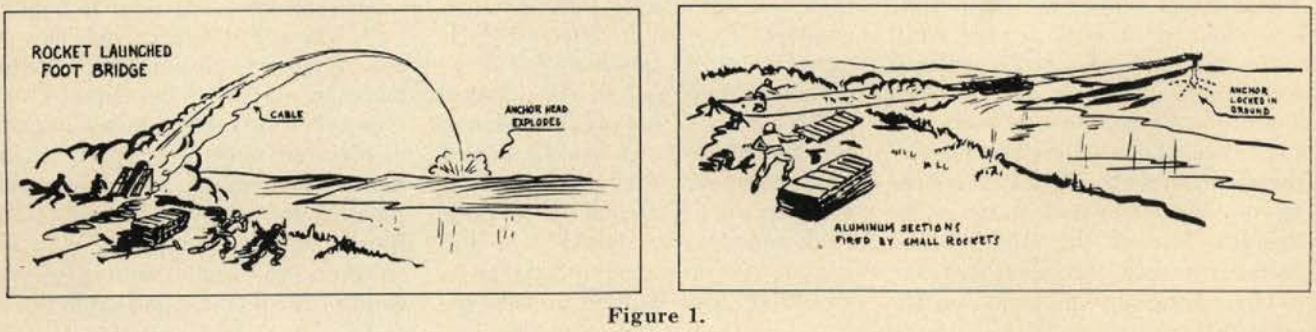


Figure 1.

would have to be aimed at a suitable point on the distant shore. It should have sufficient speed and power to enable it to overcome the effects of wind and water current. It might even be radio guided, but in any event the success of the bridge would hinge greatly on the anchoring qualities of this first boat. It should be so designed as to have self-anchoring devices that could be sprung or shot out upon impact with the shore. Once this pontoon is in place, its trailing cable should be made taut with the near bank, and additional JATO-fired pontoons would be launched to ram and lock into each other. Each of these pontoons would be a complete bridge unit with superstructure of stringers and planking. See *Figure 3*.

At the expense of seeming on the verge of Rube Goldbergism, it is practical to state that these JATO-fired pontoons should be amphibious in order to simplify the task of bringing them up to the near shore for launching. Properly designed, the components of this type bridge could be rammed across a river in a very short time, and the first tank over would knock down the approach-trestle on the anchor pontoon and make shore.

Conclusions

No effort has been made here to involve the reader in the technical details of equipment which at the moment is nonexistent. The inventive or critical minds will see many difficulties in the way of perfecting these unorthodox military bridges, yet I believe the same minds can solve the problems related to their perfection.

We as users of military equipment are too often prone to accept the matériel at hand, or be content to modify and improve it slightly. There has been too little inventiveness in military circles, and the future demands that the army apply the imagination and experiment that produced guided missiles and similar weapons. Ground warfare is a slow process at best, and it is slowed by terrain obstacles. The military can provide not only the specifications of what it will require, but also some constructive and imaginative ideas as well. The scientific talent and industrial know-how of the United States would not be hard pressed to perfect these bridges in conjunction with the military.

Let us modernize ground combat.

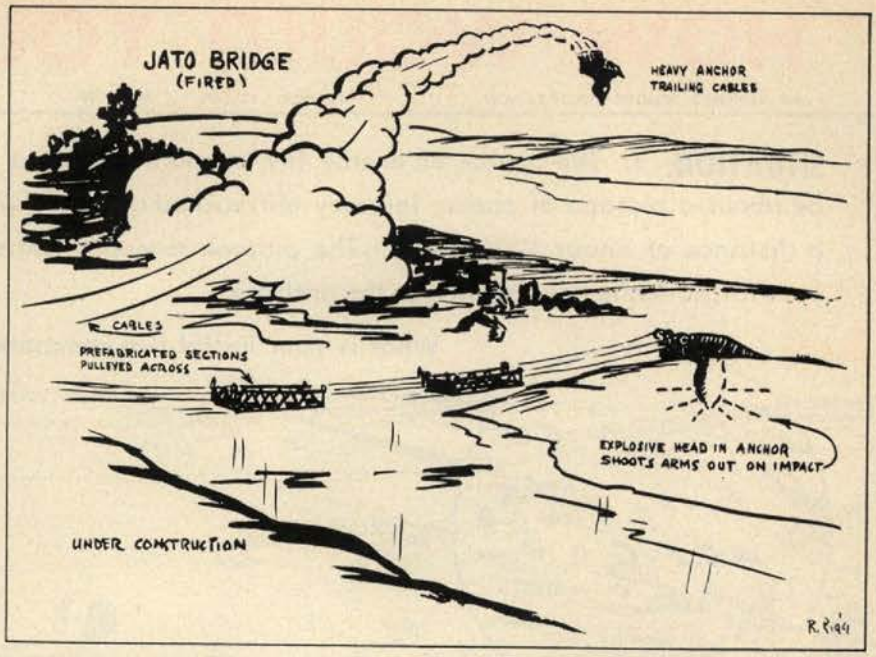


Figure 2.

Illustrated by the author.

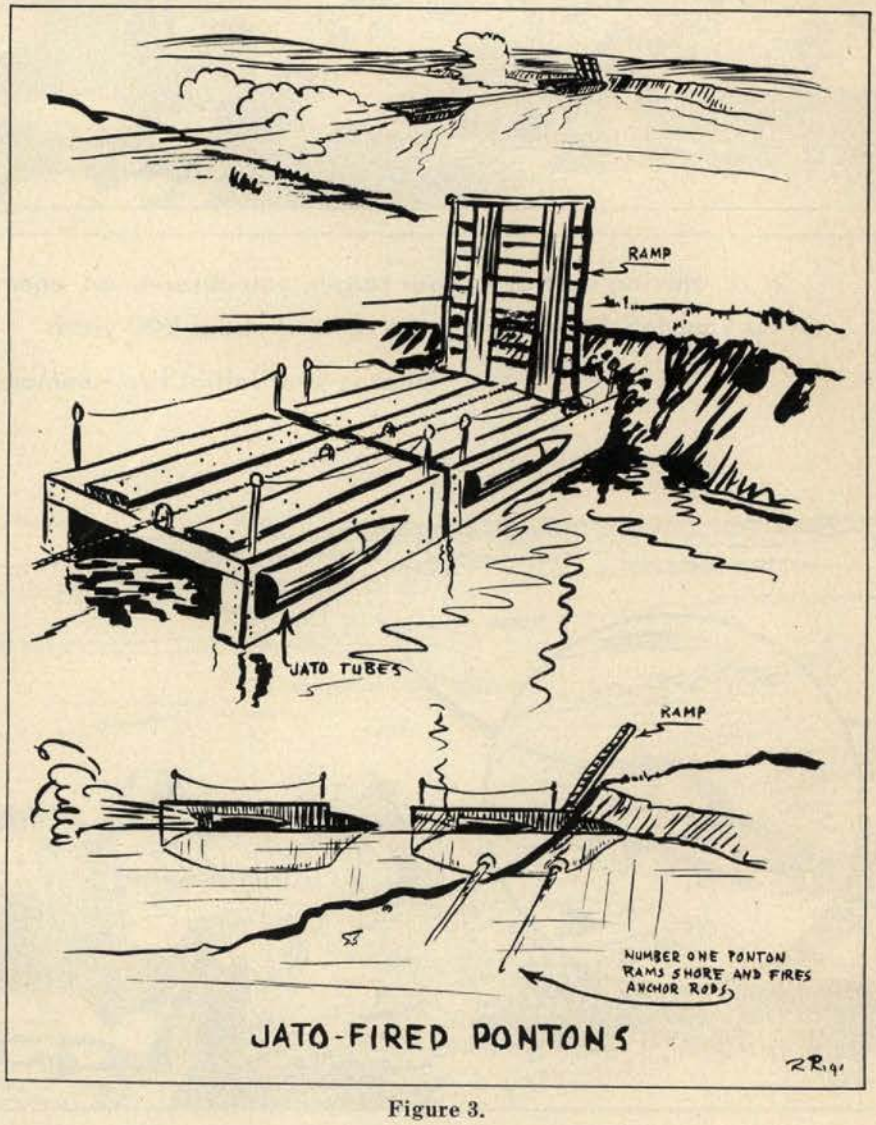


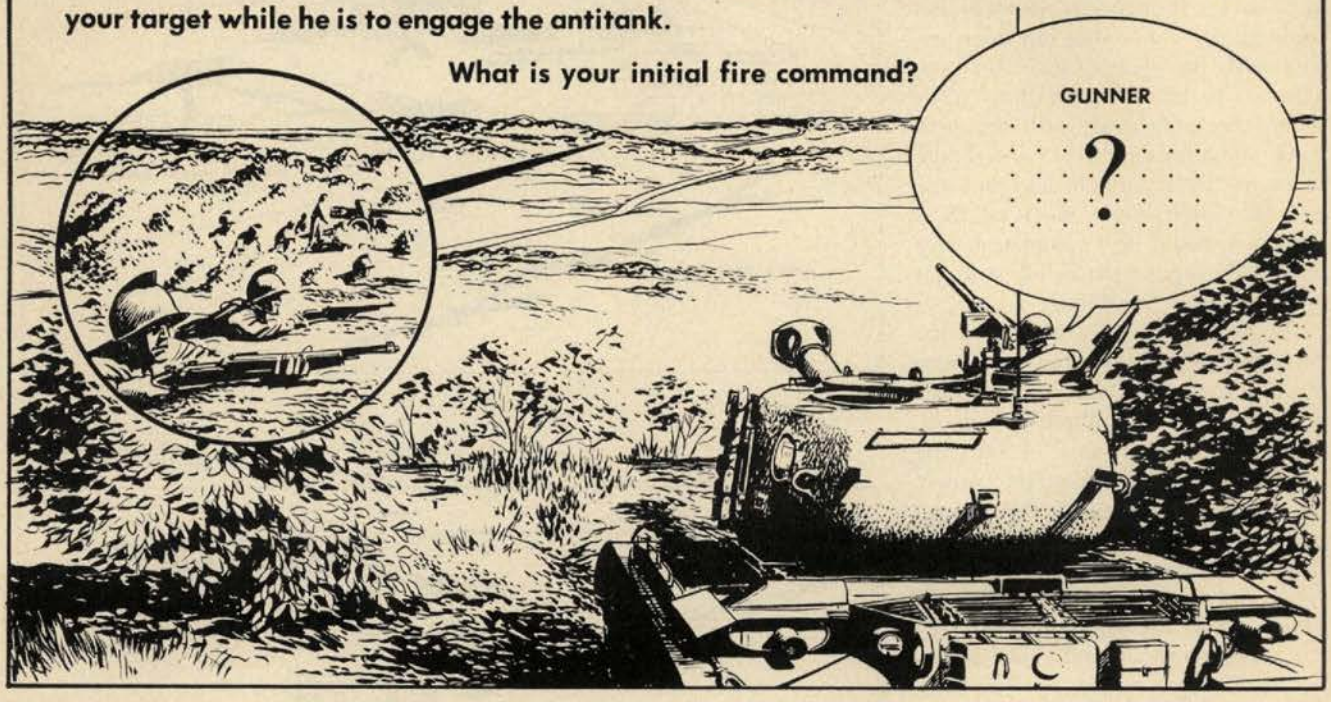
Figure 3.

HOW WOULD YOU DO IT?

AN ARMORED SCHOOL PRESENTATION AUTHOR: LT COL J C NOEL, JR ARTIST : M SGT W M CONN

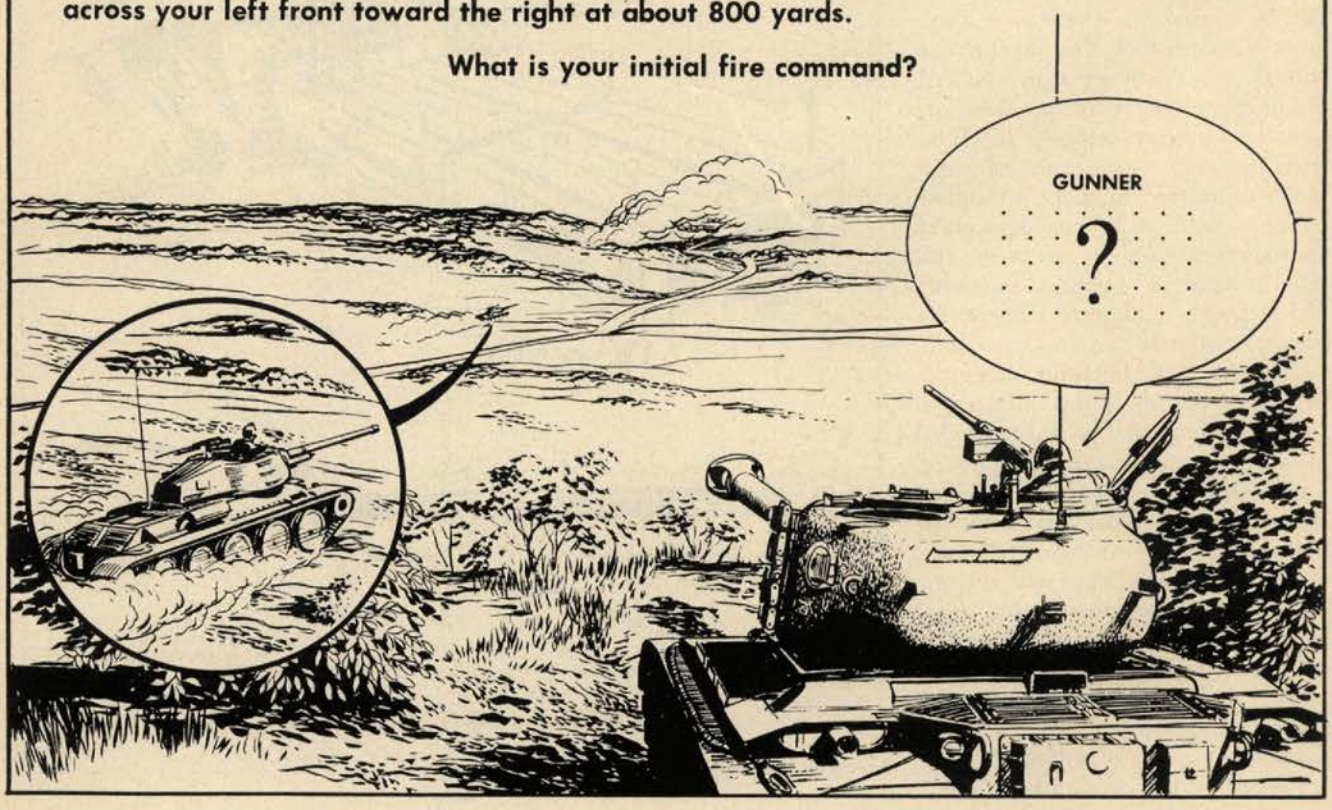
SITUATION: 1. The source of enemy fire encountered by a tank section is discovered to be about a platoon of enemy infantry entrenched around a well-concealed antitank gun at a distance of about 1200 yards. The platoon sergeant allocates the enemy infantry as your target while he is to engage the antitank.

What is your initial fire command?

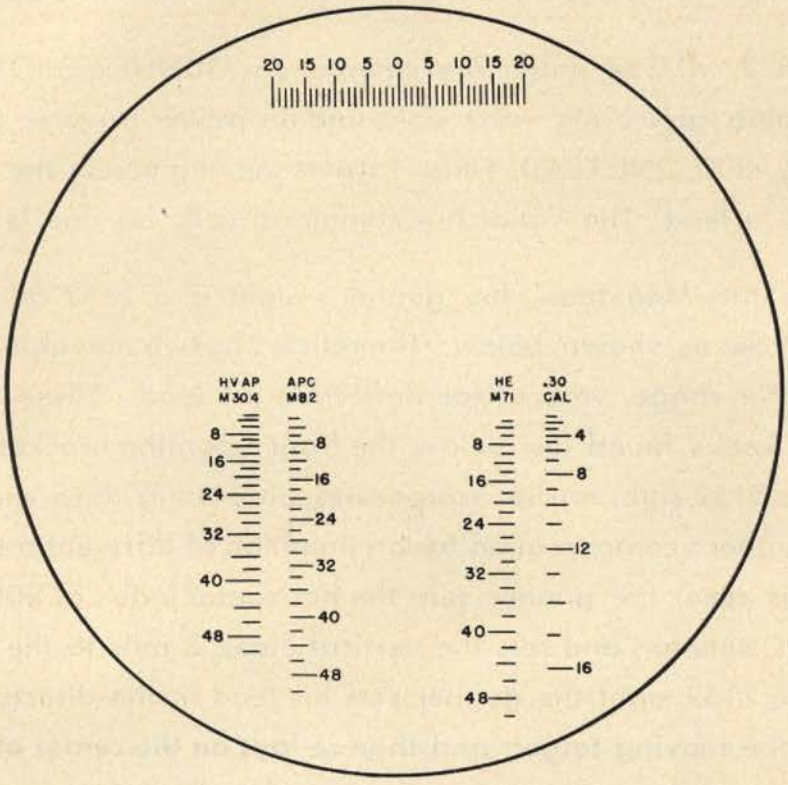


2. a. Having destroyed your target, you observe an enemy tank moving diagonally across your left front toward the right at about 800 yards.

What is your initial fire command?



b. In the preceding action the gunner, using a T152 telescopic sight, was successful. On the diagram below draw the index lines showing the setting made by the gunner on the initial fire command.



SOLUTION AND DISCUSSION

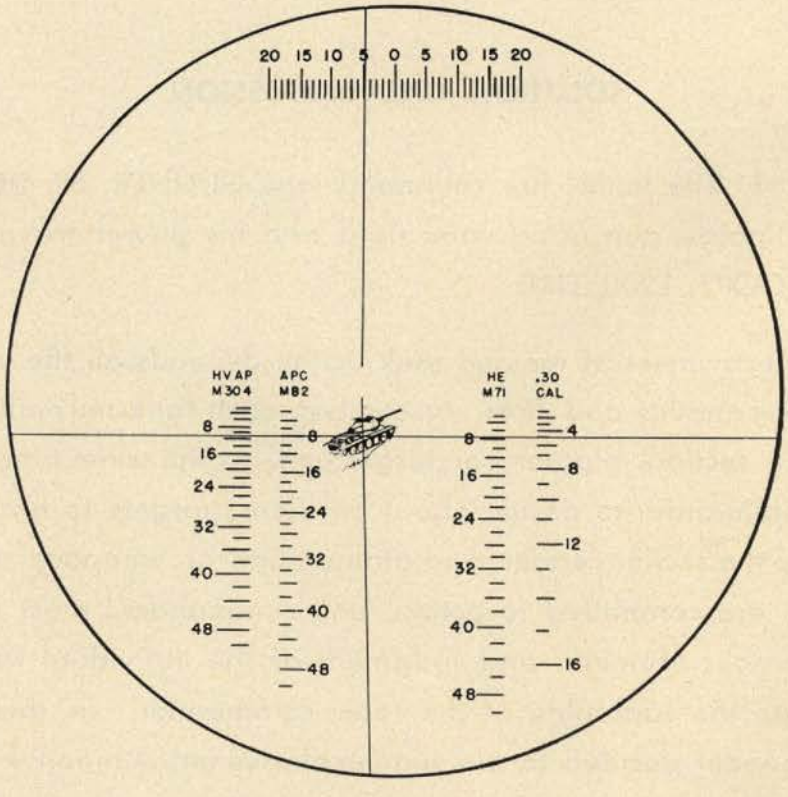
SITUATION 1. The initial fire command was GUNNER, HE DELAY (tank commander points gun using vane sight and his power traverse control handle), TROOPS, 1200, FIRE.

The effectiveness of massed tank action depends on the way the individual tank moves and fires. In combat, each tank normally performs as part of a section, platoon, or larger unit. At the same time, it is up to the **tank commander** to decide about positions, targets to engage if not specified by the section leader, and ammunition or weapons to be used. Once tanks are committed to action, unit commanders must rely on the initiative, resourcefulness, and judgment of the individual tank crew—especially on the capability of the tank commander. In this case, the tank commander decided to use high explosive ammunition with fuze de-

lay against the dug-in enemy personnel. Not only would this ammunition give ricochet air burst on the position, but it would provide sensing indication: the range to the target was in excess of the burn-out time of the tracer element in caliber .30 machine gun ammunition (700-900 yards).

SITUATION 2. a. The initial fire command is GUNNER, SHOT (tank commander points gun using vane sight and his power traverse control handle), TANK, 800 ONE LEAD, FIRE. Targets moving across the field of vision require a lead. The initial fire command calls for one lead (5 mils).

b. On the M46 tank, the gunner's sight is a T152 telescope with a sight reticle as shown below. The reticle has two movable index lines: horizontal for range, vertical for deflection or lead. These reticles are moved by knobs found just below the front mounting bracket of the sight mount. The T152 sight reticle incorporates an aiming data chart to facilitate the gunner's compensation for ammunition of different muzzle velocities. In this case, the gunner sets the horizontal index at 800 yards, under the APC column, and sets the vertical index 5 mils to the **left** of center. On the T152 sight the gunner sets his lead in the direction opposite to that of the moving target, **and then re-lays on the center of the target.**



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A GREAT FIELD COMMANDER'S WORLD WAR II MEMOIRS

A SOLDIER'S STORY. By General of the Army Omar N. Bradley. Henry Holt & Co., New York. 640 pp. $5.00.

Reviewed by

ROBERT S. ALLEN

A Soldier's Story adds another notable achievement to the many that already emblazon the distinguished record of General Omar Bradley.

This book is outstandingly the best memoir so far published by a top military commander of World War II.

It is a superb literary and history feat.

In readability, organization of material, range and authoritativeness of contents, both for the layman and the professional, in candor and, above all, honesty, this after-action report is in a class by itself. There is nothing comparable to it by a battle commander in this or any other country. As World War II history, it is surpassed only by the masterful volumes of that peer of them all in any field —Winston Churchill.

There will be some who will fret and sputter over Bradley's blunt statements. Partisans of this and that outfit and personality are sure to be miffed, to put it mildly. This reviewer, for example, an impassioned zealot of General George Patton's illustrious Third Army, is firmly convinced a very good case can be made on the contention that on occasion, General Bradley displays an undue protective partiality toward Hq First Army, which he commanded in the Normandy invasion.

But no one can question his honesty or accuse him of malice or unfairness.

Although he was obviously irked by Third Army's boisterous cockiness and strident aggressiveness, Bradley warmly lauds its great fighting qualities and history-making triumphs. He acclaims as "brilliant" the fabulous work of Patton's Staff in the Battle of the Bulge, and in recounting Third Army's subsequent equally astounding drive to the Rhine, remarks, "Third Army viewed defensive warfare as something to be shunned at all costs."

Bradley is similarly frank and fair about all others throughout the book. He gives generous praise where he considers it merited, and blunt criticism where he considers that due.

And he does the same thing about plans and operations. Bradley doesn't claim that everything worked out according to prior concept and schedule; that no mistakes were made and that all came out for the best. Above all, he doesn't profess to have done all the masterminding himself and to have won the war practically singlehanded.

Not only in literary quality, but in tone and viewpoint *A Soldier's Story* is a far different—and much better —book than several others in the same category published a few years back.

Bradley tells all about the blunders; plenty of them, from Africa to the Elbe; bitter and tragic. He tells who was responsible for them, how they happened, and the grim cost. He spares no names and no details.

This honesty is one of the wonders of this volume.

Such forthrightness is virtually unknown among the military hierarchy. It seems to be an unwritten law

The Author

General of the Army Omar N. Bradley, graduate of West Point in the Class of 1915, became a major general two months after Pearl Harbor. Along a path from the States to Africa, Sicily and the Continent, in successive command of division, corps, Army and Army Group, he became field commander of more men than any military leader in U.S. history.

The Reviewer

Robert S. Allen, well-known journalist and Washington correspondent, formerly co-author of the syndicated Washington Merry-Go-Round column, is a Staff Writer of the North American Newspaper Alliance, and a radio commentator. He served as Executive G-2 of Patton's Third Army throughout the European campaign, telling its story in *Lucky Forward*.

With the 28th Division in amphibious training along the Florida Coast, 1942.

among them not to talk out loud about their failings and shortcomings, professionally and personally. Bradley's outspokenness is as rare as it is gentlemanly.

He makes no bones that he erred, and that he has likes and dislikes. He is a human being, and acts like one. But, always, a very decent one. He affects no superman role. There is no posturing or grandstanding. He is fully aware he is a commanding general, and also that he is not a tin god on wheels.

Luck and fate may have made Bradley a man of destiny, but he isn't running for anything—announced or unannounced.

He is a steadfastly honest, honorable and conscientious American officer and gentleman, and his magnificent book is equally fine and satisfying. It's an exhilarating experience; makes you proud to be an American.

This country is truly in safe hands so long as it has leaders of the quality, courage and integrity of Omar Bradley.

Those who may be irked or offended by what he has to say will find it difficult to deny that Bradley bases his opinion on the record. There will be disagreement with his opinion —some of it probably very violent disagreement—but the record will be difficult to deny. That's the great strength of Bradley's book and his character.

He lays it on the line without malice or pettiness, and lets the record speak for itself.

A graphic illustration of this ingrained honesty is his attitude toward General Dwight D. Eisenhower, who not only was his superior officer, but who, literally, gave him his chance to win fame and exalted rank. Repeatedly, Bradley does not hesitate to let the record speak in a highly critical manner of his friend and commander.

The most dramatic instance of this is Bradley's account of his blunt showdown with Eisenhower after the Germans' back had been broken in the Bulge. Montgomery had staged one of his more odious antics, in the form of a press conference in which he modestly told British newspapers how he had saved the Allied armies—an utterly unfounded claim, as the record clearly proves. Not only did Eisenhower not repudiate this thoroughly dishonest declamation, but he did nothing to put the quietus on an even more mischievous situation—Monty's long conspiracy to make himself commander of all Allied ground forces.

Following is Bradley's remarkable account of this extraordinary affair:

"While we labored to retrieve the integrity of U.S. command, the proposal that Monty be named top ground commander snowballed with the assistance of a part of the British press. And even though General Marshall had once reassured me that we would never be sandwiched under British command, I felt it necessary to state my position uncompromisingly to Ike. When I raised the issue, Eisenhower fended it off impatiently with a reassuring reply.

" 'Nevertheless you must know,' I said, 'after what has happened I cannot serve under Montgomery. If he is to be put in command of all ground forces, you must send me home, for if Montgomery goes in over me, I will have lost the confidence of my command.'

"Ike flushed. He stiffened in his chair and eyed me hotly. 'Well —' he said, 'I thought you were the one person I could count on for doing anything I asked you to.'

" 'You can, Ike,' I said. 'I've enjoyed every bit of my service with you. But this is one thing I cannot take.'

"Several days previously I had indicated to Patton that I would feel

With Collins at Cherbourg.

Ike pins on a DSC cluster.

With Patton at Bastogne.

With Private John Powell.

obliged to ask for relief rather than submit 12th Army Group to Montgomery's command.

"George clasped me by the arm. 'If you quit, Brad,' he said, 'then I'll be quitting with you.'

"By this time I could not have temperamentally subordinated myself to Montgomery's command. Not only were we as fully competent as the British but by now the U.S. had committed 50 divisions in the ETO in contrast to the 15 of Britain. So overwhelming a superiority, I argued, strongly supported our insistence that U.S. troops be fought under a U.S. field command.

"On this question of a super ground commander, Eisenhower stood firm and the British press relented. But during the period that this campaign raged, Montgomery did nothing to curb it. Yet he could easily have snuffed it out with a simple press statement disavowing any need for the over-all command that had been proposed for ground forces."

A Soldier's Story is in many respects the best account so far available of the virtually forgotten Sicilian campaign. Why this operation has been overlooked by military and other historians is a mystery. It included everything; amphibious, airborne, allied forces, and was completed in 38 days. It's a perfect example of a comprehensive and conclusive operation, yet practically nothing has been written about it. Bradley's account is excellent, but the campaign is worth a book of its own.

Regarding the ETO, which understandably occupies the bulk of Bradley's story, two facts stand out above all others.

(1) The previously noted conspiracy by Montgomery to set himself up as top battle commander, despite Britain's one-to-three inferiority in troops and his own many limitations, numerous costly blunders, and provocative anti-American bias and arrogance. The only two American commanders who were able to stomach Montgomery with any degree of tolerance were Eisenhower and the late Lt. General William H. Simpson, who commanded Ninth Army. All through his book, Bradley records instance after instance of Montgomery's infuriating scheming and highhandedness—including outright affronts to Eisenhower.

(2) The protracted struggle with the British over basic strategy in waging this war. This conflict lasted from the planning stage of OVERLORD until after the Bulge. The British were obsessed with one concept—to clear the Channel Coast. That alone ruled all their thoughts and aims. Everything else was subordinated to it. Bradley makes it abundantly clear that Eisenhower was under constant and tremendous pressure to give in to this demand. And he did give in, unfortunately. That's why the war was prolonged six months; why Third Army was sat down when it had nothing out in front of it but a routed and disorganized enemy and could have speared to the Rhine by November, 1944; why Monty suffered his bitter defeat at Nijmegen, and why he dallied about clearing the Scheldt, with the result that weeks were lost before Antwerp, already captured, could be used as a desperately needed supply base; also, why the tragic Battle of the Bulge occurred.

This astounding "war within a war" is forcefully summed up in Bradley's dramatic account of the final collapse of the Wehrmacht, as follows:

"As Third Army made ready to bolt south from its bridgeheads below the Moselle and crash down on the Rhine at Mainz, Eisenhower at last came face to face with the long-disputed issue of a single versus a double envelopment of the Ruhr with a second thrust from the south. The question had been simmering for almost six months. In addition to the Canadian First, the British Second, and the American Ninth Armies already al-

High noon and a pull of the lanyard for Independence Day, 1944, Normandy.

A decoration from Koniev.

Montgomery of 21st Army Group.

lotted him for his major effort on the north, Montgomery had insisted that SHAEF set up a follow-up force in reserve of ten divisions to be 'borrowed' from First Army. It was in anticipation of this request that SHAEF had originally limited me to four divisions in the Remagen bridgehead. Had those ten been transferred to Monty as he asked, I would have been left with only the Third Army. And as a consequence Patton and I would probably have sat out the remainder of the war in a holding position on the west bank of the Rhine.

"Fortunately Eisenhower called Montgomery's bluff. If those ten divisions of First Army went north, Eisenhower told him, 12th Army Group was also to go north in command of both the First and Ninth U.S. Armies. Just as soon as Monty learned of Eisenhower's condition on those ten divisions, he promptly dropped the request. Rather than give up the Ninth Army and share the northern thrust with an American Group command, he preferred to go at it with what he had and direct it from 21st Army Group. As a result our six months' struggle was finally won by forfeit and Eisenhower was able to resolve this most contentious tactical dispute of the war. First and Third Armies were directed by SHAEF to encircle the Ruhr from the south. Despite Bull's gloomy objections, Remagen was to form the springboard for First Army's advance to the Elbe."

A Soldier's Story is fascinating reading. It would be profitable reading at any time. It is particularly so in these chaotic and strife-torn days, when it is profoundly inspiring to have reaffirmed the fact that able, sincere, plain-talking and honorable men ARE in command of our armed forces.

With Army commanders: left to right: Simpson, Ninth Army; Hodges, First Army; Patton, Third Army; Gerow, Fifteenth Army. At 12th Army Group, March, 1945.

SPEAKING OF BOOKS

In previous issues of the magazine we have made known our desire to assemble at the Headquarters of the U. S. Armor Association a library on mobile warfare that will rate as second to none. We have set up a long-range procurement plan which visualizes the addition of every book that comes along on our special subject.

At the present time, we are somewhat ashamed of the library. Try as we will, we can't understand what successive staffs of our 66-year-old Association and 63-year-old publication did for essential reference material. The existing library is nothing more than a bare start. It is completely deficient in background on cavalry. It contains just a start on armor, and we have vowed that we will not allow the situation as regards cavalry background to happen to the armor end.

In mentioning our thoughts in the magazine we have had several offers from branch personnel to contribute books to our library. Coming for the most part from retired officers who wish to see valuable material put to good and active use, they have offered their personal libraries, so far as military books go, for donation to our shelves. Their kindness has prompted us to set forth some thoughts for other interested personnel.

The Association will be most happy to accept contributions of books for the Headquarters library. We would like the items to be limited to military subjects, and we are particularly interested in the technical and general books on *Cavalry* and *Armor*. Books covering campaigns in any war in history are most desirable. Our big emphasis goes on mobile warfare.

Those who feel they may wish to contribute books are requested to use the following procedure: Send us a list of the books you care to offer, in order that we may check it against our present file. We will then notify you which items we do not have and would appreciate having. All shipping charges will be paid by the Secretary of the Association. The books will be logged in the library, and in addition to personal acknowledgement by letter, a list of donors will be carried in the pages of the Book Section of the magazine. In later issues we will publish a list of titles of important books on our activity which are not in our collection. Undoubtedly some of the more valuable historical items will later be transferred to the Mounted Service Museum library when it is established, with the usable reference items being retained in the Headquarters for editorial use in connection with the magazine; for member use; and for historical research.

Any and all assistance in establishing our mobile warfare library will be sincerely appreciated.

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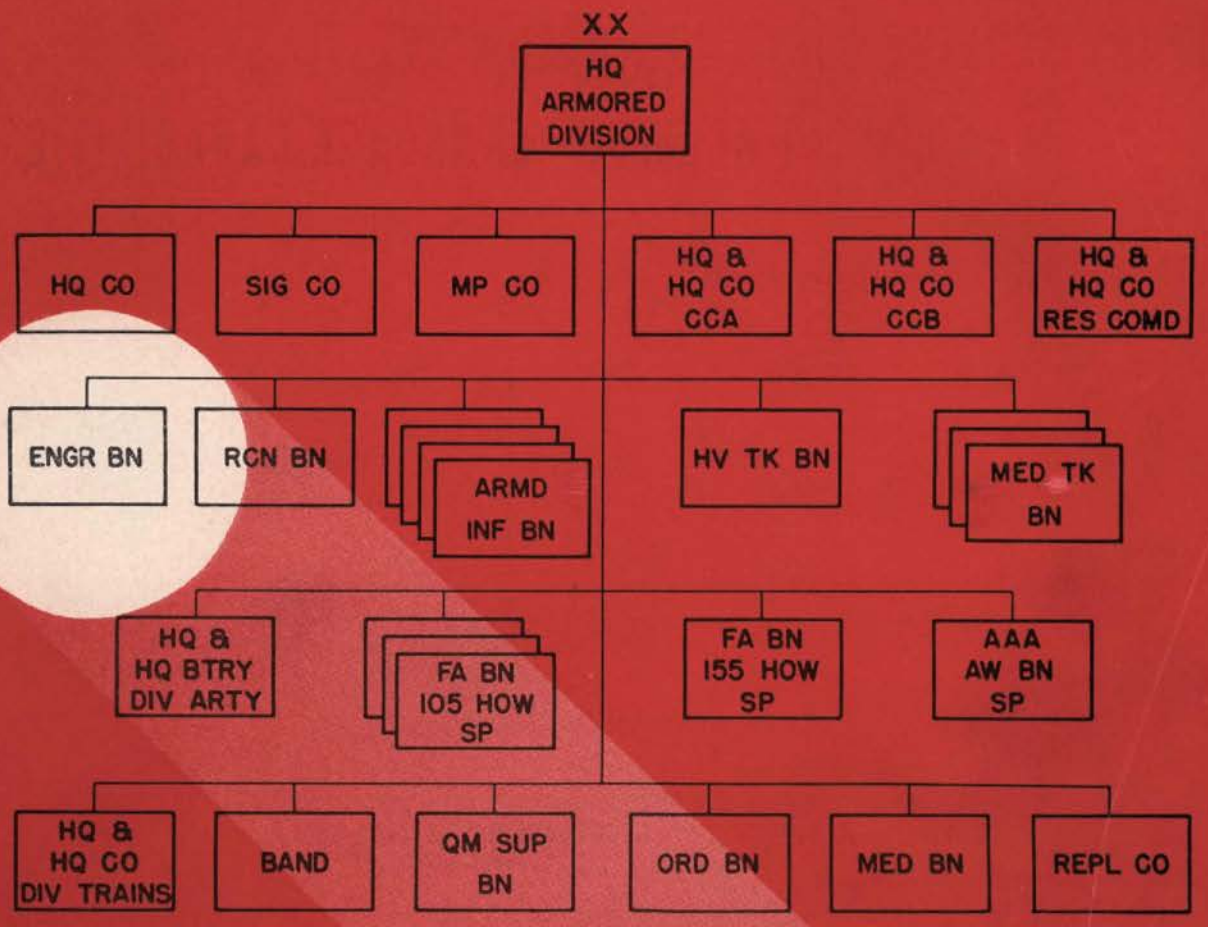

ARMOR'S SPOTLIGHT ON ENGINEERS

Engineers are a key factor in making possible Armor's role of breakthrough and exploitation. There is a whole battalion of engineers in the armored division (see above), the largest of its type in the Army. On the battlefield of today engineers will be constantly at work, blocking enemy armor while advancing our own. If you're an engineer you're a part of the punch! Subscribe to ARMOR!