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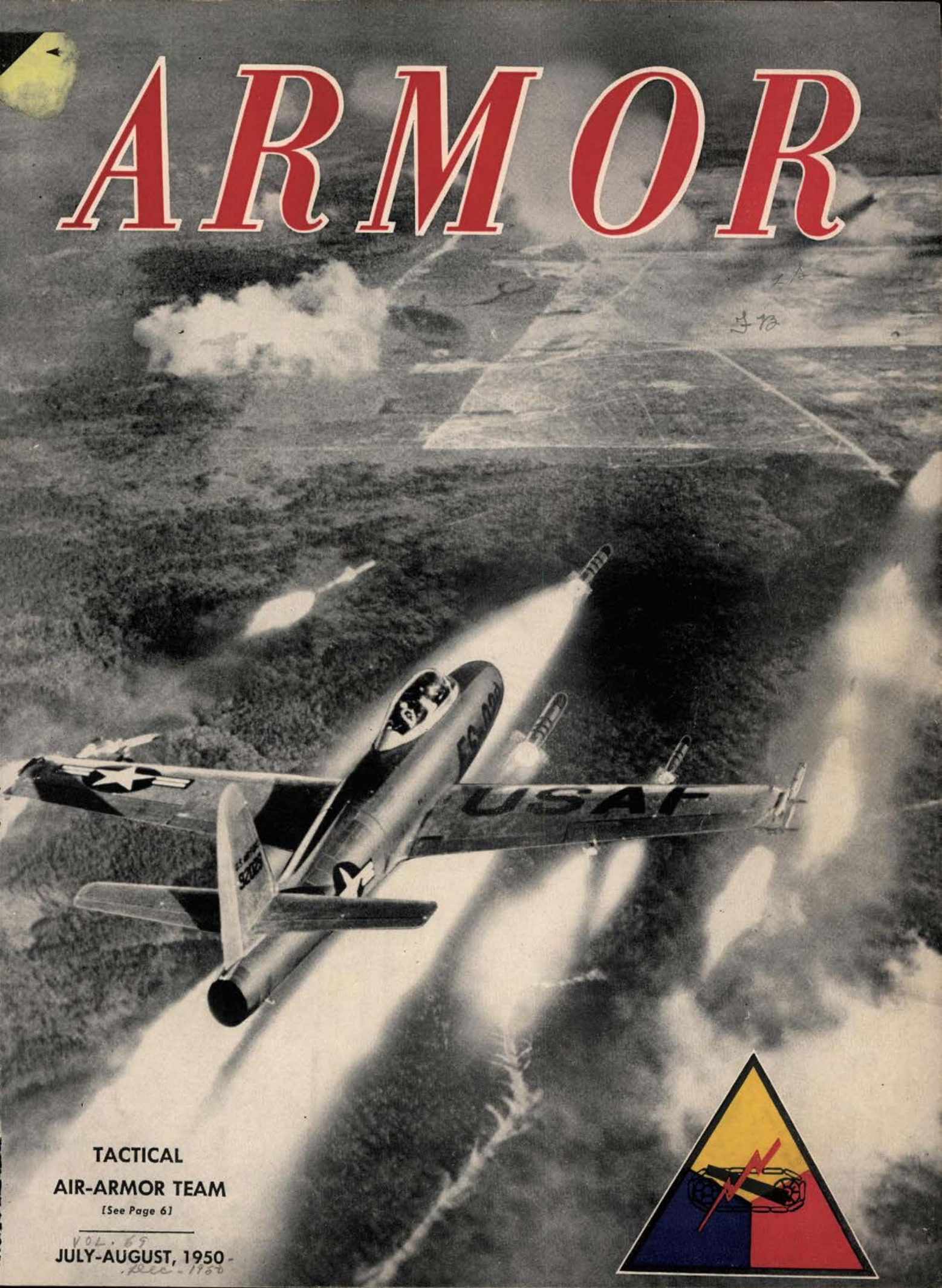

TACTICAL

AIR-ARMOR TEAM

[See Page 6]

VOL. 59

JULY-AUGUST, 1950

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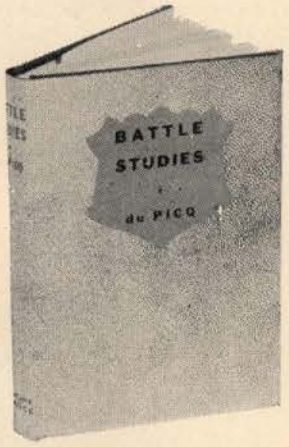

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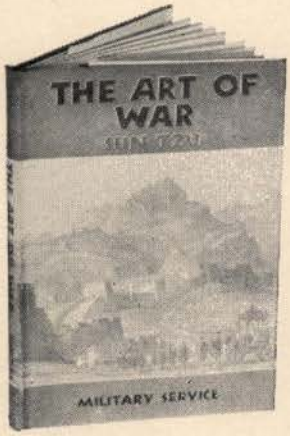

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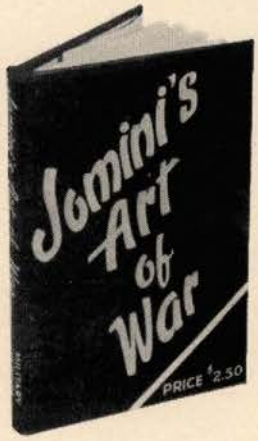

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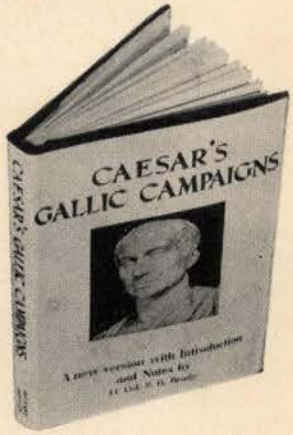

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CONTENTS

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LETTERS to the EDITOR

Dear Sir:

I read with much interest the article "A Tank Platoon in Tunisia" by Charlie Davis in a recent issue. The photograph of the suspension of the Tank Medium M3 No. 309478, on page 40, is not directly referred to in the article and the following is an addition to the remarks made by Captain Davis pertaining to the condition of our tanks in Africa.

The photograph, which was taken in mid-December 1942 near Souk El Khemis, Tunisia, clearly shows three blown bogie wheel tires, and a close examination reveals between the rear track support roller and idler, the absence of rubber in three of the blocks. This is indicative of the poor condition of tracks and road wheels of the M3 medium tanks of the 2d Battalion, 13th Armored Regiment, immediately following the fighting in November and December in the Medjez El Bab-Tebourba area. The mobility of the tanks was seriously affected as tracks worn to this degree make operation slow, difficult and unreliable. In other words, these vehicles were close to being totally immobilized.

Why were they in this condition? Just prior to the invasion of North Africa, in North Ireland, where the 1st Armored Division was located at the time, the tracks were turned (this was the period of the reversible block) in lieu of replacement with new tracks, which were not available in Ireland or England. Following its landing and short combat period in the Oran area, the battalion was ordered to get on to Tunisia, preceded by the 1st Battalion, 1st Armored Regiment, equipped with light tanks, M3A1, which were shipped by rail. Railroad, shipping, and tank transporter facilities were lacking to move mediums: to get on meant a road march of some 500 miles from Tafaroui, Algeria, to near Medjez El Bab—broken only by a sea movement on British landing craft from Algiers to Philippeville. As a result, when the tanks completed the road march, much of which was over mountain roads, they went into combat in a bad condition. Time nor parts were available to remedy the situation. To finish, a limited amount of suspension parts were acquired through supply and controlled cannibalization during a so-called refitting period (replacement tanks and engines are another story) in late December and the armored vehicle shoestring continued with little improvement in Tunisia until 9 May 1943.

Richard J. Grondona,
Major, Ordnance.
U. S. Army Mission—Argentina.

Dear Sir:

Upon receipt of your promotional letter my first impulse was to tell you why I would not become a subscriber. However, I waited to see the Mar.-April issue. One page 33 of your magazine, I found the indication that you are aware of your shortcoming. I am referring to your editorial on "Company Grade, etc."

Possibly the reason for the dearth of material on the company level is not apparent at first glance.

I believe there are numerous reasons:

1. Inexperience of lower grades in analysis.
2. Lack of facilities to prepare a decent article.
3. A reluctance to enter into a field which might be considered reserved for people of a higher level.

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Rates: See bottom of contents page.

A couple of suggestions which probably have occurred to you already are:

1. A vigorous encouragement of Letters to the Editor.
2. Rewrite specialists who can dress up some of the more worth-while ideas.
3. Questions by the magazine that encourage replies.

I believe we should play up the Squad Leader or Car Commander. In the final analysis, he's the one who carries the ball.

E. F. BRESLIN,
2d Lt., Armor.

APO 201, San Francisco.

● *The company level is something always in our mind. We have incorporated some items in this issue. More will be forthcoming in each issue.*—ED.

Dear Sir:

I would like to call to your attention an article in the April 1950 issue of the California Institute of Technology magazine, *Engineering and Science Monthly*, titled "A Case Study of Innovation." This article, I believe, should be read by every Army officer. I thought that ARMOR might be interested in publishing the article in whole or in part.

The author of this article, Mr. Elting E. Morison, is a distinguished historian. Using as a background the story of the introduction of continuous-aim firing in the United States Navy, the author discusses the process of change in general. His story of Admiral Sims' (then Lt. Sims) successful fight against superiors in the Navy who appeared dead set against change in any form should be an encouragement to young Army officers who feel that they have no chance in effecting changes in their own military spheres because the brass opposes.

ELMOR G. LAWTON,
Lt. Col., Corps of Engineers.

Fort Knox, Ky.

● *ARMOR has reviewed this article and agrees with Colonel Lawton concerning its value. Arrangements have been made with Editor Hutchings of* Engineering & Science Monthly, *and the article will appear in the next issue of ARMOR.* —ED.

Dear Sir:

In the Jan-Feb issue there was an exceedingly engrossing article concerning the history of the Mounted Rifles by Col. Samuel L. Myers which, I believe, contains an incorrect statement.

Col. Myers states, and I quote, "The spirit of the new regiment was better demonstrated in the storming of Chapultepec, a stone castle which guarded the approach to Mexico City. Second Lieutenant Jeb Stuart was a member of the storming party. . . ."

To the best of my knowledge, Jeb Stuart did not participate in the Mexican War, for in the year that Chapultepec was assaulted, Stuart was only about fourteen years of age. He did not graduate from West Point until 1854, 13th in a class of 46. Incidentally, Brevet Lieutenant Colonel R. E. Lee was commandant of the Academy at that time.

Stuart joined the Mounted Rifles in that year (1854) when the regiment was stationed in Texas.

CHARLES WEIRICH.

Washington, Penna.

● *Excellent proof of how a misstatement can be fostered through history. 3d Cavalry will check its historical record. ARMOR's staff is so strapped that much dependence must be placed upon our authors.*—ED.

Courtesy *Life* © Time, Inc.

THE COVER

The tactical air-armor team sprang to life in World War II. This wedding of high-performance, close-support aircraft with armor produces a team of range and shock. In the offense or the defense it is a team of decision. (See page 6.)

reconnoitering

As the last several issues of the magazine were printing we made it a point to be on hand at the plant, equipped with camera, to cover the various phases of the operation. The reason—to corral details of one of the most interesting operations in the field of publishing—the printing. Here, supported by a few pictures to make it live, is the story of the physical putting together of the magazine you have in your hands.

◀ *G. Edmond Massie (left), President and Treasurer, and G. Edmond Massie, 3rd, Assistant Treasurer, consider some of the fine points of the magazine.*

ARMOR is printed by the firm of Garrett & Massie, in Richmond, Virginia. The magazine, under its previous names, Armored Cavalry Journal and The Cavalry Journal, has been printed by Garrett & Massie for many years. The firm is equipped for and specializes in the printing of magazines, including four-color work, in quantities up to 100,000 per issue. G & M has its own modern one-story plant, will soon put under way an addition for 1951 occupancy.

◀ *Linotypes under the deft touch of skilled operator Winston and others, put copy into metal for printing.*

The average person considers the printing of a publication as getting under way at the moment it is "put to bed." Actually the printing is a never-ending cycle, particularly in the case of a magazine such as this. Copy flows back and forth regularly between the editorial office and the printer.

All copy logged out of the editorial office is logged in at the office of Garrett & Massie. After a careful check it is routed to the plant and set up on the work schedule.

▶ *Louis G. McClellan, Plant Superintendent, routes copy to the plant via the composing machines, and sets the work schedule.*

First step in the printing is the setting in type on the linotype machines of the original manuscript. From the linotype comes the long galley proof for proofreading at both plant and editorial office.

◀ *Henry W. Cottrell, Sales Manager, checks copy for ARMOR and marks up "pix" for plates.*

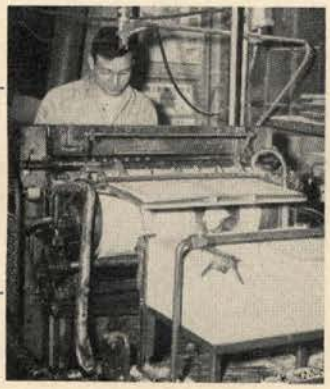
The next detail falls to the compositor, who will receive the layout for the first page proof, will set the hand type for titles, put engravings in their proper place in the page frames, and drop in the lines of type from the long galley trays.

▶ *When galley proofs are returned correct, "hand men" like compositor Tatum make it up into page form as shown in layouts.*

Big, automatic-fed Miehle presses like this one in charge of pressman Thomas are made ready in 16-page forms and the sheets of the magazine begin to roll off.

When 64 individual pages have been similarly made up, all corrections and adjustments have been made by the editorial office, and a final page proof is in the hands of the printer, the major part of the operation gets under way.

To describe how pages fall would involve us in a sort of Abbott and Costello routine, but it is enough to say that four big frames containing 16 pages each are made ready. Sixteen pages will go on each side of 36 x 48 inch sheets of processed enamel paper, a total of 32 pages to the sheet. These sheets go through the big Miehle presses, then go to the Dexter folder for folding into 32-page signatures.



Front covers are run on a Miehle Vertical (small automatic) press. Here pressman Nuckols watches color, impression and register as the sheets stream through.

This combination Gatherer-Stitcher-Trimmer assembles the signatures into magazines, wire stitches them, and trims the magazine to correct size. Here porter Shands tidies up around the machine, operator Vaughan sets it for correct size and thickness, Miss Giddings feeds cover, Miss Spencer drops in the subscription cards, while Mrs. Merriman and others feed the inside signatures.

Meanwhile, the cover, which includes front, inside front, inside back and back covers, is running on a separate vertical press. Front cover is a four-color job, and that familiar triangle for ARMOR requires lots of work to insure the proper register.

Printed sheets must be folded and folder operators Pyles (upper) and Robins quickly put them through this Dexter folder in 32-page signatures (16 pages on each side of the sheet).

The final operation is an assembly line arrangement that drops the first signature down, puts in the subscription form, covers it with the second signature, and tops out with the cover. The aligned units pass under the stitcher, then the magazine goes under the knife for the trimming of the right margin, the top and the bottom. The finished product rolls out ready for insertion in the mailing envelope or the bulk package. From there the postman takes over to put your magazine in your hands.

This is the Trimmer at the delivery end. Misses Spencer, Orange and Giddings are feeding signatures to the machine, while operator Vaughan checks the publication as it passes through the Trimmer. When the magazine reaches the delivery end of the Gatherer-Stitcher-Trimmer, it is ready for mailing.

The printing is a fascinating end of the publication business. We wish every reader of ARMOR could go through the plant with us. As a substitute, we hope you have enjoyed this little trip in words and pictures.

The Editor

Tactical Air . . . .

Tactical Air and Armor are a potent partnership in modern warfare. Products of technology, both arms are equipped to meet the demands of the battlefields of today and tomorrow. One of our top airmen looks at the team

by COLONEL GILBERT L. MEYERS

THE Battle of the Bulge of World War II will probably be cited for a long time to come whenever the subject of tactical warfare is mentioned. As Combat Operations Officer of the 9th Tactical Air Command I had a ringside seat at this battle and because it is so apropos to my subject I am going to fall in line and use it as an example of the effectiveness of combined tactical air and armor.

At this stage of the war, German air power had been demoralized by Allied counter-air and strategic bombing of its factories and vitiated by the mistakes of its own high command.

Acting on the principles of surprise and the attainment of the initiative by an offensive operation, the Germans launched a desperate counterattack which succeeded in driving our forces back and resulted in the concentration of a large amount of armor in the "bulge" that was formed. That they were very near a complete break through our lines, although almost totally without air support, can be attributed to a great extent to the fact that our tactical air power was grounded by weather.

When the weather lifted sufficiently to allow unlimited counter-operations, our fighter-bombers ranged over the area, striking at enemy tanks, trucks, columns, command posts and lines of communications while our own armor slowed the German drive to a walk and then stopped it altogether. The Germans had, perforce, attempted a World War I operation and been repulsed by the modern combination of air and armor.

In the first great war of this century the infant military airplane developed into early adolescence and became the "eyes" of the Army. The tank made its first appearance in the same conflict and was largely responsible for breaking the trench stalemate brought about by the perfection of the machine gun. World War II saw both air and armor grow to maturity and, when jointly employed, become one of the most

formidable teams ever known in tactical warfare. It is most important that we do not forget the tremendous striking power of the tank and the airplane and it is equally important that we do not forget the intricate technique of "quarterbacking" the team they form.

While the history of tactical air and armored forces is relatively short, their development into an effective team was hastened immeasurably by the advances made in the application of communications and electronics in the later stages of the last war. But aside from the scientific improvements that are continuing as never before in time of peace, certain basic principles of air-ground employment were learned that I believe will remain valid no matter what is evolved in technology. I will list these simple principles and then expound on the least obvious of them:

Five Basic Principles

First—there must be equality of command between the tactical air and ground team.

Second—tactical air force control must be centralized.

Third—the efforts of the tactical air and armored forces must be integrated for real effectiveness.

Fourth—general control of the air, or at least local air superiority in the area of operation, is a prerequisite to the success of the air-armor team.

Fifth—the immediate requirement for close tactical air support, however desirable, must be weighed against the need, in a given situation, of using tactical air in the longer range effort of interdiction.

For the purpose of this discussion, I will skip the first principle, which is now generally accepted, and begin this review with the second mandate.

The necessity for centralized control of the tactical air force effort. The tactical air control system of the Air

THE AUTHOR

Colonel Gilbert L. Meyers entered the Flying Cadets in 1937, graduating from the Pursuit Section of Advanced Flying School at Kelly Field to be assigned to the 35th Pursuit Squadron at Langley Field. In the early days of the war he was active in the air defense system of the Eastern Seaboard of the U.S. In April 1943 he flew the first P-47 Thunderbolt delivered to Air Force Tac units. He also commanded the first group equipped with these planes. In 1943 he organized and took overseas the 368th Fighter Group, which, under his leadership, was to play an outstanding role in the Normandy invasion and subsequent campaigns across Europe. In November 1944 he became Operations Officer of the 9th Tactical Air Command. In this post and as Chief of Staff he planned many of the decisive air operations during the final assault on Germany, including the defense of the Ludendorff Bridge and the air operations during the Battle of the Bulge. Colonel Meyers has held various posts since the war, becoming proficient in jet fighters in the period 1946-48 while commanding the famous 1st Fighter Group at March Field. In the fall of 1949 Colonel Meyers became Vice Commander of the Tactical Air Force.

. . . . and Armor

Dept. of Defense

Section of a Tactical Air Force Joint Operations Center. In the JOC air and ground intelligence and operations officers work side by side to insure the maximum possible coordination of the air-ground team. Requests from front-line ground commanders for close air support filter in to the ground officers in the JOC. They recommend approval or disapproval, based on needs for air support at other points on the front, etc. The air officers make the final decision, and issue orders to tactical units.

Force and air-ground operations system of the Army are designed specifically to put close support aircraft over the desired spot in the shortest time possible. When the situation requires, aircraft are kept on station over the front lines, available to be called down on targets by air control parties in the same manner that aircraft assigned as column cover for armored spearheads are called down by forward air controllers in the lead tanks. If a flight of aircraft is not immediately available, the front line ground commander initiates a request for a mission. At this point the need for centralized control becomes most apparent. The ground commander's request is relayed through the air-ground communications system and arrives at the Joint Operations Center at Army and Air Force tactical headquarters in a matter of minutes. Here, at the nerve center of the whole operation, the request is analyzed in view of the over-all situation from both the Army and Air Force aspect. It is decided how best the ground commander may be aided and the aircraft that can be diverted or called down on the job. In other words, it is this centralized control that provides that essential unity of effort and direction without which air potential would be expended in sporadic and ineffective attacks. The communications system in the Tactical Air Control Center, located adjacent to the Joint Operations Center, permits direct contact with aircraft that are available, and pilots are briefed on their new targets. The entire process, from initiation of the request to the arrival of aircraft may take less than ten minutes.

The third principle—*the integration of effort of tactical air and armored forces*—is most simple. In reality it is only a continuation of the second, but as I wish to stress the essentiality of teamwork in the air-ground tactical operation I am giving it a separate designation. Without detracting in the least from the striking power of the tanker in his own right, the relationship between the tanker and fighter-bomber pilot can be compared to the hound and the hunter. The analogy can be carried too far, for the tanker may also be the hunter, aggressively reaching out and destroying whatever target he finds. But in his relation to the fighter-bomber pilot in the team they form, the tanker does function much as a highly trained bird dog. He flushes

Dept. of Defense

Section of a Tactical Air Control Center. Nerve center of Tactical Air Force operations, the control center serves as collecting agency for information on all flights in the TAF area of operations. The large horizontal board shown above is a map of the area, and the small pedestals represent flights of aircraft in the area—(both friendly and enemy). The cards on the pedestals indicate whether a flight is friendly or enemy, the altitude of flight, approximately the number of aircraft in the flight, etc. Airmen around the board receive information from radio stations, thus presenting an up-to-the-minute picture of all air activity in the area at all times.

the quarry from cover so that the hunter can see it and get in a shot. When an enemy is out in the open he is a prime target for the fighter-bomber pilot. Again, the tanker in the team is instrumental in solving, to some extent, the bomb-line identification problem. The problem of identifying the foremost outposts of friendly lines in order to prevent air action against our own troops is as old as air support and will probably be with us to some degree as long as air and ground forces are jointly employed. Bulky armored forces are usually easy to spot and identify and as they are generally in advanced positions they constitute a very practical method of locating the enemy forward line.

A further example of the third principle is illustrated in the method of communication between the tanker and the fighter-bomber pilot. The most efficient means we have found is to carry the team effort to the point of putting an experienced pilot in the lead tank with a VHF radio so that he may talk directly to his own supporting planes. These pilots on duty with front line Army units, known as Forward Air Controllers, serve a dual purpose. Besides "talking" the fighter-bomber pilots onto targets, they are able to advise front line ground commanders as to the capabilities of tactical aircraft and aid in the selection of suitable targets. Using pilots as forward air controllers in tanks is a far easier expedient than their use with other ground arms. In the case of airborne troops, for instance, it is necessary to send pilots through a paratroop school to train them in jumping techniques. In the case of armored units, the pilot in the lead tank plugs his radio into the tank power system and is ready to begin work.

Principle number four—*general control of the air, or at least local air superiority in the area of operation*—is the most elemental of them all—applicable to tactical air-ground operations whether the air mission is in close support of tanks or infantry or to interdict a battle area. In essence, air superiority means for our purpose that our air force has sufficient advantage over enemy air power to allow our planes to exert air-to-ground effort in support of the tanker without prohibitive interference. It is gained by combat in the air or by attacks against the enemy's logistical facilities that are required to put his planes in the air. In either of these cases, the goal is numerical advantage. On the other hand, air superiority may have been achieved long before the particular operation by the development of better airplanes and more capable pilots—in any event, whether by numbers or capability, the fighter-bomber pilot must have, in reasonable degree, control of the air before he can really become an effective half of the air-armor team.

Dept. of Defense

Controllers in a Tactical Air Control Center. Seated on elevated stands in order to have a clear view of the plotting board in the center of the room, the controllers keep a constant check on air activity. They have a complex communications system at their disposal, allowing decisions of the Joint Operations Center to be flashed to interested agencies. As an example, flights of aircraft in the area can be contacted directly from the TACC, and ordered to targets designated by the JOC. This enables the JOC to employ the aircraft against targets dictated by minute-by-minute information available.

By an effective half, I mean that the fighter-bomber must both aid the tanker in the surface operation and protect him from air attack. One of the prime requirements for armored forces is the ability to maneuver and to concentrate in accordance with the tactical situation. This cannot be accomplished under sustained enemy air attack. A tank is in many respects an ideal target for opposing air forces, and because its power is so universally respected it is always high on priority lists of tactical air targets. A tank operation should not be mounted until general air superiority has been gained. If that degree of ascendancy has not been possible, then at very least there must be a guarantee of local superiority—predominance of air power in the immediate objective area.

I have used the Battle of the Bulge as a classic example of general air superiority. The evacuation of Dunkirk is as good an example of local superiority. The British demonstrated there that when the situation demands, it is possible to concentrate fighters over a small area, and deny the enemy the use of the air over that area, notwithstanding his overall numerical superiority.

Up to this point I have been generalizing on the subject of the air-ground team mainly as regards the close support furnished the tanker by the fighter-bomber. The fifth principle I have enumerated—*the immediate requirement for close tactical air support must be weighed against the need, in a given situation, of using tactical air in the longer range effort of interdiction*—amounts to a limitation on this support that every tanker should understand.

It must be remembered that tactical air has the ability to aid in the

surface battle in several ways. While the close air support mission is indeed of great value, it is by no means the total of tactical air capability in relationship to the tanker, nor need it even be the one of greatest importance.

The man fighting on the ground in a tank or with a rifle is, quite understandably, primarily concerned with what is immediately confronting him. In a sense he is an opportunist—he takes every advantage that offers itself today and hopes that tomorrow will take care of itself. A constant patrol of fighter-bombers overhead must be a fond dream of the ground commander. But tactical situations are not that ephemeral. Other than immediate requirements must be considered. It is very possible that the tactical air effort in a given situation may be more profitably expended in isolation or "interdiction" of the battle area.

The interdiction mission borders on the strategic concept of air employment in that tactical air can range behind the enemy lines, attacking troop and vehicle concentrations and columns, fuel dumps, trains, and other lines of communication—in short, cutting off and immobilizing the objective area in order to cripple the enemy's capability to fight tomorrow, or the next day, or perhaps a week from now.

I don't mean that tactical air should not be "on call" to aid the tanker. This concerns constant overhead air patrol versus employment of tactical air to isolate the battlefield, to deny the enemy the ability to reinforce and maneuver, and to destroy as much of his fighting machine as is possible before it is committed to battle.

Airplanes are profitable weapons only when they are attacking profitable targets. There are simply not enough suitable targets in the immediate vicinity to make the assignment of a flight of aircraft to every ground unit a paying proposition. Air power must be free to range over the entire area, countering enemy air and concentrating on ground targets as dictated by the over-all situation. The other course is wasteful and restricts the flexibility of the airplane, which is one of its most valuable qualities.

So much for what I consider the basic principles of tactical air employment. In the hope that it will be of interest to tankers, I would like to trace roughly the development of the aircraft and its armament as a weapon against enemy armor.

* * *

The problem of devising a satisfactory air weapon for use in penetrating tanks was ultimately answered in the last war after a long period of constant improvisation. The trouble, quite naturally, stemmed from the difficulty in mounting in an airplane a gun with the striking power of an artillery weapon without sacrificing the accuracy and rate of fire necessary for aerial attacks on tanks.

In the Russian campaign, the Germans tried to develop specialized antitank squadrons, equipping them with the heavily armored and slow (250 mph) Henschel 129, armed with a 30mm tank-busting cannon. These squadrons were first used as part of the offensive armor-air team, but they were eventually relegated to the vain attempt to check the Soviet tank thrusts. The Henschel was not a success because it was too specialized. Its slowness made it an easy victim for a light fighter.

Allied experiments followed somewhat the same lines in the early days of the war. The Bell P-39 Aircobra mounted a heavy caliber gun in its propeller shaft. Though faster and better suited for general air fighting than the Henschel 129, the P-39's low ceiling soon put it in secondary roles in the American Air Force, though it remained a great favorite with the Russians.

All-Purpose Not Practical

Periodically, proposals were advanced for the construction of specialized U. S. ground support airplanes. Suggested types were invariably heavily armed and necessarily ponderous so as to be able to carry antitank cannon. The answer was obvious—"flying tanks" would require an escort of fast and high-altitude fighters. One of the mistakes of the Luftwaffe high command, referred to before, was that they devoted too much of their aircraft production to highly specialized ground support aircraft. In early campaigns, before the Germans were opposed by first class allied fighters, their specialized types were terrific air-ground weapons. Thereafter, their lack of versatility put an end to their effectiveness.

The answer to the requirement for "tank-busting" fire power came before the evolvement of the ideal type of aircraft to carry it. Many methods of putting tanks out of commission were tried during the last war—dive-bombing with armor-piercing bombs, skip bombing to hit the tank's vulnerable traction mechanism, and the use of incendiaries, including napalm. These methods were successful in varying degrees, but none of them appeared to be the real solution. It was not until the later part of the war that the best weapon, the aircraft rocket, made its appearance.

We received aircraft rockets in the European theater late in 1944. Our experiences with them left something to be desired in the way of accuracy, but this was not the fault of the weapon. Our pilots had not been trained to use them and our sighting equipment was not completely satisfactory.

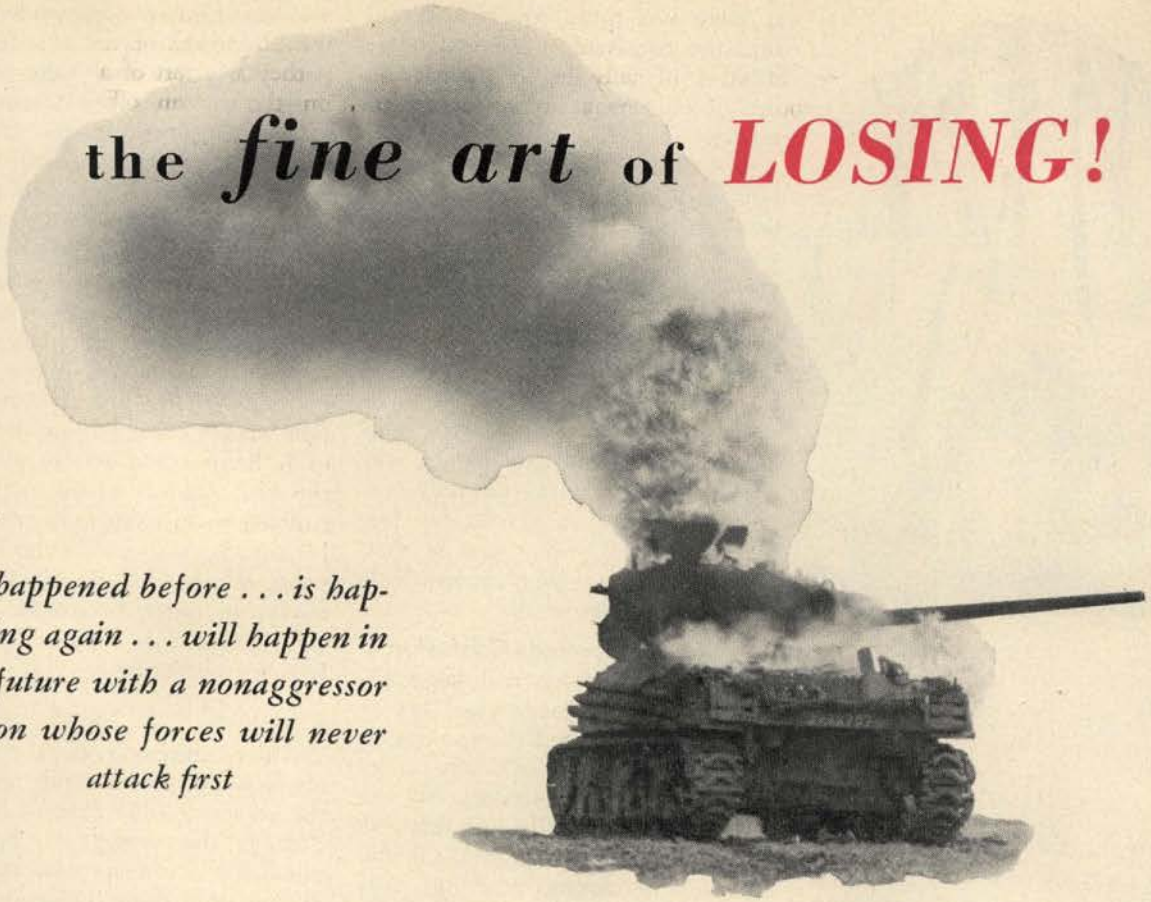
The rocket, with its shaped charge, has tremendous penetrating power. Today, our late model fighter-bombers can mount up to 32 five-inch rockets or 12 five-inch rockets with two 1200-pound Tiny Tims. This gives this aircraft a one-time "punch" almost comparable to the salvo of a destroyer.

Of course, the solution to the problem of providing this armament with the proper aerial platform was met by the postwar development of the jet aircraft.

* * *

The principles of tactical air employment I have discussed are as appropriate to today's fighter-bomber as they were to the wartime conventional aircraft. The techniques for the application of these principles are constantly advancing through developments in communications and electronics and improvements in training standards. The air-armor partnership of a future war has a destructive potential inconceivable in the last war. We will have the equipment and the individual skill. We must maintain and increase the ability to integrate our forces into a team so closely allied that our joint effort will have the effectiveness of a single offensive weapon.

the *fine art* of LOSING!



It's happened before . . . is happening again . . . will happen in the future with a nonaggressor nation whose forces will never attack first

by COLONEL HAMILTON H. HOWZE

IN this short article I shall undertake to discuss a number of matters, mostly unpleasant, pertaining to the fighting of a losing battle. It is more agreeable to write about victories, and those are the tales that find their way to the pages of this and other service magazines. But it is healthy, sometimes, to have a good look at the dirty end of the stick.

United States forces operate on an offensive principle, and feel that by vigorously carrying the battle to the enemy the greatest gains are to be had. As a theory this is irrefutable, but I do suggest that some of our commanders have come to look upon it as a simple and infallible secret of success to be applied, like paregoric, in all cases. The theory produced a succession of impressive victories in World War II—when backed by a tremendous superiority of means. It is not too difficult to work up an enthusiasm for the offensive if one has three times the enemy strength in tanks and infantry, can lay down twenty-five rounds of artillery for each round one must take in return, and commands a hundred-to-one superiority in tactical aircraft. Of course it was not ever thus, but in the last few months of the war it was.

In the limited field of my own observation there was, in the last phase in Europe, a pretty general disregard of the requirements of defense, and some startling arrangements were to be found: battery positions and fire direction centers a few hundred yards behind a thin outpost line, 40mm Bofors casually disposed forward of the infantry battalion CPs, ammunition stocks so far up that the handlers could hear the burp pistols of the German patrols—and very frequently, no reserve position prepared or occupied behind the front line. Besides this we neglected almost totally the practices of dispersal and camouflage, we drove streams of 6 x 6 trucks over supply lines in full view of the Germans, we flew cubs lazily up and down the front lines at three thousand feet, and when we heard fighter aircraft overhead we didn't even bother to look up.

This is not criticism. The German forces by this time were so short of ammunition, equipment and manpower that they did not (with one notable exception) possess the capability of launching a sizable counter-effort. Consequently Allied troops were able to attack until they were quite worn out and then take a comfortable breather, confident that the battle would not be resumed until they themselves judged the time and place to be right. It is a great privilege thus to be able to call the play, but it leads to sloppy habits which will, in other circumstances, be a bit costly.

It is unnecessary to point out that the next war will start with our having something less than a preponderance of ground-and-tactical-air combat strength. From this it is not wise to conclude that we cannot eventually gain preponderance in this field, but (unless strategic bombing can accomplish the whole job practically unaided) we must go through the whole cycle: an initial inferiority; after a period of Allied rearmament, a struggle on approximately

equal terms (so far as individual combat units are concerned) to establish superiority; and finally, we hope, a supremacy which will be decisive. So it is not only the initial stage of the fighting which must concern us, but also Phase II; in both of these phases we must be prepared to operate under unfavorable circumstances —the *most* unfavorable being that the enemy exceeds us locally in combat power and is possessed of a fervid desire to do us in.

* * *

My principal qualification to write this article arises from having participated on the losing side of an important battle, at Sidi bou Zid, in early 1943. There is no glory in such an experience, but it is illuminating. Both sides in a severe engagement suffer losses, but the retiring side finds its normal battle difficulties compounded.

We had very heavy battle casualties at Sid bou Zid. In our withdrawal from that area, across the Tunisian desert and through Kasserine Pass, we had the usual, normal, percentage of mechanical failures among our vehicles. The difference was that the tank or halftrack or truck that threw a track or blew a bogie or clogged its fuel line stayed right there; it was set afire if there was time, otherwise it fell into the hands of the enemy. The number of vehicles totally lost on this account may become a serious matter.

A similar fate, all too often, befalls misplaced or "lost" vehicles and detachments. In an advance these are a nuisance to the commander principally because by their confusion they fail to repair to the spot where they are needed; in a retreat, the enemy will scoop up a lot of them. In this and other ways small units or parts of units simply drop from sight, without explanation, and the higher commander not only sees holes developing in his defense but becomes acutely aware that he may be penetrated in some areas on which he has no reports at all.

Retreat Compounds Confusion

The retiring force will leave behind a number of maps which betray part of its plans and dispositions; it will lose complete radio sets, codebooks and procedural data. So the attacker receives intelligence that gets better and better, more complete, while the retreating force finds that the situation grows progressively more obscure and misleading. A graphic demonstration of this, repeated again and again in the long advances, arose when a German column was unexpectedly intercepted by an American column. Almost in every case the American force lambasted the other. Our people were more alert, with their weapons loaded and their eyes peeled; for while our subordinate commanders were well informed of the situation—and particularly that they were part of a deep penetration—the German officers were almost always astounded to find us at their throats. The advance disrupted their communication nets, and their resulting ignorance aggravated the general disaster.

An incurable Pollyanna may contend that the retreating commander gets some compensation in that he falls back upon his supply system, and shortens his line of communication—so he does, but in the course of it he leaves a goodly portion of the end product of the LOC, the supplies themselves, to the enemy for his use. Suggestions for the improvement of the logistic situation are always in order, presumably, but a general retreat is not usually a satisfactory solution.

* * *

An examination of the matters above listed, plus a vivid memory of the rather terrible days of Sidi bou Zid, is discouraging—it brings to mind the Irishman who said of a particularly trying epidemic of influenza, "there's people dying now that never died before."* Of course there is no satisfactory solution—the very fact that one *is* losing ground is indication enough that the situation is partly out of control. I nevertheless have a number of points to make.

*Somerville and Ross, *Further Experiences of an Irish R. M.*

First, I suggest that we study the art of battle fought under unfavorable conditions. It will be an unpleasant and sobering study, and will pose problems many of us have never faced. I recall the order issued by Headquarters First Armored Division during its first days on the Tunisian desert—that no vehicle would use any road, in daylight, within thirty miles of the front line, unless on a mission of urgency. This order was brought on by the simple fact that even a single vehicle scurrying across the desert invited *probable* destruction by a Messerschmitt —a startling contrast to the situation obtaining a couple of years later, in which it was not uncommon to see a number of U. S. units locked in a tight, motionless (and usually wrathful) embrace, vehicles bumper-to-bumper and four columns wide, within light artillery range of the enemy. There is a vast, indescribably great difference between these two situations: what can be accomplished easily and without much risk in the absence of strong enemy air and artillery, is quite out of the question where these elments are present. When one side of a battle enjoys air *supremacy* the very rules of ground warfare are different; what is entirely permissible for one side is totally forbidden to the other. To a somewhat lesser extent the same remark applies when there is a great disproportion in the strengths of artillery.

The second point is akin to the first. In our war games and maneuvers conducted, as suggested above, under unfavorable conditions, we should determine how to minimize the punishment incident to numerical and material weakness. Certainly we must learn how to force the enemy into concentrations sufficiently large to make profitable the employment of atomic explosives, while avoiding similar concentration. And we must develop the art of the defensive zone,* as distinguished from the linear defense.

A corollary matter is that of the active defense. Everyone acknowledges the validity of the theory, but the practice of it is quite another thing. The diversionary attack or the counterattack, essential to effective defense, requires forethought and advance planning—and it requires reserves. An already committed unit that has been severely punished in the recent past will not make a good effort on a counterattack mission, and it is frequently a waste of means to order it to such a task. On the other hand, the commander of a greatly inferior force will require strong will and fixity of purpose to stand off the entreaties of his subordinate commanders, made even before the main battle, for help. These pleas he must firmly resist, and keep sizable reserve forces mobile and in hand.

Though a little obvious, I bring up the subject of discipline—for never is this soldierly quality put so severely to test as in retreat. Rumors of disaster spread like wildfire and are difficult to controvert; panic is close to the surface, nurtured constantly by confusion and rumor. The temptation to funk it is ever present. Truly, the seeds of discipline must be sown deep, and cultivated carefully.

Finally, the leader must previously have developed in himself "great strength of mind and soul," as Clausewitz says. He'll need it, to contend with the conflicting and erroneous reports, the false tales of disaster, and the very real facts of loss of ground and men and matériel. He'll need it to withstand all the disadvantages of the retrograde movement, while fighting to bring about, a little sooner, the grand turning of the tide.

*The defensive zone must, it seems to me, have one outstanding characteristic. It must absorb, without vital effect and without moving the general location of the zone, fairly deep enemy penetrations, to be dealt with first by a slowing process, then a containment, then a choking-off at the root, and finally destruction. But although the zone itself may not be forced backwards, units within it at the point of enemy thrust must know how to retire gracefully—and hence the requirement for study of the fine art of losing.

FROM HORSE TO HORSEPOWER . . .

The Armor shall be a continuation of the Cavalry.

The enactment of the Army Organization Act of 1950, from which the above line is quoted, carries a midcentury implication of great significance to the mobile branch of the ground forces. Its passage makes legislative fact an evolution which has been in process over the course of a critical decade or more. The law is evidence of a modern legislative-military pattern, guided by leaders determined to keep pace with changing times.

Armor is a name of potent character, descriptive of the mobility, the fire power, the shock action of the blitz type of warfare so decisive in history's latest and greatest war. Its very significance is a challenge to the members of the arm of mobility, one to be met with characteristic flexibility and adaptability, in a transition from a great past to a greater future.

On firm professional ground, the arm may now step forward, free of compromise, with definite name, color and insignia. The air is clear for that group of officers assigned in other branches whose wartime service was in armor, and who, since 1947, have suffered under the transient and impermanent status of detail. To these officers ARMOR says "Welcome Home!"

The continuation from Cavalry to Armor has its close relation to our Association and to our publication. It is now over sixty-five years since foresighted Cavalry officers, recognizing the value of a professional grouping in furthering their qualification for service in the mounted arm and to their country, formed the first of the combat arms organizations. It is over sixty-two years since the arm put under way the first of the combat arms magazines. Through the years, the Association has been the leading nonofficial agency concerned with mobile warfare. The Association's imaginative publication has been the focal point of professional interest in this imperative field.

NEW EDITOR

Captain William Gardner Bell assumed the post of Editor of ARMOR effective with the retirement in May of Colonel Claude O. Burch. As Associate Editor, your new Editor provided the thread of continuity under three predecessors in a period of frequent change.

The new Editor has no idea of dishing out a lengthy statement of policy. For that we prefer to direct your attention to the pages of this and future issues of the magazine. The individual concerned with mobile warfare will find in this publication the gratification of full attention upon this technical, special and essential field. We are profoundly impressed with the need for a medium to represent mobile warfare. In this respect we shall serve the demands of the membership, which we feel embody a privilege which should not be denied in spirit, and cannot be denied in fact.

. . . THE MOBILE ARM BECOMES ARMOR

Capable of rapid adjustment in the very nature of its character and activity, the Association continues abreast of change with its action conforming to the legislative process (as announced on page 9 in the May-June issue). Effective with the passage of the legislation into law, the organization of personnel of the mobile arm now becomes The U. S. Armor Association. For purposes of strength, simplicity, usage and utility, the official publication of the organization becomes ARMOR. The short title has punch! The story is there! It requires no further qualification.

Armor embraces all of the arms and services. It is a *team* in every sense of the word—a combined arms team. Its role—of aggressive action—of mobility, fire power and shock—of the offensive—is based in the principles of war.

The manner in which Armor addresses its future was set forth by General MacArthur two years ago in a congratulatory note on the occasion of the Sixtieth Anniversary of our magazine. Praising the publication for its "sixty years of distinguished service in keeping the military profession abreast of the advance of the cavalry arm in the art of war," our Supreme Commander in the Pacific went on to say of the branch and its members: "During these decades no other branch has experienced greater change in weapons, in technique, and in tactical requirement. Discarding the horse and the saber to keep pace with the increasing tempo and violence of modern war, the cavalryman speedily adjusted himself to armored mechanization and commensurate fire power, firmly to hold his historic role of the far-flung and rapid movement echelon. In this he demonstrated with striking clarity that the invincible *esprit* which has characterized his past yet carries him to the vanguard of every advance, an irresistible force toward victory."

NEW FEATURES

Sum & Substance

This is the spot (see page 26) where you may sound off on the meat of any problem, praise or prejudice which takes something more than a letter and something less than an article to get across. To inaugurate the feature we have selected a subject, arbitrarily, and sought the views of outstanding authorities. We shall do that again in later issues, going out to top sources on the key subjects of the day; but the pages under Sum & Substance remain open to your use.

Magazine Roundup

Few of you realize how many journals do exist in the service field. And few of you could afford them all, even assuming that you might want them. Nor could they very well be packaged into one magazine, unless you were satisfied with a smattering of knowledge on all subjects, and no very great qualification in your specialty. But most of these are available to you in your library or your unit. Therefore, beginning in this issue we will round up for you the desirable contents of the current issues. We commend these fine publications to your attention (see page 62).

Just ten years ago a lashing air-armor team was rolling the German Blitzkrieg across France and the Low Countries. Although French and German armor strength were roughly equal, France fell in a matter of days. The background adds up to a story of

ARMOR IN A DEFEAT

by RICHARD M. OGORKIEWICZ

THE lightning, six-week campaign in Holland, Belgium and France during the fateful months of May and June 1940 was something in the nature of a revelation. It was hardly the first one of its kind since the mechanism of the "Blitzkrieg" was demonstrated before, on a small scale in Spain and then in all its fullness in Poland, but until then most people—not least the French—were of the opinion that, while such methods might succeed in Poland for instance, in France, with her Maginot Line and a fully mobilized and well equipped army backed by Anglo-French air forces, they were unthinkable.

It would be difficult to ascribe the French collapse to any one single cause but there is little doubt about

the very important part played in this campaign by the German armoured forces. Their highly successful operations have received some of the attention they deserve and something of the story of the Panzer divisions has already been told, but so far very little has been said about their opponents—the French armoured forces. The latter were the losers and therefore any lessons to be drawn from their performance will be largely negative, but for that very reason hardly less interesting and important.

As in so many other cases, the history and background of the development of the French armoured forces had a very important bearing on the events of the hour and therefore to get a more complete and accurate picture of their performance it is necessary not only to examine them as they appeared in the late spring of 1940 but also to look at some aspects of their development from their birth during the First World War.

French Tank Development

The stabilization of the Western Front after the initial moves of 1914 and the onset of trench warfare and in particular the new problems of overcoming machine guns and barbed wire inspired the first French experiments in the field of tank development as it did the original British tank development. The first attempts, in 1915, consisted of an odd collection of unarmed barbed wire destroyers but with the appearance on the scene of General (then colonel) Estienne the development took a more realistic turn. Having seen some Holt tractors at work he conceived the idea of constructing on their basis armoured mobile artillery and armoured infantry carriers—or in present day language the mechanization of these two arms. Undismayed by an initial lack of response, he managed to secure the support of the French Commander in Chief, General Joffre, for his ideas and on this basis in December 1915 contacted the firm of Schneider of Le Creusot. Schneider had already done some preliminary work of their own and in collaboration with Gen. Estienne soon had a tank project under way. The need to convince various military and industrial sceptics, as well as labour and material shortages, delayed the execution of the original order for 400 vehicles scheduled for delivery by November 1916. In the meantime the Army-sponsored Schneider project was followed by another, authorized by civilian government agencies, which was designed and built at the St. Chamond works.

Both the 15-ton* Schneider and the 25-ton St. Chamond were first demonstrated in September 1916 and many shortcomings became immediately apparent. But, since the British Army had made its first use of tanks on the Somme in the same month—

Richard M. Ogorkiewicz was born in Poland, in a military family. He was educated in England and is a graduate of London University with a degree of B.Sc. (Eng). He has recently been engaged on research and lecturing in mechanical engineering at the Imperial College of Science and Technology. Mr. Ogorkiewicz has made an intensive study of the history and development of armored vehicles and their employment. He was in France in May and June of 1940.

which the French with some justification regarded as premature—it was decided to rush production without waiting for modifications.

In the meantime Gen. Estienne, by then placed in command of the "Artillerie d'Assaut"—as the French tank units were called—paid, in June 1916, a visit to Britain on receipt of the first news of British tank development. After seeing something of British heavy tanks, he suggested that the two countries might divide their efforts, France concentrating on light vehicles. On his return he took this matter up with the Renault firm, who by December 1916 built a pilot model of a light tank, but delays and bickering followed and, although some 3000 machines were ordered in the spring of 1917, delivery did not commence until a whole year later.

The Renault F.T., as it became known, was a light 2-man tank of about 8-tons with armour varying between 0.6 and 0.3 in. and capable of a maximum speed of 4.8 m.p.h. and a radius of action of 24 miles. Instead of the 75-mm gun and machine guns of the heavier vehicles it had either one machine gun or one short 37-mm gun, but while the Schneider and the St. Chamond were merely armoured boxes placed on copies of the Holt caterpillar tractor the Renault was a much more advanced design with a turret—the first service tank in fact with an all 'round traverse turret.

First French Tank Action

The first French tank action took place on April 16th, 1917 with Schneider tanks and like subsequent engagements of the St. Chamonds' was not a conspicuous success. Their original method of employment was in keeping with the name of the Corps: as assault artillery carrying forward the fire power of field guns with the advancing infantry. The poor performance and lack of success were not, however, due to their method of employment as much as to their mechanical weaknesses and limited obstacle crossing ability—greatly inferior in this respect to contemporary British tanks. As a result they were abandoned after the completion of the original contract and production was concentrated entirely on the light Renault F.T., one of the lessons with the medium tanks being that a number of less powerful machines was preferable to one heavy tank.

The original intention as regards the employment of the Renaults was to wait until considerable numbers were produced and to launch them into action *en masse*. The German offensive in the spring of 1918 upset these plans and the light tank battalions, which had hardly completed their organization, were sent to support the hard pressed infantry units. In spite of being employed in small packets under unfavourable circum-

*All weights quoted are in U.S. short tons (2000 lb.).

A WORD ON PRINTING

This story has been set with original spelling and punctuation of the author.

Char NC1 (Renault).

St. Chamond.

French Char Schneider 1916.

stances they acquitted themselves well in the defense of the Retz Forest and by their counter-attacks contributed to the checking of the German offensive. In July some 250 were concentrated and used with great success in the French counter-offensive at Soissons and they continued the successes in numerous engagements in which they took part until the end of the war. Leading or working in close cooperation with the infantry units to which they were attached, as a sort of armored skirmisher, the Renault tanks fulfilled at least partly Gen. Estienne's original idea of armoured infantry.

The Renaults were fortunate in their actions in that they operated over ground which had not been heavily shelled—initially by accident and then partly by design—and they also proved remarkably reliable, apart from the troublesome cooling fan drive. Thus, although they were not much different in speed or armour from the medium tanks and far less powerfully armed, they were able to perform more successfully, and while the number of serviceable Schneiders and St. Chamonds rapidly dwindled away the Renaults increased at the rate of one complete battalion per week.

Out of a total of some 3600 tanks produced, the Armistice of 1918 found few of the earlier machines in working order, but in spite of battlefield casualties there were some 2000 Renault F.T.'s. Since the production of armoured vehicles stopped almost immediately they became the main and almost only equipment of French armoured units of the post war period.

As such they remained for the following 18 years, although in a report written less than a year after the end of the war Gen. Estienne cautioned about the value of the F.T. As he pointed out the Renault F.T. was constructed and used at a time when the enemy had nothing comparable and was therefore able to enjoy an uncontested superiority and it ought to be replaced by a more powerful vehicle—a real combat tank and not merely an accompanying one. Powerful vehicles of this type operating in mass would become the decisive factor of future operations, in attack and in counter-attack, and would counter enemy anti-tank guns not merely with the sheer thickness of their armour but by their concentrated employment and mobility. The value of accompanying tanks, those "armoured skirmishers" which he predicted would ultimately replace infantry fighting on foot, was not rejected, especially if they would become more mobile. But, as they would be designed to engage infantry targets they would be less powerful and therefore, however useful, their construction should on no account interfere with that of the combat tanks, which could never be too numerous or too powerful.

Armor and the Future

Speaking two years later, in 1921, in Brussels, Gen. Estienne drew in vivid colours the changes which mechanization would bring to the armies of the future and the potentialities of a mechanized force of 100,000 men, made up of tanks, armoured infantry and artillery on self-propelled chassis, operating as a single arm. Again he reaffirmed his faith in the decisive role which armoured forces would play in the future and made a plea that they should be kept in peace and in war as a separate arm and not made subservient to the infantry.

As a hint it could not have been more timely as only a little earlier the H.Q. of the "Artillerie d'Assaut" was abolished and tanks were placed under the care of a subdivision of the Infantry Department. This reaffirmed the use of tanks in their accompanying role and was hardly a move towards the development of an independent armoured arm, which Gen. Estienne demanded. However, having once found the tanks a useful auxiliary the infantry was not likely to relinquish its claims on them lightly and in all fairness it must be admitted that the Renault F.T. tanks were suitable for little apart from an accompanying role. Yet the creation of a separate arm such as the British Royal Tank Corps or later the German Panzertruppen was the only way of insuring that the new problems would receive their due attention and scope for development and that tanks would not be regarded as a mere auxiliary of the foot soldier.

While the tactical development was thus destined to remain completely static there was at least some technical development in the field of armoured equipment—even if only on a very small scale. First a small number of heavy tanks, which were evolved from war-time prototypes and on which work was begun, were completed. They were large 75-ton vehicles, armed with one 75-mm gun and 4 machine guns with a crew of 13 men, intended for special breakthrough missions. Next, attempts were made to improve the performance of the standard Renaults by fitting them with Citroen-Kegresse continuous rubber tracks. One vehicle of this type was tested in 1925 by the U.S. Ordnance Department, but as they proved vulnerable and lacking grip on wet ground they were abandoned although rubber tracks of this type were used on a variety of half track vehicles. A number of experimental one- and two-man tankettes were built and work was started on a medium tank with a hull-mounted 75-mm gun. In 1927 Renault produced a greatly improved version of the original F.T. design, the N.C. 27, which retaining the former's general layout and armament had armour

up to 30-mm (1.2 in.) and a maximum speed of 11 m.p.h. It was not adopted by the French Army—although a number was sold to Japan and Yugoslavia—but it served as the basis for the development of the D.1, which was adopted in 1930 and 160 of which were ultimately produced. This was a tank of some 14 tons with armour and speed similar to that of the N.C.27, with a turret mounted 47-mm gun and machine gun and another machine gun in the bow served by the third crewman, who also operated a wireless set with which this vehicle was fitted.

Speed and Doctrine

The D.1 was the only new type which was issued to the French tank units between 1920 and 1935 and during the whole of that period the majority of the units were equipped with the Renault F.T. Within its limitations the F.T. was a serviceable and economic machine and there were few armies which during the twenties did not have at least a few, or close copies of them—the U.S. 6-ton M1917 and the Italian Fiat 3000 being good examples of the latter category. Yet its long life—some went into action against Allied troops in North Africa in 1942—was a mixed blessing, for had it dropped to pieces earlier the dead weight of obsolete equipment might have been less. Lack of a new doctrine was partly responsible for a lack of understanding for the need for new equipment, but on the other hand the absence of modern vehicles was partly responsible for the lack of understanding of the potentialities of mechanized warfare: it was not easy to visualise it and far more difficult to demonstrate it with the 4.8 m.p.h. F.T. tanks.

Together with a lack of understanding for the need for new equipment, and partly caused by it, went another very important reason for the absence of modern tanks—the lack of money for the purchase of new vehicles. With Germany defeated and the League of Nations in full swing France paid less attention to her land forces and the greater part of the defense budget was spent on building up the navy. A good portion of such credits as the army had were used for the maintenance of obsolescent matériel and what was left went for the provision of such basic needs as new light machine guns and gas masks. Then when the horizons in Europe begun to darken, milliards of francs were poured, from 1930 onwards, into the permanent fortifications on France's eastern frontier, which grew up in keeping with the defensive attitude and the belief that future operations would be largely on the lines of those of 1918. In vain could the commanding general of French tank units appeal in 1932 that a fraction of the money sunk into the steel and concrete of the Maginot Line be spent on the production of new tanks. It required three more years and the appearance of the first German tanks before new models of vehicles were finally adopted and put into production.

The monopoly of infantry in tanks was for some time undisputed but in the early thirties the cavalry, which, incidentally, supplied the majority of the enlisted personnel for the "Artillerie d'Assaut," also entered the field. In 1914 French cavalry corps had two armoured cars each and by 1917 each cavalry division received a group of 18 armoured cars, which were intended to act as mobile fire support for the mounted units or in defense as mobile pill boxes. After the war, in 1923, the number of armoured cars per division was doubled but a far greater change came about in 1930 when one of the three horse brigades was replaced by a regiment of "Dragons Portés"—truck-borne riflemen. The divisional artillery was partly motorized and two years later the group of 36 armoured cars was expanded into a regiment of 80 combat vehicles, some of which were later fully tracked light tanks.

Lagging Realization

The mixture of the 5 m.p.h. mounted units and 20-30 m.p.h. motorised elements was not a happy one, yet one with which many armies experimented, unwilling, for various reasons, often mainly emotional, to give up their horses. In France mixed formations of this type survived until 1940, but the next logical step in the evolution of the mobility and power of the cavalry was a homogeneous, fully motorised force, and the official birth of the first French light mechanized division (Division Légère Mécanique or D.L.M.) took place in 1934. Its organization had all the characteristics of various armoured formations of later years and as finally established consisted of a reconnaissance regiment of motorcyclists and armoured cars (40), a brigade of two tank regiments representing a total of 160 tanks, a brigade of "Dragons Portés" of three battalions (each of which in addition to a generous allowance of 52 light and 20 heavy machine guns had 29 light tanks), an artillery regiment, engineer battalion and the necessary service units. However it differed considerably from the German Panzer division, which it anteceded by about a year, the main diffierence being in its method of employment. According to the official doctrine the primary mission of the D. L. M. was strategic reconnaissance and security for the benefit of the infantry formations—an important but hardly decisive role to which the cavalry

Char B.

Renault FT.

Char Leger R. 35.

was reduced during the 19th century. Mobile offensive warfare was not precluded but was definitely of secondary importance.

The first D. L. M. took part in various army manoeuvres from 1935 onwards and attracted a good deal of attention, but it appears that if its potentialities were recognized even more attention was paid to the difficulties associated with the fuel consumption of such a formation. Its 260 armoured and 1400 motor vehicles and 1500 motor cycles when on the move consumed fuel at the rate of 400 U. S. gallons per mile. However, by 1938 there was a second D. L. M. and their combat value was increased by the arrival of new types of tanks, which supplemented the 1934 Model machine-gun armed 7-ton A. M. R., until then the cavalry's only fully tracked armoured vehicle. In May 1940 there were three fully organized D. L. M.'s and a fourth one in the process of organization.

German panzer troops poised for the 1940 push.

The French Somua.

In the meantime the growing shadow of German rearmament and the recognition of the deplorable lack of modern equipment produced at long last funds for the provision of new equipment. The 1935 defense budget made possible the adoption for production of several new models and the program of the following year, 14% of which was set for mechanization, planned the production of 3200 tanks. But, even the provision of considerable sums of money can produce results only after a time especially if industrial mobilization is inadequate or largely nonexistent. The highly specialized armaments industries, for years starved of long term orders, such as those which kept naval shipyards going in peace time, needed time to get ready. Industrial troubles, inadequate orders for certain types which did not allow up-to-date mass production methods to be applied, added difficulties to the usual problems of organization, machine tools and raw materials. It is not surprising therefore that in the summer of 1936 there were less than 40 new tanks in service—excluding the cavalry's AMR—and that numbers increased very slowly at first. But once the production got under way numbers begun to increase and by the time the Germans attacked Poland the French had produced 2200 tanks and in May 1940 this figure reached an impressive total of 3500 modern tanks, including some 800 medium and heavy tanks.

Compared with anything the French Army previously had these new vehicles were a great step forward. The most numerous was the 13-ton Renault R.35, which replaced the F.T. in the infantry tank battalions. Carrying a crew of two, it had armour up to 40-mm thick and was capable of a maximum speed of 12 m.p.h. A very similar but faster light tank, the Hotchkiss H.35 was furnished to the cavalry and later to some infantry units. The cavalry also received a 22-ton SOMUA medium tank, on the general lines of the D.1 and of the later 21-ton D.2, but capable of speeds of up to 25 m.p.h. and a radius of action of about 150 miles. Finally the infantry units received heavy 30- 37-ton type B tanks, with a hull mounted short 75-mm gun and a turret identical with that of the SOMUA and D.2 having a coaxial 47-mm gun and machine-gun, which could trace its ancestry to a modification of the original Schneider tank.

All were well armoured, the thickness varying between a maximum of 40-mm on the light tanks to 60-mm on the type B—the Germans were just beginning to introduce 30-mm plates on their mediums—extensive use being made of cast armour which the French pioneered. The infantry tanks were rather slow and the principal armament of the light tanks was a 37-mm gun Model 1918, which was effective only against the lightest of armour. But the 47-mm gun of the medium and heavy tanks was at the time of its introduction the best anti-tank weapon in any army and even when in 1940 the Germans introduced their 5 cm KwK L/42 the French 47 was only slightly inferior to it—certainly not to the extent the British 2 pdr (40-mm) and the U.S. 37-mm M5 were in Libya in the following year. In addition to cast armour they also had such advanced features as electric turret traverse (SOMUA) and regenerative controlled differential steering on the SOMUA and B tanks, in which they were 5 years ahead of the British (Churchill I) and six ahead of the Germans (Tiger I).

Progress in equipment was not, however, matched by any marked progress in their employment or organization. With the exception of the cavalry's D.L.M. the bulk of the tank units continued to be mentally and physically tied to the speed of the foot soldier. Their employment followed the lines of the 1930 "Instruction on the Employment of Tanks" which commenced with the definition that "the tank is an infantry supporting weapon" and went on that tanks are nothing but supplementary means placed at the disposal of the infantry, entirely subordinated to the infantry

units to which they are attached. Thus the light tank battalions were still intended for an accompanying role only, joined in the ratio of one infantry regiment and one tank battalion in a "groupement mixte." The less numerous medium and heavy tank units, which started with the D.1 were similarly intended to operate for the benefit of the infantry though on a higher level of division or corps. They were classified as the "chars de manoeuvre d'ensemble" and their place was generally ahead of the infantry and accompanying tanks, paving the way for them by destroying enemy guns and armour.

Shortcomings of the Infantry Army

At various times views were expressed criticising this complete subordination of the armoured units to the infantry and pointing out the potentialities of mechanized warfare. These, among others, included General de Gaulle's "Vers l'Armée de Metier" (Army of the Future) published in 1934 which vividly described the shortcomings of the system based on an "infantry army" and the potentialities of an armoured striking force (but which did not, contrary to popular belief, serve as a text book for the Germans). But individual views were not able to change official opinion which firmly believed in the doctrine of long continuous fronts and generally fighting à la 1918.

In the case of tanks the prevalent view, reinforced later by some misguided lessons from the Spanish Civil War, was that they met more than a match in modern anti-tank guns. This was partly responsible for keeping the tanks closely bound to the infantry and the slow artillery barrages and the lack of faith in the possibilities of their more independent action. But on the other hand it seems to have been overlooked that the intended method of employment was one best designed to expose them to the full effectiveness of anti-tank fire. In the words of the German "Truppenführung" manual "if the tanks are held in too close liaison with the infantry, they lose the advantage of their mobility and are likely to be destroyed by the defense." The Germans did not mean this to preclude the cooperation of tanks with other arms, including infantry, but they preached and practised that "in the zone of action of tanks, the action of other arms is to be based on that of tanks." No greater contrast with the French doctrine would have been possible.

Even the formation of the first French armoured division (Division Cuirassé as different from the D.L.M.) did not mean as great a departure from hitherto accepted practice as might have been expected. The creation of armoured divisions was seriously considered by 1937 but when the war broke out there was only one—hastily assembled—based on the four battalions of heavy B tanks then in existence. By modifying the organization to two B and two light H.35 battalions—a total of 64 heavy and 90 light tanks—per division, two divisions were formed in January 1940, a third was added shortly and a fourth was in the process of organization when active operations begun.

The permanent grouping of a number of tank units was in itself a definite step forward and with their 4 tank, 1 infantry and 2 artillery battalions in addition to engineers and services the "Division Cuirassé" had the making of a mechanized formation. In fact, however, it represented little more than an administrative grouping of the "chars de manoeuvre d'ensemble" and its mission was to act as a sort of battering ram in breaking through organized positions and not to conduct mobile warfare, for which in any case some of the equipment (the type B tanks) was not very suitable. In theory, any breaks-through were to be exploited by the Division Légère Mécanique and motorised infantry.

French Armor vs . . .

With such a background of doctrine and organization the disposition of French tank units on the day active operations began becomes more readily understood. The bulk of the tanks were in the light tank battalions attached in groups of 2 to 7 battalions to each of the eight French armies stretched from the Swiss frontier to the English Channel—with about half the total actually behind the Maginot Line between the Rhine and the Ardennes. These were in the greater part equipped with R.35 tanks, but there were also some F.C.M. (generally similar but of welded construction and with Diesel engines) and still a few old Renault F.T.s. The heavy B tanks and the infantry's Hotchkiss were all grouped in the armoured divisions which were held in reserve, three of which were hastily completing their organization and the fourth was just beginning. The rest of the infantry's tanks, mainly the old F.T., were held in various training establishments all over the country and a small number of modern tanks was in French overseas possessions.

Of the cavalry's tanks, which included all the SOMUA's and the greater part of the Hotchkiss', the majority were in the 3 existing light mechanized divisions, which formed part of the 1st Group of Armies facing the Belgian frontier. Altogether, the first line units of the infantry and cavalry had some 2500 modern tanks and 700 "automitrailleuse"—called armoured cars, but over half of which, the AMR and AMC, were in fact fully tracked fighting vehicles. To be added to this total were another 500 modern tanks in units in the process of organization.

. . . German Armor

Against this the Germans launched some 2600 tanks and 800 armoured cars. But, if the total figures of French and German first line tanks did not differ materially, all the German tanks and the majority of the armoured cars were incorporated in the 10 Panzer divisions, nine of which were concentrated along the Belgian and Luxembourg frontier on a front of less than 100 miles (the remaining Panzer division was further north, on the Dutch front). These massed Panzer divisions, most effectively supported by large scale tactical attacks of the Luftwaffe, delivered the swift and crushing blows which shattered the French front along the Meuse. The drive to the Channel which followed and the subsequent elimination of the French, British and Belgian forces of the Northern Group of Armies virtually decided the issue of the campaign which was sealed by the break through of the "Weygand Line" and the outflanking of the Maginot Line.

In contrast to this the French armoured forces were committed to battle piecemeal—a direct outcome of their operational doctrine and strategic dispersion—only to suffer heavy

losses without being able to achieve anything. An unfortunate absence of any clear principle of concentration of effort, let alone knowledge of methods of tank employment, plagued the employment of French tank units at all levels of command. It led to such things as the annihilation of the 1st Armoured Division, which, thrown in on the left flank of the ill-fated 9th army with limited fuel reserves, found itself alone and immobilised—when its fuel trains were destroyed by German bombers—facing the 39th Panzer Corps. Or to the piecemeal employment a few days later of the 2nd and 3rd Armoured Divisions in vain attempts to stop the drive of two other Panzer Corps (including Guderian's 19th). On a smaller scale it was responsible for the failure of the counter-attacks of Gen. de Gaulle's hastily assembled 4th Armoured Division at Laon and Abbeville, which were repelled with heavy losses by German infantry and artillery. Even the units of the 2nd and 3rd D.L.M., which were organized as a mechanized cavalry corps, had a tendency to operate in small packets rather than as one well coordinated team. Moving into Belgium in their text book role of a strategic advance guard to the 1st French Army at the beginning of the campaign they were badly mauled in turn by the 16th Panzer Corps.

Squandering the Armor

And if the employment of large mechanized formations lacked concentration and coordination hardly better results could have been expected from the light tank battalions attached to the various armies. Used by companies and even platoons to bolster the morale of the infantry units, a tendency evidenced also in the Russian army in 1941 and the German in 1944, they were simply squandered without being able to achieve anything, for the benefit of infantry or any other arm.

By refusing to concentrate a part at least of its scattered tank units, as Gen. de Gaulle proposed during the period of the "phoney war," and by squandering the few formations which it had concentrated in the reserve the French High Command insured that they were used in the least effective way. But there were also several other factors, which further reduced their effectiveness.

With the exception of the mechanized cavalry none of the tank units was really trained or equipped for the type of mobile operations in which they had to take part. Long marches imposed a heavy strain on the equipment and the shortcomings of the supply and repair services, with consequent frequent lack of spares, added to the difficulties of maintenance. Also, since they fought a retreating battle the French had few opportunities to recover their casualties —even if their recovery units had been as efficient as the German ones —while the Germans were able to repair and put back into service most of theirs. German air superiority, the crowds of refugees and the growing confusion in the rear areas added further difficulties to the movement of units and supplies. And, although air attacks on the whole had little material effect on the actual tank units they seriously affected the morale of the troops.

Lack of Training

Training of many units also left a good deal to be desired and this applied in particular to the four armoured divisions. None of these went into action fully organized or trained together. Some of their non-armoured elements such as artillery, riflemen and signals joined the divisions either on the eve of the departure for the front or even actually at the front, having never before had an opportunity to work with tanks. Such a state of affairs was hardly one which would make for efficiency or effective cooperation in battle.

But, while some new units were very short of trained personnel, men and resources were used in keeping no less than 8 first line battalions of the obsolete Renault F.T. tanks—of very doubtful fighting value by then—providing yet another example of the absence of economy of effort. The same could be said about the battalion of six ancient 2C tanks, which might have impressed some newspaper reporters, but whose proper place in 1940 was in a museum. Ironically, these 75-ton relics were ultimately destroyed on their special railway carriages without ever going into action.

Lastly the equipment itself had many shortcomings. These were, to be true, largely the outcome of specifications laid down by the High Command and of the prevalent doctrine and were far less serious than the disastrous method of employment. None the less they contributed their share to the difficulties.

The infantry tanks were slow, underpowered and had limited radii of action (less than 90 miles generally), which meant frequent and laborious refuelling. None of this appeared too serious in small scale peace time exercises but it soon made itself felt in combat. The Hotchkiss tanks, which originally were ordered for the cavalry were better and could do more than 20 m.p.h. and the SOMUA's were definitely above average. In fact the SOMUA's performance, armour and armament made many regard it as the best tank in the world at that time and the Germans certainly rated it highly.

The armament of light tanks was not very impressive and only a few later models, the H.39 and the R.40 had the longer barreled Model 1938 guns instead of the Model 1918, but even this was well below the average perfomance of other contemporary 37-mm guns. It must not be forgotten, however, that two thirds of the German tanks were light Pz.-Kpfw.I and II. The first was armed with rifle calibre machine guns only and the second with a 20-mm cannon, which though superior to the 37-mm Model 1918 was not very effective against the 40-mm armour of French light tanks. In medium tanks to oppose the 800 German Pz.Kpfw. III and IV, the French had about an equal number of medium and heavy tanks armed with 47-mm guns (type B, SOMUA, D.2) which was only slightly inferior to the German 5-cm KwK L/42 and greatly superior to the 3.7-cm KwK with which Pz. Kpfw.III were armed.

Too Many Jobs

Of all the bad design features, and these included cramped interiors, poor means of vision further aggravated by hard springing, one is particularly worth noting: all French tanks, whether light, medium or heavy had one-man turrets. It meant that in combat a single man had to fire and load the turret armament—which included a manually loaded 37- or 47-mm gun—and at the same time he was expected to act as a com-

mander of the vehicle and tactical leader. As a result not only did the rate of fire suffer but also it becomes clear why French tanks could not—even if their crews had been better trained in this as the Germans were—take greater advantage of the ground and cooperate more efficiently with one another. This feature alone was sufficient to hinder materially any type of joint manoeuvre whether on a large or small scale.

Lack of Understanding

Directly or indirectly the majority of the shortcomings and faults were due to one thing: the almost complete lack of understanding of the potentialities of mechanized warfare. This was in turn responsible for the lack of progress in employment, for the type of vehicles which were produced, for the half-hearted way in which armoured divisions were organized and used. None of the advantages of mechanized mobility appear to have been able to attract seriously the attention of the French High Command, which seemed equally deaf to practical and theoretical developments in other countries, including Germany, as well as to views expressed in France, and quite incapable of lifting its eyes from the very restricted lessons of 1918. The whole underlying philosophy as regards tanks seemed to be almost entirely in terms of the benefits of armour protection and hardly at all in terms of the far more important benefits of mechanized mobility.

The Hour of Test

In the hour of test the French Army found facing it an enemy who was capable of looking beyond the limitations of the fighting vehicle and of making full use of the strategic and tactical advantages of mechanized forces. An enemy who had organized and trained his mechanized forces to act together as one well balanced team and who instead of dissipating his efforts made a principle of being as strong as possible at the decisive point. Neither the courage of individual units nor the heavy armour of tanks nor the considerable material resources were able to redeem the mistakes, which cost the French armoured forces and the whole French Army dear.

A TRIBUTE TO THE CAVALRY

By HANSON W. BALDWIN

Reprinted through the courtesy of the *New York Times*

Reverse the stirrups, turn out the mounts to pasture; the cavalry has gone. The crepe is on the pommel, the mourning bow upon the sword hilt; the cavalry has gone.

No more the glint of sunlight on the saber, the sweet music of the creak of saddle harness, the champ of bits. The sound of "Boots and Saddles" sings no more across the Great Plains; the horse has retired from the field of battle. The "yellowlegs," who won the West with carbine and with Colt; the "Garry Owens" of the famous Seventh, who died with Custer at the Little Big Horn, ride no longer; for the cavalry has gone forever. . . .

Even the gallant name . . .

Today for the first time in a century and a half of "progress" there is no cavalry in the United States Army. A signature last week—that of Harry S. Truman—was its requiem. But the President's endorsement of a bill reorganizing the Army, abolishing the cavalry as an arm and substituting armor for it represented merely legal recognition of historical fact.

The Man-Made Horse

Nostalgia for the past, melancholy pride in great achievements, and all the panoply of jingling harness and troopers at the charge could not hide the doom of the horse on the field of battle. Inanimate mechanisms made by men were his undoing; the machine gun, the tank and the plane were the robots which inherited his world.

Not since the Twenty-sixth Cavalry, harried and bloody, tired but gallant, covered the rear guard of the Army from Damortis to Bataan had the "yellowlegs" straddled their mounts. The First Cavalry Division, a fighting outfit, was in the van of combat from Australia to Japan, but it fought dismounted, and improvised horsed commands and mule pack trains toiled in small units over the bitter mountains of Italy. In World War II, the horse, in the United States Army, had but a small role.

And so the cavalry, like all things mortal, has died.

But its soul goes marching on.

For the soul of the cavalry is élan, aggressiveness, the will-to-fight, dash, the debonair, reckless but ordered discipline that took The Six Hundred into the Valley of Death at Balaklava, that rode with Stuart and with Sheridan, with Custer and with Lee. The spirit of the cavalry is the spirit basic to any army, a spirit not exclusive to this arm alone, but one of which it was peculiarly possessed.

A Sense of Tradition

For the cavalry had a sense of tradition, an awareness of its responsibility to history, to the men who have gone, to the standards of the past, to those who died that the way of life we want, the things for which we fight, might live.

It has been popular in these times of fatalism and doubt to impugn tradition, to cast aside as worthless the bright heritage of valor and hope the past has given us. No more fatal mistake to Army or Nation is possible, for tradition, sound tradition, both civic and martial, is the inspiration from the past which must light the future.

The history of the cavalry, gone in name but never in spirit, provides some of the finest of our Army's traditions. The lilt of von Borcke's songs, he who rode with "Jeb" Stuart, long has been stilled; Pelham's guns thunder no more; "Light Horse Harry" Lee, and Marion, "the swamp fox," are long dead; the dragoon with brass helmets and horsehair plumes who fought with Wayne at Fallen Timbers, live only in old prints.

Forgotten, Far-Off Things

Resaca de la Palma and the wild charge with sabers are but an incident in the history books now, and the Indian Wars, when the "yellowlegs" fought from Red River and the Rio Grande to Montana and the Rockies, are but dates and figures. The Cheyenne, the Sioux, and the Apache are mere ghosts from a dim, forgotten past.

The men are dead, the graves grass-covered, the horses gone, even the monuments weather-stained and strange, a bronze or marble charger oddly out of place in this mechanized age.

But the tattered battle streamers and the silver battle rings bear the great names of the past into the future: Bull Run, Chancellorsville, Gettysburg, Comanches, Oklahoma, The Admiralties, Leyte, Luzon, Tokyo. And the great names will not die. From Henry Dodge, the first colonel of the "American Cavalry Service," to George Patton, the roll call of the cavalry will live on.

The cavalry is not dead; its spirit, its traditions, its immortal intangibles endure. Its tactics, its *esprit* are the heritage of armor and of the Army; the "yellowlegs" are gone, but they have left behind them the things that soldiers live by.

WHY NOT . . . . . .

by CAPTAIN CHARLES W. KOBURGER, JR.

THERE are those who claim that Armored Infantry Battalions, of which there are four in an armored division, can do everything that standard infantry battalions can do, and a few things they cannot besides. There are those who differ, pointing out that the "tin can doughboys" lack, for instance, the heavy mortar and communications support available to the standard battalions. Let us take a look at the facts.

The mission of the armored infantry battalion is "to close with and destroy the enemy by fire and maneuver, to repel hostile assault in close combat, and to provide infantry support for tanks." It is capable of dismounted support of tanks, normal infantry action with or without tank support, and high cross-country mobility with light armored protection when mounted. It provides greater automatic fire support than other infantry.

To do its job the battalion has a headquarters, headquarters and service company, four identical rifle companies, and a medical detachment. It differs from the standard battalion in being administratively independent, in having four, not three, rifle companies, in not having any heavy weapons company, and in being entirely on tracks or wheels. It does not have on call any of the combat or service support available to the standard battalion at regiment. It has several organizational "bugs" that should be worked out. What can be done?

The headquarters, headquarters and service company is capable of providing for the battalion and its attached units' command, control, staff planning and supervision of operations; reconnaissance; communications; supply, administration, and organizational maintenance; and the fire support of a platoon of three 81mm mortars.

Communication

There is no provision for adequate personnel to operate the wire net that higher headquarters, in giving a considerable amount of wire and wire equipment, admitted the battalion needs. The addition of a skeleton wire section with one wire chief, one switchboard operator, and, say, one or two linemen, would set up a *trained* cadre around which the normally overworked radio people could in fact operate "in addition to their other duties."

Supply, administration and organizational maintenance

There is now no provision for the defense of battalion headquarters; this necessitates pulling guards from the operating sections and making enemies for the Headquarters Commandant. The addition of a ten-man security squad with a personnel carrier would help solve this problem.

There is no longer a service company; for an administratively independent battalion this is a necessity. The company breaks itself down in the field to headquarters (including here the mortar and reconnaissance platoons), combat trains, and field trains. The headquarters and the combat trains are usually in the same general vicinity so that supplying, administering, and maintaining them from one company headquarters is no problem. The field trains are usually far to the rear and they are a problem. Service company should be organized; it would guarantee that the rear echelon gets its papers shuffled anyway.

What happened to the full-tracked supply vehicle it was reported we learned the Germans had found they needed? One section of the supply platoon at least should be full-tracked.

Mortars

There is no provision anywhere in the division for the 4.2 mortar; the three 81's here in the battalion mortar platoon are the heaviest now available to the riflemen for support. The substitution of 4.2's for the 81's —four for three—would give all the support that could be asked; the addition of one more mortar squad with a carrier would take care of

EXISTING: MORTAR PLATOON— Present support within the Armored Rifle Company

Capt. Koburger was graduated from Georgetown University School of Foreign Service in February, 1943. From Infantry OCS at Ft. Benning, he served with the 83d Division until going overseas as a replacement to the 1st Armored Division. He fought in Italy with the 11th Armored Infantry Battalion. He served 8 months with the 42d Armored Infantry Battalion, 2d Armored Division and is now CommO of the 67th Medium Tank Battalion.

. . . . . EVERYTHING?

personnel and transportation.

The mission of the (armored) rifle company is to "close with and destroy the enemy . . . ." To do its job the company has a company headquarters, three identical rifle platoons and a mortar platoon. Company headquarters has a headquarters section, a maintenance section, and an administrative, mess and supply section. The rifle platoons have a headquarters, three 10-man rifle squads and a 12-man (two-gun) machine gun squad. The mortar platoon has a headquarters and three 60mm mortar squads.

Headquarters

There is only one messenger in the whole company; that is not enough. There should be at least two messengers in company headquarters, preferably three. There is no gain when a company commander is forced to pull men from the rifle squads to do this work. There should also be two in each platoon headquarters.

Experience in the field has shown that the company commander must have more than just a 2-channel 5-mile SCR 510 in his much-used command ¼ ton. The constant shuffling of companies in the infantry-tank teams and the long distances at which the teams operate call for an SCR 508. The fact that the commander would then be able to monitor both his own and the battalion command net gives yet another reason. The commander should have an SCR 508.

Throughout the company there are vehicles marked to be driven by platoon sergeants, food service apprentices (mess attendents), and by radio repairmen. This is not realistic; I have never seen a platoon sergeant who would or a cook who could properly care for a vehicle. There should be an assigned driver per vehicle.

Rifle Platoon

These could be made more effective if the machine gun (4th) squad was redesignated headquarters squad and included an assistant platoon sergeant (squad leader), one 5-man light machine gun crew, two messengers, a radioman, and a driver. The four line companies would lose a total of twelve A6 machine guns, four of which (A1's) could go to a machine gun platoon in headquarters company. Additional automatic weapons are available in the line companies' OVM. Just as much fire would be placed on the enemy, and the platoons would be more efficient.

Support

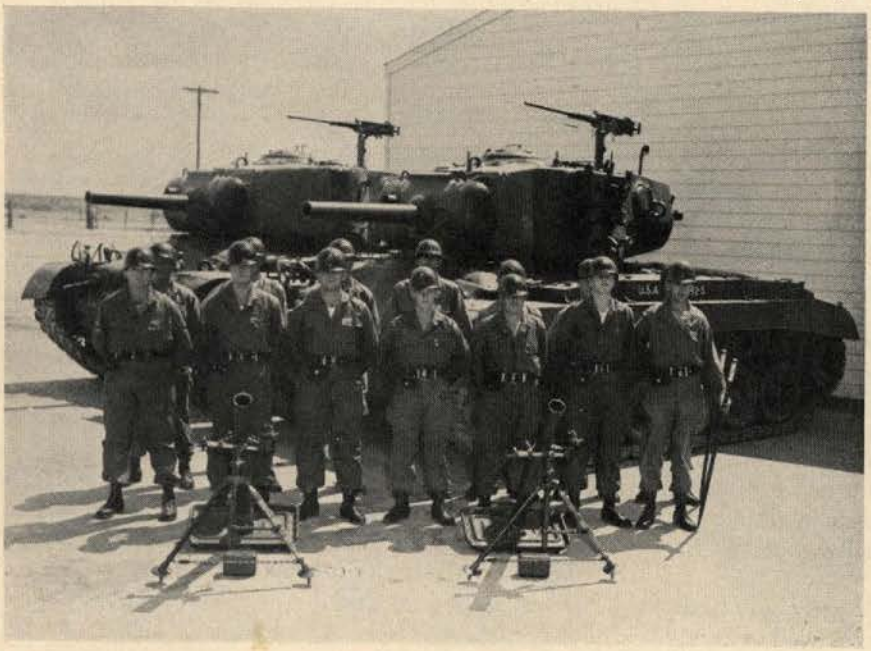
The three 60mm mortars in the mortar platoon are not adequate for the company. The fourth platoon could well be made into a really effective weapons platoon by giving it two 81's (battalion lost them remember) in place of the three 60's to form a mortar section and by giving it two M-45 assault guns to form an assault gun section. The tactical simplicity of these two weapons, coupled with their power, makes them ideal supporting weapons, separately and as a team. The platoon would lose a mortar carrier and gain two M-45's; the addition of two assault gun crews would take care of personnel.

Lastly, there should be little or no need for the addition of recoilless weapons to the battalion as is sometimes suggested. The rare occasions when they would pay their way would not make up for the expenditure of men and effort. After all, the battalion is supposed to be part of a tank-infantry team; why waste time on unprotected 57's and 75's when armored 90's are available? There should be no need at all if the companies are equipped with an organic section of assault guns.

There is, however, an immediate need for a full-tracked, full-armored vehicle capable of carrying the infantry squad anywhere the tank can go.

With everything in the Armored Infantry Battalion on tracks or wheels, and reorganized as shown above, there should be little that would keep this battalion from doing everything the standard battalion can do. The reorganization would in no case require any large increase of personnel, equipment, or transportation; the battalion would be more effective dismounted and it would be able to do even better at its primary task—the support of tanks in all phases of combat. The changes can and should be made.

PROPOSED: WEAPONS PLATOON— **Proposed support within the Armored Rifle Company**



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.

*History moves rapidly in these times. The breakneck pace of the first half of the 20th Century requires almost momentary searching to remain abreast of change. Against a background of two world wars and great technological advancement, the need for constant review of our doctrine, organization and equipment is most evident. ARMOR has queried a number of outstanding authorities in various countries on a subject of compelling interest to us all as we stand at mid-century—***THE ROLE OF THE TANK IN FUTURE GROUND WARFARE.** *Their respective appraisals follow.*—THE EDITOR.

The writer of the following is a leading author and commentator on military affairs. Among his recent books are "Hate, Hope and High Explosives" and "If Russia Strikes."

It would hardly be worth while for a civilian to discuss the future of the tank in terms of the age-old contest between gun and armor, or between fire power and mobility, for so well-informed an audience as the readers of ARMOR. Such discussions can be far more competently conducted by professional officers, supported by the evidence of service tests and of actual field service.

Eliot

For my part I should prefer to think of the *immediate* future of the tank, within the framework of American military policy.

We have seen in Korea the lamentable result of not having a complete team in readiness for action. The North Korean army was a complete team. The South Korean army was not. It was not just the tank which gave the North Koreans their initial successes. It was the fact that they had an organized and tested team, complete in all its parts—infantry, armor, artillery, engineers and supporting aviation. The South Korean army seems to have been little better than a collection of partially armed rifle battalions.

It is painfully clear that the United States does not have complete teams, ready for action, either. We are better off than the South Koreans, of course. But we have only a single Regular Army armored division in the United States. We have neglected our tactical aviation. We maintain units called "infantry divisions" at 60% or 70% of their proper fighting strength, and suffering from fluctuations in personnel due to various short-service arrangements, and then can't understand why we can't load them on ships and send them into battle halfway across the world at the drop of a hat.

It seems to me that we must be better prepared to face emergency situations like that in Korea, as well as trying to be ready for complete mobilization if that becomes necessary.

So far as the Army is concerned, I should think the absolute minimum of preparation for quick action would be to set up a complete war strength reinforced corps in the United States—2 infantry divisions, 1 airborne division and 1 armored division, with supporting troops as required. This corps should be kept absolutely free from commitments to the mobilization structure, ready in all respects to move out of the country when and where needed.

Its training program would, however, give us a far better opportunity than we have had so far to test out the composition and employment of our fighting teams. We should begin to know what we could expect of new tanks, new communications equipment, new antitank weapons in battle. There is no comparison between proving-ground tests or small-scale maneuvers at battalion or RCT level, and the maneuvers and training programs made possible with the possession of a war-strength corps. Production could be gauged and guided in accordance with reports from the field. Furthermore the corps would be a yardstick against which could be measured the battle-readiness of National Guard and Reserve units. Here too the teamwork principle applies: both the regular and civilian components would benefit, and National Guard armored divisions would become something more than a collection of fairly well kept machines manned by crews which would require a year's training to fit them for combat.

Whatever may be the future of the tank on the battlefields of a hypothetical war of another decade or two, we have been sharply reminded in Korea that armor is an essential part of ground fighting today. We had better see to it that our battle team is ready, not half-ready or a quarter-ready or dependent on conflicting theories based on rival blueprints, of just what kind of tanks (or of any other weapons) we ought to have: presuming that the unexpected doesn't come along to upset the theorists, as it usually does.

The way to find these truths, short of the actual test of combat, is to have an organization capable of putting all theories at least to the test of full-scale field trials within the framework of a major combat unit.

The way to be sure that the next Korea will not result in useless carnage is to have such a major field unit ready

to move out, provided in all its parts with tanks, guns, planes, every element of the fighting team in due proportion.

The future of the tank I'm interested in is the part it must play as a member of our weapon-team under these conditions. We shall always be inferior in numbers to the enemy at the beginning anyway. We cannot afford not to have superior weapons. Indeed we cannot afford not to have the BEST weapons.

GEORGE FIELDING ELIOT.

• • •

The writer of the following is Military Editor of The New York Times *and is a widely known military analyst. He is author of "The Price of Power" and "Great Mistakes of the War."*

The role of the tank in future war depends in considerable measure upon the meaning assigned to the word "future."

If by "future" is meant today or the next three or four years, Korea is something of a pattern. The tank spearheaded the attack in Korea and the tank must be defeated to win the ground battle. And clearly, the best way to defeat the tank on the battlefield is still (today and in the immediate future) by other tanks. Air power can help to dry up the enemy's sources of supply—particularly gas supply—and, under favorable conditions, can intervene decisively in the ground battle, but the side that fights modern war without armor or with second-rate armor, fights with one arm in a sling.

The importance of armor ought to be emphasized, for at times during the last war, the preeminent importance of the tank was not recognized, and—just before the Korean fighting started—we were told that Korea was not "good tank country," and that weapons were in hand or under development to "stop" the tank. This reasoning represents in part a consistent underemphasis on armor. In part, it also represents a groping out into the more distant future, an attempt to translate the *potentialities* of future weapons—which are still in blueprint form or under development—into *present actualities*. New antitank arms for use by the ground soldier and by the plane may in time increase somewhat the power of the ground defense as compared to the power of the ground offense, and this will be particularly true in difficult terrain, where the flanks of a front are anchored on impassable obstacles.

Baldwin

But the tank will not remain static in power; and any antitank weapon which can be carried by man can be mounted in a tank, which inherently has superior mobility to the foot soldier (except in the jungle, or very rugged terrain). More than any other ground weapon, the tank combines mobility, fire power and protection. It offers, moreover, to any nation that develops armor fully, the inestimable advantage of offensive capabilities, and wars cannot be won by defense.

HANSON W. BALDWIN.

• • •

The writer of the following is an internationally recognized authority on military affairs. He is author of "Armored Warfare" and "The Second World War."

As always, there are two futures—the immediate and the distant.

As regards the first, I see little reason to suppose that tanks could not be used much as they were in the last war, and more effectively if they are more closely combined with aircraft and organized on less complex and more flexible lines.

Fuller

As regards the second, the problem is speculative, for we have no actual experience of the effects of several of the new inventions on the use of tanks, and so far as I am concerned some of them are probably unknown to me. Nevertheless, as heretofore, the tank problem will remain a threefold one: the break-through, exploitation and supply.

The first will largely depend on the width of the area of operations and upon which side holds the initiative. In it, speed to concentrate at the point of assault will remain the governing factor. Second to it comes covering fire, which in the main should be effected by support tanks equipped with multiple rocket throwers. The flanks of the assault should be protected by bomber aircraft, and its front cleared by minesweepers. The break-through should be carried out *by night* instead of by day, *in order to create the maximum confusion in the enemy forces and gain the maximum security for one's own.*

Granted that local command of the air is assured, the second operation should not be very different from what it was in the last war. But exploitation must be *uninterrupted*—that is, carried out *by night* as well as by day. Therefore at least two echelons of tanks will be required, each provided with duplicate crews, and the largest possible reserve of tanks should be kept in hand to meet wastage.

The third problem, that of supply—the foundation of momentum—demands a dual organization: one on the ground and the other in the air. For the first, all supply vehicles must be fully tracked, so that they may be as mobile as the tanks themselves. The second should consist of supply aircraft with fighter escorts. Only then will tank warfare become truly roadless.

To sum up. In the future, as in the past, the secrets of tank warfare are to be sought in mobility and momentum. The first in order to concentrate against a selected point and spring a surprise assault upon the enemy. The second

to maintain the pursuit once the break-through has been effected. Both, to attain maximum effect, demand *uninterrupted* movement.

Once armies went into winter quarters, and thereby halved the operational year. Still in the last war they went into night quarters and halved the operational day. Tomorrow, the side which can first obviate this by establishing round-the-clock movement will double its mobility. This, I hold, is *the* tank problem of the future, because movement is the soul of war.

MAJOR GENERAL J. F. C. FULLER.

• • •

The writer of the following has been a Washington reporter on military affairs for some years. He is the author of the recently published book "Disaster Through Air Power."

In the last decade the pendulum of public opinion has swung almost completely through the arc from blind acceptance of the invincibility of armor to the assumption that armor has been nullified by defensive weapons. This revulsion of feeling is one of the products of the same sort of wishful thinking which consistently leads Americans to believe they can win wars without fighting.

Andrews

One apparent effect of this sort of thinking is the failure to recognize that the ascendancy of defensive means over offensive must inevitably lead to stalemate whose result, in turn, is not victory but stagnation. Ultimately the offensive must be assumed, with mutually dependent weapons and tactics improved and altered to overcome the new defensive power. In this process, unless the theory that no more ground battles will be fought is the right one, armor undoubtedly would play an important and perhaps decisive part.

That the apparent invincibility of the tank in 1940 was a momentary phenomenon is historically demonstrable, as is the fact that its temporary ascendancy owed more to imaginative tactics than to its inherent characteristics as a weapon. The rapid development of defensive power forced successive changes in tactics and emphasis, but nevertheless the tank emerged the most important single weapon in ground combat within clearly delineated limitations. There can be no doubt that weapons are in process of development which will further narrow these limitations, particularly as they apply to the already greatly circumscribed mass employment of armor.

But the problem of how to gain the most from armor within these limitations reverts for a solution back to the mutual dependence of tactics and physical improvement. The application to this problem of imagination should result not only in maximum results within the visible limitations, but an eventual broadening of the limitations themselves so that mass application of armor might again be momentarily feasible.

Since offensive warfare is necessarily mobile warfare, the value of the tank, whose essence is mobility, cannot be discounted unless stalemate and attrition are to form the basis of doctrine. Rejection of such a concept leads inescapably to recognition of the tank's indispensability in ground combat.

The value of armor in reconnaissance will be enhanced rather than diminished by the enlarged fire power of ground troops. The tendency toward self-propelled artillery will demand great improvement in semiarmored tracked mounts. No doubt the new defensive weapons themselves will develop maximum effectiveness when linked with the mobility and protection of armor. Development of an armed and armored fully tracked troop carrier already has become a practical necessity.

In its demonstrated role as a partner in the infantry-artillery-tank team there is every reason to believe armor would be of undiminished importance in the offensive and, therefore, decisive phase of another war. Its employment would demand no less tactical flexibility than physical improvement, but the history of armor in the last war was one of unceasing change in both.

Whatever may be done to continue this application of imagination to armored tactics and matériel must proceed under the onerous handicap of public indifference and even rejection. It is perhaps fortunate that such a challenge is apt to prove more stimulating than otherwise.

MARSHALL ANDREWS.

• • •

The writer of the following was one of our foremost armored commanders during World War II. Now retired, he is President of Norwich University, Northfield, Vermont.

The events in Korea have forced our attention to a realistic viewpoint as to the role of the tank in warfare of today and the immediate future.

The role of tanks during the next three to five years will not be much different from their role in World War II.

Today the tank is the decisive ground weapon of the battlefield. Without it our infantry cannot advance against an enemy well equipped with armor. No decision of large proportions will be gained without first defeating the hostile armor. Armor will attract armor like a magnet. Hostile armor must be sought out and defeated, and the battlefield will belong to the winner.

To reap complete results from the use of armor we must develop the closest teamwork with low-flying supporting aviation and close supporting mechanized artillery. If this teamwork is superior our infantry can arrive on objectives practically unhurt and standing up. If the teamwork is faulty or lacking, the results will be in proportion.

There is no such thing as "unsuitable tank terrain." What is good for the enemy is good for us.

To achieve decisive results our tanks must be employed in mass, and campaigns should be directed to utilize the best terrain for armor in order to produce decisive results. The factors of mass employment, suitable terrain, and superior coordination with air and artillery must be present.

Our potential enemy will employ tanks as outlined above, and in large masses, to produce a decision. We must be better, must shoot more accurately and must have better coordination with air and artillery or we will be beaten.

The real roles and possibilities of the tank in modern warfare were only partially understood by our Army during World War II. Some of our leaders utilized the tank to its fullest possibilities while others, either through ignorance or prejudice, used it sparingly.

Harmon

The conception of building a campaign around armor and on terrain most suitable to its use was rarely employed in our Army, although used with great success by the Germans and Russians.

The mine, recoilless weapons and more powerful artillery and air will greatly aid the defense and make the work of the tank more difficult. These will require greater skill in the supporting team of air and artillery in the armored attack and will require more skill in dispersion and deployment tactics.

We must attack; we can't hope to win sitting on a defensive position. Large formations of tanks well dispersed over favorable terrain will withstand heavy artillery concentrations and air attacks. Air, after all, is simply long-range artillery without its volume of fire or accuracy or its ability to shoot in bad weather.

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.*

The desired performance of tanks, now as in the past is: First: gun power; Second: battlefield maneuverability; Third: as much armor protection as can be had after meeting the first two requirements, still staying within a weight that can be gotten across obstacles with our bridge equipment. At present this is around 40-60 tons.

I believe we should have a family of tanks, with light, medium, and heavy types—that the bulk of the tanks should be the medium type with the most powerful gun that we can mount on it. The light tank can perform the lighter work and the heavy tank can support the medium. The weights of tanks and calibers of guns are all relative from time to time. We must continually develop so as to be able to knock out the tanks of our potential enemies. That alone is the true objective of our development.

We need tanks massed to provide for a deep breakthrough with wide open flanks and seeking for a decisive objective in the hostile rear. We need tanks to stay right with the infantry soldier on attack and defense to assist him in moving forward or holding his position.

The Armored Carrier is a special requirement. All infantry cannot be equipped with it. The best protection for the infantry soldier is "Mother Earth" with her creases, folds, shades and shadows.

In our love for the essential, ofttimes lowly, but gallant foot soldier, let us not bleed him to death by failing to let the tank take the brunt of the battle because of jealousy or prejudice against it.

An objective taken so that the infantry arrives with little loss and in fine shape to exploit the successes should be the desire and dream of every armored soldier.

MAJOR GENERAL ERNEST N. HARMON.

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The writer of the following, a well-known military analyst and historian, is Military Critic and Editorial Writer of The Detroit News *and author of "Men Against Fire."*

This is a tough one, being not unlike the question: "If you had a brother, would he like blue cheese?"

What is the future of the bullet? Of the field gun? Or for that matter, of the poor devil of a foot soldier who has always carried so much of the load in war?

Frankly, I have no idea. The fog lies so thick that even the foreground is hidden.

All depends on whether science is about to unloose new forces which will transform war (and maybe peace) altogether.

For example, if a hydrogen bomb can be developed, with the destructive powers which some scientists ascribe to it, that could mean an end not only to armor but to all of war's conventional weapons.

Too, it would blot out the "principles of war," as we have known them, and as described by Ferdinand Foch and J. F. C. Fuller.

Let's discount the possibility of chain reactions promoting endless chaos. Then try to envisage a weapon capable of working total ruin over a 100-mile area.

Marshall

We have talked much about push-button warfare. This would be it! One button would suffice if the shot were on the target. War could be won at a single blow.

Why talk of nations picking themselves up after this shock treatment and fighting on with shot, pikes and billhooks? It would not happen. Men are not that rugged. No kind of new conditioning can make them so.

Purely for peace of mind, though partly to answer the question, it is better to rock along for the moment with scientists like Dr. Millikan who doubt that the H-bomb can be realized.

That doubt returns us to the horizons which we have surveyed, with indifferent success, since the A-bomb fell on Hiroshima.

Then what? Sam Goldwyn is alleged to have said it: "The atom bomb—it's dynamite!"

I know nothing of stockpile counts, present or prospective, and less about what ratio of hits on vital targets can be expected from a given number of bombs started on their way. Human nature, being somewhat less than adamant,

and a further evolutionary progress in defense, can raise hell with the best of these calculations.

Even so, it is better than a remote possibility that a compounding of hits on large population centers in the first stage of war could produce total moral paralysis, the prerequisite of surrender.

Scientists tell me that it isn't possible for one nation to amass enough destructive power to accomplish the physical obliteration of an adversary.

But that isn't the problem. Forget killing and direct blast damage for a moment! The new Four Horsemen which ride in this age of super weapons are shock, terror, apathy and disorder. Science is unable to measure the withering effect of these things on the national will to survive and hit back. We are not even developing a new doctrine against the danger.

However, the door has not been slammed shut on conventional warfare. Its return might pivot on these and several other possibilities:

. . . Fear of reprisal could cause nations to engage without making initial use of atomic weapons.

. . . Both sides may feel that it is strategically and politically disadvantageous to use them.

. . . Improvement in defensive weapons (example: the guided missile) may make the attack indecisive.

. . . Mutual attrition may promote a general breakdown leading to a prolonged period of guerrilla-like warfare.

This last proposition sounds like a flight of imagination. But if war were to come to us tomorrow, and we couldn't win it in a thunderclap, we might find ourselves in just such a long-drawn, dreary sweat.

Duly regarding all of these dread possibilities, however, I believe that the place of armor, and its accompanying infantry, in the pattern of future warfare is not less decisive than during World War II, and may be even more so.

And for a very simple reason! The aim in war is not mere destructiveness; that brings forth only anarchic chaos. Unless integrated within the machinery of war is the essential force which can subdue in detail, control, persuade, restore and in general promote the organization of a viable peace, the tempest inevitably must turn against those who loosed it.

That is the supreme object of armor, infantry and the other arms which move into those areas where men live.

Recent experience should have shown us that as war builds up in destructive power, so is the difficulty of reestablishing an orderly peace compounded.

Unless, in these times, military forces are shaped, beyond war, to the understanding of what the problems of a peace would require, those who order them are arming not for Armageddon but for a second Battle of Adrianople, and a return to the Dark Age.

S. L. A. MARSHALL.

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Distances and deadline schedules combined to make it impossible to include the comments of German Generals Heinz Guderian and Ehrhard Von Manteuffel, which were on the way as we went to press. These will appear in the next issue of ARMOR, along with the views of several other distinguished authorities which we hope to have by that time.

Policy For Recall of Reservists Announced By Defense Department

The Department of Defense has announced policy for the recall of Reserve personnel to active duty by the three military departments, as authorized by President Truman.

The Army and Air Force will initiate immediately a limited recall of Reserve personnel. The Navy also will initiate immediately a selective recall of Reserve personnel.

The announcement of Army and Air Force procedure in recalling Reservists reads:

"Implementing Presidential authorization for recall of Reserve military personnel to meet the needs of the Korean situation, the United States Army and Air Force announced that they will initiate immediately a limited recall of Reserve personnel.

"Return of officers to active duty, whether on a voluntary or involuntary basis, will be in Reserve grades now held and in immediately usable skills.

"Reserve officers of field grade now serving on extended active duty in an AUS or AFUS grade lower than their reserve grade will be considered for promotion prior to any general recall of reserve officers of that grade to extended active duty. Certain specialists may be required in the field grades. In addition, all officers assigned to units called to active duty will be ordered in the grade held. With the recall of reserve officers of company grade, their contemporaries, many of whom are now serving on active duty in a lower grade, progressively will be considered for promotion.

"Enlisted reservists will be recalled in the numbers and skills required, for a year or more, and will be recalled in the Reserve grade now held.

"It is the intent of the Departments of the Army and Air Force to permit all Reserve personnel ordered to extended active duty to complete a minimum of one year's service.

"Greatest current need for officers in the Army is for Medical officers, and for Corps of Engineer and Infantry officers in company grades.

"Enlisted reservists most urgently needed by the Army are airborne-trained personnel, electronic, tank, and armament maintenance personnel, certain military intelligence, medical, communication, and wire-maintenance technicians, as well as certain engineering and construction specialists in landing-craft operation, camouflage, bridge, road, beach, port, and airfield construction."

FROM THESE PAGES

60 Years Ago

Our experience has proved that neither of the revolvers now furnished is suitable for the cavalry service. Their length makes them unnecessarily heavy and clumsy, while a shorter weapon is just as accurate for all practical purposes, within the distance at which pistols should be used.

The handle of the pistol must be made to conform as closely to the hand as possible; if corrugations were cut for the fingers, greater accuracy would be obtained for the reason that, in "snap-shooting," the result depends entirely on the revolver being always held in the same position in the hand. The stocks found on the new models of revolvers more nearly fulfill the requirements than those of any of the old single action weapons. Concerning single and double action revolvers, there is little difference of opinion as to the merits of the two for dismounted work. An infantryman should carry a single action revolver with a very light trigger pull; for mounted work, the double action weapon should be used. There is one defect in the present hammerless revolver which will postpone its adoption; if the cartridge happens to be a trifle too thick at the base, the friction against the recoil plate renders it impossible to revolve the cylinder. It seems to be the great drawback with all double action weapons that the forefinger is not strong enough to overcome the necessary resistance when the revolver becomes fouled whereas, with the strength of the thumb and the assistance of the hammer, the pistol can always be cocked.

Revolvers and Revolver Practice

Powhatan H. Clarke
Lieut., Tenth Cav.

25 Years Ago

An additional feature of the graduation exercises this year at The Cavalry School was the contest for the . . . prize, presented by a Cavalry Reserve officer, for the most efficient leadership of small units. The contest was open only to one lieutenant and one rifle platoon from each of the six rifle troops of the 2nd Cavalry.

The contest was divided into two phases. The object of the first phase was to test the individual ability of the lieutenants eligible to compete. This phase was practically the same as the Standard Stakes . . . except that pistol firing was conducted mounted instead of dismounted. Lieutenants Conrow, Edmonds, Jennings, Reinburg, Todd and Wofford qualified in this phase, thus assuring themselves of the opportunity to lead a platoon in the 2nd phase.

The 2nd phase consisted of a test of platoon leadership, each platoon, equipped with full field allowance of rations and forage, being tested separately in an indentical 30-hour problem. The platoon was ordered to proceed to Keats, Manhattan and Dewey's Ranch and reconnoiter those places for enemy troops reported to be detraining there. The platoon and its leader were marked during the march, which continued into the night, on equipment, march discipline and conduct, care and condition of animals, reconnaissance and security and avoidance of aerial observation. A short night camp was made, the platoon leader and his platoon being marked on camp site, security and going into and breaking camp.

K. S. Bradford
Major, Cavalry.

50 Years Ago

In 1882, I saw a Colt's revolver, caliber 45, emptied into the back and legs of a buck Indian, and he did not stop running; he limped somewhat, it is true, but was not "shocked" severely. The revolver was fired at no greater distance than five yards and once or twice closer.

Being somewhat surprised by this circumstance, I experimented on a young wild animal, riding alongside of it for the purpose. My fifth shot dropped it, I holding the muzzle of the Colt within a few inches of the animal's head. Upon skinning the animal it was found that four of the five shots had just penetrated the hide.

By inquiry it was ascertained that the powder used in that lot of catridges was some that had been obtained from the old paper cartridges remaining on hand after the war, 1861-65. For some years after that I purchased my revolver ammunition, or until the old stock was exhausted.

Later I have experimented with similar results with carbine ammunition manufactured in '70. In '83 it was worthless. Ammunition of the year 1876 was practically worthless in 1884. Perhaps a majority of the shots would be carried well up, but enough of them would drop, and drop badly, half way at 200 yards, so as to thoroughly discourage average marksmen.

Revolvers and their Caliber

George H. Morgan
First Lieut., 3rd Cav.

10 Years Ago

Having been on duty recently with the Organized Reserve Component, and having had close association with the National Guard and Regular Army Components, your editor deems it appropriate and advisable to clarify the definition of cavalry—this, for the benefit of all who still visualize cavalry solely as the horse. Let us get this straight and pass it around. Cavalry should not be identified by the mode of travel, but by the missions which it is intended to accomplish. The tactical principles have not changed with modern developments. It is the methods of cavalry that constantly are undergoing improvement affecting mainly the factors of time and space, armor and armament.

When the army advances to battle, some mobile group, for the "mass," must perform those time-honored ground missions involving reconnaissance, security, offensive and defensive combat, exploitation, covering, or pursuit operations. Whether the horse—in saddle or pack, camel, elephant, the motorcycle, scout car, armored car, combat car, truck or portee trailer is used (any or all) is merely a means to the end of accomplishing cavalry missions. Whether it be by horse cavalry, mechanized cavalry, or both, getting the cavalry job done is the main idea—call it what one may.

Let us not be hidebound to terminology. The terrain, time element, and opposition indicates the mode of travel; the specific situation indicates the required type of combat. The respective equipment and organization should meet this requirement.

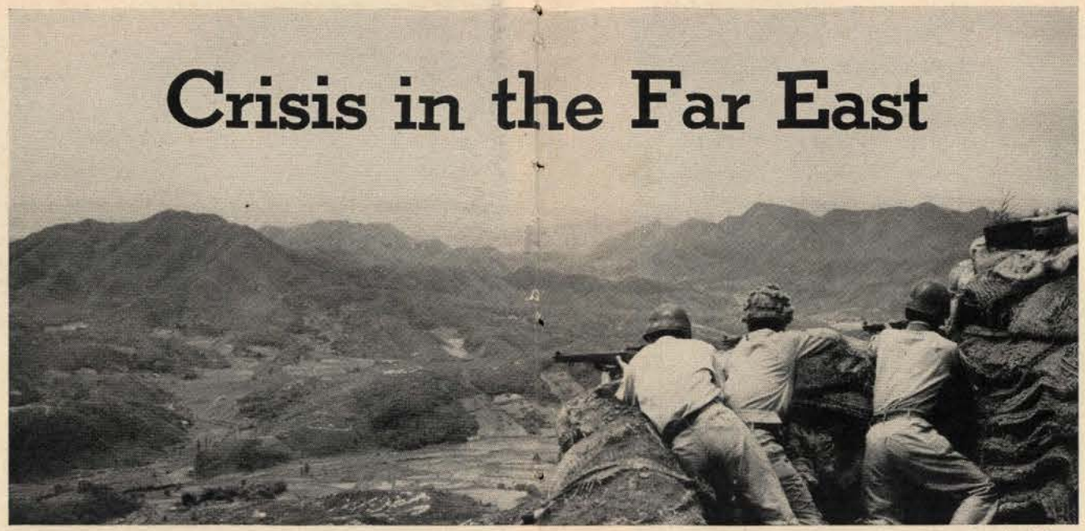
Crisis in the Far East

In the small hours of Sunday morning, 25 June 1950, Communist forces in North Korea launched an attack across the 38th Parallel Demarcation Line against the Republic of South Korea. United States reaction was immediate. U. S. planes and ships were ordered out against the aggressor, followed by ground troops, all in support of United Nations decisions. Spearheaded by armor the North Korean forces drove deep into South Korean territory. The eyes of the world were on the crisis. (For other news on Armor in Korea see page 40.)

President Truman's Statement

In Korea the government forces, which were armed to prevent border raids and to preserve internal security, were attacked by invading forces from North Korea. The Security Council of the United Nations called upon the invading troops to cease hostilities and to withdraw to the 38th Parallel. This they have not done, but on the contrary have pressed the attack. The Security Council called upon all members of the United Nations to render every assistance to the United Nations in the execution of this resolution.

In these circumstances I have ordered United States air and sea forces to give the Korean government troops cover and support.



Associated Press

The attack upon Korea makes it plain beyond all doubt that communism has passed beyond the use of subversion to conquer independent nations and will now use armed invasion and war. . . .

It has defied the orders of the Security Council of the United Nations, issued to preserve international peace and security. . . .

Accordingly I have ordered the 7th Fleet to prevent any attack on Formosa. As a corollary of this action I am calling upon the Chinese government on Formosa to cease all air and sea operations against the mainland. The 7th Fleet will see that this is done. . . .

I have also directed that United States forces in the Philippines be strengthened and that military assistance to the Philippine government be accelerated.

I have similarly directed acceleration in the furnishing of military assistance to the forces of France and the associated states in Indo-China and the dispatch of a military mission to provide close working relations with those forces.

I know that all members of the United Nations will consider carefully the consequences of this latest aggression in Korea in defiance of the charter of the United Nations. A return to the rule of force in international affairs would have far-reaching effects. The United States will continue to uphold the rule of law.

I have instructed Ambassador Austin, as the representative of the U. S. to the Security Council, to report these steps to the Council.

NEW YORK Herald Tribune City Edition

WEDNESDAY, JUNE 28, 1950

U. S. Planes and Ships Fighting in Korea On Truman Order; Fleet to Defend Formosa; Philippines Reinforced; South Repels Reds

Collision Rips Liner in Bay; 114 Taken Off

United Congress Backs Truman. Speeds $16,000,000 Korea Fund

Truman Acts In Red Threat To the Pacific

A Blow for Peace

MacArthur Puts Rocket Jets in Fight

International

KOREA

U. S. Army

Maj. Gen. William F. Dean, Commanding the 24th Infantry Division.

New York Times

INDO-CHINA

U. S. Marine Corps

Maj. Gen. Graves B. Erskine, USMC, Chief, Indo-China Mission.

Acme

As the crisis broke the U. N. Security Council met at Lake Success, voting to impose "stringent sanctions" against North Korea. Russia's seat was empty.

International

General MacArthur, United Nations Commander in the operations, visited the Korean front with staff and Korean officers.

FORMOSA

U. S. Navy

Vice Admiral Arthur D. Struble, Commanding U. S. Seventh Fleet.

U. S. Army Radio

U. S. 24th Infantry Division were first ground troops to go. GI's leave Taejon, South Korea, on their way to the front.

Dept. of Defense

Japan-based B-29s took up the bombardment of North Korean positions deep in territory north of the line.

The Deliberate River Crossing

THE 6TH ARMORED AT THE OUR RIVER

This article is the combined effort of Research Committee Number 22:

Major Elbridge L. Brubaker
Major Maxwell B. Thurmond
Major William E. Potts
Major Charles A. Henne
Major Roosevelt T. Plummer
Major John R. Watson
Captain Philip F. Dean
Captain Leonard M. Kirk

WHEN it is impossible for the leading elements of an Armored Division to seize a bridge intact, it will be necessary for the division to make a deliberate crossing of rivers along its axis of advance. This is especially true during the exploitation phase when the Armored Division has penetrated deep into enemy territory thus relying entirely upon its own organic facilities to accomplish its mission. Such a crossing of a major river requires the maximum in coordination and teamwork among the combined-arms teams of the division.

The crossing of the Our River by the 6th Armored Division in February 1945 is an historical example that will contribute immeasurably to the training of personnel serving in Armor.

This article is based on the after-action reports and histories of each organization with the 6th Armored Division. In addition, General Grow, the Commanding General of the 6th Armored Division during this operation, and many of his officers have contributed detailed information that presents a complete picture of this difficult crossing of the Our River.

The General Situation

As a member of the fighting team of the United States III Army Corps in January 1945, the 6th Armored Division had knifed its way steadily east from Bastogne in spite of heavy to moderate resistance, deep snow, and very difficult terrain. Even though the German forces were fighting a planned withdrawal, they offered exceedingly stubborn opposition at all advantageous defensive positions. Elaborately placed mines were encountered at critical points. These mines were effectively covered by small arms, automatic weapons, tanks, mortar, and, in some cases, artillery fire. Strong fire fights usually preceded each enemy withdrawal but by the 25th of January, the Division gained its objective on the high ridge between the Clerf and the Our Rivers. This ridge was called the "Skyline drive" because of its prominence in the area.

Even as the 6th Armored Division was consolidating its objective, aggressive patrols were sent to the west bank of the Our River to reconnoiter possible crossing sites and to clear the enemy from the west bank.

The Special Situation

The Our River was a serious obstacle to the contemplated operations of an advance to the east. The thaw that started on the first of February had caused most of the snow to melt. The river, swollen by the melting snow, was flowing at the rate of 10-15 miles per hour. It was approximately ten feet deep and several times its normal width. The approaches to the river were steep and the terrain generally rough, permitting vehicular movement only on primary and secondary roads.

Regardless of the existing weather conditions and the difficult terrain, the III Corps Commander, Major General Milliken, issued orders on the 5th February at 1200 for the Division to make a reconnaissance in force across the Our River on the night of 6-7 February. General Grow, the 6th Armored Division Commander, immediately prepared the following plan, and it was approved by the Corps Commander.

First Objective: Seizure and securing of two bridge sites on the east bank of the Our River by two reinforced infantry battalions under the Reserve Command.

Intermediate Objective: Establishing a bridgehead on the east bank of the Our River by the Reserve Command from which the remainder of the Division could assault the SIEGFRIED LINE.

Final Objective: Penetration of the SIEGFRIED LINE.

Tactical Plan: A night crossing by infantry using assault boats and the rapid expansion of the bridgeheads covering each bridge site to form a consolidated Division bridgehead. The entire Division reinforced to achieve the final objective with CCB passing through the Reserve Command and leading the effort to penetrate the SIEGFRIED LINE.

The Reserve Command of the 6th Armored Division was holding the Division front and because it was thoroughly familiar with the terrain, the Division Commander decided to use this command to establish the bridgehead. At 1500 General Grow, the Division Commander, and Colonel Albert E. Harris, the Reserve Command Commander, were in confer-

A WORD TO THE READER

Military date-time system has been used in this article, i.e., 061630 Feb. means 4:30 p.m. of February 6th.

Military history is replete with detailed accounts of military operations against both natural and man-made obstacles. In every incident the objective lay beyond the obstacle and did not constitute the obstacle itself.

Wide and unfordable rivers exercise considerable influence on military operations, due to the restrictions which they impose upon movement and maneuver. Rivers constitute obstacles to an attack and natural lines of resistance for defense.

In a research program in operation at The Armored School a committee addressed its efforts to a study of river crossings, treating the subject in three phases: the hasty crossing, or the crossing of opportunity, in which the crossing is effected with the technical and tactical means immediately available to the unit making the crossing; the deliberate crossing, in which additional personnel and equipment are required by the unit making the crossing; and the supported crossing, which is the deliberate crossing with armor utilized in a supporting role on both shores.

Continuing its policy of one combat narrative per issue, ARMOR brings you this study of a deliberate river crossing. The entire series of research reports will be used to illustrate various types of armored action in coming issues. ARMOR extends its sincere thanks to The Armored School for making these items available.—The Editor.

ence in Boxhorn at the Reserve Commander's Command Post.

A detailed study was made of air photos and patrol information with particular reference to suitable crossing sites, and General Grow issued the following orders:

The Reserve Command would cross the Our River beginning the night 6-7 February with two infantry battalions and establish a bridgehead on the high ground north of Dahnen. A vigorous reconnaissance would be conducted along the west bank of the Our River to determine suitable crossing sites for the assault troop; three sites would be selected. The operation would be initiated during the early hours of darkness with emphasis on stealth and secrecy. No artillery preparations would be fired. CCB would be prepared to assume command of the troops in the bridgehead east of the Our River on Division order and CCA would be prepared to assume command of all troops on the west bank of the river on order.

The Reserve Command was allotted the following units to accomplish its mission:

44th Armored Infantry Battalion
9th Armored Infantry Battalion
50th Armored Infantry Battalion
68th Tank Battalion
69th Tank Battalion
86th Cavalry Recon Squadron Mechanized
25th Armored Engineer Battalion
777th AAA Battalion (–)
Company A 603d Tank Destroyer Battalion
Company C 76th Armored Medical Battalion
212 Armored Field Artillery Battalion, Direct Support
128th Armored Field Artillery Battalion, Direct Support
231st Armored Field Artillery, Direct Support
1123 Engineer Construction Group, General Support

The Reserve Command Commander, utilizing infantry and mixed infantry and engineer patrols, extended the reconnaissance throughout the zone. The primary mission of these patrols was to locate routes of approach, attack positions and suitable crossing sites.

Reconnaissance in the area was hampered by close hostile surveillance of the area. Movement by friendly forces in forward areas during daylight received prompt attention from hostile mortar and artillery fire. It was soon evident that reconnaissance would be limited to the hours of darkness.

Gen. Grow, 6th Armored's CG.

During the night of 5 February 1945 three crossing sites were selected, two in the north numbered one and two and another in the south numbered three. Routes of approach and attack positions were determined and located on the ground.

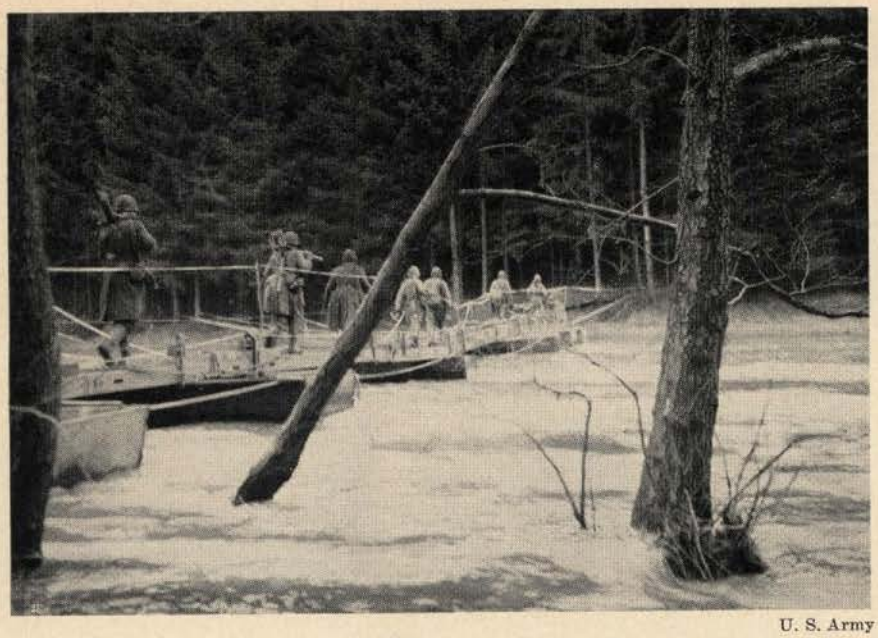
At dark 6 February 1945 the situation relative to weather and terrain was characterized by a temperature that had dropped below freezing. The ground was partially covered with snow and the Our River was swollen to ten feet deep, 100 feet in width and flowing at 15 miles per hour. The trafficability on level ground was good but on the icy slopes only foot troops could move and then with difficulty.

The assault plan indicated the 44th Armored Infantry Battalion, commanded by Lieutenant Colonel Charles Brown, commencing at H-hour would cross the Our River at crossing site one and crossing site two, seize and secure the high ground at Langfukr.

The 9th Armored Infantry Battalion, commanded by Lieutenant Colonel Frank K. Britton, commencing at H-hour would cross the Our River with one reinforced company and advance generally east and seize the town of Dahnen.

The 50th Armored Infantry Battalion, commanded by Lieutenant Albert Ward, initially constituted the reserve that was alerted to move within two hours across the Our River to occupy the ground seized by the assault battalions.

Due to adverse weather and terrain conditions, which rendered approaches



U. S. Army

9th AIB men cross the ponton bridge over the Our River several miles east of Clervaux, 8 Feb. 1945.

impossible to wheeled vehicles, the assault boats were located at the junction of the Dahnen-Kalborn road. This necessitated the hand carrying of assault boats over one and a half miles of steep, icy mountain trails to selected attack positions.

The Engineer Plan stipulated that the 25th Armored Engineer Battalion supported by the 1123d Engineer Construction Group would provide engineer support for the crossing operation.

Company A, 25th Armored Engineer Battalion, would support the 9th Armored Infantry Battalion by providing and operating assault boats, and the construction of footbridges at the battalion's crossing site.

Company C, 25th Armored Engineer Battalion, would support the 44th Armored Infantry Battalion by providing and operating assault boats, and constructing footbridges at the battalion's crossing site.

The 25th Armored Engineer Battalion less companies A and C reinforced by the supporting Corps Engineer unit would prepare and maintain avenues of approach, construct a Bailey bridge at the old bridge site on the Dahnen-Kalborn road, and provide any additional support required by the assault battalions.

The allocation of crossing means provided assault boats (the exact number cannot be determined) for the assault elements, footbridges not to exceed two per assault battalion for the supporting foot elements, and a Bailey bridge for the crossing of vehicles.

A carefully prepared fire support plan indicated the 69th Tank Battalion would provide direct fire support to the 9th Armored Infantry Battalion and be prepared to cross the Our River on order.

68th Tank Battalion would provide direct fire support to the 44th Armored Infantry Battalion and be prepared to cross one medium tank company over the Our River on orders. The tank company would be attached to the 44th Armored Infantry Battalion upon reaching the east bank.

86th Cavalry Recon Squadron Mechanized would support the 44th Armored Infantry Battalion by fire from positions on the west bank of the Our River.

Battery A, 777th Antiaircraft Artillery Automatic Weapons Battalion (—) would be prepared to move one platoon on order to the vicinity of the bridge site and provide protection for the construction of the bridge.

The 212th Armored Field Artillery Battalion would be in direct support of the 44th Armored Infantry Battalion.

The 231st Armored Field Artillery Battalion would be in direct support of the 9th Armored Infantry Battalion.

The 128th Armored Field Artillery Battalion was placed in general support of the crossing operations.

At 061630 February 1945 the Reserve Command's new command post was opened at Heinerscheid, the assault battalions were closed in their assembly areas, and supporting units and weapons were in position. The operation had progressed to the end of the preparation and planning phase and the conduct of the crossing was at hand.

Crossing of 44th Armored

Immediately after dark on 6 February, the engineers moved the assault boats by truck to the selected unloading point. The 44th crossed the line of departure and on arriving at the unloading point, found the engineers had encountered their first unexpected difficulty.

The boats had been obtained from Corps, and upon removal of the covering tarpaulin, the engineers found that they were heavier than the ones requested and that they were nested, top side up, with the top boat three-fourths full of water, the upper three or four inches of which was solid ice.

Orders were issued to break out the pioneer tools, smash the ice in the top boat, and bail out the water. As it struck the ground around the truck, the water promptly froze, and the unloading detail slipped on the icy footing.

After a desperate struggle the boats were unloaded. Carrying their burdens, the infantry-engineer teams started the long, slow trek to the launching site, trying to make up the time already lost.

The last of the 500-pound assault boats was finally in place at 0200 7 February. To the amazement of all, what had seemed to the participants a noisy debacle still seemed to have left the German unaware of the activity on his front.

Company A was at the head of the column to make the initial crossing. The leading platoon was brought forward, and the first wave of assault boats was placed in the water.

Standing at the bank of the river the water could not be seen but the ominous rushing sound indicated plainly that the river was swollen out of all proportion to its normal size. The platoon leader quickly changed his original plan, deciding to cross with one boat towing a line. This line was to be secured to the

opposite bank and serve as a guideline for the rest of the boats. This decision undoubtedly saved a number of lives and the loss of irreplaceable equipment.

The first boat was manned by a crew of two engineers and a rifle squad. Launched into the darkness and swirling water, it had moved only about its own length when it was seized by the current and dashed downstream and back into the near shore.

The same crew tried several times but the swift current of the river threw them back. Eventually it became clear that at this point the current was almost head-on because of a sharp bend in the river a few yards upstream. Darkness and the need for haste made it unwise to search for a new site. The men would make another try where they were.

This time the infantry crew of the first boat was replaced by carefully selected engineers who had been thoroughly trained in handling boats and were expert oarsmen. But the efforts of this new crew failed.

Feeling that stealth had been compromised anyway, the battalion commander decided to dispense with it. He ordered the engineers to bring up two 35hp outboard motors which were part of the boat equipment.

The first of these was mounted on a boat, the infantry-engineer crew boarded, and a line was attached. The motor was started and the boat moved off. Almost immediately a wave washed over the stern of the boat and caused a motor failure. The boat was swept back to the near shore.

The motor was removed and replaced. The boat was reloaded, and launched once more. It shot away, roaring at top speed.

As the boat disappeared toward midstream, it was literally lifted by the torrent and turned upside down. Crew members were thrown clear and found themselves in a desperate life-or-death struggle with the cold and violent waters of the river.

Heavily clothed and numbed by the shock of the icy waters, they were further handicapped by the impenetrable darkness. Seven of them were lost.

Of the remainder, four succeeded in returning to the near bank. A fifth crew member, swept some distance downstream, became, at approximately 0400 7 February—the first man of the 44th to set foot on German soil on a combat mission. Ironically, he was unarmed.

This man made his way back upstream on the far shore—largely by instinct and good guessing—to a point directly opposite the crossing site.

He could hardly be expected to appreciate at once that through his unhappy circumstance, the success of the entire operation was now possible. He promptly reported his situation and whereabouts.

An engineer sergeant came forward with the suggestion of shooting a rifle grenade across with a tape tied to it.

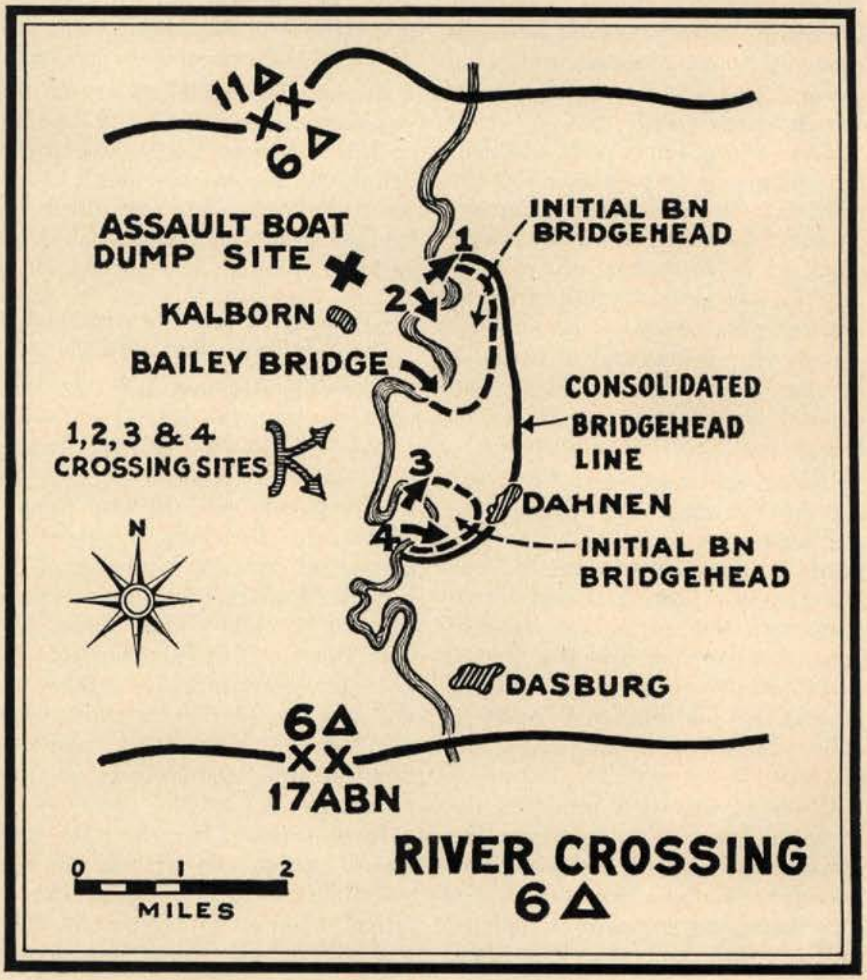
A few minutes later, as the first grey light filtered down into the canyon, a grenade was fired across, trailing a slender white line, so light a strong man could have broken it with his hand. The man on the far side grasped the tape, and eventually drew in a length of cable which was fastened to a tree on his side, and secured by the engineers on the opposite side.

The engineer company quickly arranged what they call a "flying ferry," consisting of pulleys that ran along the cable, to which ropes were attached and in turn secured to each end of a boat. By shortening the forward rope, it was possible to pull the boat, assisted by pressure of the current, across the river at a surprising speed.

Through this quick turn of events, the rushing torrent which had defeated all the normal measures to bridge it during the night, was now harnessed and its powerful force was actually helping pull the boats back and forth in a round trip that took less than five minutes.

At 0715 the first boatload of infantry landed on the far shore. The process was quickly repeated and shortly all of Company A was across. As rapidly as squads were landed, they were moved directly to covering positions to secure the crossing site.

With the coming of light, examination of the immediate terrain rising from the far side of the boat



crossing made it easier to understand why there had been no enemy reaction, and why even now the bridgehead was rapidly expanding without any apparent sign of detection.

Besides the roar of the river, which had drowned out the noise of the crossing effort for the most part, the attackers found the slopes on the far side so steep as to defilade them from the main line of Siegfried defenses. During the early morning of 7 February, it also became apparent that the Germans maintained no observation posts and operated no patrols in the vicinity of this crossing.

This area was littered with booby traps and anti-personnel mines, and prisoner information later revealed that the Germans in the sector had taken it over only a few days previously. They knew this ground was mined, but did not themselves know the exact locations of the fields. Fear of entering this uncharted danger area had caused them to rely upon the river and the difficult terrain for close-in protection.

As a result, the initial lodgement was expanded until the whole of Company A had worked up into positions some distance from the crossing and extending in a wide semicircle around it.

The "flying ferry" was excellent for moving the first waves across the river, but was inadequate to support an entire battalion. Since the enemy appeared to be unaware of the crossing, it was decided that prior to moving more troops over and expanding the bridgehead to battalion size, two footbridges would be constructed—one to be a suspension type bridge, the other a floating type.

During the remainder of this day and the following night the engineers continued the battle with the elements to provide the bridges. In one instance, as a floating bridge neared completion, the rushing waters surged upward to catch it and tear it out. More equipment was obtained as rapidly as possible, and renewed efforts during the night proved successful.

While Company A protected the engineer work at the crossings the remainder of the 44th had been withdrawn to Kalborn to wait under cover until the engineers completed the foot spans. As these were finished, more infantry was on the way, and before the darkness had completely lifted on the morning of 8 February, the rest of the 44th was moving rapidly across and into positions on the far side.

One platoon of Company C was ordered to move directly down the river and reduce a pillbox immediately overlooking the Bailey bridge site, securing a small bridgehead at this point. The remainder of the battalion was to pass through Company A and push vigorous reconnaissance against the Siegfried Line in the battalion zone. Company A was to extend to the right portion of the bridgehead, anchored on the Bailey site. Company C less one platoon was to operate in the center, while Company B took the area left (north) of the bridgehead.

This attack began soon after dawn.

The battalion encountered small arms and mortar fire and heavily booby-trapped areas. Once he discovered the crossings, the enemy placed heavy fire upon them. The suspension bridge went out when a mortar round snapped a supporting cable but it was immediately repaired. The floating bridge was undamaged throughout the operation.

Because there was no enemy resistance opposing the initial crossing of this battalion, the 44th enjoyed definite tactical surprise and by 1030 on 8 February had expanded its bridgehead to a mile and a half deep and two miles wide.

Crossing of the 9th Armored Infantry Battalion

The 9th Armored Infantry Battalion, under command of Lieutenant Colonel Frank K. Britton, began movements to cross the Our River simultaneously with the 44th Armored Infantry Battalion. Company C, the assault company, commanded by Captain Paul Storck, moved into a forward assembly area along the Our River at 061530 February. At 1610 the plans and preparations for the crossing of the battalion were completed when the engineers dumped the assault boats at the attack position.

In a driving freezing rain the assault troops moved out of the assembly area in boat crews so as to arrive at the attack position at 1845 and pick up the boats. It took the assault troops until 070100 February to carry the boats to the crossing site, due to the length of the move, weather conditions, and the difficult terrain. During this time five men were wounded by enemy mortar and small-arms fire.

Company C worked from the time they arrived at the river until 070345 February before they were successful in placing the first boatload of men on the far bank. The remainder of Company C reinforced was ferried across by 0645 using assault boats, thus arriving on the east bank approximately 30 minutes before the first boatload of the 44th Armored Infantry Battalion. Captain Storck, the company commander, was seriously wounded by enemy small-arms fire soon after his arrival in the small bridgehead. Lt. Colonel Britton immediately placed Lieutenant Everett C. Martin, Jr. in command of Company C and directed the company to continue its important task of expanding the battalion's bridgehead.

Company B, under command of Lieutenant Percy R. Blundell, arrived at the crossing site at 0645. Leading elements attempted to cross the river in assault boats; however, it was getting light, thus resulting in the crossing site being covered by accurate and effective enemy small arms, observed mortar, and artillery fire. Only one boatload was placed on the east bank before it became evident that the crossing could not be effected without concealment from the enemy position. This resulted in Colonel Britton issuing instructions that the crossing would be completed that night on a footbridge to be constructed by the engineers.

Company A 25th Armored Engineer Battalion was given the mission of constructing the bridge. They found the work slow due to the flooded stream and the enemy harassing action. Another difficulty was the replacement of equipment that was washed downstream by the surging waters. The bridge was successfully completed just before noon the following day, February 8th.

After completion of the bridge the battalion continued the crossing of the river, with Company A commanded by Captain John L. Rice leading. By 1345 Company A had cleared the bridge and Company B had started crossing. At this time the

Germans threw a heavy concentration of mortar fire at the bridge and the approaches to it, but no direct hits were scored. Company B pushed ahead and by 1500 had cleared the bridge and established contact with Companies A and C on the far shore.

The companies at this time were ordered to consolidate their gains and establish physical contact for the night. This was difficult due to the mountainous terrain, but by 1830 this task was accomplished and the bridgehead was firmly established. A small counterattack along the entire battalion front was repulsed at 1740 with no loss to the battalion.

In order to support the battalion on the east bank of the river, Company A of the 25th Engineers were ordered to establish a ferry at the crossing site the morning of 9 February. This mission was completed by noon.

The 9th Armored Infantry Battalion had accomplished a most difficult crossing in the minimum time expected. Unlike the 44th Battalion's unopposed crossing to the north, the 9th had received effective enemy small-arms, observed mortar and artillery fire from the time the first troops arrived at the crossing site until the battalion repulsed the coordinated counterattack on the east bank of the Our River 1740 on February 8th. Even though the 9th Armored Infantry Battalion crossing was opposed by the enemy and in spite of the difficult terrain and extreme weather conditions, this battalion was successful in capturing the first objective on German soil for the 6th Armored Division.

With the build-up of troops across the river it was now possible to join the two bridgeheads, so Reserve Command ordered the battalion to send one company to the north to make and maintain contact with the 44th Armored Infantry Battalion. Contact was established and a continuous defensive line was tied in by 091830 February.

Summary

The crossing of the Our River by the 6th Armored Division was a well executed operation in view of the particularly difficult terrain, adverse weather conditions and the strong hostile positions of the Siegfried Line. Fortunately the enemy did not exploit his advantage and success was attained against light resistance with the exception of the crossing made by the 9th Armored Infantry Battalion where effective enemy fire was received. But, before reaching any conclusions it is felt that the enemy situation opposing the over-all operation should be reviewed.

profile

Stephen T. Early, Deputy Secretary of Defense . . . born Crozet, Va., . . . Washington staff UP 1908 to 1913, AP 1913-17 . . . served with 80th Division in WWI . . . following armistice he was assistant officer in charge of Stars & Stripes at Paris . . . honorably discharged from Army in July 1919 . . . returned to AP Washington staff for seven years . . . Washington representative for Paramount News and Famous Players Motion Picture Company 1927-33 . . . Assistant Secretary to President Roosevelt 1933-37 . . . Secretary 1937-45 . . . VP of Pullman Car Mfg. Company 1945-49 . . . appointed by President Truman as Under Secretary of Defense in May 1949 . . . title changed to Deputy Secretary of Defense in August 1949.

The German forces had been revealing definite signs of strain as they were gradually driven into the Siegfried Line from where their Ardennes offensive had been launched six weeks earlier. Official reports reveal that the defensive potential of the forces opposing the crossing were the following averages per kilometer of assigned frontages.

26 Infantrymen
1.62 Artillery pieces
0.4 Antitank guns

The West Wall fortifications were considered by Field Marshal Model, Commanding the German Army Group B opposing the III Corps, to be obsolete. Its works and installations provided the US Forces with much better targets in that they were vulnerable to the matériel and tactics of the Allies, the latter by reason that sufficient German troops were not available to occupy all positions.

The planning for and the performance of the troops during the crossing were exemplary. The fact that the hostile resistance was light was more than compensated for by the extreme conditions imposed by the weather and terrain.

This river crossing operation illustrates the typical in deliberate river crossings. It chronologically outlines the operation from its conception to its termination as it blended into another variation of offensive operations, the attack on fortified positions.

Conclusions

1. Armor can operate effectively in difficult terrain and cross rivers under adverse weather conditions.

2. Armored divisions can successfully execute deliberate river crossings but, due to certain equipment limitations, are less adapted to this operation than infantry divisions.

3. The reserve command can be used to accomplish tactical missions with effectiveness equaling the combat commands. The commander who does not consider such employment of the reserve command is not availing himself of the full organizational potential of his division.

4. Any river, regardless of its topographical characteristics, the meteorological and climatic conditions of the period, is an obstacle that can be successfully crossed with little reinforcement of organic equipment.

5. River crossings are operations that are normal occurrences in the combat operation of armored units.

6. The difficulties encountered during the crossing of the Our River by the 6th Armored Division could have been tempered by more effective reconnaissance for a selection of crossing sites. This was especially illustrated in the crossing of the 44th Armored Infantry Battalion.

"...nothing to stop those tanks!"

The New York Times.

CITY EDITION

NORTH KOREA TANKS ENTER SEOUL; SOUTH MOVES ITS CAPITAL 25 MILES; TRUMAN WARNS SOVIET, SATELLITES

The Washington Post

RED TANKS OVERRUN U.S. OUTPOST

Allied Planes Batter Targets in North

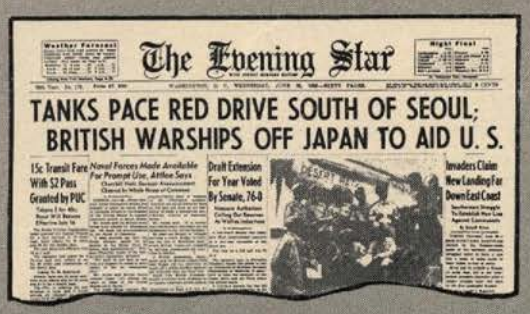
THE BOSTON HERALD

YANK BAGS SOVIET FIGHTER, RUSSIA WARNED BY TRUMAN, RED TANKS DRIVE INTO SEOUL

Korea War Briefs

Minneapolis Morning Tribune

Red Tanks Enter Seoul; American GIs Under Fire



The Evening Star

TANKS PACE RED DRIVE SOUTH OF SEOUL; BRITISH WARSHIPS OFF JAPAN TO AID U. S.

The Herald-Dispatch

TRI-STATE EDITION

U. S. Flier Shoots Down Soviet Plane; Red Tanks Smash Into Tottering Seoul

FLOOD DEATHS CLIMB TO 29; THREE MISSING

Korea News Terrorizes Europe

SOUTH KOREANS FALLING BACK ON WIDE FRONT

Council Okehs Bond Vote

Dispatches on Korea*

From the size and speed of the Communist attack, it was evident that it was a premeditated action; that it had been carefully plotted for many weeks before. *The initial thrust, supported by planes and tanks, had clearly caught the Korean government troops by surprise.* Although the defending forces rallied and launched several small counteractions, it did not appear that they were in a position to bar *the tank-and-plane-supported Communist thrust* down the corridor to the capital city.

Secretary Acheson
(Before the American Newspaper Guild)
The Washington Post

* * *

United States advisers may say that the tank is a military handicap in a country such as Korea. Bare mountains divide the valleys filled with paddy fields, which this time of year are simply muck two and three feet deep. Tanks thus must move by roads and should be sitting ducks for determined men with antitank guns, bazookas and demolitions. *Every South Korean regiment contains one antitank platoon, and eight engineer battalions were specially trained in how to deal with armor.*

Military experts now admit, however, that they failed to give sufficient weight to the psychological effect of tanks, and recall what happened in the Low Countries when Hitler's armor finally broke through in the last war. . . . The tough Korean troops have not been able to follow plans for meeting the tanks . . . too often the appearance of tanks is the signal for the troops facing them to evaporate.

Burton Crane to *The New York Times*

* * *

The marines have the best communications system from ground to air and the trained fliers and planes to carry on tactical warfare against tanks. It certainly isn't easy for B-29s to locate tanks. The job of fighter planes is to get control of the air against enemy aircraft and not to conduct low-level or dive-bombing operations against tanks.

David Lawrence in the *New York Herald Tribune*

* * *

American jet fighters and Mustangs have knocked out numerous North Korean tanks. *These tanks were primarily responsible for the earlier breakup of two of South Korea's four front-line divisions . . .* The importance of rockets is seen in the fact that *the South Koreans have so far found no effective means of stopping North Korean tanks.* The South Koreans have no tanks of their own and have *no experience in fighting this formidable assault weapon . . . when tanks first made an appearance north of Seoul, they quickly broke through two of South Korea's best divisions, leaving the city of Seoul wide open to invasion.*

Gordon Walker in the *Christian Science Monitor*

* * *

. . . The sudden Communist attack and *the lack of tanks* and heavy weapons on the part of the Korean defenders combined to place the severest possible strain on the untried Southern army, and it is not surprising that there was confusion, that units broke, ground was lost.

The Washington Star

* * *

. . . the dispatch said that the outnumbered Americans had halted the North Korean advance while both *artillery and aircraft chewed at Red infantry and tanks. There was no indication that United States armor, tanks or armored cars, had been committed.*

The Associated Press

* * *

. . . In the east coast area, *previously unrestricted movements of enemy troops and armor . . . were stopped by naval bombardment and air strikes . . . Fighter planes performed* escort, cover and *close support missions. Numerous* bridges, *tanks,* trucks, locomotives, artillery pieces, oil storage tanks and boxcars *were destroyed and damaged.*

Communiqué from
General MacArthur's Headquarters

* * *

. . . The Korean always has considered himself brave. *When he ran from tanks he felt baffled and ashamed.* When the Americans were pulled back from positions that the Koreans felt were the stepping stones back to Seoul, he was stunned and surprised, but he felt better about himself. A bond of kinship was established. *He feels that with the arrival of United States armor the tide will change.*

The Associated Press

★Italics are ARMOR'S.

Editorial Note: When a cavalry veteran turns to plots and politics, motivated withal by good intent, strange things can happen. Here is perhaps the most curious coup in all History, whereby jailed and jailers twice reversed themselves in a single momentous eve, while Paris slept and the "deceased" dictator sweated it out in Russian snows. There was palace drama when Stalin ousted Trotsky twenty-three years ago, but it was nothing compared to old Horseman Malet's fleeting defeat of a fabricated ghost. To wit . . .

TWO HOURS:

While Paris Slept

by DR. ROGER SHAW

PROLOGUE

Claude Francois de Malet, our libertarian dictator for some 120 minutes, on the long dark night of October 22-23, 1812, was born at Dole, in easterly Burgundy, in 1754. He entered the old Royal Army of Bourbon France in 1771, and went over to the Revolution of 1789, with some other self-made officers. He served on the Rhine with the National Guards, and also, with credit, in Italy. He became, in 1799, a brigadier-general, but was dismissed from the army by Napoleon, for alleged republican "disloyalty," by 1807. He was then confined at La Force in Paris, and in state-prisons. Escaping, shortly after he perpetrated a magnificent game of bluff, which ended only with the firing-squad. This forgotten man—this warped but gallant and audacious brain—this hater of Caesarism and of counter-Revolution—must have, and probably did, soliloquize somewhat as follows, back in prison after his Two Hours, as he and his comrades awaited the exterminatory End . . .

STREAM OF CONSCIOUSNESS

I was a brigadier, and a republican as well. I belonged to the Order of the Philadelphians, whose secrets and ideology Bonaparte, a renegade Brother, has so blatantly betrayed. Now, my friends, I am about to die at the hands of the agents of this Corsican upstart—this self-made *Imperial* upstart who outwitted us all in 1799, and again in 1804.

Four years after his usurpation, his silly Notre Dame display of kingship, Bonaparte jailed me, along with some of my friends—*Me*, a convinced hater of kings and clerics, a Brutus of our time. Men like we made this Bonaparte; now, in turn, he un-makes us. Such are Emperors, more reactionary than Hapsburgs and Guelphs, more despotic than Romanovs . . .

Now, this Bonaparte is doing badly in Russia in the current 1812! His legions, and those of his all-European puppets, are in retreat and the grim avenger-angel hovers over all. They tell me he got the news of me at Smolensk, and that he turned pale, and then deserted his army, as once he had deserted the true republicans, like Carnot and like—myself.

People have ever said I was over-imaginative, over-strung, visionary and perhaps utopian, yet with a taste and talent for high intrigue. In my four years of captivity I plotted and planned, fumed and forged. On October 22, 1812, as the time arrived for the destruction of the Kremlin and Bonaparte departed from Moscow, I escaped by dark from prison. I took the name of "General Lamotte" and marched straight to the Tenth National Guard of Col. Soulier. I told him, frankly and convincingly, of the "lamentable death" of the "great Napoleon," and announced a "necessary" change of government. I told Soulier, in no uncertain terms, to resign command of the Tenth.

This was, indeed, at two o'clock at night, and the Colonel was sick in his bed. When he heard "my news," poor snob and dupe, he burst out crying but said he could not get up because of his disabilities. Alas! His adjutant assembled the Tenth, sleepy bourgeois, half clad, half armed, and put it under my command. Here was a tool for my plans and my ambitions: the beginning of the end of this Bonaparte, the scourge of the philosopher's God and of all good Men of the Mountain . . . Armed only with a flaming torch, I read to the National Guardsmen a series of proclamations and "decrees" which I had fabricated while in confinement, and won to my false colours some hundred dozen hometroopers who expressed their complete willingness to follow the lead of the resourceful "General Lamotte." It seemed, my friends, almost *too* easy, this acting the part of Brutus against the modern Caesar.

We marched, the Nationals and I, to the old jail of La Force, where we released two more good republicans, Generals Guidal and Lahorie, friends of Moreau and Bernadotte, true sons of Liberty. At once, these veteran reds arrested their arresters, as mice might seize the cats. Soon the police minister and the police prefect, the infamous lickspittles Pasquier and Savary, were in our power, and singing a different tune from their customary Imperial huzzas. These Bonapartists, surprised like old Soulier, in their beds, offered no protest and believed firmly in our "death" of the Despot. Lahorie and Guidal—I laugh as I think of it—locked up this Savary and this Pasquier in old La Force in their *own* cells; a just and justifiable turn and turn-about if ever there were one.

The *sacré* Frochot, prefect of the

Roger Shaw is a political scientist, with a broad background in the field of journalism. From a first assignment as reporter on the Reading *Times* in 1925, he switched to the post of Foreign Editor of the *Review of Reviews* in the period 1932-1937, moving over to the *Literary Digest* in the same capacity during 1937-38. Next came a tour with *Current History*, followed by three years of radio commentary with New York's stations WNYC, WOV and WOR. Dr. Shaw has been Professor of International Relations at Trinity College since 1946. He is author of the "Handbook of Revolutions," "Outlines of Governments," "175 Battles," "Mars Marches On," and "From Adam to Atom."

Seine, a Bonapartist pet if ever purred such a pest, swallowed our long tale, hook, line, and sinker, to use an English simile, and set about preparing suitable apartments for the new government of "General Lamotte et Cie." Man, my friends, is more fickle even than woman; more perfidious yet than an Albion. But I had sore trouble with the military governor of the capital, General Hullin, who openly, and even defiantly, demanded to see my specific "orders." He resisted our arrest, making embarrassing comments disrespectful in nature and incredulous of our just aims. Finally, exasperated by such a boorish attitude, I wounded this rascal in the face—and *what* a face—with my pistol, and he fell wounded in the presence of a capitain of the Tenth (who naturally sided with me in the *affaire*).

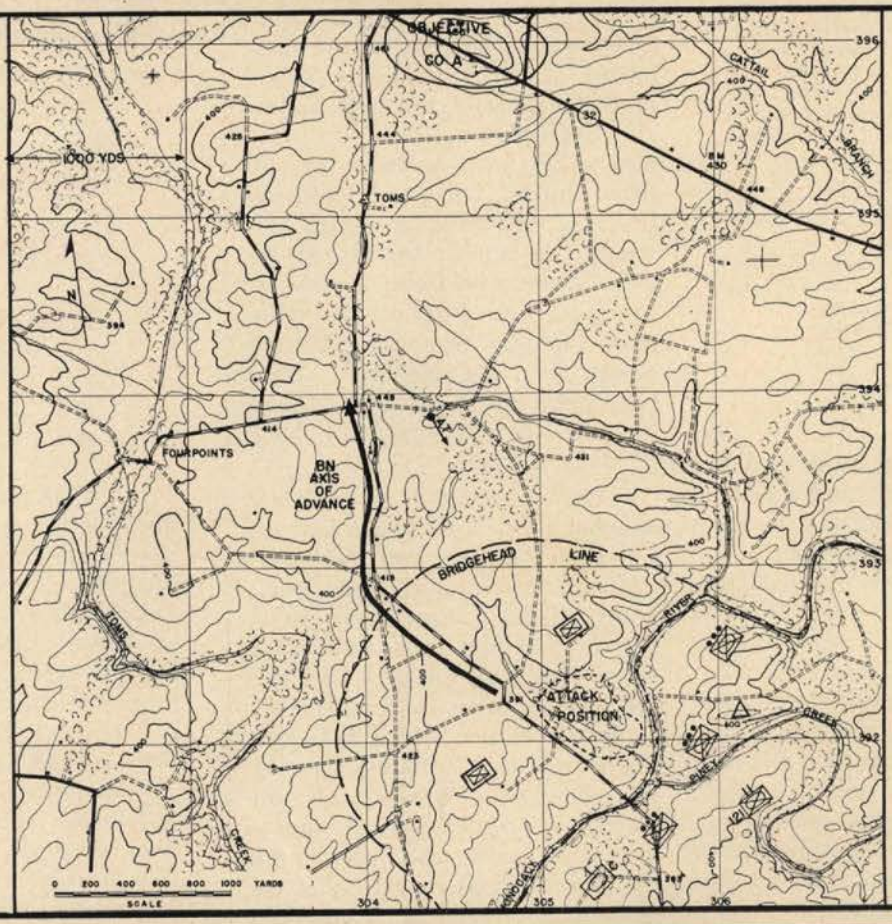
Hullin's adjutant was General Doucet, and we next interviewed this worthy. But unfortunately, there was present with this Doucet an inspector of police, M. Laborde, who recognized in the celebrated "General Lamotte" a certain General Malet. This flat-foot, this veritable *vache,* swiftly ordered my arrest as an "imposter" and a saboteur. The Nationals —my trusty Tenth—seemed wavering in the light of this fresh, impassioned evidence. I saw, in a flash, the end of the road I had travelled so hopefully, and with so much imagination. Having a second pistol on my person, I attempted suicide, in the manner of the philosophical ancients, following the lead of Socrates, of Cleopatra, indeed of my hero, brave Brutus. The pistol failed me. I was overpowered and placed in rough and tumble custody by the police *vache*. The Tenth, abominable bourgeois, turned against me in the most approved manner of Citoyen Sheep. Soon we were back behind bars, and again Savary and Pasquier, Pasquier and Savary, were in charge of Madame Paris.

It was a sleeping Paris, for it was now but a little after four oclock and still pitch dark. For two hours we—Guidal, Lahorie, myself, good republicans all—had reigned and ruled. Now we are back, trussed up, in our *not* so gilded cages at grim La Force. Soon we are to be shot: as "traitors" to the Revolution which Bonaparte has destroyed, as "unfaithful" to this Bonaparte who was himself unfaithful to republicans all—and to the sacred and secret Order of the Philadelphians. It may be that our philosophic brethren abroad—the *Tugendbund,* the Men of Carbon, The *Illuminati,* the Accepted Brotherhood of Redemption—will someday avenge us. *Now,* we die. We die to end militarism, to check Imperial onslaughts of aggression, to sound the knell of capricious tyrants like a Caesar, a Cromwell, a Bonaparte. World wars are out of keeping with the philosophical and Enlightened era in which we are fortunate enough to have lived. There must be no more of them. And so, after two brief hours of republican power, of upholding the restoration of Voltaire de Ferney and of the great Jean-Jacques, we die. *Vive l'humanite!*

EPILOGUE

Malet, Guidal, and Lahorie, republican generals, and liberators for their two brief hours while *tout-Paris* snored fitfully, were executed on October 29, 1812, by Savary and Pasquier, the men they had outwitted (and lampooned for eternity). Next year, the *Tugendbund* (like old Arminius in his Germanic forests) accounted for the beginning of the end of Napoleon Bonaparte, self-made Emperor of the French and Scourge of the philosophical Godless. And the Philadelphians, still alive today, only smiled; for they now had (and still have) *other* fish to fry.

HOW WOULD YOU DO IT?



YOU ARE PLATOON LEADER, 1ST PLATOON, COMPANY A, 1ST TANK BATTALION, REINFORCED. YOU HAVE JUST RECEIVED YOUR ATTACK ORDER FROM THE COMPANY COMMANDER AT AN OP.

YOU KNOW THE SITUATION; *(SEE MAP)* WE WILL ATTACK AT 0600 TOMORROW THROUGH THE 121ST ARMORED INFANTRY BATTALION, REINFORCED, WITH THREE PLATOONS ON LINE TO THE RIGHT OF THE ROAD, TO SEIZE THE OBJECTIVE.

LINE OF DEPARTURE FRIENDLY FRONT LINES.

RECONNAISSANCE PLATOON AND FRIENDLY INFANTRY WILL GUIDE US FROM THE ATTACK POSITION TO THE LINE OF DEPARTURE.

1ST PLATOON, REINFORCED WITH 1ST PLATOON, COMPANY B, 121ST ARMORED INFANTRY BATTALION, ATTACKS ON THE LEFT, SEIZE LEFT PORTION OF OBJECTIVE, REORGANIZE AND COORDINATE WITH COMPANY C ON THE LEFT.

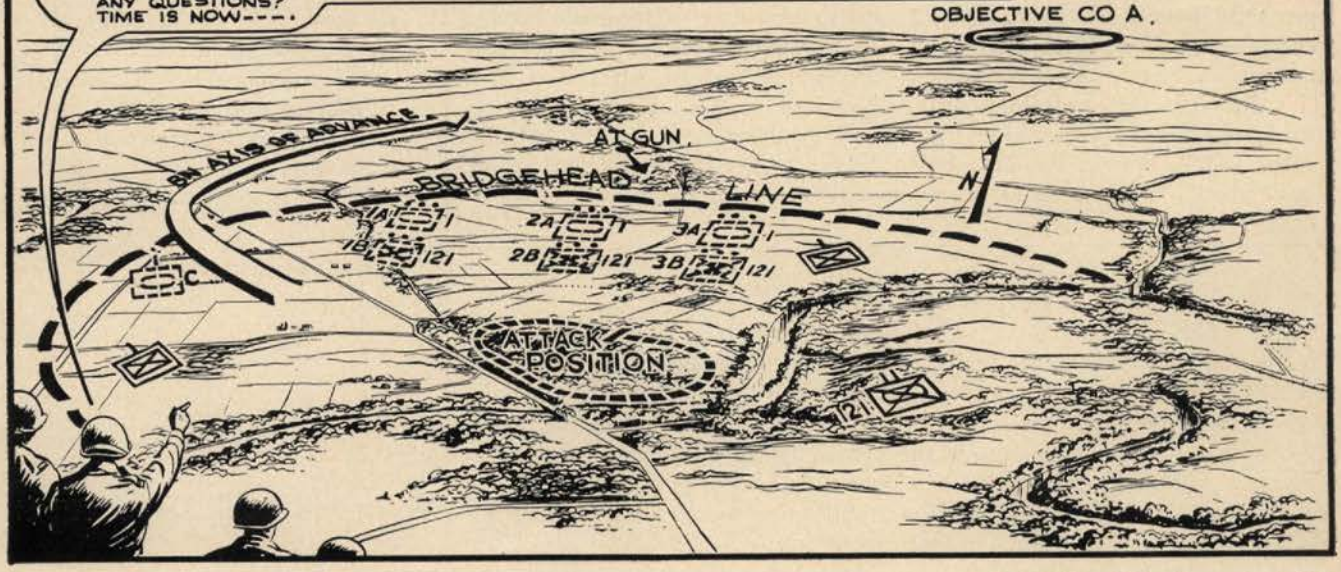
2D PLATOON REINFORCED, ATTACKS IN THE CENTER------.

3D PLATOON REINFORCED, ATTACKS ON THE RIGHT------.

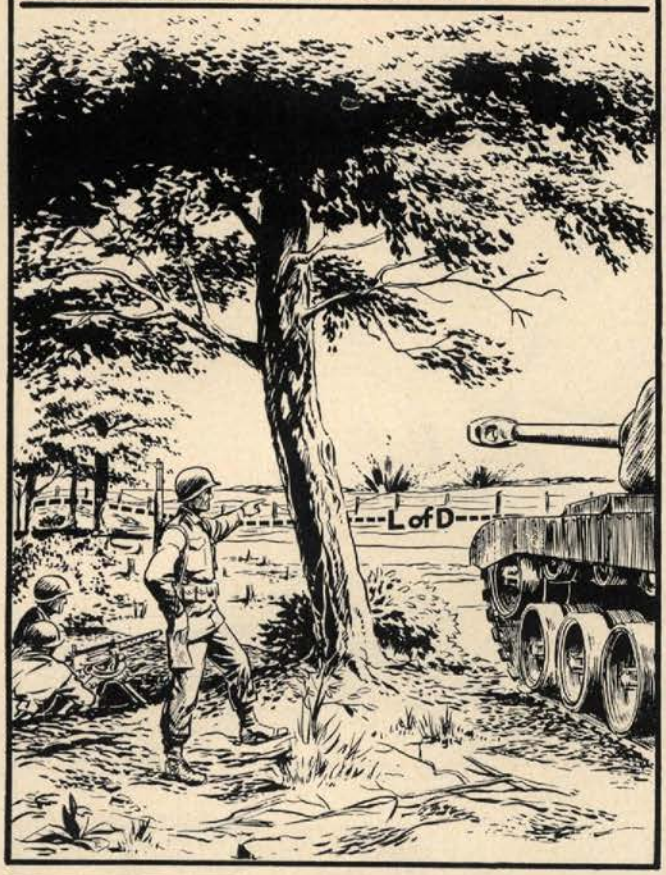
ARMORED INFANTRY PLATOONS MOUNTED, WEDGE FORMATION IN REAR OF TANKS. ONE FO IN HEADQUARTERS TANK, THE OTHER IN ¼ TON. NECESSARY SUPPLY ON THE OBJECTIVE. COMPANY NET OPENS ON MY ORDER. ARMORED INFANTRY CO VEHICLE AND MY TANK WILL BE BEHIND THE CENTER TANK PLATOON DURING THE ATTACK.

ANY QUESTIONS?

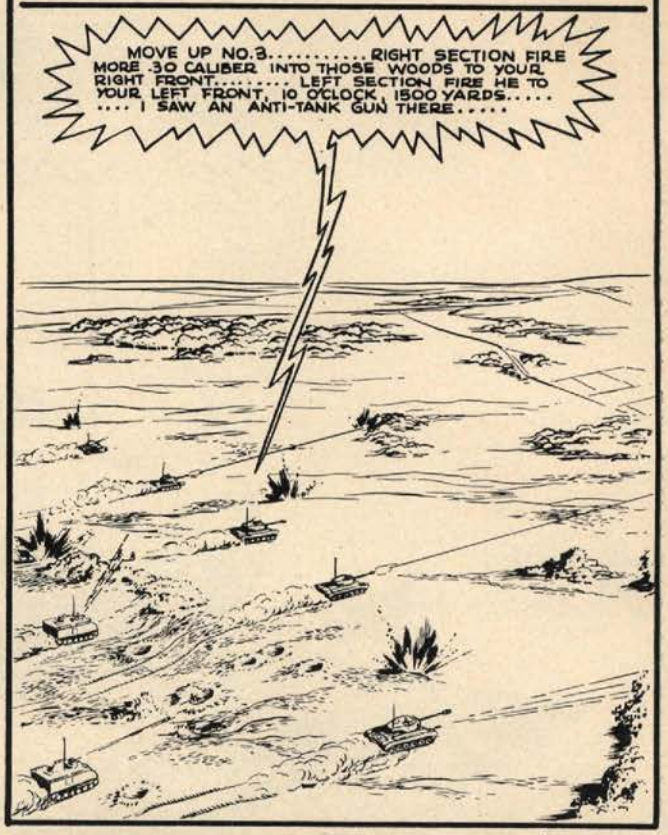
TIME IS NOW---.



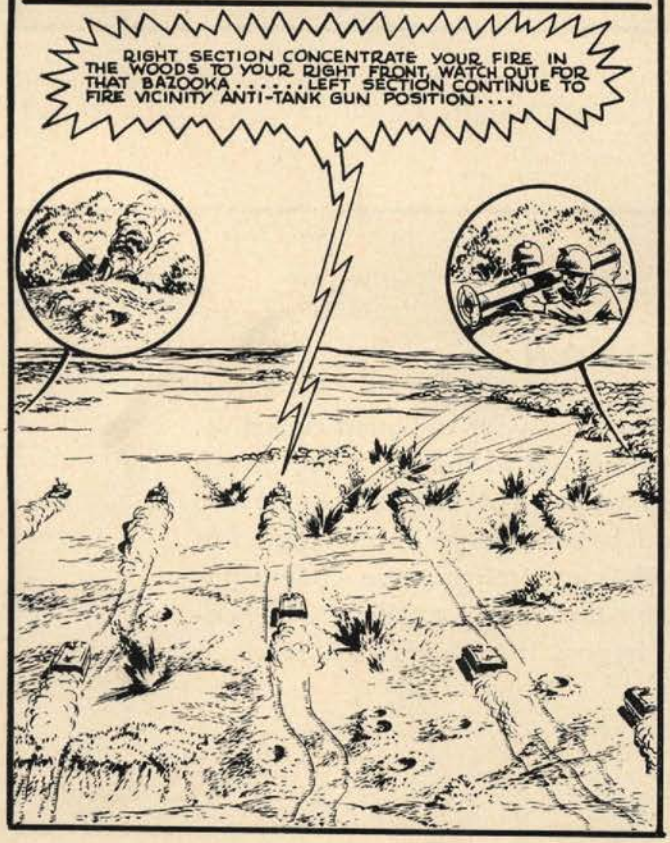
YOUR PLATOON BEING GUIDED FROM THE ATTACK POSITION TO THE LINE OF DEPARTURE.



AFTER CROSSING THE LINE OF DEPARTURE MACHINE GUNS OF YOUR PLATOON ARE USED FOR RECONNAISSANCE BY FIRE OF SUSPECTED ENEMY POSITIONS.



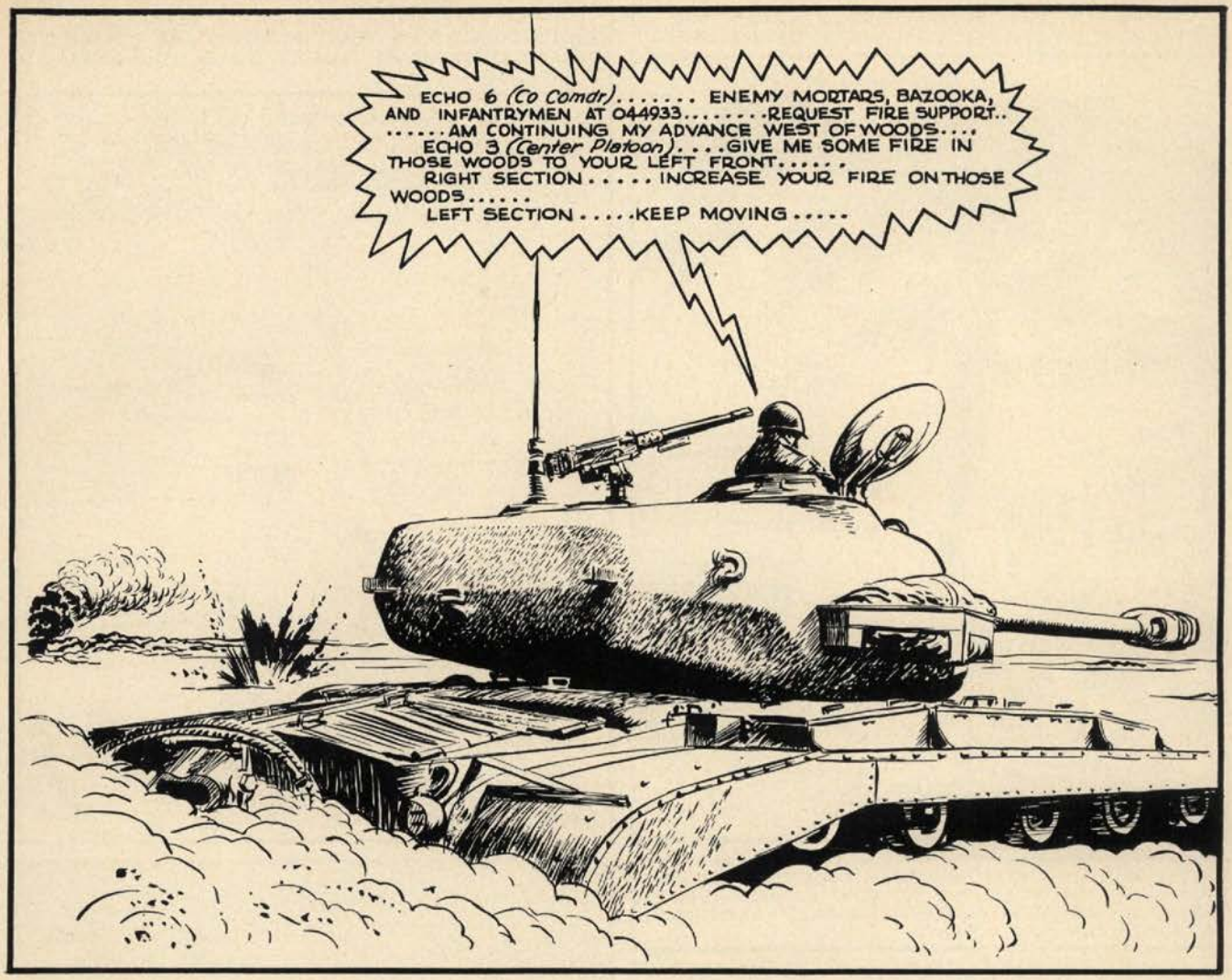
THE ANTI-TANK GUN HAS BEEN DESTROYED. AS YOUR PLATOON CONTINUES THE ATTACK, IT COMES UNDER HEAVIER FIRE FROM ARTILLERY, ROCKET LAUNCHERS, MORTARS, AND SMALL ARMS.



WHAT WOULD YOU DO

SEE NEXT PAGE FOR SOLUTION

TNG LIT & REPRO DEPT T.A.S. FT KNOX



DISCUSSION

You should continue the attack to seize your assigned objective. You should inform your company commander of the situation, giving him coordinates of the enemy strong point. You should request fire support on this location. You should coordinate your tank gun fire with that of the adjacent platoon while neutralizing the enemy position. The sudden massing of fire on the enemy position will neutralize the enemy resistance as you bypass the woods and continue on to the objective.

COMPANY PUNISHMENT

Company level is the working area for discipline, morale, effectiveness. Company punishment plays a large part in the pattern. The President recently signed the bill providing a Uniform Code of Military Justice for the Armed Forces. Here is the first of two articles on an important subject, presented in a manner readily understandable by those who do not have training in law.

by DEAN E. RYMAN

THERE is no substitute for discipline. A commanding officer who does not get instant and implicit obedience from all his men day-in and day-out is a failure. If he cannot invariably put his unit exactly where its striking power is required, at the very moment that need therefor is urgent, or if he cannot be wholly confident that his command will then do precisely what he directs —neither more nor less, and never something else, praise for accomplishments previously credited to him is but as sounding brass or a tinkling cymbal.

Many schemes for attaining discipline exist. Some are more effective than others, but none are infallible. Each emphasizes one or more of the incentives to which commanders have appealed under varying circumstances when seeking wholehearted and unquestioning compliance with their orders. Among them is the age-old "Company Punishment" which has been published to the Army for many years as Article of War 104 and is more or less familiar to all small-unit leaders. It will presently be available in a rather substantially modified form, under a new name—"Non-judicial Punishment," in the recently enacted UNIFORM CODE OF MILITARY JUSTICE.

Twenty-five centuries ago, Sophocles made the earliest extant declaration of the principle that a smarting penalty, promply but equitably inflicted, is the stable foundation upon which discipline ultimately rests. If anyone has since learned a practicable method for securing unvarying obedience which has no place for summarily imposed punishments that sting, his discovery has not yet become generally known—at least not with convincing evidence that it is efficient.

Dean E. Ryman is Judge Advocate Liaison Officer for European Command in the Office of the High Commissioner for Germany. He is serving in a civilian capacity following his retirement in 1948. This article is based on a series of Talks About Military Justice, a general name applied to the manuscript and notes for a series of small books, telling the court-martial story in understandable terms. Colonel Ryman began writing these in France in 1919. Since then he has given various talks officially and unofficially, the last complete presentation being made at Bremerhaven in 1947.

Soldiers (like many other folks) most readily acquire the habit of doing what they should, in an acceptable manner and at the proper time, after there has been created among them a widespread belief, founded upon daily observation, that an appropriate and lawful punishment always goes hand-in-hand with misconduct, even their "minor offenses." Leadership, the art of securing specific performance of military duty without compulsion (or with a minimum of it), thrives when that conviction is prevalent throughout any command.

Who may summarily punish

We do not yet know exactly how "Non-judicial Punishment" will be imposed when the new law becomes effective on 31 May 1951. That can hardly be ascertainable until a Manual to implement the UNIFORM CODE OF MILITARY JUSTICE has been published to the Army. It is a fair guess that there will be a separate Manual for each of the armed forces, containing "such regulations as the President may prescribe," as well as others to be issued by the Secretary, both of which are authorized in Article 15 of the new code. It is also a reasonable expectation that—for the Army, at least—there will not be many startling departures from the regulations which now implement the 104th Article of War, though more detail would certainly be very acceptable to most of those who must use those regulations.

Presumably only a commissioned officer will be allowed to impose "Non-judicial Punishment," as is now the rule with respect to "Company

Punishment"; and there is no indication that the increased power provided by the new law will be entrusted to any officer other than the offender's immediate unit-commander, or to a superior in the same command channel. That is the present practice, and the authorization for an "officer-in-charge" to summarily punish subordinates is expected to be utilized only by the Navy.

Validity of a summarily imposed penalty depends upon the existence of an actual command relationship toward the offender at the moment the order is given. It matters not when or where the misbehavior occurred, if within the accused's current period of service, though prompt action is essential for good results; most successful commanders think sixty days the maximum, despite there being a two years limit in the new law.There is no significance in the facts that the officer may be commanding only temporarily, or that there is no formal order appointing him to command, or even that a superior may have directed him to desist from using his summary punishment authority at all, or for a certain case, or with respect to a class of cases which would include the one wherein he acts. Congress has conferred the authority and no other power can take it away, though a superior can reasonably restrict the exercise thereof by a subordinate—up to the point where his restriction amounts to a complete destruction of the power. That cannot be ordered by a superior; but regardless of that limitation, if the officer who orders the punishment is at that moment the commander of the accused, the latter is lawfully penalized. It matters not that a superior of the commander may later modify or annul the punishment order, extend clemency, or discipline the officer; the order is lawful until the superior directs otherwise. A staff officer cannot summarily punish anyone.

Successful commanders of smaller units have learned, frequently by hard experience, that they must freely but intelligently utilize their prerogatives under the 104th Article. The authority thereby conferred (or confirmed if you prefer) carries the responsibility for personally exercising this power on each appropriate occasion. No such leader can ever delegate the performance of this function, an attribute of command; though it matters not who gathers pertinent information, summons the culprit, makes the required record, or actually enforces the punishment order.

Each commanding officer must not only make the decision that a "Company Punishment" is warranted, and of what the retribution shall consist, —he must also make the offender realize who has done so. Though neither the 104th Article and its implementing regulations, nor the new law, requires the commander and the accused to be present when a penalty is ordered summarily, there is no good way to avoid it—not even when the punishment order must be written. A personal interest in each case is essential. A strictly formal compliance with the necessary routine, by a commander himself or by a subordinate in his behalf, is substantially useless. Soldiers cannot long be kept ignorant as to who actually punishes or rewards them, whoever may pronounce the words; and no commanding officer can afford to let his men have any justification for thinking that person to be anyone other than himself.

Who may be thus penalized

The 104th Article of War describes those subject to summary punishment as "persons of his command" and the regulations thereunder call them "persons of his command who are subject to military law, including officers." There is probably no difference in meaning between the two quotations: both seem to indicate any soldier or civilian described in the first four subparagraphs of the second Article of War. The word "command" appears to signify the smallest military administrative unit (whatever its size or mission) to which the offender is assigned or attached, or which he accompanies, in a duty status. It is commonly believed that the word also includes a detachment of any such unit while that group is so isolated, or otherwise removed from the direct and immediate disciplinary control of the unit commander, as to warrant the latter looking to that group's leader for control of the behavior of its members. However, since every "Company Punishment" is awarded by consent of the alleged culprit, or what amounts thereto, the uncertainties here suggested are of little consequence. The new law appears to make summary punishment imposable without the accused's consent, express or implied, but there will be time enough to consider how that bridge may be crossed when the Army reaches it, more than a year after these words are being written.

The UNIFORM CODE OF MILITARY JUSTICE speaks twice of those who may be penalized by means of what it calls "Non-judicial Punishment"—as though all other military punishments are not also non-judicial. First it subjects to what has long been known as "Company Punishment" the "officers and war-

rant officers of his command" and in the next paragraph it authorizes such penalization for the "other military personnel of his command." One must conclude that civilians who accompany the Army to perform some useful service (but not to fight) will be exempt; for practical purposes, at least, they are already. But there is little profit in speculating on this; the regulations authorized by the new code will doubtless make clear the true significance of the phrase "of his command."

"Minor Offenses"

Both the 104th Article of War and the new code's 15th Article limit summary punishment to "minor offenses" without defining the term. Since a summarily imposed penalty lawfully inflicted—that is, both imposed and enforced—bars a later trial for the offense which brought about the penalty, despite an inadequate statement of that fact in the 104th Article which is repeated verbatim in the new code, commanding officers ought to be careful that their authority is exercised only with respect to offenses which are aptly described by the word "minor." It would seem obvious, though evidently some officers do not think so, that this limitation prevents any commander from summarily punishing an act for which the death penalty could be voted, or for which there is a mandatory punishment of any sort, or for which a Federal statute makes confinement in a penitentiary possible. It has been found necessary to issue regulations and make rulings so stating. No matter how much extenuation exists or how likely an acquittal in a particular instance, no such offense is "minor" and a "Company Punishment" order with respect to one of them is a nullity. There may be room for a fair dispute as to whether other offenses are "minor" under particular facts.

Conduct which is tinged with "moral turpitude" can not be considered a "minor offense," though the current Manual for Courts-Martial (Chapter XXVII) describes those acts only as "larceny, fraudulently making or uttering bad checks, and the like" without indicating what "the like" means. The civil courts are hopelessly in disagreement, but a clear majority of them say there is "moral turpitude" in any conduct of which fraud is an essential element, in most sexual irregularities, in larceny or embezzlement, in distributing narcotics unlawfully, in perjury or false swearing, and in espionage or disloyalty evidenced by spreading subversive propaganda. Being a "peeping Tom" has been ruled free from moral turpitude and punishable summarily. So has careless handling of a fund entrusted to the accused, when the loss is promptly paid and there is no attempt to gain a personal profit; but making an unwarranted claim for allowances, when mere carelessness is negatived by the circumstances, does show it. In general, one must examine the circumstances of the objectionable conduct and determine whether they show baseness, vileness, or depravity in relation to the customary rules of right and duty between man and man. If he finds these qualities present, the offense is one involving "moral turpitude" and it is not subject to "Company Punishment."

If the culprit's misbehavior is wrongful principally because some law or regulation has forbidden such conduct at certain times or under specified circumstances, his offense is apt to be "minor"—like an assault (with or without battery) or what is called "drunk and disorderly" misbehavior. Slapping the face of a woman with whom he has had a dispute, even when that occurs in public, may be summarily punishable; but striking a Naval officer or an officer of an Allied army, publicly or privately, can not be so considered. A correct classification of the misconduct requires a thorough inquiry as to the circumstances surrounding the objectionable action and an estimate of its probable effect upon the discipline or reputation of the command. Get the facts—all the facts—before making a decision, though it is well to bear in mind that (subject to what has just been said) the intent of the Commander-in-Chief is manifestly to trust the judgment of his smaller-unit commanding officers.

Strictly military offenses—those which only a soldier (as such) can commit—may be "minor" or otherwise. A "rule-of-thumb" which usually works satisfactorily in deciding which of such offenses are "minor" and which must have the attention of a court-martial is that if one-half of the most severe punishment stated in the Table of Maximum Punishments includes confinement for more than thirty days, the offense is not to be deemed "minor" unless there are substantial mitigating or extenuating facts. Rarely will a determination of the applicability of Article 104 to a military offense, which is made in accord with that rule, be upset by a military superior of the commander who utilizes it.

How the penalty is imposed

There are several requisite steps in any lawful imposition of a "Company Punishment." They are an initial inquiry by or for the commanding officer, notice to the accused by or for

profile

Hubert E. Howard, Chairman of the Munitions Board . . . born in Fairfield, Iowa . . . graduate Parsons College 1909 . . . Bachelor of Laws degree from Harvard 1912 . . . law practice in Chicago . . . captain in 331st FA, 86th Division in WWI . . . returned to law until 1923 . . . became an executive of Binkley Coal Company and Pyramid Coal Corporation of Chicago . . . successively served as secretary-treasurer, president and chairman of the board . . . a director of Mercantile Trust and Savings . . . Chairman of the Personnel Policy Board of Dept. of Defense for several months in the fall of 1949 . . . appointed by President Truman to the post of Chairman of the Munitions Board on November 25, 1949.

the commander that the latter intends to summarily punish him—and for what, the culprit's waiver of trial by court-martial after a reasonable time in which to decide whether he will accept the summary penalty, an informal hearing by or for the commander should the accused desire one, an order by the commander in person—fixing the punishment, notice of the penalty to the culprit by or for the commanding officer, and then requisite entries in the "Company Punishment Book" of the unit.

Although the action of a commander when summarily imposing a penalty is executive rather than judicial, whoever challenges its legality must prove (to whom, the regulations do not say) which of these steps were not taken, and that the commanding officer's failure in this respect has injuriously affected a substantial right of the person ordered to be punished.

The commander is presumed (subject to being disproven, of course) to have done all that the law and the regulations required of him under the facts of the case being considered; but there is no presumption, when his failure to do any of these acts has been shown, that an injurious effect to any of the accused's rights followed. The person who complains must show both the irregularity and that it was harmful. It must also be shown that the penalized individual did not waive any of the disregarded requirements, and that when he remained silent as they were passed over it was only because he did not know he could insist upon them. Any soldier who would have a military superior of his own immediate commander void that officer's imposition of a "Non-judicial Punishment" has a hard row to hoe; and his only real chance for success is to establish that his failure to demand a trial by a court-martial was because he did not know he had the right to do so.

The commander's initial notice

This notice is essential and it is usually given by the commander himself to the suspect in person. Only when the accused is an officer or warrant officer must the same be written, though it can be given in writing to any person about to be summarily punished; but even when written it is best that the same be delivered by the commander himself to the accused in person and that it be supplemented with an oral statement of what is in the commanding officer's mind as to the propriety of his action. Whether oral or written, this notice is to state the time, place, and general nature of the offense "as clearly and concisely as may be possible" (to adopt the wording of the regulation); and it is to warn the supposed culprit of his rights under the 24th Article of War, now—somewhat modified—in Article 31 of the UNIFORM CODE OF MILITARY JUSTICE, and afford him the privilege (to again quote the regulations) of submitting "such matters as he desires in mitigation, extenuation, or defense." The notice is to tell the accused soldier plainly that the commander intends to punish him under the 104th Article of War (though not what the penalty will be) unless the alleged culprit elects to take his unconditional right to appear before a court-martial instead. No exact language is prescribed: it is merely required that words well within the understanding of the person in danger of punishment shall be used.

The notice closes with a statement of the day and hour (seldom sooner than the next day at the same hour) when the asserted offender must claim his right to a trial by court-martial—or be considered to have waived it—and put in whatever defense he chooses to submit. Neither the 104th Article nor its implementing regulations say how much time is to be allowed—merely that it shall be "reasonable" when all the circumstances are considered. Of course, the accused can waive that waiting time, or any part thereof, but there is no presumption that he did when the punishment order follows hard upon the initial notice.

If the notice is a written one, it will require a reply by indorsement before a stated time; and if the intent is to impose a forfeiture which the notifying commander himself has no power to direct, the notice should state that a particular commanding officer will be asked to impose the penalty, though not that it will be a forfeiture nor the amount that will be suggested to that superior.

Trial by court-martial

At present the accused has an absolute right (by Act of Congress) to claim such a trial, but the commander to whom such a demand is made does not have to accord him one. That officer can simply drop the idea of punishing the suspect at all, if he prefers. Under the UNIFORM CODE OF MILITARY JUSTICE, the accused will have a right to trial, if at all, only to the extent and subject to the conditions stated in the authorized regulations: a very sharp alteration of the basic concept for this method of attaining discipline.

The accused may withdraw his demand for trial, if it be done of his own volition, at any time before he is arraigned; but whether that will put him back subject to "Company Punishment" is decided by the commanding officer then responsible for the disposition of the charges.

The commander's informal hearing

"Company Punishment" is limited at present to cases where guilt is expressly or impliedly admitted by the accused. It is, therefore, intended to be summary and one-sided to a considerable degree. The accused is protected from injustice by demanding a court-martial trial when he considers himself not guilty or when he thinks his guilt cannot be proven. But, if the accused does not claim that right, he still has (under 1949 regulations) the privilege of submitting a defense to his commander, and that officer is clearly bound to accord the alleged culprit a chance to show that there is merit in what he submits. Although that action is not expressly required by any regulation or order, any other course is completely out of harmony with American ideas that are fundamental.

An accused person who submits "such matters as he desires in mitigation, extenuation, or defense" must be accorded a hearing, if he so desires; but the inquiry will be akin to the action of a businessman when solving a problem of misconduct by an employee in an instance where there is no labor-union contract, civil service regulation, or grievance committee to hamper the free exercise of the employer's best judgment. The

supposed culprit starts in the relative position of one before a court-martial against whom a prima facie case has already been proven: he must immediately take up the defense.

There will be no presumption of innocence, no requirement for proof "beyond a reasonable doubt," no formal pleadings, and no disputes over the admissibility of evidence. The commander, presumably already convinced fairly well of the accused's guilt, must hear at least one witness or read at least one deposition, one affidavit, or one unsworn statement in support of each fact asserted by the alleged offender which he is unwilling to concede to be the truth; more than one, if being reasonably thorough in his inquiry seems to so require. The asserted culprit himself cannot be questioned against his will.

By electing to submit a defense to his commander, the accused waives a trial by court-martial. When the session is over, the commander either destroys the papers (if any) or orders a punishment summarily just as if the offender had ignored the chance to defend, or he prepares a charge sheet for normal pre-trial processing despite there being no demand for such a trial. A soldier is never "tried under the 104th Article of War," as one often hears. When the regulations therein authorized are used, the alleged culprit faces a tyrant (benevolent or otherwise) rather than a court. The new law does not disclose a different concept of the nature of the proceeding.

The penalty itself

The order which summarily imposes a "Company Punishment" is usually given orally to the offender in person by the commander himself, even when there is a written initial action which requires a written order as well. No such order can lawfully provide for confinement or for duty under a guard; but the new code permits this for one week, if the offender is on board a ship when the penalty is ordered. No summary punishment order can direct a "cruel or unusual" punishment, nor one which either degrades the rank of the offender or requires a strictly military duty such as walking a sentinel's post, drilling, marching, or sounding bugle calls. An order to "double time" which has no discernible purpose other than to make the soldier run is forbidden—though not when there is a military reason other than punishment to get the man quickly to another place; but duty which is primarily fatigue (like kitchen police) can be ordered as a penalty summarily imposed. To what extent the new regulations will continue these long-established rules is not yet known.

Subject to these comments, the commanding officer may restrict the offender to prescribed limits, deprive him of a cherished privilege, and direct "extra fatigue" for not to exceed one week; and to these he may add an admonition or a reprimand. Under the new law, an enlisted offender may be reduced to the next lower grade; and if he is on board a ship when the punishment is ordered, he may be confined (at hard labor?) for seven days or on bread and water for three days, neither of which are permitted under the 104th Article.

There was sought, by the proponents of the new code, a relatively mild forfeiture of pay for enlisted offenders; and they endeavored to retain the savage one for officers and warrant officers that was introduced into Military Justice nearly two years ago. Congress stuck to its long established policy of not allowing any forfeiture of pay against soldiers, however, though the basis for initiating that policy has long since disappeared; and the provision for forfeiture of pay against officers has been brought somewhere near the bounds of reason.

More than one penalty (other than an added admonition or reprimand) for a single offense will be impossible under the new code; but now more than one can be used, if all that are utilized in a particular case are finished—no two at the same time—within seven consecutive days. The new code limits confinement (at hard labor?) to seven days, and confinement on bread and water to three days, but it allows other punishments (excluding forfeitures) to run for "not to exceed two consecutive weeks." The quoted words will doubtless be defined to mean fourteen consecutive days, including the day the order is given, since the term "one week"—now the limit for those penalties—has been declared to mean seven consecutive days which start to run when the order is made or (rather) delivered to the accused.

It has been ruled that the present 104th Article permits any penalty other than those specifically mentioned therein, provided it is "similar in nature" to a specifically authorized one—whatever those quoted words may mean—and that the Article forbids any punishment "similar in nature" to a prohibited one. Since the reason for the ruling has not been made available, one can only surmise whether it will be applicable to the new law which omits any express prohibition of any penalty and couches the allowable ones in somewhat different words.

At the next session of this conference there will be comments concerning each of the authorized penalties, with a brief survey of the recording and execution of the commander's order imposing the punishment.

"QUOTE"

War in its ensemble is not a science, but an art. Strategy, particularly, may be regulated by fixed laws resembling those of the positive sciences, but this is not true of war viewed as a whole. Among other things, combats may often be quite independent of scientific combinations; they may become essentially dramatic; personal qualities and inspirations and a thousand other things frequently are the controlling elements. The passions which agitate the masses that are brought into collision, the warlike qualities of these groups, the energy and talent of their commanders, the more or less martial spirit of nations and epochs—in a word, everything that can be called the poetry and metaphysics of war—will have a permanent influence on its results.

Jomini

The Art of War
Military Service Publishing Co.

NEWS

Small Army Units to Participate in Joint-Training Program With Air Force

An extensive joint-training program which will give to small units of the Army and Air Force practical training in tactical air-support operations was announced recently by General Mark W. Clark, Chief of Army Field Forces at Fort Monroe, Virginia, and Major General Robert M. Lee, Commanding General of the Tactical Air Command at Langley Air Force Base, Virginia.

The program is designed to acquaint all personnel of ground tactical units within the United States with the fire power and reconnaissance capabilities of tactical aircraft and to train commanders and staffs in the mechanics of obtaining close air support when required in combat. The program also will give Air Force personnel training for combat operations in support of ground troops.

◇ ◇ ◇

ROTC Training At Fort Knox

Approximately 390 students from seventeen universities and colleges, nine of which offer Armor training in their ROTC program, reported June 17 for a six-week period of field training in the performance of tactical, technical and administrative duties designed to develop leadership ability and increase their technical knowledge in a practical way.

The students are expected to profit during their senior year at their schools by the training they receive at Fort Knox. When graduated all will be eligible for commissions in the ORC, and ten per cent of them designated Distinguished Military Students will be eligible for commissions in the Regular Army.

◇ ◇ ◇

World War II Unknown To Be Entombed Near Unknown Soldier of World War I

Entombment of the World War II Unknown will take place on Memorial Day, May 30, 1951, in a concrete vault under the resting place of the Unknown Soldier of World War I at Arlington National Cemetery.

The sarcophagus which now marks the Tomb of the Unknown Soldier will serve in the future to designate also the World War II Unknown's grave. The inscription on the Tomb will be changed from "Here rests in honored glory an American soldier known but to God" to "Here rest in honored glory members of the American Armed Forces of the World Wars known only to God."

Immediately to the west of the present tomb, an opening will be made some time next fall which will permit access to the two burial vaults. The opening, lined in black marble, will be of sufficient size to allow the casket of the World War II Unknown to be lowered into the shaft by pallbearers during the interment ceremonies. After the burial on Memorial Day, the shaft will be sealed.

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Time Limit Extended for Awarding Armed Forces Decorations

Recommendations for decorations for wartime acts and services are again being considered by the Army, Navy and Air Force in accordance with the time-limit extension granted under Public Law 501, enacted by the 81st Congress.

★ ★ ★ ★ ★ ★

Major General William G. Livesay, Commanding General of The Armored Center and Commandant of The Armored School retired from the Army in late June after a long and distinguished career in the service. A native of Benton, Illinois, General Livesay has been in command at Fort Knox since mid-1948.

During World War II General Livesay commanded the 91st Infantry Division, which fought through the bitter Italian Campaign.

General Livesay is a member of the Executive Council of the U. S. Armor Association, publishers of this magazine. He will continue in this post through the Council's current term.

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This extension was granted in order that deserving acts and services performed during the period December 7, 1941 to September 2, 1945 may be given appropriate recognition.

All recommendations must be written and submitted to reach the respective services prior to May 3, 1951.

Recommendations for Army personnel should be submitted to The Adjutant General, Washington 25, D. C.; for Navy personnel, the Board of Decorations and Medals, Navy Department, Washington 25, D. C.; for Air Force personnel, the Director of Military Personnel, USAF, Washington 25, D. C.

The services will be able to act upon recommendations for all decorations authorized for World War II. Awards must be completed prior to May 3, 1952.

◇ ◇ ◇

Army War College to be Relocated at Carlisle Barracks, Pennsylvania

The recently re-established Army War College, temporarily located at Fort Leavenworth, Kansas, will be permanently established at Carlisle Barracks, Pennsylvania, the Department of the Army announced recently.

Under plans approved by Secretary of Defense Louis Johnson, the move will necessitate relocation of the Armed Forces Information School, the Army Security Agency School, and the Chaplains' School. The three schools, now located at Carlisle, will complete transfer to new locations by April 15, 1951. A decision as to locations for the three facilities is now under study.

Re-establishment of the Army War College at the apex of the Army educational system was announced last December as the result of recommendations by the Army Board on the Army Educational System for Officers. The 1950-51 course was scheduled for Fort Leavenworth pending selection of a permanent site.

The Army said a gap has existed in its educational system since the former War College was converted to the National War College in 1946.

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MDAP Training Program Expanded For Western European Military Personnel

Additional training courses in the use, maintenance, and repair of military equipment, provided European countries under the Mutual Defense Assistance Program, are scheduled for July and August in troop schools of the United States Army in Europe, General Thomas Handy, Commander in Chief of the European Command, announced recently.

Approximately 200 students from seven different countries will enroll in the courses which will include instruction on ordnance procedures, artillery, radio and signal equipment, infantry weapons, and military engineering. The courses will be similar to those given American troops.

The classes approved by the Department of the Army for presentation this summer are in addition to courses now being given at the United States Army training centers in Germany to some 1600 officers and enlisted men from the military forces of Belgium, Denmark, Luxembourg, France, Italy, The Netherlands and Norway.

The students selected to attend from the MDAP countries will be familiar with the operation of similar weapons or equipment in their respective services. Upon completion of the courses at the American training centers, they will return to their home stations to teach other troops the operation and care of the United States matériel.

Classes are scheduled to open at in-

tervals at the United States Army Engineer School at Murnau, the Ordnance School at Eschwege, the Signal School at Ansbach, and in training centers of the United States Constabulary and 1st Infantry Division.

◇ ◇ ◇

Army to Open 62 Schools for Reserve Corps Training

A total of sixty-two Army Organized Reserve Corps Schools throughout the United States have been approved for opening between October 1, 1950 and January 1, 1951, General Mark W. Clark, Chief of Army Field Forces, announced recently.

Operated by Reserve personnel with the assistance of Senior Army Instructors, the schools are planned to offer a maximum number of volunteer Reservists progressive branch training, and an opportunity to maintain and expand their military education.

It will give Reservists a chance to earn credit for retention in the active Reserve, gain retirement points and possible credit for promotion. Other advantages include eligibility as replacements in Reserve units, utilization in any possible expansion of the Army of the United States, and eligibility for such Reserve or active duty training pay as may become available.

Instruction in the ORC schools is designed primarily for the volunteer Reservists. This includes members who are not assigned to troop program or mobilization designation units under the current ORC reorganization.

The number of ORC schools is expected to increase gradually, reaching an eventual total of 334. The new schools are designed similar to the Allentown, Pennsylvania, experimental school which began instruction in January.

◇ ◇ ◇

First Cavalry Division to Hold Reunion

The 1st Cavalry Division will hold its Third Annual Reunion in New York City on September 1, 2, and 3. Headquarters will be the Biltmore Hotel. A full three-day program has been arranged, to include unit meetings and bull sessions, combat motion pictures, a night baseball game at Yankee Stadium, a bus excursion, a steamer trip up the Hudson for a visit to West Point and the Military Academy, a dinner dance, a memorial service, and of course the business meeting with the election of officers for the coming year. As of this writing it looks good for some five hundred to be on hand for the get-together. For further information contact the Registrar at Box 201, Pomona, Calif.

◇ ◇ ◇

American Military Cemeteries Overseas Now Open To Visitors

Transfer of 12 permanent World War II United States Military Cemeteries overseas by the Department of the Army to the American Battle Monuments Commission has been completed and they are now open to visitors, it was announced recently.

Cemeteries now under supervision of the Commission and the number of graves in each, include those at Cambridge, England, 3,800; St. Laurent, France, 9,345; St. James, France, 4,394; St. Avold, France, 10,433; Epinal, France, 5,235; Draguignan, France, 844; Margraten, Holland, 8,182; Henri Chapelle, Belgium, 7,960; Hamm, Luxembourg, 5,045; Florence, Italy, 4,391; Nettuno, Italy, 7,863; and Carthage, Tunisia, 2,830.

Two other military cemeteries, those at Neuville-en-Condroz, Belgium, and at Manila, Philippine Islands, will be transferred at a later date.

The cemeteries turned over to the American Battle Monuments Commission and reopened to visitors were closed during the operations incident to the return and final burial of World War II dead.

The permanent military cemeteries of World War II will become memorials to the war dead. Present plans call for the erection of white marble headstones, landscaping, construction of roads and walks and memorial buildings.

Overseas offices are maintained by the American Battle Monuments Commission at 20 Rue Quentin Bauchart, Paris, and Via Veneto 119, Rome. Visitors may obtain information regarding the cemeteries and how they may best be reached at these offices.

NOTES

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Army Ordnance Department To Flight Test Guided Missile At Air Force Test Center July 19

The first guided missile to be flight tested at the new U. S. Air Force Long Range Proving Ground, Cocoa, Florida, is planned to be launched from the Cape Canaveral area, July 19, the Defense Department announced recently.

The purpose of the test, the announcement added, is to investigate certain high supersonic velocity phenomena at relatively low altitudes and to make a further study of the principle of launching a smaller rocket missile from a larger missile in flight.

Under the over-all supervision of the Army Ordnance Department, the General Electric Company will fire the two-stage rocket missile, known as "Bumper." This is the same rocket which set an altitude record in February, 1949.

Construction of the U. S. Air Force's new Fairchild XC-120 transport plane, an experimental aircraft having a detachable cargo compartment, has been completed and the twin-engine "Pack Plane" has been rolled out of its production hangar at Hagerstown, Maryland.

The XC-120, although similar in appearance to its "Packet" and "Flying Boxcar" predecessors, the twin-boomed C-119 and C-82, introduces a new feature to military air transportation. It has an under compartment which can be modified to carry cargo or to serve as a temporary installation at a forward airfield. This 2700 cubic foot cargo "pod" can be quickly detached from the plane.

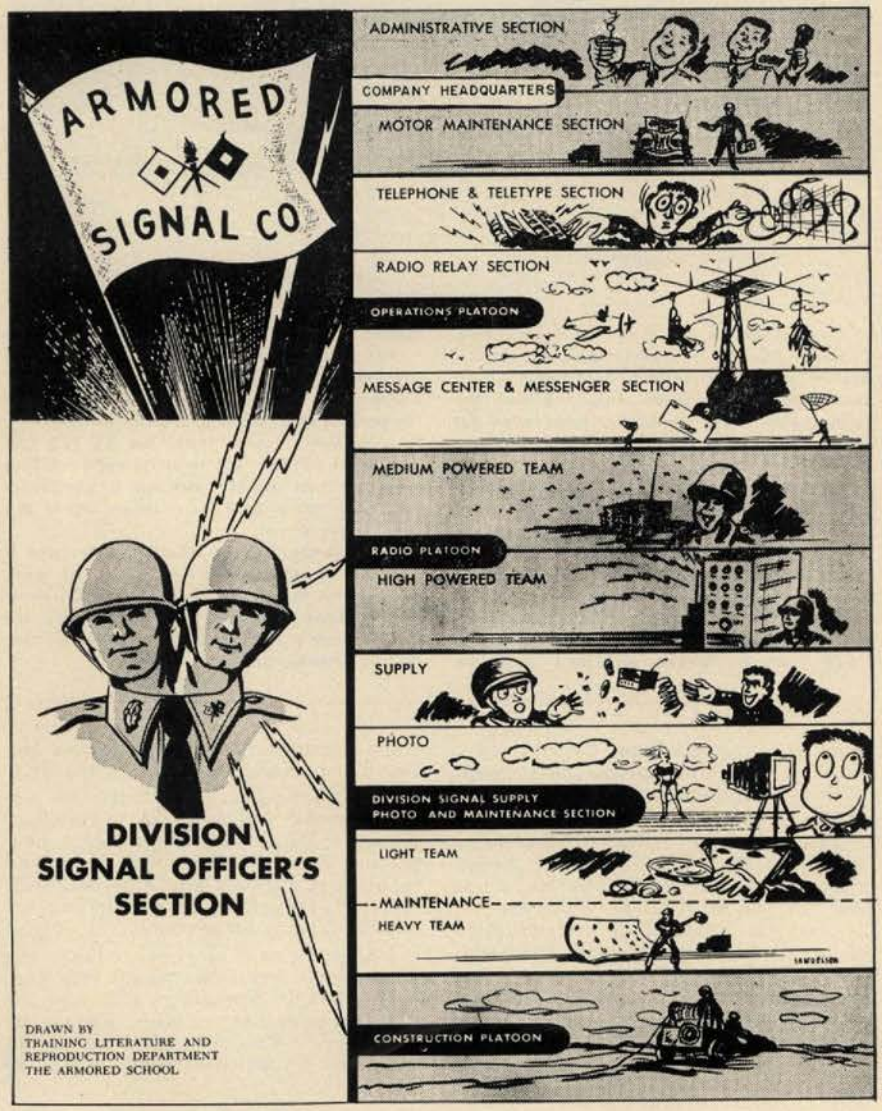
The "Pack Plane," built by the Aircraft Division of the Fairchild Engine and Airplane Corporation, is designed to fly with or without the pod slung beneath it. Similar in operation to a highway trailer truck, the XC-120 can shuttle its loaded van to a forward location where it can quickly pick up a previously delivered van or pod for a return trip to the rear supply depot.

Development of the XC-120 will make it possible to design various types of pack sections for the plane. These pods can serve as equipped hospitals, communications centers, refueling and repair shops and administrative headquarters.

"Get the Message Through!"

by MAJOR FRANKLIN M. DAVIS, JR.

Hub of Communications of the Armored Division—The Armored Signal Company—and the story of an activity where two heads are better than one . . . except that in this case both heads have to be on the same person, an awkward thing at best.



GET the Message Through!" is the unofficial motto of the Signal Corps, and the Armored Division Signal Company reflects the determination of that statement in its assigned mission, organization, and employment.

Actually big enough to be dignified with the title of battalion—the Signal Company has an aggregate strength of only fifty men less than the Armored Division's Quartermaster Battalion—the Armored Signal Company is organized to provide twenty-four-hour execution of its mission. Division Signal Officers will tell you, though, that such twenty-four-hour continuous communication service takes some stretching of the 379 signal personnel to "provide signal communication for division headquarters to include communication to units operating directly under division headquarters; to provide photography, signal supply, and field maintenance of division signal equipment," as the company's mission is stated in T/O and E 11-57N.

Organic to each Armored Division, the Armored Signal Company represents the lowest level within the division that Signal Corps personnel are assigned, communications personnel at lower echelons being branch immaterial specialists. Accordingly, the Signal Company takes a sharp interest in its difficult task, and that motto, "Get the Message Through!" is pasted in the helmet of every member of the company, from the Lieutenant Colonel, Division Signal Officer, down to the filler low-speed radio operator.

The Division Signal Officer, if he had his choice, would probably like

Major Franklin M. Davis, Jr., has been a Regular officer since 1942. He served with the 10th and 6th Armored Divisions, the XVIII Airborne Corps and the 3rd Armored Division during the war. He is an instructor in the Communications Department at The Armored School. He recently won top prize in the Army-wide Short Story Contest.

to be twins. Charged with a dual task, he serves as technical adviser to the Division Commander on communication matters, and as such, is a member of the Division Special Staff. At the same time, he commands organic and attached signal troops of the Armored Division, and thus is both a staff officer and a commander. The Division Commander, of course, is responsible for communications within the division—communication is a common responsibility, and the responsibility cannot be delegated. The duties and functions of such responsibility, however, are delegated to the Division Signal Officer; as one former Division Signal Officer remarked, "The Old Man is responsible, but he can sure make it hot for the Signal Officer if anything goes haywire."

The two-edged aspect of this dual duty is minimized, however, by the command setup of the company. A captain is designated within the unit as Company Commander, and he takes a great deal of the administrative command load from the Signal Officer, leaving him free to concentrate on his staff capacity and to be concerned primarily with the tactical operation of the company.

As staff adviser to the Commanding General and Division Staff, the Division Signal Officer handles a variety of specific jobs that keep him and his Division Signal Officer's Section of one major and six enlisted men (clerks and drivers) spinning to handle the wide range of tasks. Functioning as a signal staff for the division commander, this section prepares the Signal Operating Instructions (SOI), Standing Signal Instructions (SSI) and the signal section of Division SOP's. The preparation of the SOI's alone is a monumental clerical project, and though these vital documents are issued in the name of the commander and authenticated by the G-3 or the Division Signal Officer, the necessary work is done by this group, which is an element of the Signal Company. This little signal staff is a busy bunch.

The Division Signal Officer will recommend to the commander, after working out the details with the G-3, paragraph 5 of operations orders. In addition, in the event a signal annex is to be issued with an operations order, the Signal Officer will work this up. A signal annex, however, is simply an operations order to signal or communications units, and is more apt to be used at Corps or Army level than at the Division, where the relatively small number of signal personnel permits tactical handling without the medium of formal written signal-operations orders.

Classified Material

Such codes and ciphers as the division may use are a direct concern of the Division Signal Officer. These items, and communication security in general, are likewise within the scope of G-2 activity, but the G-2 is interested more in the security aspects from an intelligence viewpoint, whereas the Signal Officer must be concerned with the employment of these codes and ciphers. The Army Security Agency issues to the division the classified code and cipher equipment the division will use in combat at division level, and the Signal Officer provides the personnel to use the equipment in the Division Communication system. This is quite a responsibility, and Signal Officers still wake up in a cold sweat when they think of such disasters as befell a Signal Officer in Europe whose Message Center and Messenger Section managed to lose a truckload of classified cipher equipment.

Biggest job of the Division Signal Officer, of course, is the supervision of the many aspects of the commander's responsibility for the installation, operation, and maintenance of the Division Communication System.

Functioning

This requires close tactical control of the Division Signal Company to keep communications in for Division Headquarters; it means the Signal Officer must supervise training of all communication personnel within the division, and though there are communication officers down to battalion level to help with these chores, the Signal Officer has got to keep close check with them, guide their efforts, counsel, advise, and lead by the hand so that he can tell the Old Man, with a straight face, "Sir, the Division Communication System is functioning."

The sharp Division Signal Officer, however, will utilize his division training time to develop dependable communication systems within the lower units of the division so that come combat, he is reasonably free to concentrate on the difficult task of keeping his division headquarters in constant reliable communication with the far-flung next major subordinate units of the division; maintaining a signal supply, photographic, and salvage service for the division; performing field maintenance on the division's communication equipment, and supervising its organizational communication maintenance.

To accomplish this, the Division Signal Officer uses the Armored Signal Company.

Organization

The Armored Signal Company is organized to provide the three most dependable means of communication, through a variety of agencies, for the division. These means are, of course, Radio, Messenger, and Wire. At the same time, the company is organized to be reasonably self-supporting and self-administering—all on a 24-hour-a-day basis.

Operationally speaking, flexibility is this Armored Signal Company's basic characteristic, and it's pretty hard to cook up a combat plan for the division that this company can't support—particularly if the Signal Officer has been consulted in advance to be certain that communication requirements aren't going to exceed the capabilities of the equipment.

In addition to the Division Signal Officer's Section mentioned earlier, this company has five other major sections.

First, there is the company headquarters, which contains the necessary command and administrative personnel to run the company, such as mess facilities for an outfit that may be scattered across a hundred miles of countryside; or the personnel to service and maintain 94 motor vehicles. To do this, this element has two officers—a company commander and executive; one warrant officer with a Motors SSN, and sixty enlisted men. This is a substantial administrative overhead figure, but don't forget that this section is supporting 339 men who are all involved in getting the message through.

The four tactical elements of the company, so to speak, are the Operations Platoon, charged with provid-

ing the Telephone and Teletype, Radio Relay and Message Center and Messenger services for the Division Headquarters; the Radio Platoon, which provides a total of twelve radio stations manned and equipped to serve various command and staff elements of the division; the Division Signal Supply, Photographic and Maintenance Section, which, as the weighty title implies, provides an important support service for the division and includes a variety of highly skilled technicians among its seventy men; and the fourth element, the Construction Platoon, capable of fielding six 8-man construction teams to run the many wire lines connecting the division headquarters with its various elements and major subordinate commands.

Operations

Since the primary concern of the company is the provision of a number of communication agencies for the Division Headquarters, the company usually operates in two or more echelons to provide such service. At the same time, since the company can provide skilled teams and technicians with high mobility and extensive capabilities, Armored Divisions will usually attach smaller teams of personnel and equipment directly to the Combat Commands or Reserve Command of the Division. These teams augment the meager communication capabilities of these units, since a Radio Relay team from the Operations Platoon of the Signal Company, for example, can give the Combat Command a twenty-five mile radio link with the Division Headquarters, or a Construction Team of eight skilled field linemen can help a Combat Command Communication Officer solve the problem of laying wire to as many as six scattered units when he has organically but eight miles of wire and nobody authorized on the T/O and E to lay it.

Flexibility of communication, of course, is a specific requirement in Armored operations, and when you consider the capabilities of the various tactical elements of the company it's obvious that this Armored Signal Company is able to do almost anything but produce television shows in the Division Commander's tent.

Operations Platoon

The Operations Platoon, which includes three officers, two warrant officers, and ninety-nine enlisted men, can squeeze out two complete message center teams from its Message Center and Messenger Section of one officer, two warrant officers and thirty-nine enlisted men. These teams, with their own transportation and equipment, operate the communication centers, or Comcenters as the Signal Corps calls them, at Division Forward and Division Rear. The service each team can provide includes, under the over-all supervision of a lieutenant who is the Division Message Center Officer, the expeditious handling of all message traffic through the division headquarters. This includes necessary records, cryptographic service, and an efficient scheduled and special messenger service between these comcenters, the commander's group (since the Old Man wants to get out where he can run the division without being tied to his larger Forward Echelon Command Post, the Armored Signal Company is able to give him whatever he wants in the way of communication service. The cagey Signal Officer, when he's drafting up his Signal SOP's, will work out the details of the communication facilities for that commander's group—he will unless he wants to go back to training pigeons at Fort Monmouth), and subordinate units directly under division control such as the Combat Commands, Reserve Command, Division Artillery and such battalions as the Division may be keeping the command string on.

Because armor likes to move fast, the Radio Relay section of this Operations Platoon plays a big part in keeping the Division effectively tied in to advancing Combat Commands with a communication system that provides the convenience of telephone-talk without the time-consuming restrictions a regular wire system involves for armor. By putting a 4-man radio relay team—a team, incidentally, that carries its own equipment and rides in its own 2½-ton truck—with each Combat Command and Reserve Command, anybody at Division Headquarters can pick up the French-type telephone on his desk (the Signal Company carries ten and they're used by the Division Headquarters), put a call through the switchboard, flash out on the air over the radio link equipment, and get a Combat Command staff officer at his phone. Give even a partially trained team 30 minutes and they'll have that radio relay terminal operating, but the lieutenant, Division Radio Relay Officer, isn't going to be happy until all six of his teams can horse the antenna in the air and get the equipment operating in fifteen minutes.

The Telephone and Teletype Section of this Operations Platoon, under the guidance of the Division Wire Operations Lieutenant, will usually be split into two echelons. The element with Division Forward will install and operate the local wire system within the Forward Echelon, will run the wires to the staff phones, loop them overhead so no wandering liaison officer will decapitate himself, make the proper ties so that rain won't form at loops and short the system out, and then will operate the big 20 and 40 line switchboards the Company carries to service the Division Headquarters.

Smaller teams will operate at Division Rear, and because switchboard and wire requirements will vary with each phase of the various situations, the organization of these teams is not fixed. They can, however, operate as many as five switchboards for the Division Headquarters, and this is plenty to take care of both Forward and Rear, the commander's group, and to allow two switchboards to leapfrog as the Division CP moves. This section also can turn out seven teletype operators and the equipment necessary to put a teletype station with each Combat Command and Reserve Command and Division Artillery, or to man the Division Teletype Station. Again, these people are as interested in flexibility of their particular communications setup as any one else in the Company, and when necessary, can provide a switchboard and operating team for the combat commands or for any unit that command decision requires.

Radio Platoon

Armor, of course, uses radio as its primary means of communication because of radio's flexibility—radio communication fits almost any operation Armor may mount. Accordingly, the Division Radio Officer, a lieutenant —all the officers in these tactical elements of the company are lieutenants,

but they often feel that from the amount of work they put in they should be full colonels at least—uses his twelve radio teams in a variety of jobs. The twelve teams, actually, are broken down into six high-power teams, and six medium-power teams. The high-power teams, in turn, are broken down into three 4-man teams and three 5-man teams.

In the high-power teams, which are equipped with the most potent radio the Armored Signal Company has, the big 250-mile SCR-399, the 4-man teams are mounted in 2½-ton trucks with a trailer and the 5-man teams are mounted in armored personnel carriers. The extra man is included in the 5-man teams as a driver for the armored personnel carrier; in the 4-man teams one of the operators drives the 2½-ton truck.

These high-power teams are little empires of communication. The personnel include operators to keep the sets on the air 24 hours a day; the vehicles are wired for light and are, of course, light-safe. The equipment for the radio set includes a portable typewriter (in the proper shade of OD finish) to permit taking traffic on the typewriter so the staff sections don't have to decipher penciled messages.

The allocation of these teams, again, will depend on the communication demands of the situation, but as a rule the armored personnel carrier teams will operate with Division Forward as Net Control Stations of the Division Command Net and the Division Reconnaissance Net, and as the Division Station in the Corps Command Net.

The 2½-ton truck stations, because of their lack of protection, will operate in Division Rear as the Adjutant General's Station and the Division Supply Control Point Station in the Division Administrative Net, Rear, and the third team will be at Division Forward as Net Control Station for this Division Administrative Net, Rear.

The medium power stations, six in all, are all mounted in armored personnel carriers and use the 50-mile SCR-506. These six teams, all organized for round-the-clock service, give an extra fillip of flexibility to the Signal Company's radio capabilities, one set being used as a rule as Net Control Station of the Division Administrative Net (Forward) located at Di-

ARE YOU WELL INFORMED?

Mapped out below are eight unidentified geographical locations, indicated by crosshatching. In each case several contiguous areas are spotted for your orientation. How well do you know your world? Name the places.

1

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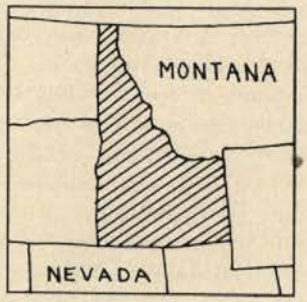

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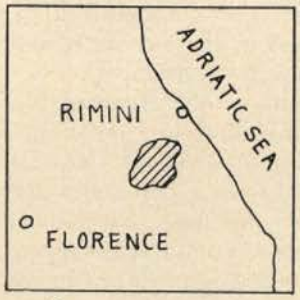

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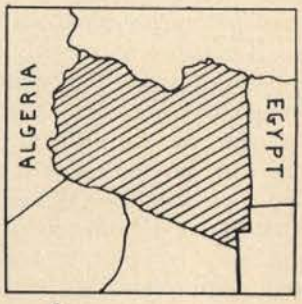

8

1. Albania 2. Paraguay 3. Idaho 4. Siam
5. San Marino 6. El Salvador 7. Iraq 8. Libya

vision Forward and as the Net Control Station of the Division Liaison net. The remaining four stations can be used as the requirements dictate, perhaps to bolster the communication facilities of the commander's echelon, to keep communication with the Division Liaison Officer at an adjacent division, to relay messages from a distant unit, or to augment existing nets.

Construction Platoon

One of the best features of the employment of the Construction Platoon is the fact that its six 8-man teams will permit the use of two teams at Division Forward, one team at Division Rear, and the allocation of one team each to the Combat Commands and the Reserve Command. Thus, within the Combat Command, these eight men can use their own 2½-ton truck, power-driven wire reel equipment, and their hard-won skill to put down thirty miles of wire a day in average conditions of terrain and weather to service the combat command. In addition, the platoon leader, who is the Division Wire Officer, has three jeep-mounted 3-man wire maintenance teams he can use to trouble-shoot the great bundles of wire circuits that seem to swell out of the ground around Division Headquarters every time the Division installs wire. The remaining eight men in the platoon, members of the Platoon Headquarters and Service Section, are used to assist in wire construction and service, and are usually the men you see at all hours of the day and night, picking up wire from old command post locations.

Division Signal Supply, Photo and Maintenance Section

Most unique organization within the Signal Company is probably the Division Signal Supply, Photographic and Maintenance Section. Second largest element of the company, it carries the title "section" with a certain disgust, since it provides some of the most vital service the company can offer, and includes a baker's dozen of specialist skills on its rolls.

Biggest help this section provides to units of the division is its maintenance service. Light maintenance teams, mounted in armored personnel carriers, are normally provided to each Combat Command and Reserve Command. These teams, which like to get a building or a tent to operate in, perform field maintenance on the signal equipment of the unit they are supporting. Thus, at the Combat Command, the attached team can put voice radios, telephone equipment, and CW radios into operating shape in the event of major failures. Whenever possible, these teams will replace unserviceable items with serviceable units, so that a battalion communications chief, for example, turning in a receiver for repair, can walk away with a good receiver under his arm without waiting for his damaged unit to be repaired.

The amount of spare parts and replacement components these teams can carry is limited, especially since they must also carry the necessary shop tools and equipment for their variety of repair jobs. The fact that they have protected transportation, however, lets them visit units of the Combat Command, so that during the preparation for the attack, for example, the team can visit each battalion and element of the Combat Command to put equipment in top-flight condition. One of these four light teams similarly services Division Headquarters Forward.

One limitation of the light repair teams, of course, is the fact that if they can't get some kind of shelter to work in, they are pretty well squeezed into the carrier. The heavy repair teams of the Armored Signal Company, however, travel in a fancily appointed Signal Corps shop truck and have a jeep and a 2½-ton truck for additional transportation. These heavy radio repair teams are dispatched as a rule one to each lettered Maintenance Company so that these radio repair teams can perform field maintenance on the signal equipment in the vehicles the Maintenance Companies are working on. Or, the teams may operate at the Signal Company rear echelon with a detachment at the Maintenance Company to perform the same duties as a full team. These teams can accomplish signal maintenance wizardry on any piece of signal equipment the division has. The strength of each team will vary, usually from five to eight men constituting a team. This fluctuation is due to the demand for the services of certain specialists, such as the radar repairman, who normally accompany the heavy radio repair team sent to Division Artillery.

Though the photographic capabilities of this section are limited, an amazing amount can be accomplished under field conditions. There are four photographers in the Section, and they can take still photographs of important Division events for the PIO; can make motion pictures; can take aerial photographs from the Division's light aircraft, and can, in addition to taking historical, documentary, and intelligence pictures, develop and print the photographs in a field photographic laboratory setup.

The Big Item—Supply

The Signal Supply for the division, including everything in the way of Signal property from a flashlight battery to a power generator, is a direct concern of the Division Signal Officer. Clerical personnel, supply experts, stock clerks and storekeepers from this Signal Supply element, however, do the bulk of the work involved in the requisition, procurement, storage, issue, and delivery of these signal supplies. Signal Distributing Points within the division are manned and operated by this section, once such supplies are picked up by the section from higher echelon supply agencies. In addition to carrying as much in the way of reserve supplies as transportation will permit, this section will run the main Signal Distributing Point in such places as in the vicinity of the Armored Ordnance Maintenance Battalion so that vehicles arriving to pick up vehicular spare parts may pick up signal supplies.

Oftentimes the establishment of a forward distributing point for the supply of batteries, wire, antennas, tubes, crystals and similar wide-demand items is effected at the Signal Company Forward Echelon or at any point where maximum service to the units can be provided.

In the Best Tradition

The Armored Signal Company of the Armored Division is organized to cover all nuances of its unofficial motto, "Get The Message Through!" In so doing, they effectively observe their official motto, emblazoned on the Signal Corps seal: *"Pro Patria Vigilans*—For Our Country, Vigilance."

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SPECIAL PREPUBLICATION PRICE ADVANTAGES

ULYSSES S. GRANT: THE FORMATIVE YEARS

CAPTAIN SAM GRANT. By Lloyd Lewis. Little, Brown & Co., Boston. 512 pp. $6.00.

Reviewed by DAVID C. MEARNS

How much of this soldier's story was he going to tell? Lloyd Lewis said it had always been his intention to close it on a note of triumph in the secession war. That would require three or four volumes and so far he had made only a beginning. Recently he had been urged to carry it through to the end, through the troubled Presidency and the uneasy after-years. He hadn't yet made up his mind. A week later death made the sudden decision; there were services in that April garden out at Libertyville; the beginning became as well the ending.

But it would be a reckless error to suppose *Captain Sam Grant* an uncompleted work. If it is by circumstance a major biography of a minor participant in a tumbling but-not-yet-fallen world, it nevertheless possesses a grandeur and an entity of mounting and sustained expectancy. If it is a smaller *Iliad* and a lesser *Odyssey*, it is only because comparison with an unrecounted but familiar future imposes the distinction. If it stops abruptly with a brisk order in the first days of the fractured Union, it is because meanwhile a man had come alive, matured, assumed a personality.

An Exclusive Journal Feature

The lines had been drawn, the relationships had been established, the issues had been defined; beyond them, over a transparent rise, were the gathering and the execution, and the slow fulfillment. In *Captain Sam Grant*, Lloyd Lewis, whose ranging researches remembered what his contemporaries and Sam himself had long forgotten, and what other biographers have never had so much imagination as to suspect; with a poet's rigorous simplicity and an historian's ruthlessness; has set forth the shaping forces of a life. By any measure this densely populated work must be judged a classic.

The boy grew up on a riverbank, in the frontier town of Georgetown, Ohio, with a genius for horses, a physical revulsion for music, a steadfast aversion to the family tannery, a consuming shyness, a few firm friends, an aptitude for mathematics, a love of the earth, and a prodigious indifference to whatever did not command his intense and exhaustive interest. His grim, tight-lipped, undemonstrative mother, Hannah, and his successful, exuberant, voluble father, Jesse, whose outspoken pride in him was sometimes cause for embarrassment, called him Hiram Ulysses Grant. When not grudgingly submitting to the tedium of education, "Lyss" (as his neighbors knew him) liked nothing better than to drive his father's team, sometimes carrying passengers into remote corners of the State. It was while engaged in that capacity that a conspicuous aspect of his temperament was formed; Mr. Lewis described it in the following paragraph:

> It was natural for a boy so curious about travel, new sights and fresh scenery to return from trips by new roads. When, in hunting a destination, he "got past the place without knowing it" he would, as he later said, not turn back but "go on until a road was found turning in the right direction, take that, and

The Author

Lloyd Lewis, distinguished historian, drama critic and essayist, died in the spring of 1949, while working on what he hoped would be the definitive life story of Ulysses S. Grant. Of a scheduled multivolume work, only this first volume was completed. Mr. Lewis is also author of *Sherman: Fighting Prophet.*

The Reviewer

David C. Mearns, well-known historian, is Assistant Librarian of the Library of Congress. He edited *The Lincoln Papers*, the two-volume work of new Lincoln material, published in 1948.

come in by the other side." This habit was, he later concluded, a superstition, a strange dread of retracing his way.

Superstition it may have been; it was, certainly, the contracted compulsion of his life.

As for his name, it presented no problem until the time came for him to pack his belongings before leaving for West Point. Then looking at his initials outlined in brass tacks upon his trunks, he became convinced that H. U. G. would never do. In order to forefend inevitable taunts, he adopted the easy expedient of interchanging his Ulysses and his Hiram. But the War Department went him one better, it rebaptized him in its official records, Ulysses S. Grant, and despite his polite demurrer declined ever to correct an unthinkable error. Fortunately his mother had been a Simpson.

Among the student body it was understood that he made his protest, then told the Adjutant, "The change of an initial makes no particular difference to me; my object is to enter the Academy as a cadet." The other boys learned of the incident quickly, since the authorities in posting the names of the newcomers on the bulletin board in North Barracks, had abbreviated "Ulysses S." into "U. S." Gleefully the crowd around the board began inventing witticisms: "United States Grant!" "Uncle Sam Grant!" "Uncle Sam!"

An upperclassman, "Cump" Sherman, was of the opinion that "a more unpromising boy never entered the Military Academy" than his fellow Ohioan. Still, somehow, Sam managed to stick it out. His grades were unexceptional, he was sometimes disciplined and received enough demerits to escape notoriety, he acquired a knowledge of arms, enjoyed the happiest moments of his life when on vacation, developed a dignity which even a treacherous watch concealed in his bosom could not destroy though it rang out while he was in the midst of a recitation, and came to think of the ramparts above the Hudson as "the prettiest of places . . . I have ever seen."

With consummate skill, Mr. Lewis has drawn to scale the superiors and associates who first entered Sam's

Captain Sam Grant

life while he was at West Point. There was, for example, the brilliant lieutenant, Henry Wager Halleck, recently added to the engineering faculty, "a tall, solemn man of twenty-five, who viewed the world with wide-eyed, staring abstraction." There was George H. Thomas, a first classman, "statuesque, built like a rock, eternally grave." There was "big, hulking Pete Longstreet," who "enjoyed football, military field maneuvres and sword exercises." There was an Adjutant, Lieutenant Irvin McDowell, of whom Grant would say "No one could know him without liking him," although "McDowell was never what you would call a popular man." Among his juniors was one who was only fifteen when he arrived, too young actually to qualify, but the authorities had made an exception in his case for he had already "attended the University of Pennsylvania for two years and was said to be something of a mental prodigy—a boy named George B. McClellan." Less prepossessing was "an awkward, shambling constable from the hills of western Virginia" who appeared "in homespun clothes and a coarse wool hat, and a pair of saddle bags stained with horse sweat hanging from his round shoulders [,] a deadly determination . . . on his sober face and in his large brown eyes." His name was Thomas J. Jackson and he was nineteen years old.

Grant at West Point enjoyed a reputation for "a sense of honor . . . so perfect . . . that in the numerous cabals which were often formed his name was never mentioned," but at graduation his only distinction came in the exercises at the riding hall. It was full of spectators.

Sergeant Herschberger, the riding master, strode to the jumping bar, lifted it higher than his head, fixed it in place, then, facing the

U. S. Army (National Archives)

Grant was a lover of horses from childhood

class, barked, "Cadet Grant! . . ."

West Pointers were saying to their guests, "He's on York."

York was the great horse of the stables, a powerful long-legged animal whom no one but Sam Grant and his classmate, Cave Couts, could ride—and Cave didn't pretend to ride him as well. Another classmate, Charles S. Hamilton, had once told Sam, "That horse will kill you some day," and had been answered lightly, "Well I can't die but once."

Now at the extreme end of the hall, Grant turned York, and then the two of them came thundering down toward the bar, faster, faster —then into the air and over. . . . It seemed "as if man and beast had been welded together. . . ."

The old sergeant cut the breathless silence with, "Very well done, sir! Class dismissed."

It was one of the lamentable vagaries, one of the perverse ironies of military caste, that the young lieutenant, who might well have proved himself the greatest cavalryman of them all, should be assigned to an infantry regiment.

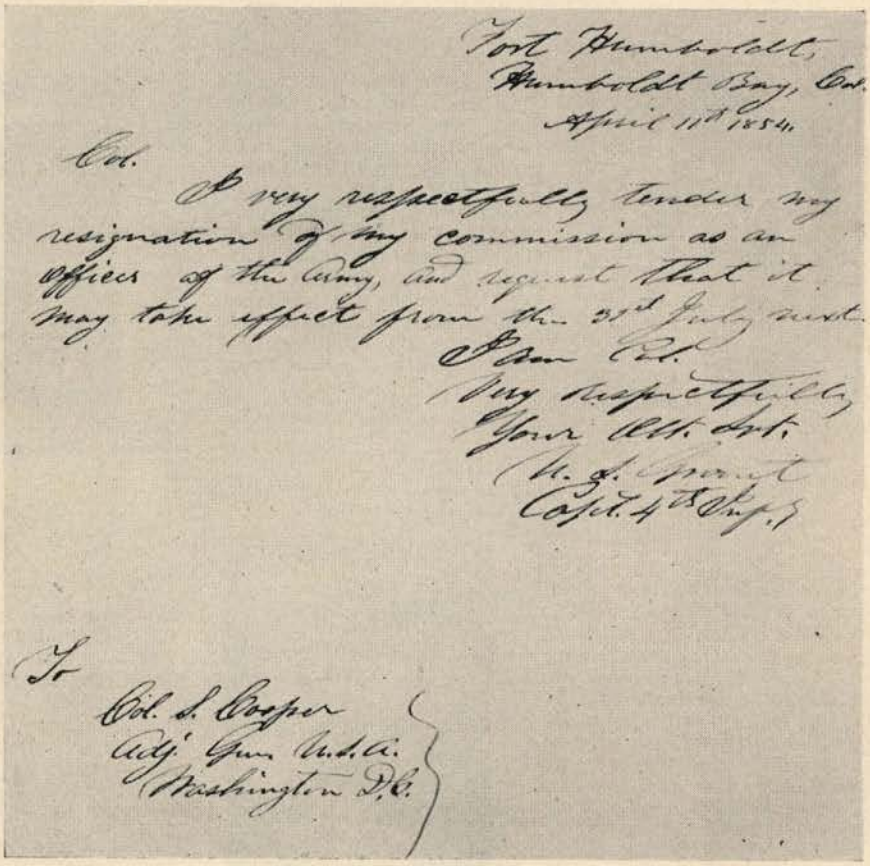
At Jefferson Barracks, near St. Louis, Grant adjusted himself to new surroundings, longed for recall to West Point as an instructor in mathematics, bought and broke a fiery stallion, treated a forlorn Negro with a cut foot, opposed the annexation of Texas, wooed the beautiful but squint-eyed and slave-owning Julia Dent, sister of a classmate, who called him neither Lyss, nor Sam, but Dudy, and just when life seemed quite to his liking and she had given him her promise true, there came a turn in national affairs and he was ordered to the Rio Grande.

It would have been not unnatural for Lloyd Lewis, one time sports editor of the *Chicago Daily News*, to dismiss the Mexican War as a scrimmage which preceded the big game. If he felt the temptation, he magnificently overcame it. Instead, he took the opportunity which it so vividly provided to illuminate the emerging qualities which made Grant at once a soldier and a man. Further, he was careful to relate Grant to those other personalities who shared his experience. As a quartermaster, the lovelorn Lieutenant might have pined away the war, secure behind the lines, faithfully discharging routine, humdrum, however important, duties, but to Grant action was always irresistible. Sometimes with and as often without an excuse he continued always to be affirmatively busy in the scrap. His was a thoughtful, deliberative, indestructible heroism. Thus he was at the siege of Vera Cruz, at Jalapa, at Churubusco (where a senior officer, a Major Robert E. Lee, described him as "usefully employed in his appropriate duties"), at Molino del Rey, at Chapultepec, at the barricades of Mexico City, and thus he was cited for gallant and meritorious conduct. He had disapproved the conflict, but he had seen a lovely land, and had learned that "disease, not bullets, was the real killer in war." He had watched some picturesque personages at close vantage: Zachary Taylor, sitting sideways in the saddle on Old Whitey, chewing tobacco, on his head a big palmetto hat, his trousers showing an expanse of bare leg, his loose linen coat flapping, "his feet in common soldiers' shoes instead of shining boots"; General Twiggs in "very unmilitary garb" come late to the field at Monterey, explaining his tardiness as induced by a dose of medicine; "the Great Western," an army washerwoman; the Dutch wife of Private Clancy who was the "ugliest of her sex" and infinitely more pugnacious than her spouse; Mexican women bathing in the river and promenading gaily in the Plaza. But U. S. Grant, brevet Captain with the actual rank of First Lieutenant was so fundamentally monogamous as to be impatient for his dearest Julia. As soon as ever he could he quit the beguiling occupation and hurried off to get married.

There were thereafter the perfect months with Julia, modest entertaining at Detroit and Sacketts Harbor, the birth of a first child and the conception of a second. Grant had assumed a more favorable status and a clearer stature than previously had been accorded him. General Hamer had found him "a most remarkable and valuable young soldier . . . too young for command, but his capacity for future military usefulness is undoubted."

A sudden, subtle, somber, inward turning in his history came when he was ordered to the West. It meant separation from his family and marked

(Continued on page 64)



Fort Humboldt,
Humboldt Bay, Cal.
April 11th 1854.

Col.

I very respectfully tender my resignation of my commission as an officer of the Army, and request that it may take effect from the 31st July next.

I am Col.
Very respectfully,
Your Obt. Svt.
U. S. Grant
Capt. 4th Inf.

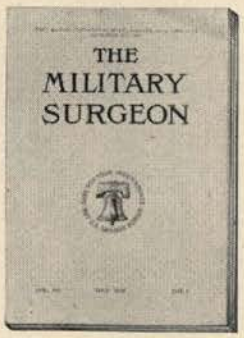
To
Col. S. Cooper
Adj. Gen. U.S.A.
Washington D.C.

National Archives

Captain Grant's letter of resignation of 1854

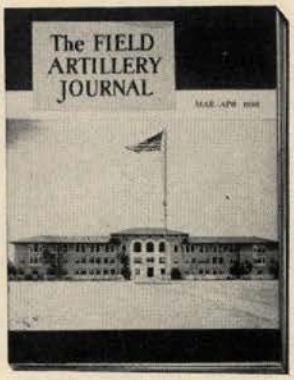
MAGAZINE ROUNDUP

In its May-June issue the ANTIAIRCRAFT JOURNAL offers several interesting articles of value to ground force personnel. Lt. Col. Dorsey McCrory writes on the subject of *AAA Automatic Weapons In Close Support of Infantry.* Major Paul F. Wilson covers *Artillery Missions By High-Performance Aircraft Observers,* by fighter adjustment.



Many interesting items come along in THE MILITARY SURGEON that are of firsthand importance to all military personnel. The June issue carries Capt. C. C. Shaw's article on *Dramamine Trials in the U.S. Navy,* significant in its relation to combatting seasickness in overseas movement or amphibious operations.

With its May-June issue THE FIELD ARTILLERY JOURNAL goes out of existence, turning over its assets to Infantry Journal to join in a two-way merger in a publication to be issued under a title of ground-force-wide implication. In this last issue Colonel William J. Thompson hits the top level with an article on *An Army Artillery Commander?*

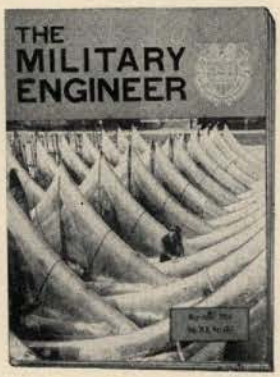


May-June issue of SIGNALS has several items on the communications end of the recent Exercise Sweetbriar. Lt. Col. Bertram Kalisch goes into the photographic end of things in his article *Shooting at Forty Below* while the general subject of communications is handled by Colonel Glen H. Palmer in his piece *Signals in an Arctic Maneuver.*

With INFANTRY JOURNAL'S July issue a title familiar since 1904 disappears from the service journal field, to be replaced by the all-embracing THE U.S. ARMY COMBAT FORCES JOURNAL. Under sponsorship of two of the dozen-odd nonofficial professional associations the new mag will try to cover the ground forces field. Top item in last INFANTRY JOURNAL is Lt. Roger Little's story, *Men Are Not Tags.*

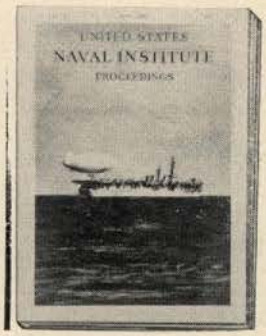
THE NATIONAL DEFENSE TRANSPORTATION JOURNAL issued its May-June number with what was to prove a most timely article in view of recent developments, Major Rowan Alexander's *Handling Military Movements in Japan.* Editor Wallace Davies has a piece on *Civil Defense Planning,* a critical subject which has lagged in somewhat tense times.

There is a wide variety of material in the May-June issue of THE MILITARY ENGINEER. Among the items is an article by Gen. A. B. Quinton on *Stockpiling for National Defense;* this goes into the background of WWII on critical materials, what caused the shortages and the results. Palmer Roberts begins a series of articles on the *Effects on Materials in Arctic Cold.*



May-June issue of the QUARTERMASTER REVIEW is the 175th Anniversary Number. The entire issue is devoted to the historical background of Quartermaster Corps, covering the activities in various war periods, as well as the complete story of evolution in an article by Dr. Thomas M. Pitkin. An issue to be added to the historical file.

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



All service personnel will find rewarding reading in the June number of the NAVAL INSTITUTE PROCEEDINGS. There is an outstanding article titled *Dimensions and Characteristics of a Future War*, by Captain W. D. Puleston, author of several books on naval affairs. There is also an article by Cmdr. John V. Noel, Jr., on the subject of *Morale and Discipline.*

If there is any second magazine to which personnel in Armor should subscribe, we would suggest ORDNANCE. Here the man on the using end can keep in touch with the making end. In the July-August issue is an article by Col. Robert H. Williams on *Armored Breaching Vehicles.* Also interesting is Dr. L. L. McQuitty's *Scientists in Reserve.*

ARMED FORCES CHEMICAL JOURNAL has a top article on *Civil Defense Planning* by Lt. Col. Barnet W. Beers, who is Assistant for Civil Defense Liaison, OSD. There are several other articles that are somewhat technical but interesting, including something on *Airplane Spray Apparatus* and *Shields for Gamma Radiation.*

Focal point of spiritual matters in the service publication field is THE MILITARY CHAPLAIN. In its Spring number, fronted by an imposing cover of the Capitol Dome, is an excellent article titled *What Is A Tough Soldier*, which is authored by General Devine, who has written several outstanding items on the spiritual side of soldiering. Also there is an article, *Caribbean Mission*, a report by three clergymen.

The July issue of the MARINE CORPS GAZETTE features Cmdr. Dudley W. Knox' article on *Naval Campaigns of the Future.* This is an estimate that sees the present use of naval forces as we know it carrying along in the foreseeable future. The political difficulties of the day are spotlighted in M. H. Willliams' story *First Line of Offense.*

THE NATIONAL GUARDSMAN, carrying along its series on the histories of Guard units, gives us a condensed story on New Jersey's 50th Armored Division. There is an article on *Better Training for B.A.R. Men,* including charts on practice and record phases of automatic rifle marksmanship. Editor Crist has rounded up the details on Exercise Swarmer.

THE RESERVE OFFICER is the publication of the Reserve Officers' Association, and while remaining well within the bounds of its primary interest, it carries many items of value in the general military sense. The number for July contains an article on *The New ORC Program,* authored by Major General J. B. Cress, Executive for Reserve & ROTC Affairs, covering the revision of troops basis, schools, armory construction plans and officer indoctrination.

Many items of interest to ground force personnel will be found in AIR FORCE. The July issue carries a complete coverage of the recent Exercise Swarmer. Another item that will catch the eye is the story of the Boeing Stratojet, titled *The Biography of a Bomber.* This carries the reader by means of text and photos through the steps of development from start to finish.

U. S. Grant

(Continued from page 61)

the opening period of his dark despair. There was the horrid trek across the Isthmus, the outbreak of Panama fever, "the sick and dying men, the rain and the mud," the burdens thrown upon him by the stupid, incompetent Colonel Benjamin Bonneville, the squalor and vulgarity and gaudy opulence of San Francisco in the days of the Gold Rush, the dreariness of Fort Vancouver, the unfilled hours at Fort Humboldt, the gnawing loneliness and biting melancholy, the impotence bred of low pay and slow advancement, the ill fortune which accompanied every effort at augmenting income, the critical attitude of Captain Robert Buchanan, the "honing for Julia" and the forsaking of the Sons of Temperance, the steady deterioration, the notification of promotion to Captain and on the same day the submission of his resignation from the Army, its acceptance by Jefferson Davis, Secretary of War.

Lloyd Lewis has told the story of Grant's dissolution starkly, straightforwardly, without apology or slurring, but strangely Grant's essential integrity breaks through at every point and wards off the utter degradation which must have befallen an ignoble spirit. Indeed, his very goodness is confirmed by the profundity of his collapse. He sacrificed admiration but withheld his honor; he abandoned his strength but retained his gentleness; he experienced shame but clung to duty; he forfeited respect but preserved an inalienable respectability; he was beaten but not overcome; a precious blossoming had blown away but the invisible seeds of greatness had fallen and been roughly stamped into the earth.

Disappointment, discouragement, futility followed Grant into private life. For a time he tried farming and was rewarded for his earnest effort with spectacular failure. Except for Julia and the children and the joy he found in them and the hardy resolution with which their company endowed him, Grant would have disappeared from history into an untouched archive of the forgotten heroes of San Cosme Garita. Because of them, he accepted a clerkship in his family's store at Galena, Illinois, where he found a mean security, gradually recaptured himself, and checked the demeaning progress of personal tragedy. He was there when the new President called for troops to restore the Union. Grant, "feeling it the duty of every one who has been educated at the Government's expense to offer their services for the support of that Government," promptly offered his. He offered his services to the Government at Washington, the Government at Columbus, the Government at Springfield. The book ends on June 28, 1861, when Colonel Ulysses S. Grant took command of the Seventh Illinois District Regiment. Lyss had reached a destination, but he had come in "by the other side."

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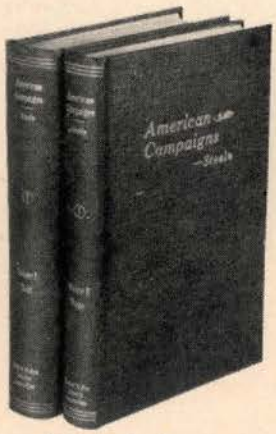

Prepared originally for students at the Command and General Staff College, this book is recognized the world over as the Standard American Military History. Much has been written on the individual campaigns and battles that make up our military history, but this is the only single work that contains a comprehensive narrative of the whole, up to and including the Spanish-American War. It is used as a text book by the United States Military Academy.

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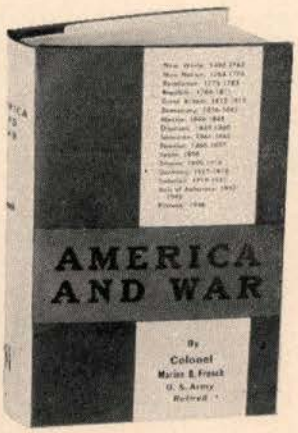

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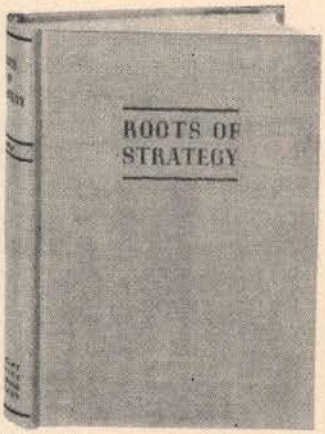

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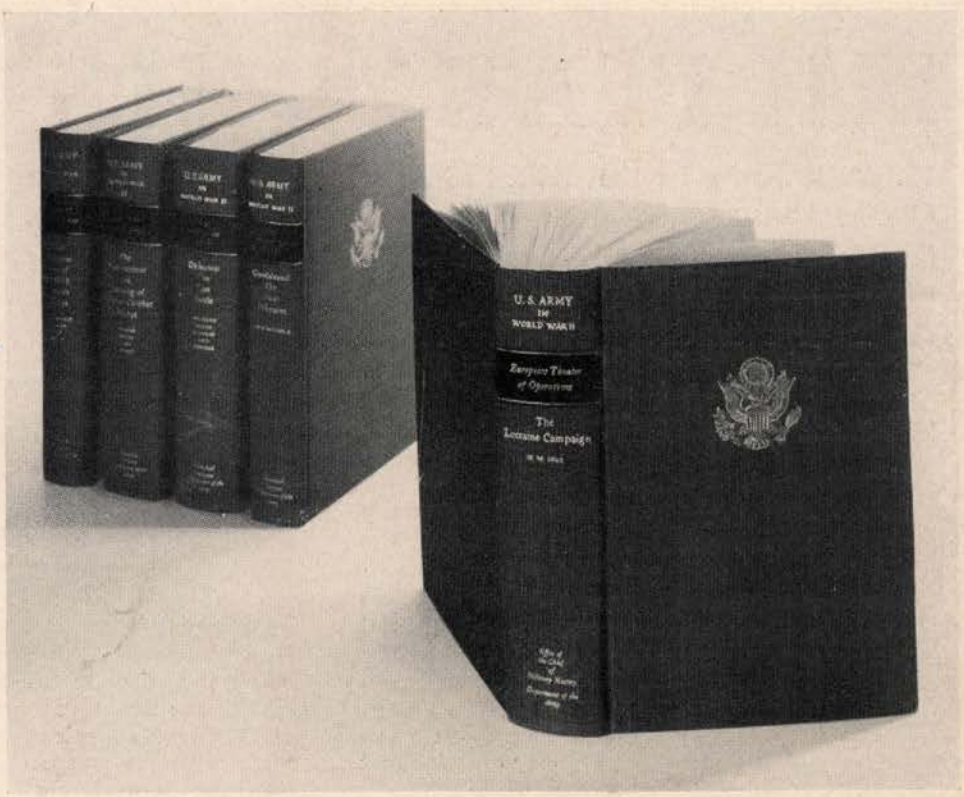

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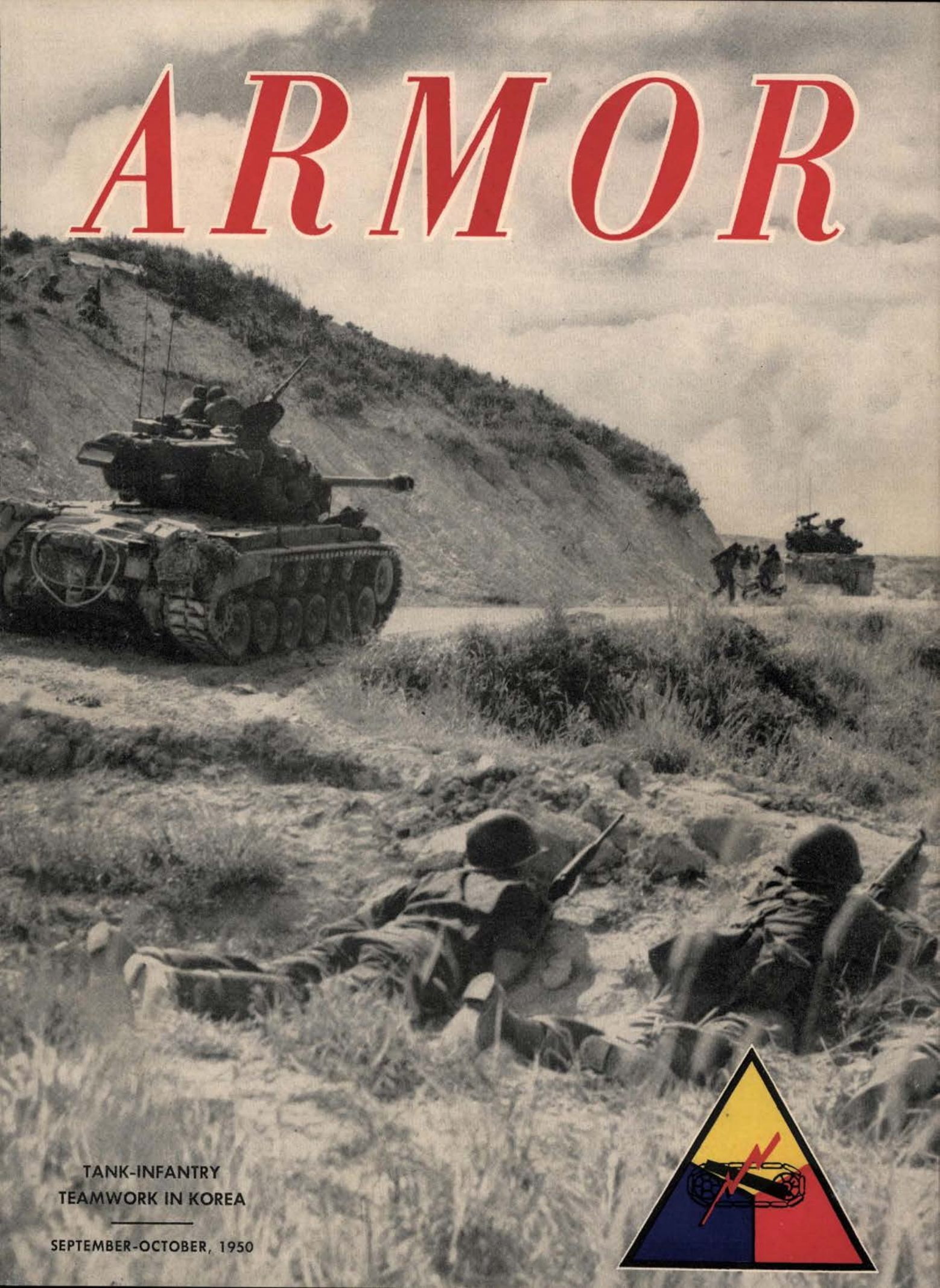

TANK-INFANTRY
TEAMWORK IN KOREA

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GEORGE C. MARSHALL
Secretary of Defense

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ARMOR

Continuation of THE CAVALRY JOURNAL

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LETTERS to the EDITOR

Air-Ground Communications

Dear Sir:

The keynote of your first issue of ARMOR appears to be "Tactical Air-Armor Team." I have read Colonel Meyers' article on the subject with considerable interest and some distress. It impressed me particularly in that it bears out the commander's reliance on principles of warfare while sometimes neglecting the tools. I have a feeling that his article, while timely and vital to us all, is indicative of many commanders' misunderstanding of the communication equipment aspect of the air-ground team.

Colonel Meyers states that there are five basic principles involved in the tactical air and armor team. One of these is:

> ". . .—the efforts of the tactical air- and armored forces must be integrated for real effectiveness."

Colonel Meyers states a principle and then goes on to say, speaking of the manner in which the forward air controller maintains contact with the air,

> ". . . in the case of armored units, the pilot in the lead tank plugs his radio into the tank power system and is ready to begin work."

How very far from the truth! The fact is that the radio which the forward air controller uses to contact air is at present bulky, costly and time consuming to install. You don't just carry one in your hip pocket. The point I make is that the equipment must be installed long prior to the time the air support is desired. Furthermore, the equipment is not necessarily in the lead tank or in any tank on the battlefield, but is in only 15 vehicles in the armored division. The loss of one of these vehicles means one less means of communication to air. And I further point out that the equipment was designed for use in aircraft and is of light aluminum construction. It is not shockproof, dustproof, or even moistureproof. Yet we mount it in a tank and expect it to operate efficiently. Of course the forward air controller has his own vehicle, a quarter-ton, with the same radio equipment installed, and capable of controlling his air support. But again, this vehicle cannot go far forward into combat areas, and when put out of action leaves the forward air controller without contact to his air. With control gone—there is no team!

The "police action" in Korea has already given ample testimony that our air-ground team is not performing up to what should be expected after five years of technological advance since the last war. As an armor officer, primarily interested in communication, I have watched anxiously for the development of a radio that would correct some glaring deficiencies in the communication support of the air-ground team. I am at present on a committee which is studying this same problem with a view towards recommending action to be taken to improve the communication link from ground to air, which is vital if there is to be an air-ground team.

True, there have been notable developments in communication equipment in the high frequencies used by the Air Force. But the answer to truly flexible, reliable communication from ground to air is not yet here.

I, too, Mr. Editor, believe that the simplest and best method of effecting air-ground control would be to have a portable set, pocket size if possible, which the forward air controller carries with him.

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Rates: See bottom of contents page.

At such time as he wishes to contact his air cover he mounts any tank as designated by the ground commander, merely plugs his radio in a simple socket, and controls his air strikes. I, too, like to dream.

The air-armor *team* can be a powerfully destructive weapon, and can frequently turn the tide of battle. All who recognize its value know the importance of control in making the team effective. Today that control is woefully inadequate. Tomorrow may be too late.

LT. COL. CAESAR F. FIORE
Director, Communications Dep't
The Armored School
Ft. Knox, Ky.

On the Rate Hike

Dear Sir:

WHEW!

MAJ. EDW. MCC. DANNEMILLER
Ft. Monroe, Va.

• *We hope Reader Dannemiller was able to offset that WHEW! with a big AH! after looking over the first issue of* ARMOR. *And we like to think that this and future issues will salt the exhalation with additional AHs! For our own end of things, the WHEW comes when we look at the bills for an issue like this. The AH comes in when we look at the renewal and new subscriptions and the book orders. Of course, the big idea is to keep the AHs ahead of the WHEWs.*—ED.

Right Name—Wrong Guy

Dear Sir:

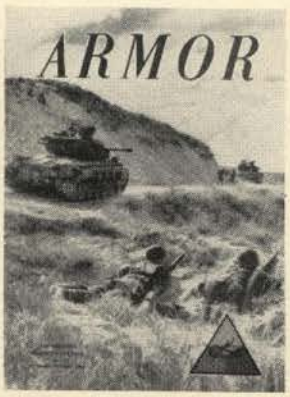
In a recent issue of your journal, a reader, Charles Weirich, commented on an incorrect statement in an article by me concerning the history of the Mounted Riflemen.

The Stuart who was meant to be mentioned in the quote in question, "The spirit of the regiment was better demonstrated in the storming of Chapultepec, a stone castle which guarded the approach to Mexico City. Second Lieutenant (JEB) Stuart was a member of the storming party . . ." was "Little Jimmy" Stuart. The latter Stuart was made a 2nd Lieutenant by Brevet upon his graduation from the Military Academy on 1 July 1846, the year of the creation of the Regiment of Mounted Riflemen. He joined Company "F" of the regiment at Fort McHenry, Maryland, and was acting adjutant of the Detachment of Mounted Riflemen from 28 November 1846 to 25 February 1847.

This James Stuart was off Vera Cruz on March 9, 1847, was at Cerro Gordo in April, and at Chapultepec on 13 September 1847. He was killed in action with Indians on Rogue River in Oregon on 18 June 1851, three years before JEB Stuart graduated from the Academy. He had been made a Captain by Brevet for his gallant and meritorious conduct at the Battle of Chapultepec.

Reader Weirich was right; JEB Stuart did not graduate from the Military Academy until 1854. He joined the regiment as a 2d Lieutenant by Brevet, being assigned to Company B on August 7, 1854, and Company G in October 1854. In January 1855 he joined the regiment's headquarters at Fort McIntosh, Texas; and was on field service with Company G again until March 26, 1855, under a Major Simonson's command. On 26 March 1855 he transferred to the 1st Regiment of Cavalry.

SAMUEL L. MYERS
Colonel, 3d Armored Cavalry
Commanding
Ft. Meade, Md.



Acme

THE COVER

In the bitter early days of Korean action Russian-made North Korean tanks paced Red operations against which our foot troops had a rough time. The story is different today. American armor is on the scene, joining with infantry in the ground teamwork so essential to success. This excellent photo by Stanley Tretick of Acme Newspictures has caught the tank-infantry team at work on the front line.

INSPECTORS FOR . . .

— INSPECTOR FOR ARMOR —

Brigadier General Riley F. Ennis takes up his post as Inspector for Armor with a wealth of experience in back of him, dating from the Tank Course at The Infantry School in 1932. In the period 1936-1938 he served as instructor in the Tank Section of The Infantry School. In 1939 he assumed command of the Third Tank Company at Fort Lewis, Washington. Late that year he was assigned to the 68th Infantry at Fort Lewis, moving to Fort Benning with that regiment in the following July, where it became the 68th Armored Regiment. He became Executive Officer in August of 1940.

Following tours in London and the Middle East as military observer, he became assistant to the Plans & Training Officer at GHQ in Washington, and in March 1942 was assigned to the Training Division of Army Ground Forces. Later that year he became assistant to the Assistant Chief of Staff for Training of Army Ground Forces.

In March of 1944 General Ennis assumed command of Combat Command "A" of the 12th Armored Division, taking it to the ETO and commanding it through combat and until July 1945.

Creation of the posts of Inspector for each of the Combat Arms has just been announced by General Mark W. Clark, Chief of Army Field Forces. Incorporated into the organizational structure of the Headquarters of Army Field Forces, the three positions will be filled by general officers.

Brigadier General Riley F. Ennis has been named Inspector of Armor, Major General George D. Shea Inspector of Artillery, and Major General John W. O'Daniel Inspector of Infantry.

The Inspectors will study and analyze operations within each branch. In releasing the announcement General Clark pointed out: "Our new Inspectors are highly trained senior officers with wide experience in their respective arms and the combined arms. All are combat veterans. They will make recommendations for necessary action to improve the effectiveness of their respective combat arms."

"The basic concept of our military planning is teamwork—the Inspectors for the combat

arms will help us build a fighting team of Infantry, Artillery and Armor," General Clark emphasized.

The Inspectors will work closely with all sections of the Office of the Chief, Army Field Forces. Each Inspector, under the direction of the Chief, Army Field Forces, has the primary function of determining by inspection in the field the degree of effectiveness of units and installations in accomplishing their training missions and the degree of combat readiness of units.

This is a major step forward in Ground Force organization, and is based in sound military thinking. It is a link which should be most valuable in joining doctrine, tactics, organization and training with research, development, procurement and production.

In taking note of an auspicious event the U. S. Armor Association and ARMOR Magazine extend congratulations to the Inspectors of the Combat Arms and assurance of wholehearted support in moving toward a common goal.

—INSPECTOR FOR ARTILLERY—

Major General George D. Shea enlisted in the Regular Army in 1915, receiving his commission in mid-1917. He served in World War I, and between the wars his assignments included a wide variety in Field Artillery and in the service schools. In World War II he commanded XIX Corps Artillery from Normandy to the Elbe.

—INSPECTOR FOR INFANTRY—

Major General John W. O'Daniel was commissioned in Infantry in 1917 and served in France in World War I. He served in assignments throughout the service between the wars, and in World War II commanded the 3d Infantry Division. Since the war he has commanded The Infantry School and more recently was Military Attaché to Moscow.

Even as Korea flares, it is Europe, only recently the ranging area of the violent mobile campaigns of World War II, that is the pivot point in a tense world situation. What lessons have we learned from our recent harsh experience at dictatorial hands? What do we need to prevent a repetition of that rampant violence over the same battlefields? One of the world's leading authorities on mechanization and armor assesses our late experience and calls for 20 Armored Divisions for the West as a deterrent against aggression.

Modern Mobile Warfare

by LIEUTENANT GENERAL SIR GIFFARD MARTEL

British Information Service

THE United States has given the Western Nations the lead in raising the necessary forces to stop Russian aggression once and for all. The main requirement in the Far East is for infantry divisions supported by some tanks and the necessary air forces. If, however, it comes to a real show-down between Russia and the Western Nations the main threat will be the advance of some 200 Russian divisions in Europe or against the Middle East. To meet this threat Field Marshal Montgomery, as Chairman of the Western Europe Committee, proposed that the necessary forces should be raised to establish a linear defence on the Elbe or the Rhine. This needed large manpower forces and to meet this demand we adopted conscription in Great Britain. As a result we now find ourselves with practically no forces immediately ready to meet Russian aggression in the Far East.

Were the Western Nations right to adopt a static role to meet this Russian threat? For many years before the Second World War some of us had been pointing out the possibility of winning great campaigns by the use of highly trained forces of a limited size making full use of mobility and armour as opposed to using large manpower armies. We considered that the day of great cavalry campaigns had returned, only with machines instead of horses. The war justified our prophecies. Let us therefore make a brief examination of the mobile campaigns in the recent war and draw our conclusions.

* * *

Lieut. General Sir Giffard Le Quesne Martel, KCB, KBE, CB, DSO, MC, served with the British forces in France in the First World War. In the period 1936-1939 he held the posts of Assistant Director and Deputy Director of Mechanization in the British War Office. In 1940 he became Commander of Britain's Royal Armoured Corps. From this post he went to Moscow in 1943 to head the British Military Mission to the USSR. He is now retired.

General Martel is author of "In the Wake of the Tank," "The Problems of Security," "Our Armoured Forces," and "The Russian Outlook, 1947."

International

Poland In 1939

The Nazi attack on Poland was the first campaign of the war. The Germans attacked with 40 Divisions including 6 Armoured and 6 Motorised Divs. The Poles had 30 Divisions and some 20 Cavalry Brigades and 9 Companies of light tanks. The Germans attacked on September 1st 1939 and started by eliminating the whole of the Polish Air Forces by air action. This was followed by the advance of German mechanised troops and panzer divisions. They advanced at great speed, bypassing any strong resistance, which was left to be mopped up by the infantry formations which followed them. Full air support was provided at every stage. They advanced about 20 miles a day and the fighting was all over in 18 days. Warsaw surrendered after 27 days. The total depth of penetration was some 300 miles and the supporting divisions were on a front of some 20 miles per division.

The German armoured forces penetrated sufficiently deeply to attack the enemy in rear and to disintegrate the Polish forces, but not with the aim of attacking the centres of government and administration behind the Polish forces. The German casualties were extremely light.

As a result of these operations it became clear that a new stage had been reached in the art of war. Use of mobility, air power and armour had rendered linear defence out of date.

France In 1940

Germany used this same technique in France. The main thrust was carried out by Von Kleist with 6 Armoured and 6 Motorised divisions and strong supporting air forces. The front was penetrated on either side of Sedan and this mechanized force was followed by normal formations used to widen the gap and to secure the right flank as the penetration progressed. Abbeville was reached in six days. This was a penetration of 180 miles at an average speed of 30 miles an hour and on a front of some 40 to 50 miles. No attempt was made at this stage to penetrate deep into France and to disrupt civil government. In fact the technique employed was almost exactly the same as in Poland. The action of these mechanised forces caused the most intense dismay in the Allied armies. Orders were issued by the Allies and then counter ordered. Long delays occurred for no reason other than the confusion which existed.

As a result of this disorder and the loss of such a large number of French troops the Germans had no difficulty in advancing through France, and the downfall of that country followed. This provided a second clear proof that linear defense was out of date.

Russia In 1941

The Germans advanced against Russia with three Army groups.

WESTERN GROUP: Field Marshal von Leeb with 2 armies and one

armoured group.

CENTRAL GROUP: Field Marshal von Bock with 3 armies and two armoured groups.

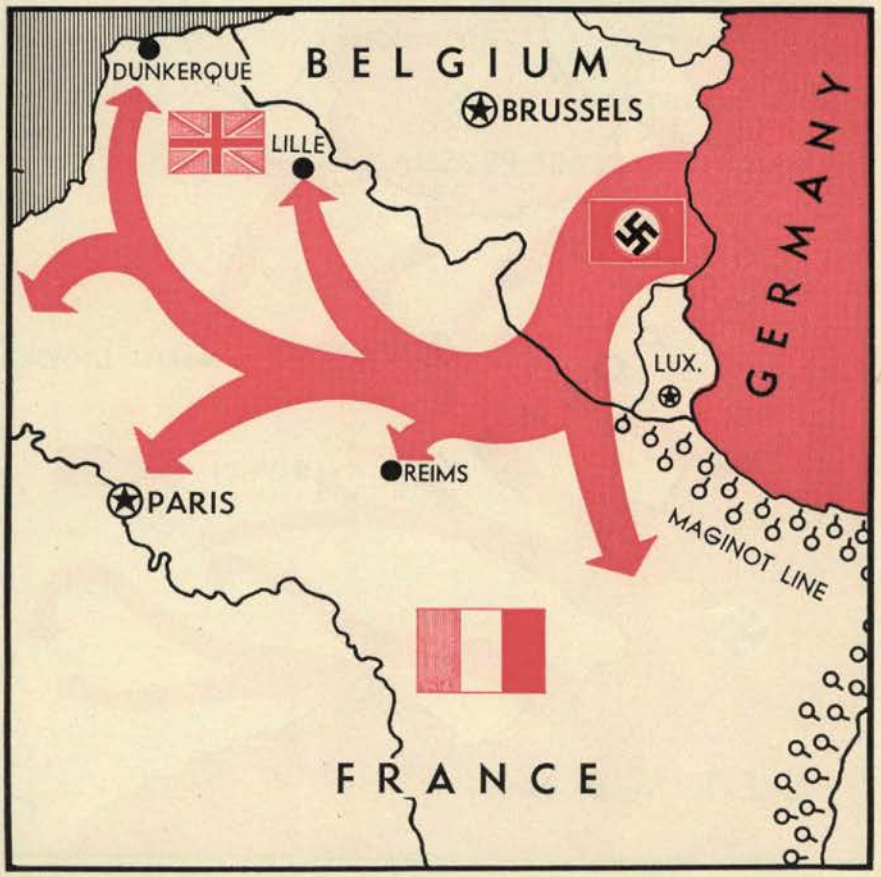
SOUTHERN GROUP: Field Marshal von Rundstedt with 2 armies and one armoured group.

It is probable that each army was composed of some 20 divisions and each armoured group had about 4 armoured and 4 motorised divisions. These mechanised forces advanced a long way ahead of the normal infantry divisions.

The invasion was launched on 22 June. Von Bock in the centre advanced with two mechanised columns converging on Minsk. These columns started at least 100 miles apart and the depth of penetration was 250 miles. Two Russian armies were said to be cut off by this advance and the Germans claimed 500,000 prisoners. The Northern group advanced on the left of von Bock and took Riga. The Southern group under von Rundstedt advanced more slowly and on a much wider front. This first stage in the advance of about 200 miles in 10 days was similar to the advance of the German forces with their mechanised forces which we saw in Poland and France.

International

The Russians lost very heavily from these attacks. When I was in Russia, a Russian General explained to me, on their battlefield, the effect of the sudden attacks on their forces by the panzer divisions at this stage of the operations. The Russian forces were moving up with their long columns of horse transport. They would try to protect themselves with outpost positions but the very mobile panzer divisions would penetrate or bypass these defences and advance on the Russian troops before they could deploy. The destruction which they effected was quite frightful and it had a serious psychological effect on the Russians. At one stage in the south they started to cease fighting. The panzer forces used their mobility to effect surprise and attack new objectives from different directions and there was little that the Russians could do. In addition the pincer movements caused very heavy losses to the Russians in prisoners.



If the Germans had been content with these great victories it is unlikely that Russia would have taken any further part in the war. Even if the Russians had raised new armies and advanced again over this ground it is likely that they would have suffered equally severely again from the German mechanised forces. But Hitler was determined to capture and take the part of Russia up to the line Leningrad-Moscow-Stalingrad and the Caucasus. To do so he had to penetrate deep into Russia and use large numbers of infantry divisions to hold down the country and guard his communications.

In spite of these difficulties, they succeeded in pushing on with little delay in the centre as far as Smolensk. In this advance the Germans claimed to have taken another 300,000 prison-

ers. This was a total penetration of 500 miles at 20 miles a day and Smolensk was reached on July 10th. The German were now suffering considerable losses on their communications from attacks by partisans. They continued however with tremendous tenacity. A vast encirclement was planned round the vital centre of Kiev. This took place between September 1st and 14th. A force under Guderian advanced 100 miles north of Kiev and von Kleist advanced with another force 100 miles south of Kiev. They joined hands 120 miles east of that town. The booty and prisoners taken by the Germans in this operation are not known but they must have been very great.

Some further advances were made in places before the winter set in and a considerable advance took place south of Moscow in 1942, but the effect was to lengthen still further the German communications. In 1943 when I was in Russia the Germans were having great difficulty in keeping up the supply of petrol, tanks and vehicles for their mechanised forces. Towards the end they were not very much better equipped than the Russians. Under such conditions they had no chance against the far superior numerical strength of the Russian forces, and the conclusion of the war was no longer in doubt.

Wide World

The Allied Theatres

We have so far drawn these lessons from the use of mechanised warfare in enemy operations. We must now turn to the consideration of our own experiences.

In 1940 we had the example of the proper use of mobile forces in the first Battle of Libya under Field Marshal Wavell. Although it was only on a small scale it was a perfect example.

Next we had the mobile warfare in North Africa under Field Marshal Auchinlech. The enemy then had first class mechanised forces. Very fierce fighting took place. We won some memorable victories but we lost some battles as well.

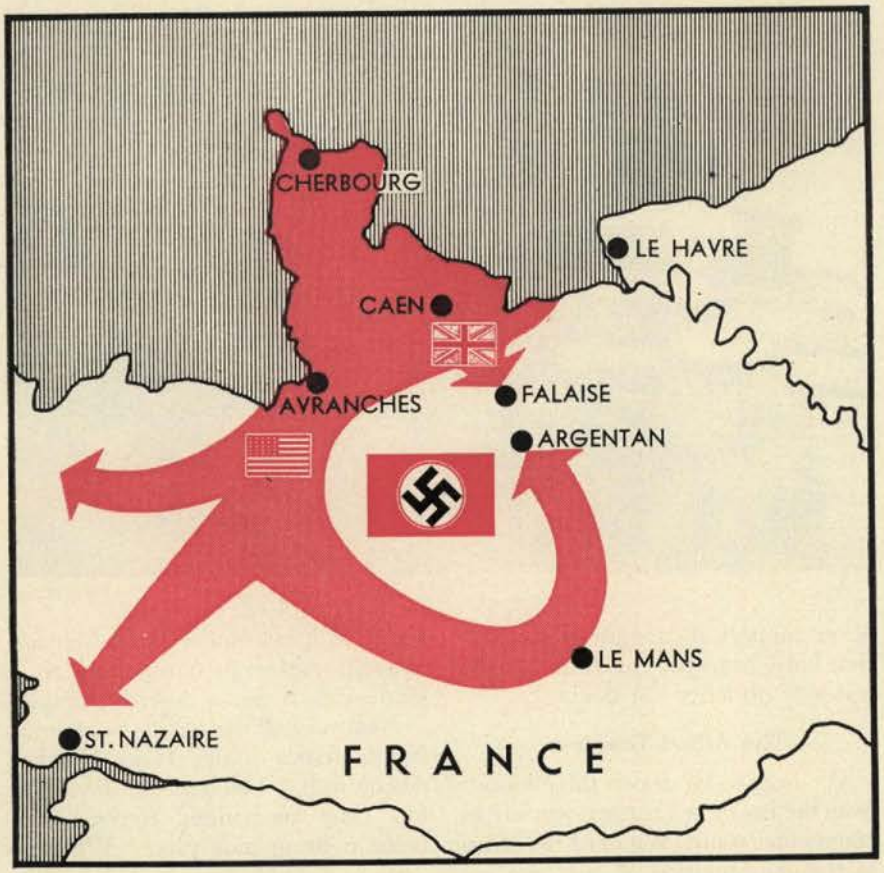
After that we had Alamein which was entirely position warfare. Field Marshal Montgomery was a past master at this art and he had the complete confidence of all his troops.

After Alamein the pursuit was badly conducted. There was no proper use of mobile warfare. Indeed the mobile forces had been largely expended by using them in position warfare which was not their role.

In Tunisia there were some good examples of mobile warfare but they were on a small scale and it was only semi-mobile warfare. In Sicily and Italy there was no opportunity for any mobile warfare.

We now come to the Normandy landings. Here again we had position warfare. Unfortunately we on the British side had never developed the next infantry tank after the Churchill. As a result our tanks were shot to pieces and we again used our mobile forces to try to break through strong positions, which was in no way their role. Eventually both the United States forces and our own broke out from the bridgehead and armoured forces led the way.

On the U.S. side the advance was made by the Third Army under Gen-



eral Patton, using the 4th and 6th U.S. Armoured Divisions. They used blitzkrieg methods, advancing at a very high speed and bypassing any centres of resistance. After reaching Nantes, the 6th U.S. Armd Division was used to clear up Brittany while the 4th Division turned eastwards. They reached Orleans on August 17th and four days later they took Lens. By August 23rd they were reaching Troyes, having bypassed a strong pocket containing 6000 Germans. Troyes fell two days later. On August 27th they reached Chalons, and by August 31st they were across the Meuse. At times they moved 50 or more miles in a day. The advance from Orleans was 210 miles at 15 miles a day. This showed remarkable skill in the handling of armoured forces.

On the British side the advance was led by the Guards Armoured Division on the right and the 11th Armoured Division on the left. They crossed the Seine on August 29th and converged on Amiens, which was taken on the 31st. The advance was made at full speed, centres of resistance being bypassed. On September 2nd the Guards had reached Douval and the 11th Division was at Lens. These armoured divisions had covered 150 miles in four days. The advance then continued without a pause and the Guards entered Brussels on September 3rd while the 11th Armoured Division moved on Antwerp which was entered on September 4th. These were advances of 90 and 110 miles respectively.

On the left the 7th Armoured Division had made equally good progress. They crossed the Seine on September 1st and reached Ghent on the 6th. This included a march from La Bassee to Ghent of 70 miles at an average speed of nearly 30 miles an hour.

The German forces were staggered by the speed of these advances by the U.S. and British forces. Whole units started surrendering to the armoured forces. The 7th Armoured Division took 7000 prisoners in the Ghent area alone. If the armoured forces could have maintained their momentum it is probable that the whole German Army would have collapsed. But at this vital stage the problem of petrol supply had become very acute. For this reason it was impossible for them to carry out any further rapid moves into enemy territory without a pause. Movement must be continual to keep the enemy paralysed and this was not possible. During this pause the Germans recovered their morale and the opportunity for quick and decisive action was lost. These remarks apply equally to the U.S. and British armoured forces. A carefully prepared plan is needed to keep these forces supplied by land and by air with petrol and other necessities in operations of this nature. This technique was under consideration at the British Headquarters of the Armoured Forces in 1943 and would certainly have been solved but these headquarters were abolished when I went to Russia.

In France last minute efforts were made to save the situation by such methods as dumping the normal loads of many lorries and filling them up with petrol instead; and a little supply was done by air on the U.S. front, but these patched up plans were of little use to solve this vital matter.

The Russian Forces

At this stage it will be well to consider the strength and efficiency of the Russian forces in terms of 1950. At sea the only danger would be from submarines and there seems little doubt that the Western Nations would soon gain a reasonable degree of security. In the air we are behind hand but we are making rapid progress and from what I know and have seen in Russia I do not believe that we should be long in gaining air superiority. It is in land forces that we are so inferior.

In what state is the Russian Army? First of all Russia has to keep a very big manpower Army. The Army is constantly used to keep down rebellions in some part of Russia. Manpower is essential for this purpose. Tanks are of very little use on this role. Hence we find a Russian Army with at least 200 divisions and about the same number available in reserve. To mechanise an army of this size is a great task. It is a task that would tax the British industry and even the much greater U.S.A. resources. It is certainly beyond the resources of any Russian capacity at the present time. We must also remember that at the end of the war the Russian Army was practically unmechanised and used horse transport almost entirely. The gigantic flow of U.S.A. trucks which poured into Russia during the

war were all used on the line of communication to try and keep up the essential requirements which would enable their Army to continue to fight. This source of supply of trucks ceased at the end of the war. It is therefore certain that the present Russian Army is only mechanised to a small extent, and that horse transport is predominant.

I do not believe that the Russians will ever forget the terrible effect of the attacks by the highly mobile German forces in 1941. They would have to advance today with much the same type of Army, encumbered with long lines of horse transport. It is mainly for protection against this form of attack that Russia has concentrated on the manufacture of tanks, and particularly on the heavy type of Stalin tank.

An army of this nature is also very vulnerable to air attack but undue faith should not be put on this aspect. I have seen these Russian forces moving cross country by day and by night and through large woods without losing cohesion. The Russian soldier is a peasant with a natural instinct for cross country movement and makes very good use of concealment and cover. It would be a difficult and perhaps an impossible task for air forces alone to stop a Russian Army.

The Conclusion

Our course is surely now quite clear. The Western Nations must have a number of infantry divisions and tanks to meet Russian aggression in the Far East, but the main threat is the advance by large Russian forces in Europe or towards the Middle East. After the experience of the recent war we must surely build up mechanised and armoured forces to meet this threat. It is foolish to try and take on the great Russian Army with a manpower army. The forces which the Western Nations need are regular forces. Highly trained, long service regular forces with modern equipment would prove to be far less expensive in the end than conscript or short service armies. It is in any case quite certain that a short service conscript force cannot possibly produce the type of highly mobile forces that are needed to defeat the Russian masses.

After much discussion with the Russians it is my belief that if the Western Nations possessed an integrated force of 20 Armoured Divisions the Russians would never dare to advance against us. The Russian Army with its limited mobility would have to advance on a wide front. The only way to protect this army from attack by mobile armoured forces would be for Russia to disperse her tank forces along this front, but even then the mobile armoured forces of the Western Nations should have no difficulty in bypassing the heavy Russian tanks which have only a limited mobility. Any strong Russian positions would also be bypassed and the Western armoured forces would pass round and attack the Russians in flank or rear or wherever they were weak.

The armoured divisions used for this purpose would have to contain the right proportion of motorised infantry and artillery, for cooperation of all arms would be essential, but mobility would be the ruling factor. The tanks would have to be very mobile. A dual purpose tank with a long administrative tail would be useless for this work. A number of really heavy tanks would no doubt be required at times to break or hold a strong defensive position but these should form no part of the highly mobile forces designed to attack and break up the unmechanised Russian forces.

Although every armoured division would have a proportion of the other arms, a number of Territorial divisions would be needed to guard the bases and for a follow up at a later stage. But the vital matter would be the possession of a striking force of 20 Armoured divisions by the Western Nations.

U. S. Army

British Official Photo

American and British Armor on two ends of a great pincer movement.

for military vehicles . . .

by C. F. BACHLE

A Family of Air-Cooled Engines

Some of the big news in military vehicles today revolves around the power plant. A pioneer in the field of air-cooled engines, and top engineer with Continental Motors, gives us some of the background on the family of motors that will power our tanks and trucks.

THE U. S. Army Ordnance Department began development of air-cooled engines for tracked military vehicles in 1932. These engines have been primarily aircraft engines of the radial type with modifications for vehicle use. During the latter part of the recent war, a special air-cooled engine, having essential features for tank service, was developed. Following the war, analysis showed that there was great opportunity for improvement if standardization could be effected. Accordingly, the tank engine program was expanded to include the same principles in other sizes of engines to be used for other types of vehicles besides tanks, all engines to have maximum interchangeability of parts. The program resulted in a line of eight engines utilizing two basic cylinder sizes and ranging in cylinder numbers from four to twelve. Figure 1 gives one view of each of the small bore engines and Figure 2 shows the large bore engine line. The main features of these engines are:

1. Maximum interchangeability of parts.
2. Lightest weight consistent with military life expectancy.
3. Minimum bulk.
4. Arrangement which permits the best utilization of space with serviceability in the vehicle an important consideration.
5. Uses Army established gasoline (80 octane with maximum lead 3cc/gal.) and oils.
6. Waterproofed so that water submersion would not interfere with operation.
7. Suitable for extremes of Arctic and Tropical climates.

Interchangeability of parts is construed to mean parts having a high wear rate and, obviously, this includes bearings, cylinder bores, valves, pistons and rings, in addition to spark plugs, oil seals, etc. It is conceded that such parts as crankcase and other larger castings are not high mortality parts in a well developed engine, and some of these parts cannot be made interchangeable between engines having varied numbers of cylinders. The main wearing parts are all associated with the individual cylinder and, by keeping the cylinders in single units, the interchangeability requirement is admirably served. In addition to this, the individual cylinder construction is especially suitable to air-cooling arrangements.

The power range from 100 to 1,000 H.P. is covered by using various numbers of cylinders of two basic sizes. These sizes are 4⅝-inch bore, 4-inch stroke, resulting in 67 cu. in./cylinder displacement and 5¾ bore, 5¾ stroke, resulting in 149 cu. in./cylinder displacement. Figure 3 is a photograph of interchangeable parts of the 149 cu. in. cylinder and Figure 4 shows the 67 cu. in. cylinder interchangeable parts. Figures 5 and 6 show the similarity of the small cylinder line insofar as the noninterchangeable parts are concerned. This integration permits many manufacturing economies as well as resulting in manufacturing flexibility.

Other information on the various

Carl F. Bachle (pronounced backlee) is Vice-President in Charge of Research for the Continental Aviation and Engineering Corporation, a post he has held since 1940. A graduate in Mechanical Engineering of the University of Michigan, he has a broad background of experience in all forms of power plants as applied to aircraft and military vehicles.

Mr. Bachle has been associated with the application of air-cooled engines to tanks from the beginning of the U. S. pioneering effort in 1932. In 1947 he served as technical consultant to the U. S. Government for the purpose of making a power plant survey in Europe.

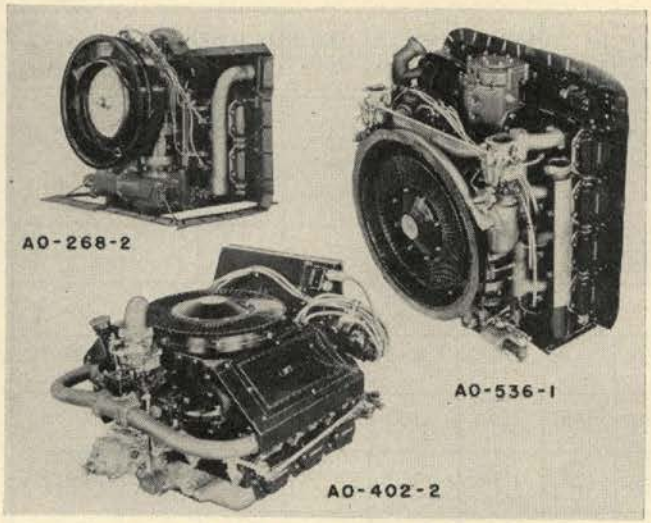


Figure 1—67 cu. in. line of engines.

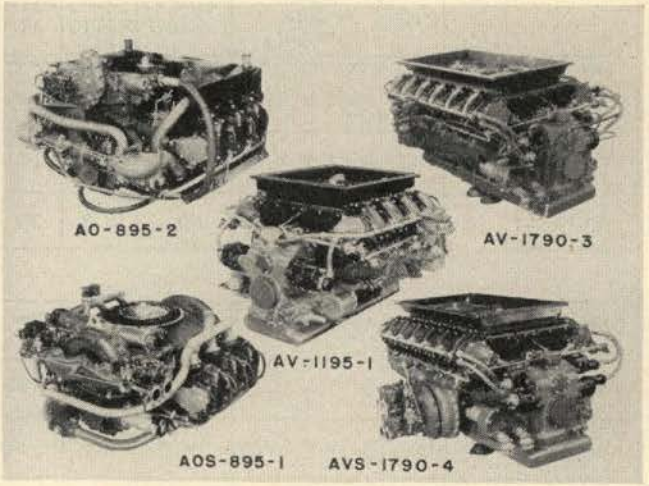


Figure 2—149 cu. in. line of engines.

models of engine is given in Figure 7. Although it would appear at first that there might be little interchangeability between the two cylinder lines, there is a considerable number of parts which are common to the two sizes of engines. Such components as fans, fan drive clutches, magnetos, oil filters, spark plugs, governors, etc., have been selected to be suitable for both engine sizes. In addition, a considerable number of standard parts are identical in both sizes of engines.

The question of the selection of the air-cooled engine principle for military vehicles as opposed to the more common liquid-cooled commercial engine practice is worthy of explanation. Figure 8 gives a summary of the various methods by which engineers evaluate engines and the comparison of air-cooled versus liquid-cooled as found from Ordnance engine experience over the period of the last eighteen years during which 30 million horsepower of air-cooled engines for tanks have been used. The military use of engines places emphasis in different directions than on commercial engines. As an example, in the Arctic the difficulty of keeping a liquid cooling system intact and operating is greatly increased since it has been reported many times that anti-freeze and water are more scarce than fuel. In addition, in hot climates it is difficult to provide proper space for adequate cooling systems in military vehicles. Air-cooled engines in general have the peculiar advantage of requiring far less air for cooling than the liquid-cooled engines and this is because there is a greater difference in temperature between the cooling air and the metal to be cooled on air-cooled engines than on liquid-cooled engines. This results in less space in the engine compartment for cooling air ducts and a consequent reduction of engine compartment size.

In comparing the weight of air-cooled engines with liquid-cooled, it is necessary to include the weight of all components of the cooling system. Figure 11 gives weight comparison on this basis and includes all accessories essential to the operation of the engine as well. This shows that the air-cooled engines are about one-third the weight of liquid-cooled, heavy-duty vehicle

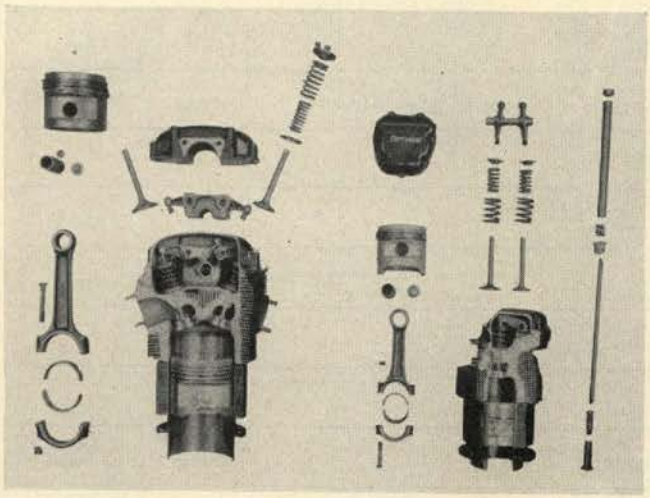


Figure 3
149 cu. in. cylinder and interchangeable parts.

Figure 4
67 cu. in. cylinder and interchangeable parts.

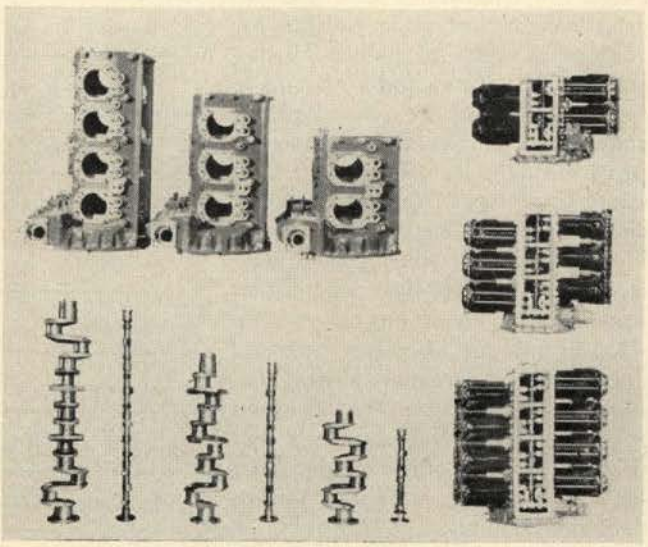


Figure 5 Figure 6
Components of the 67 cu. in. cylinder line showing similarity of parts for the 4- 6- and 8-cylinder engines.

MODEL	NO. OF CYLS	DISP	BORE AND STROKE	SUPER-CHARGED	COMP. RATIO	RATED BHP AT RPM	RATED BMEP	WEIGHT LB.	HP PER CU. IN.	LENGTH INS.	HEIGHT INS.	WIDTH INS.	C'SHAFT VERTICAL OR HORIZ
AO-268-2	4	268	4.62 X 4.00	NO	6.7	125-3000	123	560	.466	28.88	32.25	35.25	V OR H
AO-402-2	6	402	4.62 X 4.00	NO	6.7	190-3000	124	675	.472	35.94	32.10	35.12	V OR H
AO-536-1	8	536	4.62 X 4.00	NO	6.7	250-3000	123	777	.466	38.31	27.37	35.12	V OR H
AO-895-2	6	895	5.75 X 5.75	NO	6.5	375-2800	118	1650	.419	46.78	39.96	50.72	HORIZ.
AOS-895-1	6	895	5.75 X 5.75	YES	5.5	500-2800	158	1680	.560	45.33	34.59	50.72	HORIZ.
AV-1195-1	8	1195	5.75 X 5.75	NO	6.5	540-2800	128	1865	.452	50.38	38.69	61.12	HORIZ.
AVS-1195	8	1195	5.75 X 5.75	YES	5.5	665-2800	158	1985	.556	50.38	38.69	54.35	HORIZ.
AV-1790-3	12	1790	5.75 X 5.75	NO	6.5	810-2800	128	2380	.452	66.88	38.69	61.12	HORIZ.
AVS-1790-4	12	1790	5.75 X 5.75	YES	5.5	1000-2800	158	2500	.560	66.88	38.69	54.35	HORIZ.

Figure 7—Military vehicles engine data.

engines where cast iron is the basic material for the liquid-cooled engines. If aluminum were to be substituted for cast iron, the liquid-cooled engine installation would probably still be 70 per cent heavier than the air-cooled power plant. In this connection it is of interest to note that of the total weight of the air-cooled vehicle engine approximately 40 per cent is aluminum, 50 per cent steel or non-ferrous metal and 10 per cent accessories.

Figure 9 shows that the basic weight of the vehicle engines is about 10 per cent greater than the aircraft engines of comparable size, and this extra weight was designed into the engines in order to reduce bearing loads, temperatures and cost, and to insure extra long life. Standard aircraft design practice, though more expensive, might have been used with safety since experience indicated that aircraft service is more demanding on high stressed parts than vehicle service. Vehicle service does require part load operating conditions not encountered in ordinary aircraft service and one of these is extremely low oil consumption and quiet piston operation as compared to aircraft standards. For this reason the vehicle engines use longer connecting rods and pistons than aircraft engines, as shown by the comparison in the photograph, Fig. 10, which is of parts from an aircraft engine, the air-cooled vehicle engine,

	Air Cooled	Liquid Cooled
1. Plumbing difficulties	Better	
2. Anti-freeze requirements	Better	
3. Weight	Better	
4. Fan power required for cooling	Better	
5. Quantity of cooling air required	Better	
6. Temperature of cooling air leaving engine		Better
7. Power loss due to combustion chamber deposits	Better	
8. Costs	Equal	Equal
9. Established manufacturing equipment for high production	Equal	Equal
10. Serviceability	Better	
11. Long life	Equal	Equal
12. Noise	Equal	Equal
13. Cold operation	Better	
14. Oil consumption	Equal	Equal
15. Anti-detonation quality	Equal	Equal
16. Fuel consumption	Equal	Equal

Figure 8—Comparison of air- and liquid-cooled engines.

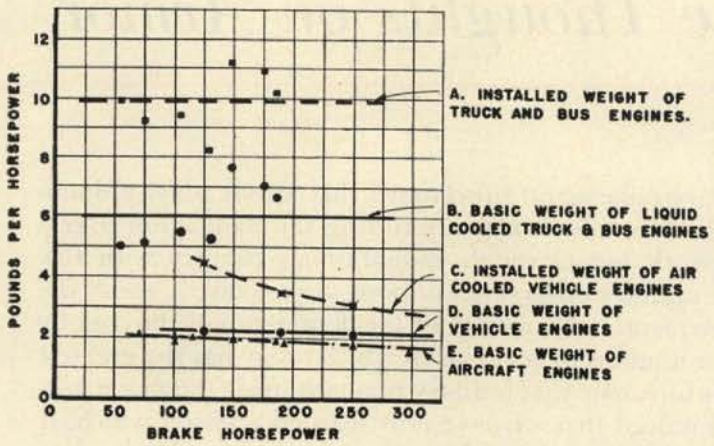


Figure 9—Comparison of weights of air- vs. liquid-cooled engines.

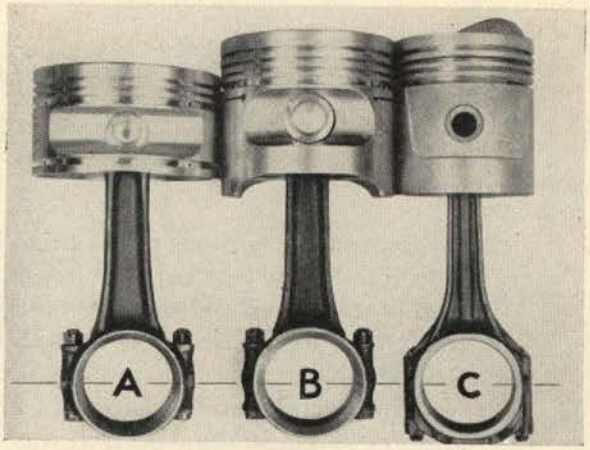


Figure 10—Comparison of piston, piston pin and connecting rod from "A" an aircraft engine, "B" air-cooled vehicle engine and "C" a high production truck engine.

and a widely used truck engine, all having the same stroke.

Modern air-cooled engine practice permits great variety in the arrangement of the air-cooling system. As an example of two types of systems, Figure 11 shows an installation where the fan blows air toward the cylinders, whereas Figure 12 shows the fan sucking air through the cylinders. In either case, the cooling air is forced through the cylinder fins by a pressure differential and the cooling result is the same if the pressure differential is the same. The advantage of the cooling system shown in Fig. 12 is that heated air is ejected from the engine compartment in as short a travel space as can be devised and the cool incoming air is in contact with the fuel tanks, thereby reducing vapor lock problems which can be severe in tank type vehicles.

The first of the Ordnance line of engines is in production. Four hundred fifty thousand square feet of plant area is equipped with the most modern engine manufacturing facilities, entirely geared to the military engine program.

The plant is arranged with two purposes in mind: (1) so that production rates can be quickly expanded in case of national emergency, and (2) so that the variety of military engines can be produced with a minimum of extra equipment for different models.

At the present time, the AV-1790-5A engine is in quantity production and the AO-895-1 engine is the next of the Ordnance engine lines scheduled for quantity production. In the meantime, all of the other engines are in small scale production, mainly for prototypes of new Ordnance vehicles. When these vehicles have been approved for production, the Army has assured an excellent source of quantities of any of the engines through use of this plant.

In case of any national emergency in the future which would require large quantities of engines for combat type vehicles, it should not be necessary for the Army to use a great variety of power plants as was done during the last war. The hardship to the military can be realized when it is recalled that in World War II the medium tank alone used six different kinds of engines requiring 5,165 kinds of spare parts as contrasted to 954 kinds of spare parts for the new engine for medium tanks. The standardized line of engines has been the subject of industrial mobilization planning so that the next emergency should see combat vehicle power plants of economical manufacture, great reliability, and improved serviceability.

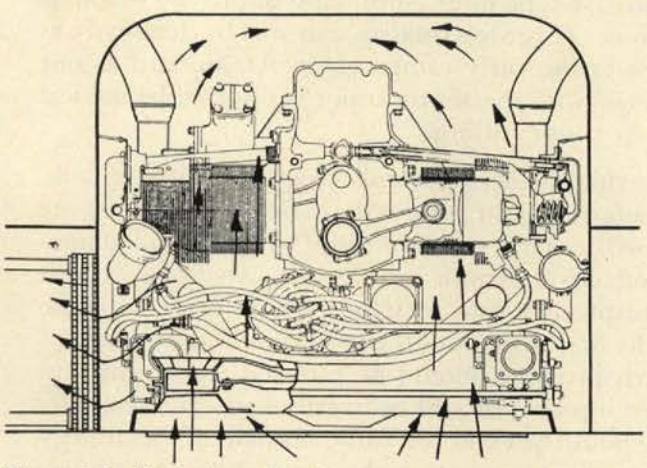


Figure 11—Top view of engine compartment of military vehicle showing installation of AO-536 engine.

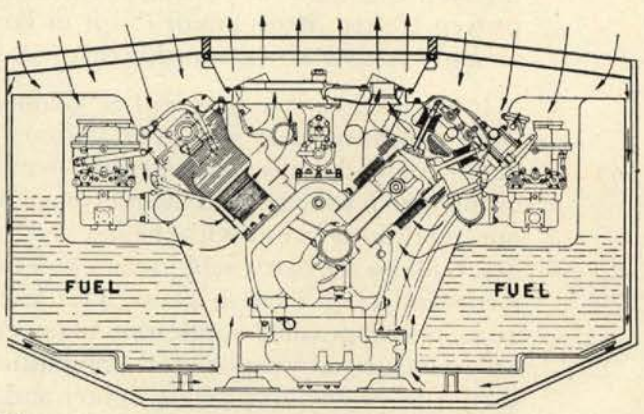


Figure 12—AV-1790 engine installed in military vehicle.

Some Thoughts on Armor

Front page headlines in the press have once again proclaimed that armor plays a dominant role on the battlefield. Not on desert sands, nor gently rolling farmlands; not over a closely integrated communication network, but in rough, mountainous country with few roads, country previously described by military observers as "poor tank country, easily defended against armored attack." Subsequently, this maxim of the dominance of the tank by terrain was completely disproved by the minions of that nation which today has the greatest armored might in the world. It was unfortunate that military planners made the grave mistake of underestimation, but fortunate indeed that we have now learned a lesson which, if understood well in this preliminary combat, can be used to our tremendous advantage in any main event—if and when it comes.

Prior to Korea a considerable amount of doubt had been generated within the Armed Forces as to the future value of armor. This doubt was predicated primarily on the reported effectiveness of current developments in the field of antitank weapons. Such doubt about an arm of proven effectiveness was only understandable in the light of the enthusiastic scientific reports we received from our research people. That such doubts should have dominated our thinking with regard to armor, however, was unfortunate. It is not necessary to point out that in some instances these new weapons are still a gleam in the scientist's eye. One recognizes the fact that there are weapons and types of ammunition already produced which have greatly increased the effectiveness of antitank means—the improved bazooka, the hollow charge and other developments appear to be most promising. But until these weapons and ammunition have been developed to the point where they can be employed effectively by crews against attacks by mass combined-arms-teams, it cannot be assumed that they have defeated our battle proven armor and forced it to retire from the battlefield. In support of this view, we frequently read in the paper that military research experts say "they look for no sensational developments in the next several years, that will make such present weapons as the plane, tank, and submarine obsolete and outmoded."

It need not be pointed out that antitank developments are defensive in character. It is true, of course, that we probably will be on the defensive in the initial phases of a future war. It is equally true that our opponents will employ masses of armor. (Apparently their scientists engaged in developing the future sensational unconventional antitank weapons are not heard above the roar of tank production lines.) But once we move from the defensive to the offensive we must have the means to envelop his positions, pursue his retiring columns, and to strike deep into hostile defenses in exploitation. The enemy is not going to be so weak that this can be easily done by light, inexpensive-type units employing improvised mounts for conventional and unconventional weapons. This, we visualize, can still be done only as the Germans did it in Poland, as it was done in the early campaign in Africa, and as our proven United States armor did it in Europe—with masses of armor supported by tactical air and a logistical organization that will keep armor rolling.

It has been, and to date still is, axiomatic that the best antitank weapon is another tank. Armor enthusiasts, as well as all military leaders, should follow these developments in the defensive fields with great interest. Armor will eagerly embrace those weapons and ammunition which have proven themselves to be effective. Armor is not static—we hope we will not fight the next war with the last war's equipment. And in its aggressive search for the best tank on the battlefield, Armor will be the first to accept all new technological developments and adapt them to its use. Our research program should be pursued vigorously and no item with possible application to tank development should be overlooked. For example, nonconventional weapons and ammunition should be explored fully, the field of metallurgy should be probed to provide lighter and more effective armor, the gas turbine and similar

power train developments should be fully exploited—all these and numerous others will provide the researcher and designer with answers to their problems of increasing the tank's mobility, and reducing its weight. And finally, these remarks would not be complete should they not state that air transportability of all armored equipment is a goal toward which we should constantly strive to the end that our armored field manuals will discuss "vertical" envelopment with the same facility they now give to "horizontal" envelopment.

Fire power, mobility and armor protection are the three outstanding characteristics of the tank. It is, of course, a truism to say that if we can provide the ultimate in each of these characteristics in one vehicle our problem of types of tanks is solved. Until that tanker's dream is realized, however, it would appear that to design a vehicle with the best gun available and to provide maximum protection for the crew, we must accept something less than the best in mobility. This is demonstrated in the so-called "tank family." Each of the tanks in this series provides Armor with the best that our researchers, designers and engineers can produce. The results are individual tanks designed for a specific job. The day of the all-purpose tank may not yet have arrived, but it would indeed be foolhardy to say that such a vehicle is impossible. The subject is a challenge to our gun designers, our automotive engineers, and our metallurgists: they are, or should be, the best in the world. We are confident they can meet the challenge; they always have.

In passing, mention should be made of one type of armor which we must not neglect in our development. For lack of a better expression we can call this "specialized armor." In this category are such devices as tank transported bridges, mine clearing tanks, flotation devices, flame throwing tanks, bulldozers, and others. Although most of this type equipment in the last war was improvised, its value was proved and we should plan now so that future improvisation will not be necessary. The bulk of this specialized equipment should be provided to allow the standard armored formations to traverse obstacles which might otherwise delay them. In other words, they add to the mobility of armor.

And Armor is the arm of mobility. It has inherited the great history and tradition of the Cavalry, of the Tank Corps, and of Armor of the last war. Here is a heritage of which every American can be proud. Armor, as part of the team, seeks to impose its will on the enemy by aggressive offensive action, employing in this its characteristics of fire power, mobility and shock.

Since the earliest days of its development here in the United States, Armor has been a team player in our Army. It was the armored division, in its first Tables of Organization ten years ago, that first included not only tanks, but also artillery, infantry, engineers, antiaircraft and reconnaissance.

As far as this team idea is concerned, history has demonstrated, the present conflict has verified and the foreseeable future will not change the efficacy of the concept. Armor is the great proponent of the combined arms teams. The organization and employment of the armored division with its tanks, its infantry, its artillery and engineers, welded into driving, hard hitting teams, typifies this type of action. And these teams are not alone. Overhead they have the fighters of tactical air on call. Feeding and maintaining them is their own division logistical support, and teaming up with them as a division in Corps are the infantry divisions. Our Armed Forces Day this year employed the slogan "Teamed for Defense"—here to characterize unification of the Services. We see demonstrated in Korea today not only on a Service level but within the ground forces themselves, those elements discussed above—armor, infantry, artillery, engineers, tactical air, navy, all of them—"Teamed for Offense" on behalf of freedom and peace.

"... the infantry as it was known in the period 1939-1945 is no longer the decisive arm. Rather, I consider as the decisive team the airborne forces fighting in closest collaboration with armor and air support."—The man who commanded Germany's strongest panzer division, and led German armor on the Eastern, African and Western fronts, sets forth his ideas on

the Decisive Arms in Ground Combat

by HASSO ECCARD VON MANTEUFFEL

THE value of an army rests not alone upon its basic elements of numerical strength, armament and equipment, but also upon the mental and spiritual forces which affect organization, training and education. To bring these values to their utmost effectiveness is what constitutes the art of leadership. Many years of experience in two wars convince me that the quality of troops and their weapons is more important than numbers and quantity. In this article I will discuss only the basic elements, placing particular emphasis on the armored forces.

Progress in the application and use of new weapons is a decisive factor. New methods must be found, methods unshackled by past customs, by conservative trains of thought or prejudices. In this respect I must warn against any ironclad application of command principles. It is well known that a lieutenant considers regulations entirely superfluous. However, regulations are essential because they reflect the experiences and lessons of battle-tried men. But they should be applied *only as a guide!* Even as division commander I always allowed myself to be guided by the principle of commanding on the battlefield only where I personally could see and hear what was happening at the foremost front. There is no real substitute for personal on-the-spot impressions for the commander.

In my opinion the infantry as it was known in the period 1939-1945 is no longer the decisive arm. Rather, I consider as the decisive team the airborne forces fighting in closest collaboration with armor and air support. This team is able to immediately exploit every success and any confusion that might arise in the enemy defense system—all this with flexibility and with such impact that a successful decision follows. The effectiveness of such an operation is open to continuing improvement; new life may be infused into a basic principle of warfare, namely, that the strongest possible forces must be concentrated against the weak points of the enemy; this principle can be stated even more categorically than before.

Captured German Photo

In 1908, at the age of eleven, Hasso Eccard von Manteuffel entered the Prussian Cadet Corps at Naumburg/Saale and in 1911 passed on to the Central Cadet Institute at Berlin, where he remained until completing his final examinations in 1916. Immediately upon graduation he joined the cavalry as an officer candidate and in April of the same year received his commission as a Lieutenant. Serving with the field forces until the end of World War I, he was taken into Germany's reduced Army and remained in service—always with the field forces—without a break until the end of World War II.

In 1936-37 von Manteuffel, who had been transferred to the panzer forces, was placed in charge of the First Panzer Force School, and in 1939-41 was chief of the Second Panzer Force School. His other assignments during World War II included tours of duty as divisional commander in North Africa, commander of 7th Panzer Division and later of the Grossdeutschland Division, both on the Eastern Front, and finally as commander of the Fifth Panzer Army, in which capacity he took part in the Ardennes Offensive.

Promoted Generalmajor in May 1943, von Manteuffel was further promoted General der Panzertruppe on 1 January 1944, skipping the intermediate rank of Generallieutenant.

Equipped with superior arms, probably of entirely new types, the units mentioned above—the airborne forces, paratroopers and armored forces—are able to fulfill ideally the classic demand of warfare, in which surprise and main effort are the prerequisites of victory.

These units provide these prerequisites in respect to locality, *and* time, *and* effectiveness. However, whether on a small or a large scale the closest possible coordination between the air force and the ground forces alone will achieve full success because together these services are in a position to solve the problem of time and space. The airborne forces and the light armored forces will always have to exploit the possibilities of the moment in continuous action, the effect of which can be still further increased by reason of their superior weapons and methods of combat. The organization, armament and equipment of these units will have to correspond to this principle.

Deep penetration of the enemy defense system is of utmost importance; there should be no premature flanking movement. The deeper the thrust can be pressed into the rear of the

enemy the greater will be the success. The fact that such offensive operations, with farflung objectives calling for uninterrupted advance, will lead to the development of extended flanks —in fact frequently flanks that are excessively extended—is nothing exceptional. Also, the fact that the penetrating armored forces, after effecting the breakthrough, will in a certain sense then have to operate and fight in open terrain presents no great problem to the attacker, who will be able to adapt himself to all difficulties that might arise. Experience has shown that these extended flanks, which are either only weakly protected or altogether unprotected, also develop on the side of the defender, and are far more disadvantageous for him than for the attacker, because the latter from the outset was able to take this risk into consideration. In the future, operational and tactical air forces cooperating with airborne forces admittedly will not be able to eliminate this risk of open flanks and initially unprotected areas because combat areas will expand to a far greater degree than hitherto; but they will be able to meet these dangers far more rapidly and effectively by adopting new principles of command which must take the modern weapons and their employment and efficacy into account.

Operational mobility has become a method of combat and applies to the entire conduct of the operation. The command technique therefore will have to be different from that still in effect in 1945 so that, in addition to finding the proper organization for the combat forces and besides the adaptation of new combat techniques it will be able to discover the means to maintain operational mobility. The main features of the new technique will consist in sizing up situations immediately and then meeting them with speedy action coupled with flexibility—all making for maximum mobility. This technique will at one and the same time bring about the drive and the power with which the commander will understand how to use effectively the main part of this arm, its armored nucleus. The armored force derives its necessary driving power from the concentrated nucleus and spearhead which consists of numerous tanks. All other elements of the force, whether it be a division or otherwise, will have but one function, namely, to augment the effectiveness of this nucleus in all situations. Concentration of the greatest possible number of tanks at the point of main effort will be the decisive factor. An attempt to support the tanks primarily by infantry is the first step toward the bogging down of the armored unit. Incidentally, such a measure would be an indication that the armored effort had passed its peak. In no event could I condone such action if—and here we come to the essential point —everything is done to perfect the support of tanks in combat by other arms such as artillery, engineers, chemical forces and tactical air forces. The essential features of this type of armored force—fire power, armor, speed, and maneuverability on the field of battle, all of which are contained in the armored nucleus—cannot be present in too great measure, always, of course, provided that the force as a unit is not rendered unwieldy and thereby difficult to control.

The time factor is of the utmost importance in war. The necessity of covering great distances quickly has given added prominence to speedy action and speedy execution of orders on the battlefield. Speed is the prerequisite of success in that it allows the enemy no time to take effective countermeasures. Of decisive importance are speed in thought, speed in action, speed in sizing up a situation and—speed in the execution of orders, for what would be the value of measures initiated by top-level and intermediate commands if the officers and NCOs in the regiments, battalions and companies were not educated and trained, were not accustomed and even willing, to execute orders speed-

Acme

". . . at the foremost front." Von Manteuffel in Russia.

A DECISIVE TEAM

Fairchild, Republic, U.S. Army

ily? Speed throughout is essential.

Even in the past war one was taught that artillery fire, in spite of its great effect on morale, as a rule actually had only a neutralizing and paralyzing effect, that an annihilating effect could be obtained only rarely, at ideal ranges, and by means of concentrated fire. It is my opinion that progress in the various technical fields will in the future make it possible to obtain actual annihilation fire by the artillery. It is likely that current discoveries and present research in the field of rocket propulsion will develop an important, probably a decisive increase in the intensity, penetrating power and area covered by the individual weapons, the projectiles of which will decrease considerably in size and weight. Far greater results will be obtained from individual pieces which will be effective at greater ranges and have great accuracy. Technical progress also will so far improve signal communication facilities and the delivery of messages that the transmission of target designations in simplified form will make it possible, at utmost speed, to bring about maximum concentrations of all the various weapons, so that an actual annihilation effect will be obtained.

To this end the most widely varied types of fire will be concentrated on the target. These will include bombardment by air, fire from craft artillery, rocket projectiles and fire by the weapons of the ground forces, so that extremely flexible massed fire, in the form of fire concentrations of widely varied forms of projectiles delivered in rapid sequence and steadily growing accuracy, will destroy all living and unprotected targets, while concerted action will destroy even those under protective coverings. The significance of man-to-man ground combat therefore will decline, and this will reduce bloody losses, the only really important consideration.

On the basis of many years of experience with armored forces, I am of the opinion that, for tanks, speed on the field of battle is of far greater importance than was generally assumed in time of peace and even during the past war. The necessity to take this point into consideration in the construction of tanks is further emphasized by the fact that all antitank weapons also will be improved. This improvement of the tank applies not

alone to the penetrating power of its guns and the intensified effect of the projectiles, but also includes firing range, a greatly accelerated rate of fire and materially improved target recognition and sighting devices, as well as excellent tank-to-tank communication facilities, which will enable them, even when widely separated in combat, to concentrate their fire speedily on a given target.

Apart from the changed methods of combat it has become vital for the tank that, when changing position from one firing point at which it has halted to the next firing point, it should be able to cover the intervening distance at a speed which will reduce the effectiveness of the defensive fire of the enemy. Combined, the mechanical maneuverability which motor and caterpillar track give to the tank, which can be increased considerably by thorough training of the personnel, and the tactical mobility given to the armored unit by existing command facilities have become in themselves a means of combat just as important for tactical action as armor-plating and fire power. Surprise attacks and sudden surprise fire are always the prerequisites for the successful execution of an assigned combat mission.

Although it has been taught in the past that fuel is a "means of command," I am of the opinion that it has become more than that; that it has become a "means of combat" for all service arms that employ engines.

In an armored force the supply services and the organization of the recovery and repair service constitute the circulatory system, without the smooth functioning of which the armored force could not continue to exist. The composition, strength and equipment of these services have become the vital nerves of the armored force. For their control a tactical command is just as essential as it is for the combat units themselves.

Vital importance must be attached to the improvement of communication facilities. The signal communication system has become an "arm of the command." The greater the degree to which operations and the outcome of war hinge upon combined action by the air force, the airborne forces and the armored forces, the more speedily must the decisions of the supreme command be put into effect.

THE TANK PROGRAM

A Statement Prepared for ARMOR by

PHILIP J. PHILBIN, Chairman

Subcommittee on Tanks, House Armed Services Committee

There are few subjects of greater moment to the Army than the tank program. Clearly, there is room for improvement of our tanks in all categories. Up to Korea, not sufficient emphasis was placed on the value of tanks in modern warfare and, therefore, our building and development program had lagged. We found out in the field the truth of the old military expression—"the best weapon against a tank is another tank." But the other tank must be thoroughly modern. It must have better and more striking power, greater mobility and adequate protection if it is to succeed against the enemy tanks. This means gun power, motor power, flexibility and armor.

Tanks cannot be built overnight. Their appurtenances require high technical skill. They must be carefully planned over a long period of time and then tested in the field to remove the "bugs."

Fortunately, we have done considerable planning and have now available several models in various categories, which would seem to meet most exacting battlefield requirements and embody latest innovations.

Our Subcommittee on Tanks, of which I am Chairman, acting under urgent instructions from Chairman Vinson of the House Armed Services Committee, filed a report only last week (20-27 August) with the President on the subject of the present tank situation. This report contained our analysis and recommendations. Since most of its data were classified and, therefore, top secret, it cannot be discussed here. The reaction of President Truman was immediate and highly gratifying. In a matter of a few days, the President approved a new five hundred million dollar program for tank production and it is expected that this program will proceed forthwith.

The productive capacity of American industry is so great that I believe we will be able to overcome all obstacles and, in due course, build tanks in all necessary categories at a high production rate.

I take this opportunity of complimenting ARMOR upon its interest in this very important subject and want your editors to know that we welcome your cooperation in helping to further this vital program.

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.

When we asked a half-dozen noncommissioned officers of the Army's Second Armored Division to express themselves on the general subject **WHAT I WANT IN A TANK,** *we were not thinking so much of Lana Turner as we were the trinity of physical characteristics – armor, armament, maneuverability – which combine to produce the essential operational characteristics of the tank—mobility, protected fire power and shock. Although the views must be expressed without the perspective of recent and classified developments, they are sound and absorbing comment, direct from the tanker who fights the tank.*—THE EDITOR.

The writer of the following served in the ETO with the 743d Tank Battalion during World War II. It was so rough getting into France on D-Day that he won the Distinguished Service Cross for action on Omaha Beach. He earned a Purple Heart with two Oak Leaf Clusters during the campaigns in Normandy, Northern France, the Ardennes and the Rhineland. He is now with Headquarters and Service Company, 67th Medium Tank Battalion, 2d Armored Division.

In describing what I want in a tank, it's necessary to mention both the light and medium variety. Unfortunately, we've not yet developed a tank which will do the job of both types, and I don't think we'll have such a tank in the near future.

Sfc. Ward

In the medium class, the M-46 is approaching what I want. Its powerful engine and cross drive transmission produce more mobility and maneuverability than that to be found in older models. Its 90mm gun is a slugger and should set any tank in the world right back on its bogies.

I still think, though, that the medium is too blamed heavy. A lot of weight could be knocked off the M-46 but it shouldn't be at the sacrifice of gun or engine. There is too much weight invested in armor. The armor plate could be shaved down to about two inches and the speed and maneuverability gained would give more protection than could be had from the discarded armor. Makes no difference if there's a foot of steel on it anyway; guns already are being used which can penetrate it. And in my tank, I'd rather have a hot one come through two inches and go out through two inches than struggle in through half a foot of steel and then bounce around inside the hull or turret.

But the M-46 is a good tank; what we really need is a new light tank. The 75mm gun on our M-24 has been behind the times since before the end of World War II. I'd like a light tank to have a 76 with a muzzle velocity around 4,000 feet per second. With that gun, the tank could do its job and play in a man's game.

We need a new light tank engine, too. The twin Cads in the M-24 just don't have the steam to push that 20 tons around corners and through bad terrain without losing enough speed to make the tank a sitting duck.

With a new gun and engine, our present M-24 would do the trick. It has plenty of armor right now.

There are some additional items I'd like to see in my new tank whether light or medium.

First, the co-ax gun should be a cal. .50. The .30 is just too light to cut the ice and, on trucks and other light stuff, the .50 is hard to beat. During World War II, I had a .50 welded to the tube of my tank gun and fired it with a string attached to a side-plate trigger. It worked like a charm.

Next, I'd like to dispense with the assistant driver and use the space he takes up for stowage. A five-man crew isn't necessary.

Lastly, but certainly not least, we need more rugged communications equipment. What we have is OK for the job if it could be kept in operation, but it's too delicate for the beating it takes in a tank.

Just to add up the score, I'll say again, the M-46 is a good medium tank, but I think we can and should build a better one. In the light tank class though, we need something new, a lot better and before too much water goes under the bridge.

SFC PATRICK C. WARD

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The writer of the following joined the Army in January 1942 and was assigned to Company I, 67th Armored Regiment, 2d Armored Division, following his basic training. First as a tank gunner, then as tank commander, he remained with the 2d Armored through all of its seven campaigns from North Africa to Germany, garnering a Purple Heart and Belgian Fourragère along the way. He is a platoon sergeant with Company D, 82d Reconnaissance Battalion, 2d Armored Division.

Thirty-five tons is plenty big for my tank. It can't get much heavier and go the 35 miles per hour I want it to go. Of course, when weight and speed are talked about, it's necessary to talk about how much armor we're going to use also.

Armor versus speed is no question at all in my book. There is more safety in speed than there is in armor. With

armor a foot thick, there is still a weapon that'll open it up like a tin can. And if there's such a weapon, an enemy will have it. However, I'm convinced that the tank I want can have adequate armor protection and speed, too. About three inches of armor is enough but it should be placed at vital spots clear around the circumference of the tank and not concentrated on its front and turret. During World War II, I had six tanks (M-4s) shot out from under me by bazookas, 88s and a Kraut high velocity 75mm gun. Only one hit was in the front of the tank; the rest were in the sides and rear and we weren't engaged in an advance to the rear, either.

M/Sgt. McAndrews

This 35-ton, 35-mile-per-hour tank should be able to perform with a 600 horsepower engine and cross drive transmission. It should be able to cruise 150 miles between refuelings.

I want any caliber gun from 76 to 90 but it has to have muzzle velocity around 4,400 feet per second. A 76 with that muzzle velocity would be far more effective than a 90 with 3,000-3,500. The projectile should be capable of penetrating 12 inches of armor or reinforced concrete at a range of 1,000 yards. The shell also should be designed to get penetration at the flattest possible angle of entry to reduce the probability of ricochets.

BOG, co-ax and AA guns are ok as they are on current model tanks except for modifications in fire control equipment.

The bow gun should be equipped with a sight and the gunner's telescope sight should be at least 15 power and should cover a wider field of vision.

The tank commander should have a co-ax mounted telescope sight so he can tell where the gun is laid.

Periscopes should be designed to cover a larger field of vision.

In addition to these factors, there are some miscellaneous items which my tank must have.

My tank will never have a rubber track on it; it'll be shod with steel which will provide sufficient traction on ice, frozen ground and in rough terrain.

The turret is going to be set well forward so the tank can be moved up to a corner and its gun fired down a cross street without exposing most of the hull.

Ammunition stowage space will be increased over that of present models and will be designed so that the loader can reach all of his ammo without having to call upon BOG for help.

And to keep the crew from being beaten black and blue in my new tank, sponge rubber padding will have to be installed more liberally than has been the case in the past.

With a tank like this, a crew could do some good. They've a fast, maneuverable hull which is pretty well protected to move a real killer of a gun to a point where it can get in some real hot licks.

That's what I want in a tank.

M/Sgt. James M. McAndrews

The writer of the following was inducted into the Army in May 1942. Following basic training at Fort Knox, Kentucky, he joined Company E, 66th Armored Regiment, 2d Armored Division. He landed with the 66th in North Africa, saw no fighting there, but saw plenty in Sicily, where, he says, "The tanks had a very successful operation." At Normandy he was with the 66th when it crossed Omaha Beach on D plus 3, and was with it on VE Day. As a matter of fact, he's still with it, although it is now the 66th Medium Tank Battalion, where he is assigned as Operations Sergeant. His wartime tour through North Africa, Sicily and Europe brought him credit for six campaigns in which he earned the Silver Star, Purple Heart and the French Croix de Guerre.

The medium tanks we're using now, the M-26 and M-4E8, were pretty good in their day but their day is much too long gone.

My first and biggest objection is to their high flat sides which I've discovered from experience furnish a lot of help to enemy gunners and bazooka men.

The armament of our old mediums is like the rest of these tanks; it no longer has what it takes for a big league shooting war.

The 76mm gun is too small and has insufficient velocity. The 90mm on the M-26 is a big improvement, but the smoke and fumes after a round is fired are so strong that crewmen often become sick.

The co-ax cal. .30 is ok for training, but inside a tank in action, it's unhandy to keep in operation. Ten to twenty minutes are required to change a burned-out barrel; longer than that if the barrel is hot and heavily coated with carbon. Too, I've heard a good many tankers cuss the necessity for careful headspace adjustment.

Going next for comment to the cal. .50 machine gun, my criticism is not for the gun; the .50 is a fine weapon which can turn out a heavy volume of hard hitting fire. It would be excellent if it were mounted where it could be used. During the time I was a tank commander, June 1944 to May 1945, I only used it once and that was in a stationary position during an air attack.

M/Sgt. Robison

A small but vitally important mechanical fault is common to both the M-26 and M-4. I've yet to see the man who can install a fan belt so it will stay put in either of these tanks. And a tank with an undependable cooling system is a dangerous vehicle.

All these factors, I *don't* want in a tank. The M-46 comes close to being what I *do* want, but even the M-46 has some bugs.

What I want in a tank is a low silhouette, even lower than the M-46, with sloping sides which will deflect antitank and bazooka fire.

This tank should weigh in at 40-50 tons with ground pressure not to exceed 9 to 1, and even less if possible.

It should have a gun of at least 90mm which can fire

at a minimum velocity of 4,000 feet per second. The ammo should be loaded with smokeless powder and the fighting compartment equipped with a fan which would exhaust the fumes after firing. The gunner's sight should be more powerful and have a wider range of vision than in those now standard.

The torsion bar suspension system of the M-46 is good; so is the torqmatic cross-drive transmission.

The power plant should not develop less than 800 horsepower.

The tank radio should be of longer range, more durable and less complex than those now in use.

With this tank, a crew could fight!

M/Sgt. Charles F. Robison

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The writer of the following shipped overseas to the Philippines in March 1941 with the 192d Tank Battalion. After the Japanese swarmed ashore at Lingayen Gulf, he took part in the defense of Luzon and Corregidor until 1942 when he was taken prisoner. He remained a prisoner in Japanese hands until early 1945. He is now section chief of the tank section in the Headquarters and Headquarters Company of Combat Command "A," 2d Armored Division.

I'd like to have a new tank.

Right now, I have a light tank section but have also worked about two and a half years with mediums. I'd like to see new ones in both classes so I'll have what I want whichever way the cat jumps on my next assignment.

The worst fault of the M-24s we're using now is that they are underpowered and undergunned. It's a waste of time trying to push that tank around with the engines it has, especially when you can't do any good with the gun it has when the tank gets to wherever its going.

The light tank should have a 76mm high velocity gun. Then it should have its two Cadillac engines replaced by a single engine which revs up about 550 horsepower. Twin engines are too much of a maintenance problem because of their complexity and the man-hours required to do the necessary work.

The secondary weapons on the M-24 are satisfactory as they are.

The criticism applied to the M-24 also can be directed at the mediums now in use; they're underpowered and undergunned.

Sfc. Lillard

These faults seem to have been corrected in the M-46, but I'd like to see a little more of them before deciding for certain.

It is a sure thing that the 90mm high velocity gun on the M-46 would fit nicely in the tank I want, and its engine seems to have ironed out a lot of the bugs which were in the old M-4 power plants.

The torsion bar suspension system on the new medium should be a big improvement over the old suspension system used.

All in all, I'd like mostly to have what I want in a new light tank.

It looks as if what I'd want in a medium is mostly available in the new '46.

SFC J. M. Lillard

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The writer of the following enlisted in the Army in February 1941 and was assigned to the 66th Armored Regiment, 2d Armored Division, not long thereafter. He remained with the 66th through the campaigns of North Africa, Sicily, Normandy, Northern France, Rhineland, Ardennes and Germany. He was awarded the Silver Star, Bronze Star, Purple Heart with Cluster, and Belgian Fourragère. In 1946 he was assigned to GHQ, Tokyo for a period of 38 months. He is now First Sergeant of Company B, 66th Medium Tank Battalion, 2d Armored Division.

Fire power and mobility. Both; that's what I want in a tank. It seems like asking for a lot, but I do not want to sacrifice even a little of one for the other. They must be given equal, maximum emphasis.

The tank is an offensive weapon which must be capable of carrying through on an entire operation. Therefore, I want a tank which can get under way in the offensive and then gather momentum. Too many times in past actions, an attack has gained ground on the initial thrust through the outer crust of the defense only to be slowed at the secondary defense. Then, the attack bogged down, units in the rear crowded forward and confusion was the result. Give us tanks with fire power and mobility and the attack won't bog down; it will gather momentum.

M/Sgt. Abrams

By "fire power" I don't mean a number of guns firing tons of ammo, but a minimum of guns that can do a number of jobs. But there must be one gun which can knock out the enemy's heaviest equipment. A gun having limitations simply limits the effectiveness of the entire tank. Therefore, I want a gun or guns that will destroy the enemy as soon as he's in range.

Fire power can be obtained only when muzzle velocity is high, the higher, the better. Diameter of the projectile is secondary. A small projectile of 57 to 76mm with over 4,000 feet per second velocity will be more effective in tanks using direct fire than a projectile of 90mm or more at half the velocity. In order to knock out the enemy, he has to be killed, and ricochets won't do the job. A small penetration will kill; a large dent will not. The larger the penetration, the better the results, but there must be penetration above all regardless of the size.

Mobility! I want a hull that will carry the gun to the enemy, that can move into their lines without having to wait for someone to clear the way. I want an engine with a rock-bottom minimum of delicate mechanism. The power plant has to be rugged to provide dependable mobil-

ity so that when contact is made with enemy armor which is stopped or turned, we can move in and destroy it.

The armor on the tank should be heavy enough to turn small-arms and small-bore antitank fire so that the vehicle won't be knocked out before it has a chance to get in close enough to neutralize the heavier stuff. The armor on the M-46s will do the job. But don't sacrifice mobility by adding armor. Do the opposite if necessary.

I want a tank that can MOVE!

M/Sgt. James C. Abrams

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The writer of the following has been in the Army since 1941. His World War II combat service was spent in the European Theater with the 45th Tank Battalion of the 13th Armored Division. Following VE Day he was shifted to Japan and the 34th Infantry Regiment of the 24th Division, where he was First Sergeant of a rifle company. He is now First Sergeant of Company C, 67th Medium Tank Battalion, 2d Armored Division.

What I want in a tank boils down to two major items —speed and armament.

By speed, I mean mobility and maneuverability at higher mile per hour ratings than can be obtained in tanks now standard.

To gain these characteristics, my tank should not weigh more than 45 tons including combat load. Its top speed must be 30 miles per hour forward and 10 miles per hour in reverse. The reverse speed is essential in order to get a tank out of a hot spot where it is unhealthy to move forward and impossible to turn around.

The maneuverability which my tank must have can come from two factors. First of these is an engine of around 700 horsepower designed for rugged operation and requiring minimum maintenance. Second is a cross drive transmission by means of which engine power can be most effectively utilized. With these characteristics, a tank could turn quickly without dangerous loss of speed.

Of course, this tank also squats close to the ground and has few flat surfaces which will help enemy gunners get one in where it hurts.

Having now a tank which is fast and maneuverable, I need armament which will make it worth moving. For the primary armament anything from a 76 to a 90mm will do as far as size of bore is concerned. But within this range of size, the gun has to launch a projectile with a muzzle velocity of at least 4,000 feet and if any more than that can be had, I'll buy it.

Further, the gun must be mounted in a turret which can spin like a top. I don't want to get caught looking to the right and have a round come in from the left when I'm standing in a turret which turns at a snail's pace. I sweat too much while it's coming around.

M/Sgt. Estep

One more modification for the tank gun is a three-round clip similar to the one used by 90mm antiaircraft guns. The clip is needed to speed up that all-important second round and to provide a third one for final destruction or insurance on the second one.

I have no arguments with secondary armament now in use except for the .50 AA gun. During World War II, I found that I could never lay my hands on that rascal when it was needed the worst. And it's a fine weapon against trucks, personnel and lightly armored vehicles. To make the gun more effective, we welded it on the turret ahead of and between the two hatches where it was available to both the loader and tank commander. It worked well.

So there's my tank; a tanker's dream.

M/Sgt. Delmer W. Estep

Wide World

Britain's New Centurion Tank

A column of new 50-ton Centurions roll out for testing. They are powered by a 635 horsepower adaptation of the Rolls Royce aircraft engine.

OUR ARMORED COMMANDERS

U. S. CONSTABULARY

Maj. Gen. I. D. White, Commanding the U. S. Constabulary, has served his entire career in the mobile branch. A pioneer in mechanization, he was aide to Gen. Lindsay, CG of the 7th Cavalry Brigade (Mech) in 1932. He later commanded a troop of the First Cavalry (Mech) at Knox, and was instructor in mechanized cavalry at West Point. In 1940 he became CO of the 2d Recon Battalion of the 2d Armored Division, and in mid-1942 he moved to command of the 67th Armored Regiment of that division, taking them to Africa for the D-Day landing. In early 1943 Gen. White assumed command of CCB of the 2d Armored moving to command of the division in Jan. '45.

THE ARMORED CENTER

Brig. Gen. Thomas L. Harrold, Commanding General of The Armored Center and The Armored School, has a full background in the mobile arm, and a wartime record with armor. He served in the 9th Armored Division as Executive Officer of CCB from mid-1942 to mid-1943. At that time he took over command of the 52d Armored Infantry Regiment, then the Reserve Command, and finally CCA of the 9th, which he took overseas. He led CCA through combat, and became CG of the 9th Armored Division in the spring of 1945. He commanded the Third Constabulary Brigade in 1946-47.

2d ARMORED DIVISION

Maj. Gen. A. C. Smith, Commanding General of the 2d Armored Division, has spent his career in the mobile end of the ground forces. In mid-1940 he joined the 13th Armored Regiment as Intelligence Officer, and shortly thereafter became Plans & Training Officer of the Armored Force Replacement Training Center. He next took the same post with the 4th Armored Division, moving then to the 37th Armored Regiment. In late 1942 he became Commanding General of CCA, 14th Armored Division, and in mid-1944 assumed command of the entire division and took it overseas, to lead it through combat and the early phases of occupation.

3d ARMORED DIVISION

Brig. Gen. Raymond E. S. Williamson, Commanding General of the 3d Armored Division, also has a career based in cavalry. In addition he has served various assignments in artillery, as instructor in our top service schools, and on the general staff. During World War II he was Assistant Division Commander of the 91st Infantry Division in the Italian Campaign. Since the war he has served a short tour at The Armored Center prior to his assignment to the 3d Armored.

13th ARMORED DIVISION

Brig. Gen. James T. Roberts, Commanding General of the 13th Armored Division, Res, commissioned in cavalry in 1925, was called to active duty in cavalry in 1940, and gravitated naturally to armor. In October of 1941 he was detailed GSC and assigned to the 5th Armored Division as Ass't G-4. In mid-1942 he was transferred to 9th Armored Division, where he served as AC of S G-4 and Commander of Division Trains. In his postwar reserve status, Gen. Roberts was instrumental in organizing the 19th Armored Division, redesignated as the 13th in 1947.

22d ARMORED DIVISION

Maj. Gen. Harry W. Johnson, Commanding General of the 22d Armored Division, Res, entered the cavalry service of the National Guard in Texas in 1920, following infantry service in the first war. Recalled to active service in 1940, he served with the 124th Cavalry as Executive Officer, the 112th as CO, then moved over as CG of the 56th Brigade and took the 2d Cavalry Division overseas as its Commanding General. Following short tours in Europe he moved to the Pacific to command the 93d Infantry Division.

49th ARMORED DIVISION

Maj. Gen. Albert S. Johnson, Commanding General, 49th Armored Division, NG, joined the Texas National Guard as a captain of cavalry following a World War I career in infantry. He served in cavalry until his induction into Federal Service in 1940. During World War II he served with the 6th Armored Division, II Armored Corps, XVIII Corps and China Theater.

50th ARMORED DIVISION

Maj. Gen. Donald W. McGowan, Commanding General of the 50th Armored Division, NG, has a background in National Guard service since the first war. He entered Federal Service as a colonel, commanding the 102d Cavalry, the Essex Troop, of the New Jersey Guard. He led his unit during the D-Day landings in Normandy in June 1944. In 1946 Gen. McGowan was assigned to organize and command CCB of the 50th Armored Division, NJNG.

KOREA: 1945 to 1950

by MAJOR WILLIAM E. POTTS

This article has been compiled from material prepared by the Historical and Troop Information Sections of the United States Army Forces in Korea.

AFTER the Cairo Conference in 1943 an official statement of Allied war aims was made. It was agreed that ". . . in due course Koreans shall become free and independent." The Korean people, having been completely dominated by the Japanese since 1910, received this news with great anticipation. However, their happiness was soon diminished for, after the termination of World War II, the 38th Parallel divided their country into what amounted to a Russian occupation zone on the North, and an American occupation zone on the South. Even though this division by the 38th Parallel was supposedly a temporary arrangement to expedite Japanese surrender, it has prevented the country from becoming united.

The role played by the United States Army subsequent to World War II, in furtherance of the Cairo Agreement and the United Nations policy of a free and independent Korea, should be briefly reviewed at this time to obtain a better understanding of the current conflict existing in the Korean Peninsula.

On the morning of September 8, 1945, the leading elements of the United States XXIV Corps under the command of Lt. Gen. John R. Hodge arrived at the harbor of Inchon, Korea. This Corps had departed from Okinawa where it had been engaged since the April invasion. As troops debarked and moved inland they were received with much enthusiasm by the liberated Korean people.

The following day General Hodge, having been designated to command all of the United States Army Forces in Korea, accompanied by Vice Admiral Thomas C. Kincaid, Commander of the United States Seventh Fleet, was escorted to Seoul, the capital city, to accept the formal surrender of Japanese troops south of the 38th Parallel. Representing the Japanese were Governor Abe; General Kazuki, commanding the 17th Area Army, and Vice Admiral Gisaburo Yamaguchi, commanding all Japanese Naval Forces in Korea. The surrender document was signed during a brief ceremony in the imperial throne room of the capitol building.

The American force was faced immediately with many problems. They included the disarmament of Japanese forces, the evacuation of all Japanese nationals to their homeland, and the arrest of war criminals. The Military Government had to assume operations without delay to insure that sufficient food was available for Korea's population; that democracy was introduced to the Korean educational system to replace the restricted system of the Japanese, and that an efficient public health program was created to check the many diseases of the Orient. In the meantime General Hodge was careful to see that the normal operations of government and maintenance of law and order were continued without undue interruption.

Allied war prisoners were quickly located and were on their way home by the 27th of September. In three prison camps in Korea, including the area north of the 38th Parallel, were 140 Americans, 71 Australians, 469 British, and 9 Russians.

When the XXIV Corps arrived at Inchon there were approximately 200,000 armed Japanese soldiers in South Korea. Disarmament proceeded without delay. By 1 December all of these troops in South Korea, except small liaison and labor details, were out of the country.

Major William E. Potts was an honor graduate of Oklahoma's Senior ROTC, in Cavalry, in 1941. He is a graduate of the Basic Course at The Cavalry School; the Advanced Course at The Armored School; and the Command & General Staff College at Fort Leavenworth. He has served with the 2d Cavalry Regt (Mech) and the 2d and 42d Cavalry Reconnaissance Squadrons, and during World War II participated in the Normandy, Northern France and Rhineland Campaigns. In 1946 he served in the G-3 Section of XXIV Corps and in 1947 he was assigned as Chief of a Special Staff Section with the Headquarters of United States Army Forces in Korea. He has recently been assigned to the Office of AC of S G-2, Department of the Army.

U. S. Army

Our Military Mission in Korea taught the M1 rifle, 1949.

Political Parties

Because of the Koreans' eagerness to express themselves politically, after almost forty years of subjection, more than seventy political parties had been formed prior to the American landing. Only a week after the landing an extreme Rightist movement came forth as a major party. Its membership included many successful businessmen and the more educated Koreans. This party, having formed an aggregation with many smaller groups, had selected as its leaders Syngman Rhee and Kim Koo. These two patriots were still absent from Korea, having carried the cause of Korean independence abroad during the siege of Japanese aggression. Large groups of Koreans welcomed them upon their return in October and November, and these men immediately began an active participation in the political life.

The Nationalist Party, becoming very active in mid-December, was anxious for unity, and endeavored to blend itself with the Rightist movement.

The "People's Party"

Another group was the Communist operated "People's Party," which attempted to conduct a self-constituted government, an outright violation of the American principle of representation, as it reflected the desires of only one small fraction of the Korean people. Its key members were Communists or extreme Leftists.

Soon after the arrival of the Americans, there emerged from its underground activities, the Korean Communist Party. It had a small but efficiently organized membership, which was active, both as a recognized party, and as a guiding factor in many pseudo-democratic groups.

The closer unity of the existing political factions became increasingly important to the American Command, as the lack of common understanding among the parties presented an arduous obstacle in American relations with them. Through the intercession of General Hodge in February, 1946, many differences among the numerous parties were reconciled. This resulted in the formation of an advisory group not including the Communists, who would not participate. This group was known as the Representative Democratic Council. Its purpose was to represent the political parties in South Korea during conferences with the US Command.

Joint Commission

On 27 December 1945 the Big Three foreign ministers, meeting at Moscow, issued a declaration, Section III of which dealt with Korea:

> "1. With a view to the reestablishment of Korea as an independent state . . . there shall be set up a Provisional Korean Democratic Government . . . 2. In order to assist the formation of a Provisional Korean Government . . . there shall be established a Joint Commission consisting of representatives of the United States Command in Southern Korea and the Soviet Command in Northern Korea. In preparing their proposals the Commission shall consult with Korean Democratic Parties and social organizations . . . 3. It shall be the task of the Joint Commission with the participation of the Provisional Democratic Government and of the Korean Democratic organizations to work out measures for helping and assisting the political, economic and social progress of the Korean people, the development of democratic self-government and the establishment of the national independence of Korea. The proposals of the Joint Commission shall be submitted following consultation with Provisional Korean Government for the consideration of the governments of the United States, Union of Soviet Socialist Republics, United Kingdom and China for the working out of an agreement concerning a four power trusteeship of Korea, period of up to five years."

The first meeting convened in March, 1946 in the Duk Soo Palace located in Seoul. However, a deadlock developed when the Soviet delegate proposed that all Korean political parties that had voiced any opposition to the Moscow Decision and trusteeship, be excluded from participation in the new Korean government. The American delegation could not agree to this adverse approach in the presentation of democracy to the Korean people, so the meeting was adjourned without arriving at any decision.

After an exchange of letters between Secretary of State Marshall and Foreign Minister Molotov, nearly a year later another meeting of the Joint American-Soviet Commission was arranged for May 21, 1947, which was as unsuccessful as the former one. The Soviet again refused to negotiate with those parties opposing trusteeship.

United Nations Commission

In order to prevent further loss of

valuable time, although contrary to the desires of the Soviet delegates, the United States in September, 1947 requested the United Nations to solve the problem of uniting Korea. In November 1947 the general assembly approved a UN Commission for Korea. On January 8, 1948 the delegation of eight UN representatives arrived in Seoul. These delegates were from Australia, Canada, China, El Salvador, France, India, Philippines, and Syria; only the Soviet Ukraine refused to accept its seat and boycotted the commission. The Korean people looked upon them as possible arbitrators who would bring about settlement between the American and the Soviet positions.

However, all the United Nations Commission's attempts to negotiate with North Korea were quelled at every turn. They were not permitted by the Soviet Union to travel north of the 38th Parallel. As it became evident that no cooperation would be received from the Communist-controlled North Korea, the United Nations decided to conduct an election in South Korea and the Office of Civil Information set up a program to educate the people in that area in the mechanics and purposes of democratic voting.

First Election

The ninth of May 1948 was first decided upon as the eventful day for the only democratic election in 4,000 years of Korean civilization. Later the date was changed to the tenth because of Korean superstition concerning a total eclipse of the sun on the ninth.

Even though there were threats from north of the 38th Parallel and despite the terrorism that was intimated, 92 per cent of the registered Korean voters cast their ballots on election day.

Radio Pyongyang, the Korean Communist station, quickly repeated its old propaganda cry that, "the United States was advancing into the Far East with the dollar in one hand and the atomic bomb in the other." Also, since the electrical power for the entire peninsula was generated in the Soviet zone, the North Koreans retaliated by stopping the supply of electrical current for the American Sector. Military Government immediately brought emergency power barges into South Korean ports to meet this emergency.

U. S. Army

Advisory Group personnel supervise Korean artillery firing, 1949.

New Government Created

The representatives chosen by the people made up the General Assembly which convened in Seoul on May 31. They prepared a constitution to suit the needs of their people, elected Dr. Syngman Rhee as Korea's first president and confirmed his appointment of Mr. Lee Bum Suk as the prime minister.

Though the North Koreans, consisting of only one-third of the total population, had not participated in the election and refused to accept the United Nations Commission or the future Korean Government, seats were left vacant in the General Assembly for their use at such time as they desired to unite with South Korea and cooperate for the common good of the whole country.

Inexperienced in governmental procedure though they were, the Koreans were preparing themselves to take the reins of their government in their own hands. On August 15, three years after the official surrender of the Japanese Empire, the Republic of Korea was inaugurated and a historic nation gained its rightful freedom.

"A New People"

As Dr. Rhee took his oath of office as the first president of the Republic of Korea he made the following plea to his countrymen:

> "To build up a new nation, a new constitution, a new government, is, of course, necessary, but what is far more needed is a new people. We cannot make a model state out of a corrupt people. With a rejuvenated national spirit blasting away all the old corrupt practices, we can possibly make up for the lost forty years, catching up with the times. My beloved thirty million brethren, let us all strive to be worthy members of the new rising nation whose foundation should be on the rock of ages, never to be washed away by the current of world events."

The process of turning the activities of the American Military Government over to the Koreans began at midnight on inauguration day and continued until Korean personnel filled every position in their government. Almost simultaneously came the announcement of the streamlining of American troop organizations in South Korea.

Even though the 12th largest nation of the world, based on population, was still divided by the 38th Parallel, South Korea had made great strides toward regaining a rightful position among the freedom-loving peoples of the universe.

Today the eyes of the world are again focused on this new government following the Communist attack of 25 June 1950.

ROLE OF THE TANK . . .

by B. H. LIDDELL HART

B. H. Liddell Hart is one of Great Britain's leading military analysts. During World War I he served with the British Army, retiring in 1927 to devote full time to his writing career. He has been Military Correspondent for several leading English newspapers, and Military Editor of the *Encyclopaedia Britannica*. He is the originator of many new ideas and methods which have been adopted in the British and other armies, and was a pioneer in mechanized warfare concepts. He is author of *The German Generals Talk* and *The Revolution in Warfare*, among other works. His latest book is *Defense of the West*.

TIME after time during the past thirty years the high priests of the military world have announced that the "tank is dead." Each time it has risen from the grave to which they had consigned it—and they have been caught napping.

Here are merely four examples of such death sentences, taken from my files. In 1928, when the first experimental armored force was disbanded by the British War Office after two years' trial, an official spokesman declared to the press that "tanks are no longer a menace." In 1934 the British Secretary of State for War predicted that in a few years' time "the most heavily armored tanks" would be as vulnerable to the new antitank weapons as "an old wooden caravan." A year later the Germans, disregarding his warning, formed their first three panzer divisions—and five years after that the defences of the West were overrun by the tank drive that Guderian led. Yet in February, 1944, Mr. Churchill was declaring that "tanks are finished"—six months prior to Patton's drive from Normandy to Germany. This summer the U. S. Secretary of the Army said: "It may well be that tank warfare as we have known it will soon be obsolete." That was only a few weeks before the defence of South Korea crumpled under the impact of a small number of obsolescent tanks. It may be presumed that this verdict, like the others, was inspired by high professional advice.

Far from being "dead," real armored forces have not yet been born.

Nearly thirty years ago I wrote a treatise on future mechanised 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 consist of a spearhead of fast tanks supported by motorised 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-armored, with the artillery on self-propelled armored mountings and a smaller number of more skilled infantry carried as "tank-marines" in armored vehicles.

When some ten years later the German army had the chance to rearm, it started to create panzer divisions corresponding to the first-phase design. Guderian wanted to go further—but was restrained by conservative superiors who were more intent to build up a vast number of infantry divisions, and so devoted much of Germany's limited resources to that old-style purpose.

Nevertheless, a handful of the "evolutionary" pattern divisions produced a revolution in warfare. It caused the defeat of Poland, Western Europe, and the Balkans in rapid succession.

But the armor in such divisions was only a small pebble in a large sling. Moreover, the pebble was then reduced in size, instead of being increased. That was due to Hitler's shortage of tanks, and his desire to create a large number of "armored divisions" to impress the Russians. He believed that these skeletons would be sufficient to defeat the Russians. It proved a fatal delusion—all the more fatal because his armored spearheads were often held up simply because their wheel-borne tails became stuck in the Russian mud. Yet ironically, the Allies copied his mistake in forming their new armored divisions, instead of developing them on newer and better lines.

The postwar armies merely carry on the old pattern. The "revolutionary" pattern suggested thirty years ago has not even yet been tried.

The "armored division" today is too much like an inverted turtle—with a small armor-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 immobilised vulnerability.

The armored force of the future must have the all-over ability of a snake, without having its tail tied to the road. We should also reduce the tail and increase the striking head.

Given such fully mobile forces the Western powers should be able to make rings round the Red army as at present organised. But if the Russians were to develop such forces and we had not done so, a disaster worse than 1940 would befall us.

There are also undeveloped potentialities in tank design. The constant efforts to mount a bigger gun and thicker armor have trebled the weight of tanks during the last decade. We have reached the limit of what is practicable without sacrificing mobility. Design must be simplified—towards producing a mechanical David instead of a Goliath. One possible way is by external mounting of the main weapon—which should be sighted, fired and fed with ammunition mechanically. The armored body could then be quite small. Much might be gained by the development of a new and lighter form of hard-hitting weapon, of rocket-launcher or recoilless gun type. Much weight, too, might be saved by the development of a new form of motive-power—such as the application of hydrogen-peroxide propulsion.

Another possibility is the development of remote-control tanks for the speartip. With such unmanned tanks there would be no deterrent moral effect from heavy losses in applying the tactical method of "saturation"—swamping the opponent by confronting him with more separate assailants than he can cope with. Much advantage might also be gained from the development of a nonspecialised amphibious tank, capable of swimming rivers, or swimming ashore, without sacrifice of its general tactical value.

. . . IN GROUND WARFARE

by HEINZ GUDERIAN

AGAINST the background of the Korean war, the question of the role of the tank in ground warfare today is a real one. Some historical reminiscences may help in pointing up the question.

In 1937, when the first German Panzer Divisions were in existence only two years, notable German staff officers declared that (a) there was *no longer any chance for tanks to surprise,* (b) *antitank weapons had become much more efficient,* and (c) *tanks would be unable to take fortresses* or fortified positions like the Maginot Line.

Under these conditions, they argued, it would be much better to by-pass the period of tank development and concentrate on the next means of fighting, even though it was not yet invented.

In January, 1942, Hitler declared that the importance of the tank—to which he owed his *blitz* victories of 1939-41—would be retarded, if not annulled, by the shaped charge. He repeated this thought in February 1943 when I became Generalinspekteur of the Armored Forces.

Well . . . *errare humanum est.*

In 1943 to 1945 the tanks were our best weapon of defense, and enemy tanks our most disagreeable adversary in ground warfare, despite the shaped charge, the bazooka and the panzerfaust, whose efficiency proved rather limited.

In June 1950 we read in the papers that the invention of the shaped charge will lessen any substantial danger from tanks. The defense against tanks was said to be strengthened by a new type of bazooka, so that there should be little fear of tanks in the future.

A few days after this quieting pill had been administered, North Korean troops crossed the 38th Parallel and, within 48 hours, reached the capital city of Seoul. Their tanks continued to roll in spite of efforts of the U.N. air force.

Let's look for the reasons back of this success.

These are *surprise;* the insufficient *armament* and *training* of the South Korean forces; the arbitrarily drawn frontier line along the 38th Parallel which rendered defense most difficult; bad weather which hindered the activity of the air force; the rapidity of the North Korean advance; and, finally, difficulties of supply for the U.N. forces; all of these combined caused the misfortune.

One is obliged to improvise. At first there were no land and air teams trained and accustomed to the cooperation necessary in the highly developed technique of today. Official communiqués reported "the situation is very liquid."

That is the effect of tanks today.

No doubt antitank weapons have grown better in recent years. The bazooka, the panzerfaust, antitank guns, antitank ditches and devices, and bombers, all are dangerous foes. But to date there is no universal remedy against the most frightful weapon in ground warfare.

If antitank weapons undergo constant development and increased effectiveness, the same may be said for the tank. For this weapon, too, inventive faculty knows no limits. Now as before, surprise is possible (see Korea!). Spaced armor will protect against the hollow charge. The bazooka and panzerfaust are employable at short ranges only, thus serving more the purpose of calming the nerves of the infantryman than for effective defense. Antitank guns, once spotted by enemy tanks, are exposed to rapid annihilation if they are not armored. Thus, armor should be combated by armor, by mobile and armored antitank guns; whether this should be done by tanks with or without turrets for their guns seems to be merely a question of costs.

Improvement of tanks is possible in many directions; in engines and tracks, in armor and guns, in optics and radio communications. Driving and shooting at night are possible, for the surprise of inattentive defenders. Infantry and artillery to cooperate with tanks should be transported by armored vehicles to enable them to lend quick support to the tanks. Antiaircraft tanks should be built to hold enemy fighters at greater height and to diminish the accuracy of bombing and shooting.

Apart from these technical developments, progress is possible with regard to supply, tactics and strategy.

Wholly motorized armies will be superior to horse drawn, although the sort of motorization should be adapted to the theater of war. For roadless countries, trucks with tracks will be necessary and preferable to wheeled vehicles.

From the tactical point of view, close cooperation between the different arms—motorized infantry, artillery, engineers—will be essential. Tactical air and antiaircraft should be accustomed to work with tanks and speak the same language, even by radio.

Strategically, the concentration of shock power—the tanks—on the target, now as before, is the decisive thing. There should be no splitting up of tanks on secondary fronts or on unfavorable terrain for merely defensive missions.

So long as the inventive faculty of the technicians does not produce a better weapon, tanks will remain the most effective weapon of ground warfare.

Heinz Guderian began his long attachment to armor and mobile warfare with his assignment in 1931 for a four-year period as Chief of Staff of the Inspection Section of Motorized units. He commanded the Black Drivers unit, Germany's first regular tank corps, and carried forward much early experimentation with the employment of fast armored vehicles. He commanded Germany's 2d Armored Division in the mid-thirties, and was later Inspector General of all German armored units. In 1939 he commanded the 19th Armored Corps in the Polish blitz and in 1940 the armored forces under von Kleist in the West. He was later Chief of the Army General Staff.

armor, Armor and ARMOR

When we speak of *armor* we mean the *equipment.*
When we speak of *Armor* we mean the *branch.*
When we speak of *ARMOR* we mean the *magazine.*

The Editor

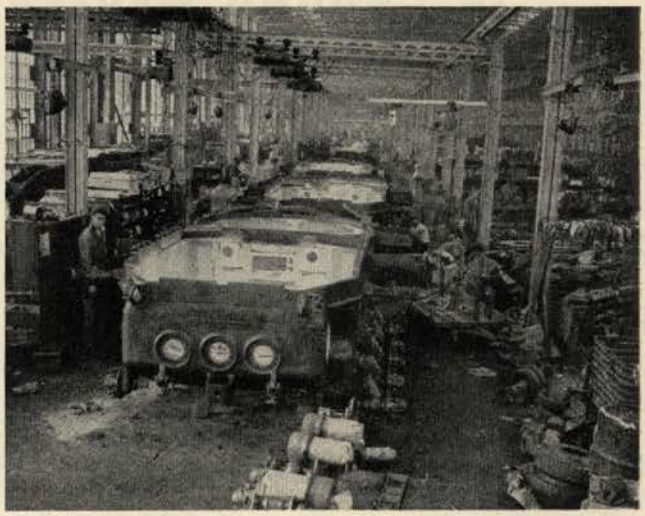
Tank Production

FROM THE MAKER TO THE USER

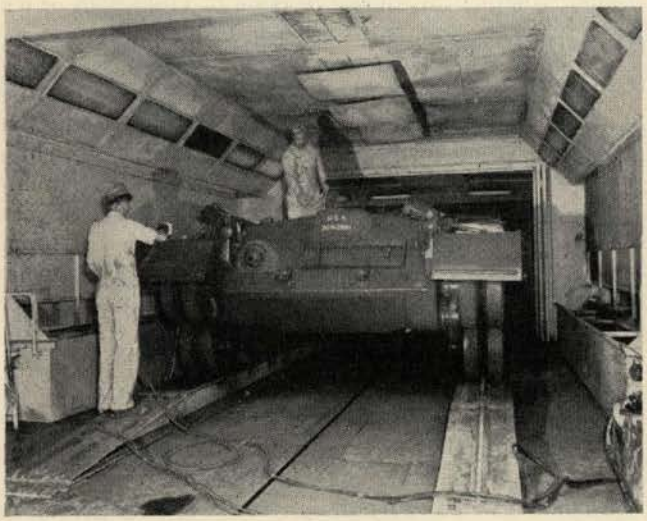
Tank production, a key part of our tank program, has been carried forward on a very limited postwar scale by our tank arsenal at Detroit. Although the current situation has brought industry back into the picture on the longer range basis, Detroit Arsenal is more concerned with current production for momentary needs.

On these pages is a picture story of the moment—a story on the top-flight M46 Patton Tank from the production line to the battle line. All together it is a story of results—and it is results that count.

Photos by Dept. of Defense, *Detroit Free Press* and Acme

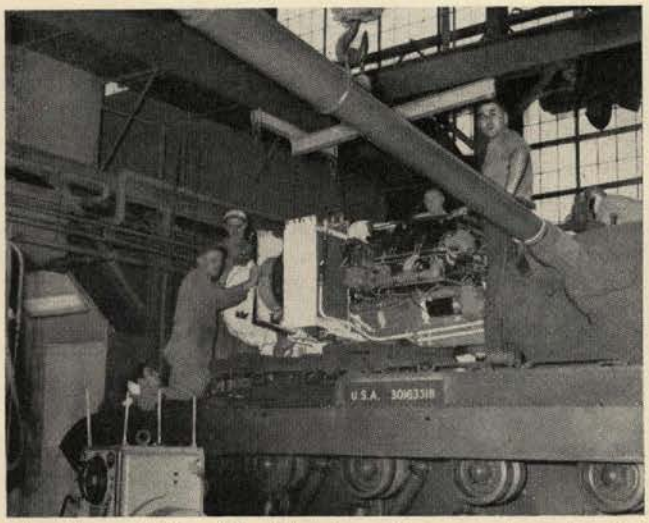


Working on the hull of the Patton tank.

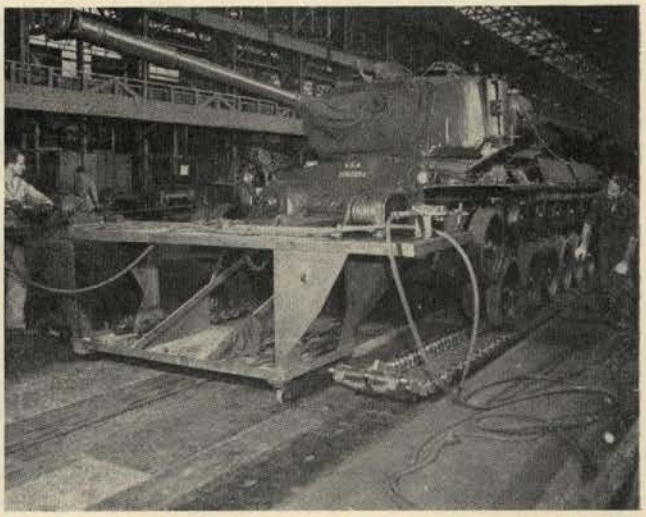


A Patton in the paint booth getting a coat of OD.

Installing the turret on the M46 assembly line.



Guts for mobility. The Continental power plant, the 810 horsepower air cooled motor, goes in.



Footwear for the rough terrain. Track installation on the end of the assembly line.

Through the paces. Testing on the test track.

On the way. Loaded on a flatcar for shipment.

The reason behind it all. The M46 Patton tank gives backbone to U.N. action in Korea.

Results. A Russian-made T-34 of the North Korean forces burns after being knocked out by a Patton.

THE TANK as a FIGHTING VEHICLE

by LIEUTENANT COLONEL STUART G. FRIES

THE tank can properly be considered as one of the principal modern weapons of war. Its first model appeared in the latter years of World War I not long after the airplane appeared in a combat role. Essentially it is an armored, track laying vehicle, armed with machine guns and larger caliber cannon. It is characterized by its ability to bring a large volume of fire close to the enemy. It has the capability of great disruptive effect against enemy forces, and has proved its value in this regard quite dramatically in many engagements during World War II.

The very success of the tank in military operations has been responsible for the development of many weapons specifically designed to destroy it. Thus, the tank has been changed through the years by giving it more powerful weapons, a more powerful engine, and heavier armor in an effort to preserve its capabilities of shock action, mobility, and firepower. Such developments have made the present tank a quite expensive and complex vehicle. The problems of gunnery, engine and track design, and armor for the hull and turret, are formidable. In this article I should like to deal with them in some detail, from the user's point of view.

The ultimate measure of a tank as an effective weapon in war is its ability to bring lethal and destructive fire against enemy personnel, matériel, and installations. The means for accomplishing this are by fire from the tank cannon and machine guns.

The tank cannon, or primary armament, is conventionally a high velocity gun, with the capability of firing both armor defeating, high explosive, and smoke projectiles. It is serviced by a gunner and a loader, and control of fire may be accomplished by either the gunner or the tank commander. The turret must contain, in addition to the tank cannon and the men, all the fire control equipment and instruments, and a large proportion of the communications equipment, vision devices, and ammunition for both the cannon and machine guns. This creates a problem almost equally as vexing as that of the weight of the vehicle.

Let us first consider the gunner, the man directly responsible for the actual firing of the cannon and the machine guns. His cannon is the means of dealing the greatest lethal punch to the enemy, and thereby becomes one of the tank's best defenses.

Probably the primary gauge of the effectiveness of his cannon is its ability to defeat armor. The simplest problem in the armor defeating role is that of firing from a fixed platform —stationary fire. This may be further broken down into several phases. These are determination of range, choice of the appropriate type of ammunition, laying of the piece accurately on the target, and finally firing the weapon.

Proper range determination is essential if effective fire is to be brought on the target. The accuracy required varies directly with the range, and inversely with the projectile velocity.

A great deal of emphasis has been placed in the past on the training of soldiers to estimate range. Some surprising results have been obtained from a statistical investigation of this method of range determination. By normal training, a soldier can learn to determine ranges up to 2,000 yards with an error of 20%. By the most exhaustive training, his ability to determine ranges can reduce this error to from 15 to 17%.

Now a change in range of 75 yards at 500 yards, a 15% error, would move the strike of a 90-mm projectile with a muzzle velocity of 3,000 feet per second .37 mils, or about 7", and would still give a hit on a 7½' by 7½' target, which is considered the frontal aspect of a tank. But 15% of 2,000 yards, or 300 yards, would move the strike 2.1 mils or 12.6 feet, which would miss any portion of the target by a wide margin. When it is considered that a tank needs to take under direct fire enemy targets at the longest range possible which is usually between 800 and 2,500 yards, then other methods of range determination are necessary to secure a first-round hit. In this connection, the desirability of securing a first hit cannot be overemphasized when tanks are firing on enemy tanks. This would prevent possible destruction by enemy tank fire of the tank before it could re-

Backbone of Armor and primary instrument of mobile warfare is the tank. It is a highly complex vehicle in which the three main characteristics—fire power, armor protection and mobility—are at once interdependent and opposed. Here is an intimate look at the complexities of this weapon of shock and decision.

lay and fire the next round.

Obviously, mechanical means for range determination must be resorted to if first round hits on point targets are to be obtained at median ranges. We can use optical or electronic range finders which are now in various stages of development, and have varying limits of accuracy.

Of the optical range finders, the coincidence type, with a fixed base of 1 to 2 meters, has been developed and used for a number of years. Under conditions of clear visibility and when used on sharply defined objects, it is quite satisfactory for ranging up to 5,000 yards with accuracy limits of 1 to 2%. It is relatively simple to obtain competent range finder operators for this instrument after about 2 hours training. It has the disadvantage of being rather bulky, and extending beyond the normal configuration of the turret, thereby making the objective windows extremely vulnerable, and usually reducing the ballistic protection of the turret armor by creating a bulge. Furthermore, it is ineffective when ranging on targets not having a sharp outline, and it is a very sensitive instrument.

The second type optical range finder, stereoscopic, has the marked advantage of being equally effective against sharply defined or rather indistinct targets, and has an insensitive design quite unaffected by sudden jars, which conditions can be expected to be the rule on the battlefield. It has the same degree of accuracy as the coincidence range finder, but also has the same disadvantages of a similar bulk and configuration. The real disadvantage of this type is the problem of selection and training of operators. Estimates based on incomplete data indicate that only 70% of the crewmen have acute enough stereoscopic vision ever to use this type of range finder, and that it will take about ten hours of intensive training for those who have the required stereo vision to acquire the necessary proficiency.

A stadiameter is being presently considered as a third type of optical range finder. This is an adaptation of the range finder used in aircraft during World War II, and will probably receive tests for suitability this summer.

Tests at present are being conducted by the Army Field Forces to make a final determination of whether to use the stereoscopic or coincidence type range finder pending availability of a more suitable instrument.

Dept. of Defense

The ammunition available for the tank cannon can be divided into two general types: (1) the high explosive and smoke projectiles, and (2) the armor defeating rounds. The high explosive ammunition is most effective with a relatively low velocity for the attainment of plunging fire best used against personnal and gun emplacements on reverse slopes. The smoke shell, either white phosphorus or other smoke-producing agent, is most effective when fired with a relatively low muzzle velocity. The armor defeating rounds present a more difficult problem. These projectiles must defeat enemy armored vehicles, and this is generally accomplished by a penetration of the enemy armor.

To penetrate the armor of existing armored vehicles with 4 to 5 inches of armor plate at angles of 50° to 60° from the vertical requires either a very high velocity projectile or one of great weight, to attain the terminal energy necessary for penetration. Since this energy varies as the square of the velocity and only with the weight, more profitable development for tank guns has thus far been derived from increased muzzle velocities.

By use of HVAP and "sabot" rounds, very high muzzle velocities have been attained. The high velocity gun necessary for this ammunition is heavy and has a short effective life, due to excessive wear of the lands. The ammunition needs extra propellant for the high velocities, increasing loading problems, reducing the number of rounds that may be carried, and reducing the life of the gun. Increases in muzzle velocities of tank ammunition are apparently fast approaching a point of diminishing returns.

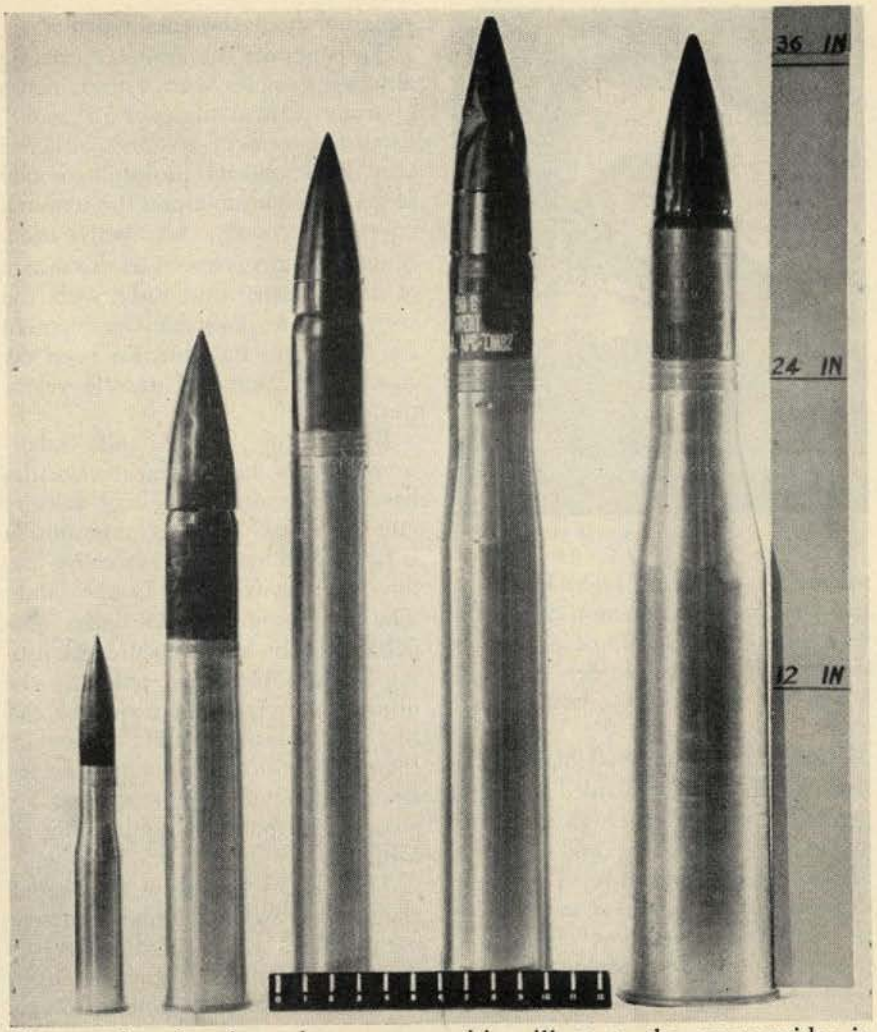
The HEAT round, or the shaped charge, has excellent armor penetrating qualities when fired under optimum conditions. Its greatest effect, however, is derived from relatively low velocities and is nearly twice as effective when the shell is not rotated, or when the effect of the projectile rotation has been counteracted.

The "squash-head" shell is most effective at low velocities, and defeats armor by spalling the rear of the plate rather than by a penetration. One of the greatest drawbacks of the HEAT and "squash-head" rounds is the requirement for very much more accurate range determination to effect a hit, than with higher velocity projectiles. Their effectiveness is therefore directly tied in with an accurate range finder.

In laying the gun the gunner must determine the range to the target, choose the type of ammunition to be used, set the corrected range to conform to the type of ammunition selected, then elevate the gun, and traverse it into position with the sight accurately alined on the target before he can fire the piece. His success is measured by the speed and accuracy with which he can perform these operations, to enable him to bring effective fire on an identified

Lt. Col. Stuart G. Fries is a graduate of West Point, Class of 1935. Assigned to infantry, he served several tours with units and attended The Infantry School in 1940. Upon graduation he was assigned to the 68th Infantry (Light Tanks), beginning a career in Armor.

In World War II, Colonel Fries commanded the 747th Tank Battalion, which landed in Normandy on 7 June 1944 and fought through to the Elbe River with First and Ninth Armies, most of that time attached to the 29th Infantry Division. Following the war, Colonel Fries attended the Command & General Staff College, served a short tour at USFET Headquarters, and a two-year tour at the University of Southern California studying jet propulsion and guided missiles, and acquiring a Master of Science Degree. Since mid-1949 he has been a member of the Weapons & Ammunition Section of Army Field Forces Board No. 2.



Comparative sizes in tank gun ammunition illustrate the great strides in development over the past decade.

target in the shortest possible time.

Remember always, that when firing direct fire against another tank or antitank gun, the gunner's tank is usually presenting a target to the enemy during the whole time of ranging and laying the piece. Every second that the gunner can save in performing these operations gives him a much better chance of getting a hit first. Any time reduction here may be the determining factor in the success of the tank.

The tank commander carries the full responsibility for fighting the vehicle. On him rests the decision as to where the tank will go, and what targets it shall engage. It must be assumed that he is familiar with the problems of his crew members, allowing him to so place and move the tank to best exploit its offensive characteristics, while minimizing its chances of destruction. He must have a good view of the terrain around him, and be ever alert to meet the unexpected.

Clear and unobstructed vision in all directions is important to him. So much so, that during World War II, where his vision devices consisted of only a small periscope, tank commanders habitually fought their tanks with the hatches open and their head and shoulders exposed. Thus, the best trained man in the tank had no protection against even small arms fire. The resulting casualty rate among tank commanders was inordinately high.

The tank should certainly be designed to give the commander the maximum unobstructed vision simultaneously in all directions, while at the same time giving him at least the protection afforded to the other members of the crew. This may be viewed from a purely functional standpoint, because a tank is a very poor fighting vehicle indeed when its commander becomes a casualty. A system of periscopes around the tank commander's cupola has been placed in British tanks. They do, however, take up critical space, and present partial obstruction to wide vision.

The tank commander usually sees targets before other members of the crew. He must then designate that target to the gunner. He may use his radio interphone and describe it to the gunner verbally, while using his override control to turn the turret and point the gun in the general direction of the target. This procedure is time consuming and subject to misunderstandings between gunner and tank commander. He could perform his job more effectively if he were provided with a target designating device, enabling him to set the range into the sight and lay the gun for elevation and azimuth by remote control from his crew position. Thereafter, either he or the gunner could fire the piece. He could then return control to the gunner until such time as another target of opportunity presented itself.

The loader's role in a tank crew can probably most accurately be described as backbreaking and frustrating. In loading, he works in a very restricted space, and cannot normally see the target being fired on. With the finest sighting equipment in the world, and a fully automatic target designating device, no gun can be fired any faster than the loader can select a round and shove it into the breech of the gun.

In a medium tank, firing a 90-mm gun, the complete AP round weighs 45 pounds and is slightly over 38 inches long. The loader must remove this round from the rack in which it is secured, pick it up, carefully guide the nose of the projectile into the breech, and shove it forward with sufficient force to trip the breech block, seating the round in the chamber. A round much larger than the one described becomes almost impossible for a single loader to manhandle. Power assisted loading, or fully automatic loading and ramming becomes, therefore, nearly essential if these or larger guns are to be loaded in a desirably short length of time. The power loading and ramming devices are necessarily large and will further restrict the space in the already crowded turret.

The foregoing discussion indicated briefly most of the major problems involved in tank gunnery—stationary

fire, except for machine-gun fire. It can be stated here that nearly all the laying and sighting problems heretofore discussed apply equally to the coaxial machine gun. This gun may be fired either simultaneously with, or independently of, the tank gun.

In firing at ranges under 1,000 yards, the trajectory of a .50 caliber machine gun is quite close to that of the armor-piercing round. Thus, for a tank armed with a coaxial .50 caliber gun, a rough range determination can be made by rolling the fire of the machine gun into the target, and then firing the main armament. For a .30 caliber machine gun, the trajectory approximates that of the main armament for about 500 yards.

The tank carries a relatively large amount of machine-gun ammunition. This is the weapon most effective against personnel, light installations and unarmored vehicles at ranges up to 1,000 yards. It is preferable to high explosive where it can be effectively employed, since there is quite a large amount of ammunition available, against the rounds of high explosive shell carried in the tank.

For close in and defense against low-flying aircraft, the tank is normally armed with a second machine gun. This gun must be at least .50 caliber, as a smaller gun is practically useless against all aircraft. It can be best controlled by the tank commander. It should be capable of being fired manually from outside the turret, or from inside the tank. To adequately fulfill the dual-purpose requirement of ground and antiaircraft fire, this gun should have 360° traverse, be capable of being elevated from −20° to +90°, and fired by remote controls when the tank commander is completely "buttoned up" in his cupola.

The problem of tank gunnery would be pretty thoroughly summarized now, if we had to consider stationary fire only—but in an attack we must move forward, and also deliver fire as the tanks are approaching the enemy positions.

A tank moving cross country is subjected to violent pitching, yawing, and to a lesser degree, rolling. Firing a gun and hitting a target when the gun is subject to these random motions is less probable than hitting the daily double at Havre de Grace. To stop a tank to fire at a target is far from a desirable solution. Since a moving target is much more difficult to hit than a stationary one, the tank that stops to fire is more easily destroyed. In the latter stages of World War II, tanks were equipped with gyrostabilizers in elevation only. This stabilization somewhat increased the hitting probability of a moving tank gun, but these were not rugged enough and did not counteract the yaw of the tank.

Tanks equipped with a gun stabilized in elevation and deflection would increase the number of hits that could be made from a moving tank. If, however, the gunner himself is not stabilized he will have difficulty maintaining his eye on the sight picture. An articulated sight eyepiece that would keep the eyepiece fixed with respect to the gunner while the sight was stabilized with the gun would probably solve this problem. The manual loading of the gun is also more difficult and somewhat hazardous with a moving tank. An effective and rugged stabilization system for the gun in at least elevation and deflection must be incorporated in the tank if it is ever to deliver effective aimed fire against point targets while moving.

Consider now the propulsion of this fighting vehicle. Nearly as important as the fire power of the tank is its mobility. It must be capable of moving cross country, as well as along all types and conditions of roads at the maximum attainable speeds. Present military requirements demand that it be capable of negotiating a 60 per cent slope. Extensive tests indicate that the power necessary for this mobility is 20 horsepower per ton. Thus a tank weighing 40 tons will require an 800-horsepower engine.

Assume a tank weighing approximately 40 tons with an internal combustion gasoline engine has a rate of fuel consumption of approximately one-half mile to the gallon. Thus with a cruising range of 100 miles

Testing on the proving ground. The Patton on a 40% grade outclimbs the Sherman on a 30% grade.

it will be required to carry 200 gallons of fuel in the tank, occupying 26.8 cubic feet of space. The low mileage obtained is one of the serious problems. Any engine giving a better horsepower per-pound per-hour ratio would improve this already critical fuel consumption problem and is certainly worthy of serious consideration and development. Two approaches that may contribute are development of a gas turbine to replace the internal combustion engine, and a concerted effort to reduce the large power loss between the engine and the tracks.

Track design itself is an important consideration in the tank. When the unit ground pressure gets above 10 pounds per square inch, many areas across which foot troops may move are inaccessible to the tank. To get traction in soft ground the tracks must have grouser action. If these grousers are steel they will very soon ruin many types of roads when the tanks move along them. Several types of rubber, steel, and steel track with rubber road pads have been designed, in an effort to meet these conflicting requirements. The width of the entire tank may not exceed 124" if it is to be transported on a standard European flatcar, and this is a major factor limiting the width of the track.

Too many hours of maintenance are required for an hour's operation. With the present necessity for more mechanical and electrical devices in the turret components and in the power train this ratio can become even more unsatisfactory. Therefore, it is essential that the various components of the tank be rugged and reliable. All sensitive devices must be cushioned against shocks to which they are subjected in cross-country driving. Electric cables must be protected against dampness and various fungi. All sensitive parts must be carefully protected against wide variations in climatic conditions.

To reduce the time required, ease of maintenance should be always considered in tank construction. Fuel lines, hydraulic lines, mechanical linkages and power cables should be easily accessible. A system of warning lights, gauges, and meters to indicate malfunctions of component parts can greatly reduce the time required to discover the source of failures. Finally, the design should allow for unit replacement of component parts by the crew or field maintenance personnel.

Proper armor must be an integral part of the tank. The most significant feature and most serious limitation of armor from the design point of view is its great weight. An increase in armor on a tank also requires higher powered engines and longer or wider tracks to maintain the same minimum mobility. Thus the amount of weight for armor has certain limits beyond which other dependent factors make it unprofitable to go. The problem becomes, then, one of distribution of a certain weight of armor whereby it can give the greatest protection.

What are the means whereby a tank can be destroyed and its crew killed or wounded? Destruction by gunfire from enemy ground forces is certainly a principal means. The front, either side, and the rear of the tank may be hit. Then all must be considered for protection.

Certain it is that a larger gun firing larger projectiles will defeat thicker armor plate. With definite weight limits to the tank, we must therefore design for protection against certain types of weapons. Let us consider that the most probable antitank gun to be encountered will be about 100mm capable of penetrating 4½" of homogeneous armor plate sloped at 55° at 1,000 yards. Then of course, any less armor on the tank than 4½" at 55° gives no protection against the most probable antitank weapon. If we were to put 4.7 inches of armor plate on the tank it could withstand this gunfire so long as it remained 1,000 yards from enemy guns. This amount of armor on the sides, front and rear would make the entire tank 4 tons heavier than permissible weight limits, but by reducing it to 3 inches it would come within weight limitations. However, since this armor could be penetrated at 3,000 yards by the antitank gun in question it is valueless. A half-inch of armor could not give much less protection from this enemy gun. We, therefore, should

Ease of maintenance is a prime consideration in the tank development program, cutting down the deadline period.

give some parts of the tank full protection, and for the present not consider the rest.

If a study of probability of hits shows the tank receives most hits on the front of its hull and turret from frontal fire then this portion of the tank should receive adequate armor protection from the antitank gun. Carrying this further, the next most vulnerable portions of the tank should receive adequate protection so long as the tank weight remains within prescribed limits.

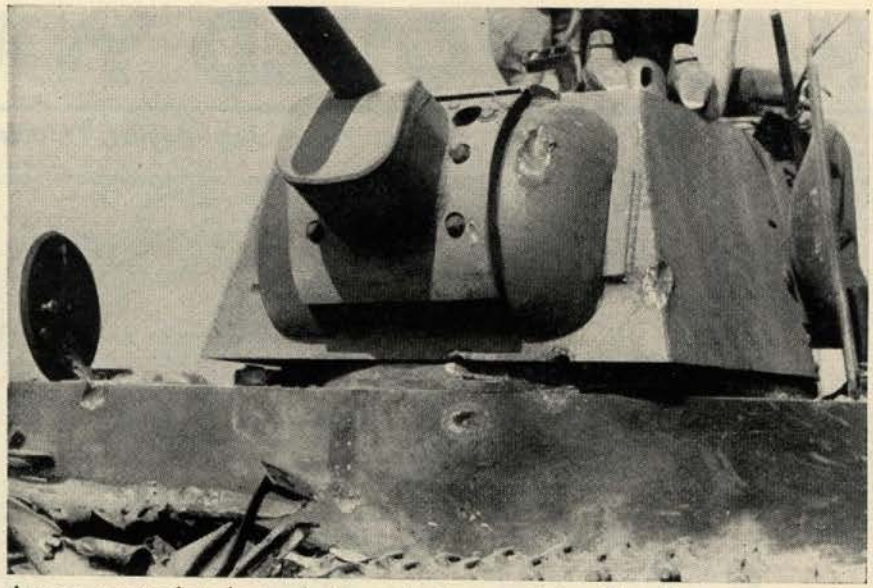
The unfortunate part of the armor plan for our tank is that we have not taken into account armor defeating rounds that do not penetrate, the shaped charge and the "squash-head," both of which can, and presumably will, be fired at us from the same or similar guns.

The shaped charge or "squash-head" will probably defeat this armor plate where the armor piercing round cannot penetrate. The spacing of armor can, however, reduce this effect. Therefore, by determining proper spacing another plate of much less thickness installed in front of the principal armor, may give adequate protection against these two types of projectiles. It would however, increase the over-all exterior dimension of the tank while adding more weight.

Land mines are effective tank weapons. Moreover, they will usually stop a tank by blowing off a track. This then will effectively immobilize a tank until it can be dragged away and the track replaced, if it is not sooner destroyed by other means. More serious, it will usually blow a hole through the bottom and kill or wound the driver or other crew members. Thus armor protection should certainly be added to the floor of the tank, at least those areas under the driver and other crew members.

While it is not possible to armor all parts of the tank against antitank fire, the less vulnerable parts should get minimum protection against air burst artillery and small-arms fire.

One great nemesis to German tanks in the last war was the airplane. Low level bombing and rocket firing fighters destroyed a large number of German tanks. Armor against such an attack would be desirable, but an effective amount appears prohibitive. The reliance for protection against air attack must then be placed on mobility, antiaircraft defenses, camouflage, night moves, and our own air forces.



Armor protection is an important characteristic. The German gun that fired on this Russian tank bounced off its armor plate.

Crew comfort is an important consideration in the design of a tank. Little mention has been made of the driver thus far, but he must be given consideration in connection with crew comfort. This member, above all, has the most continuous job. During night marches, moves to contact, pursuit, and in all phases of combat he is constantly operating the vehicle, a good portion of which time the remaining members of the crew are relatively inactive. A physically fatigued or uncomfortable man cannot properly drive a tank.

Every device that contributes toward reducing the physical strain of steering and braking the tank, permits the driver to more skilfully maneuver the tank over the best and most protected routes.

Tanks have been notoriously cold in winter, and hot in summer, and proper heaters and coolers are necessary to correct this problem. Unless proper bore evacuators eliminate flash-back and noxious powder gases, serious casualties to the crew may result. Lastly, in designing a tank, there must always be room enough remaining in the turret and driver's compartment for the crew to ride and perform essential duties without being forced into cramped and unnatural positions.

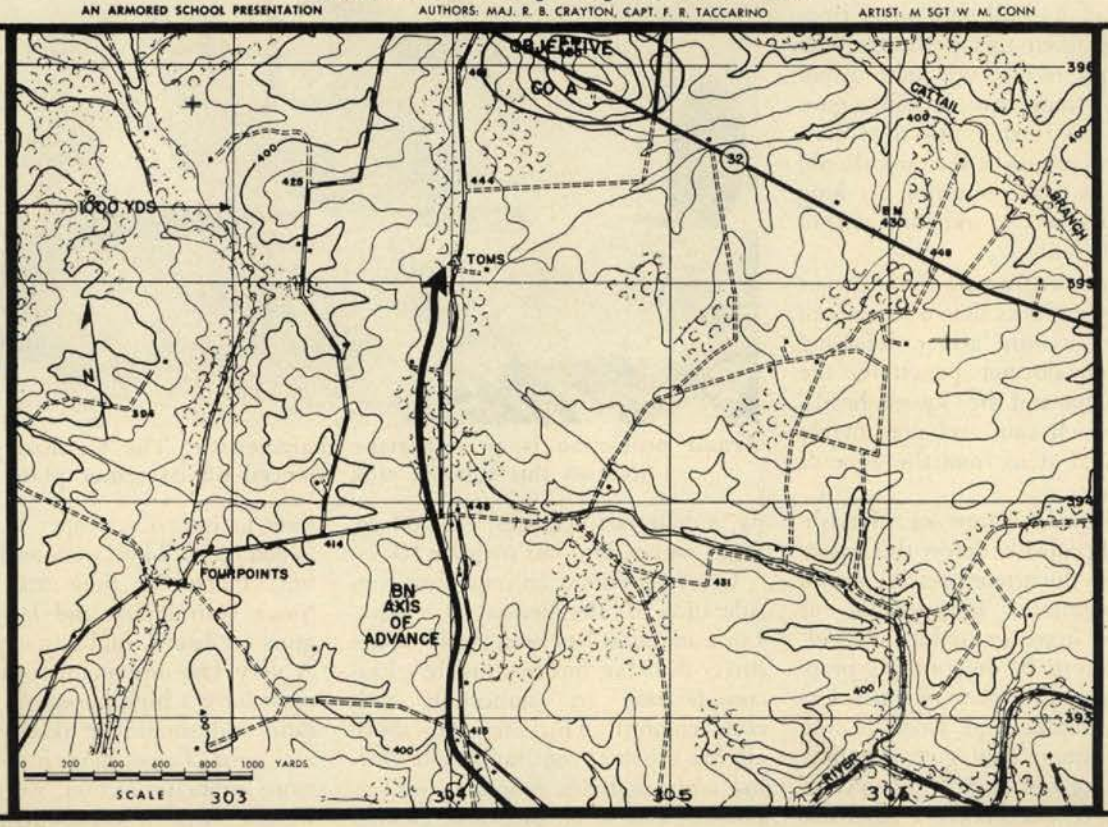
In summary, the three main characteristics of a tank are firepower, armor protection, and mobility. The crux of the problem is to design a tank to have the proper balance between them. They are interdependent but, moreover, they are opposed. Since both armor and large caliber guns are heavy, mobility is sacrificed. A very fast and maneuverable tank must have a high horsepower per ton ratio and should be relatively small and light. To get more firepower and more armor protection, we must add weight with a consequent loss in speed and maneuverability. Thus, we must fit the tank to the mission it will perform. Presently, to get a proper balance in capabilities and in the interest of economy we have three types of tank—the light, medium, and heavy.

The race between the tank and weapons to destroy it has become accelerated. The tank must be improved in its components to keep in the race. Without a suitable tank, the ground forces will be without a main element of offensive warfare. This role was once filled by horse cavalry and dragoons. Improved weapons finally forced the horse from the battlefield, but the horse is the same today as he was three centuries ago. Its modern counterpart, the tank can be improved and made more potent as well as can the defenses devised to meet it. It is in the national interest that improvements be made now, and extensive long-range research be active to insure that improvement will continue, and its dominant battlefield characteristics of protected firepower, shock action, and mobility be preserved.

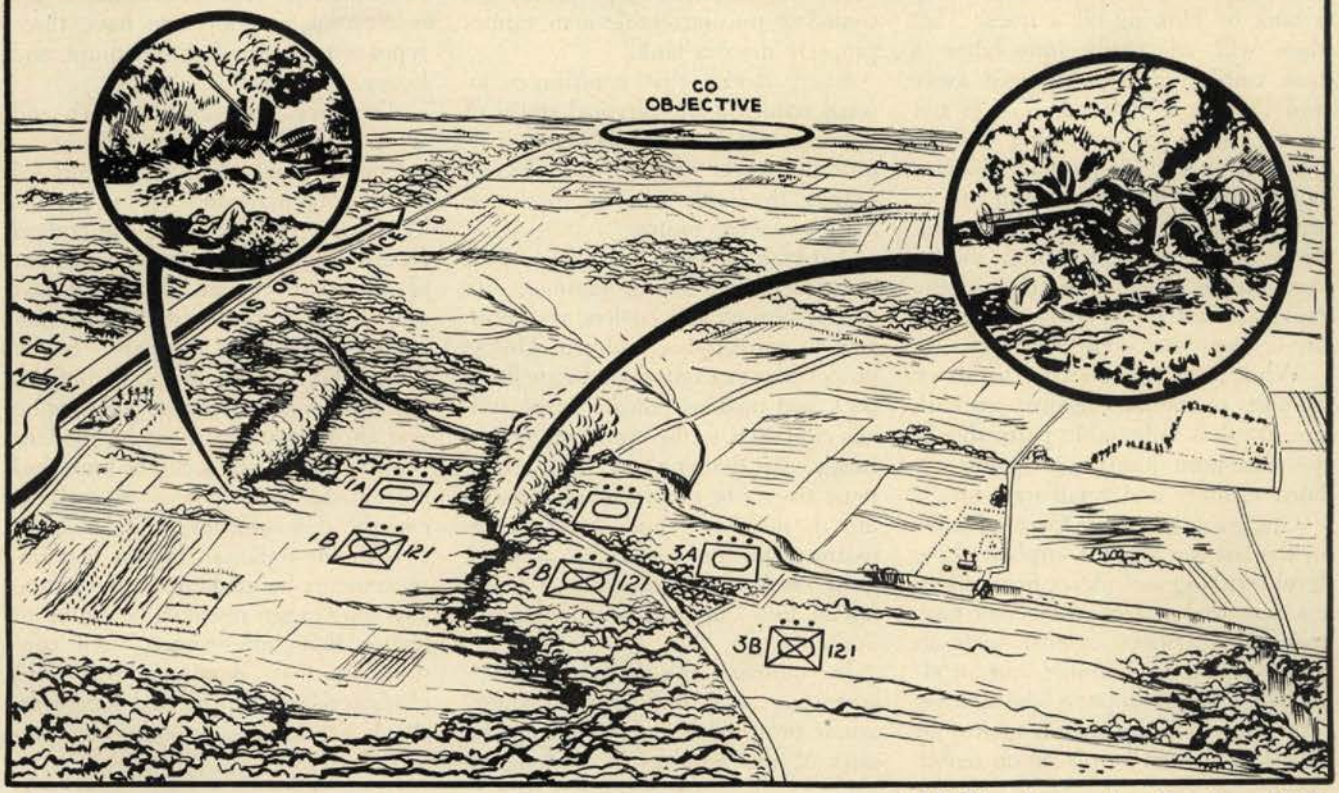
HOW WOULD YOU DO IT?

Continued from July-August, 1950 Issue

AN ARMORED SCHOOL PRESENTATION AUTHORS: MAJ. R. B. CRAYTON, CAPT. F. R. TACCARINO ARTIST: M SGT W M. CONN



SITUATION: YOU ARE PLATOON LEADER OF THE FIRST PLATOON, COMPANY A, REINFORCED. YOUR REINFORCED PLATOON HAS SUCCESSFULLY NEUTRALIZED AN ENEMY STRONG POINT AND IS NOW CONTINUING ON ITS MISSION, WHICH IS TO SEIZE THE LEFT PORTION OF THE COMPANY OBJECTIVE.



AS YOUR PLATOON ADVANCES IT COMES UNDER HEAVY ARTILLERY, MORTAR, AND ANTITANK GUN FIRE. YOUR TANK HAS BEEN HIT ON THE TRACK BY ARTILLERY FIRE AND IT IS DISABLED.

RIGHT SECTION MOVE UP.... ENEMY A.T. GUN TO YOUR FRONT, 900 YARDS.... LEFT SECTION, TWO ENEMY TANKS, 10 O'CLOCK, 800 YARDS.... APC'S REMAIN UNDER COVER....WATCH FLANKS..

TANK SECTION LEADERS REPORT....

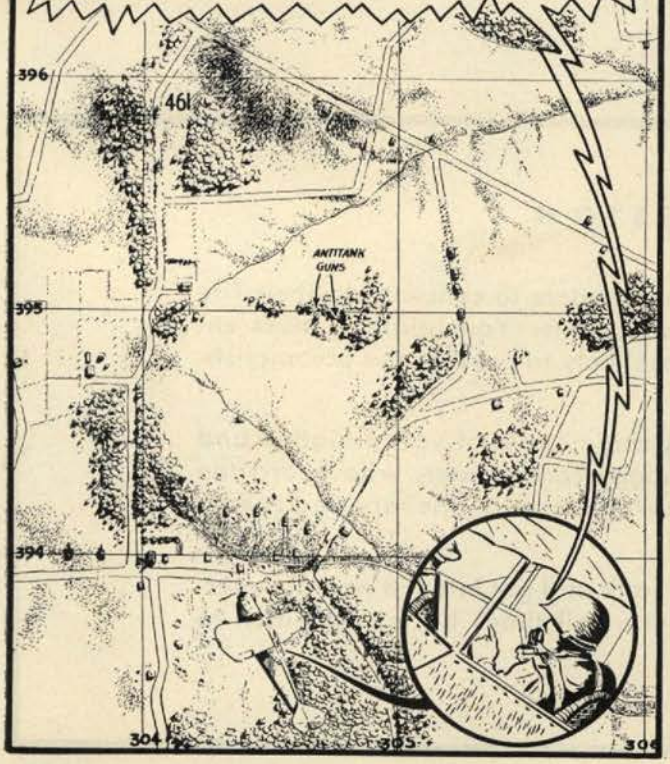
ANTITANK GUN POSITIONS UNDER FIRE ..... THERE ARE TWO OF THEM.

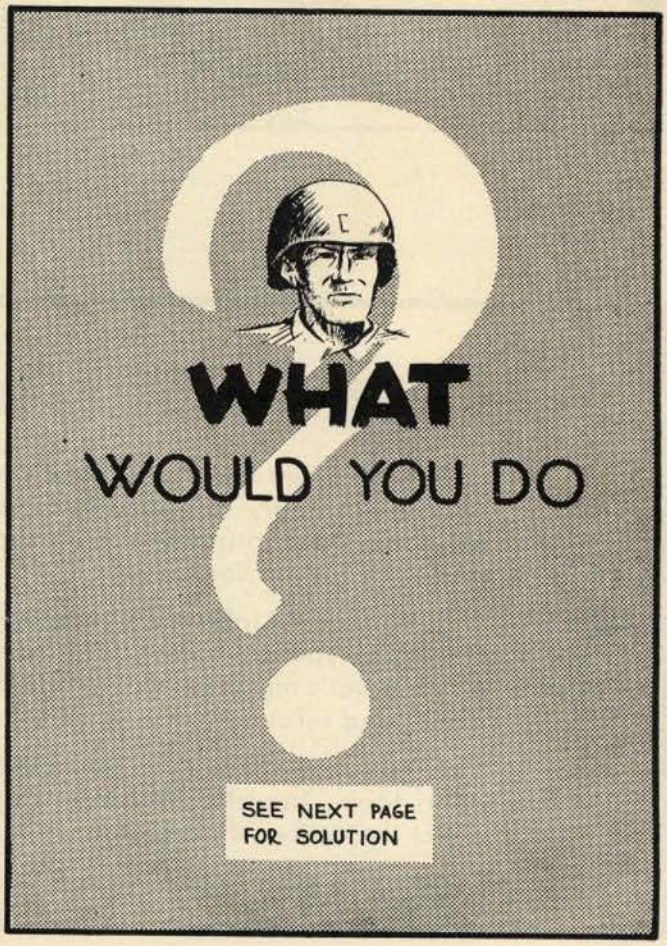
THE TWO ENEMY TANKS HAVE MOVED BACK.....

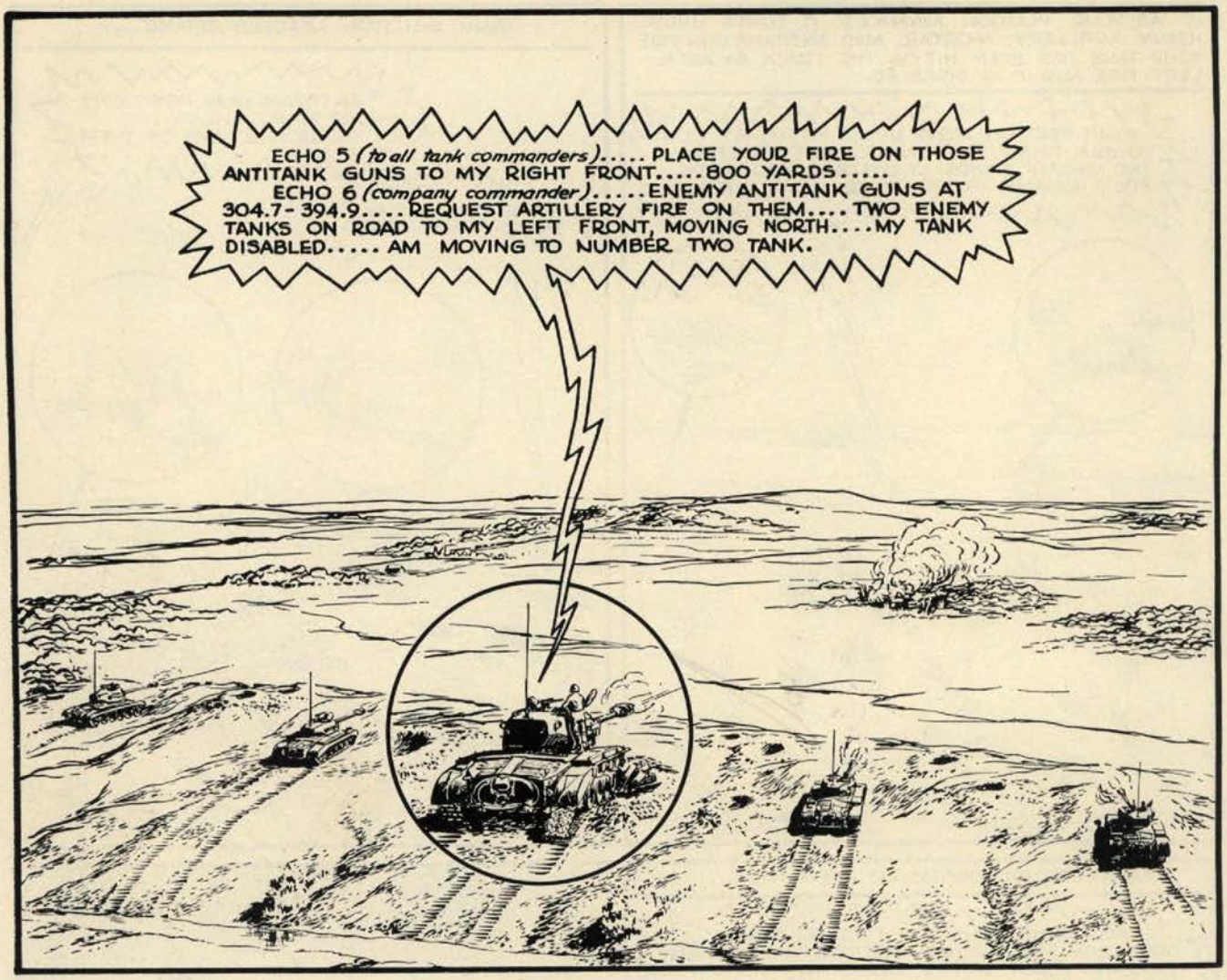
FROM RIGHT SECTION

ARTILLERY AIR OBSERVER REPORTS.....

ADJUSTING ARTILLERY FIRE ON ENEMY ARTILLERY AND MORTAR POSITIONS....FIVE ENEMY TANKS AND ABOUT EIGHTY ENEMY INFANTRYMEN AT 305.3-395.0 MOVING SOUTH....TWO ENEMY TANKS MOVING NORTH TO HILL 461.....







DISCUSSION

You should order your tank commanders to concentrate their fire upon the primary target—the antitank guns. Your platoon must engage first those targets which are most likely to prevent the accomplishment of your mission.

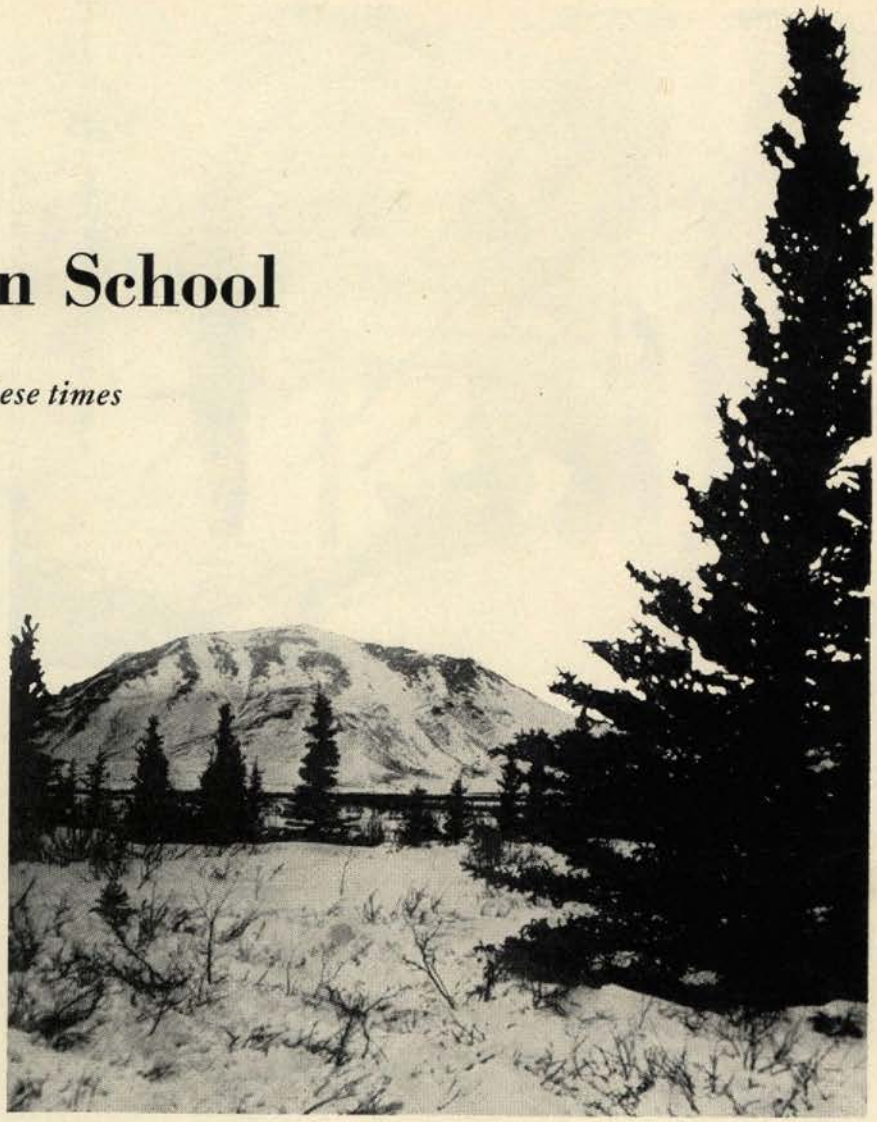
You should inform the company commander of your situation and the action you are taking. The company commander, who heard the air observer's message, will coordinate an attack on the reported enemy armor and infantrymen.

You should leave your disabled tank and get into the nearest operating tank. The platoon leader must at all times be in a position to direct the action of his platoon.

the Army Arctic Indoctrination School

A key subject in a key area in these times

by CAPTAIN GEORGE F. HAMEL



U.S. Army

GENTLEMEN, I can wish you no better luck than a good cold January."

Under ordinary circumstances, being subjected to cold weather would hardly be looked upon as "good luck." However, the above statement was contained in a message from the Commanding General, United States Army, Alaska, to the students of the first course at the Army Arctic Indoctrination School at Big Delta, Alaska, in January 1949. Cold weather, and plenty of it, is necessary for proper conduct of winter courses at this, one of the Army's youngest and most interesting schools.

The Army Arctic Indoctrination School has been in operation for the past two years indoctrinating officers of the armed forces in the techniques of living and fighting in the sub-arctic winter. It is the only school of its type operated by the Army and is the largest and most comprehensive arctic school operated by any of the Armed Services.

Background

It is well known that following the close of World War II the polar regions of the world assumed far greater importance than ever before in our strategic planning, and it has become increasingly evident that in any future war a considerable portion of our forces may have to live and fight in the arctic and sub-arctic. This concept has opened relatively new fields of endeavor in our postwar Army, one of which is training personnel for arctic operations.

As part of its postwar arctic program, the War Department in August 1947 directed the Commanding General, Alaskan Department, to establish an Arctic Indoctrination Center in the Alaskan Theater. This center was to conduct two officer indoctrination courses per year starting with the winter of 1948-49. It was further directed that the following general subjects would be stressed in these courses:

1. Orientation on Arctic Winter Conditions,
2. Survival of Individuals and Units, and
3. Tactics and Techniques for Arctic Winter Operations.

Preliminary planning for the establishment of such a center was begun immediately. In November 1947 this responsibility was transferred to the Commanding General, United States Army, Alaska, upon the inactivation of the Alaskan Department.

Prior planning was especially difficult because the proposed courses were to be far more comprehensive in scope than any cold weather courses which had previously been conducted. The Alaskan Air Command established an Arctic Indoctrination School during the winter 1947-48, but its instruction was limited solely to survival techniques, while the Army Arctic Indoctrination School was to teach operations as well as survival.*

Big Delta, Alaska

After a study of various locations had been made it was decided to establish the Arctic Indoctrination Center at Big Delta Air Force Auxiliary Field.

The Big Delta military reservation

*The Alaskan Air Command Arctic Indoctrination School is still in operation at Marks Air Force Base, Nome, Alaska. Courses of 5½-day duration are conducted weekly from October to April. This course is designed solely to indoctrinate air crewmen in survival techniques.

U.S. Army

Students are taught to improvise and live in numerous types of shelters, such as the lean-to being constructed above.

consisting of approximately 14,900 acres of land is located about 100 miles southeast of Fairbanks on the Richardson Highway. It lies in the Tanana River Valley just south of the junction of the Richardson and Alaska Highways and the Delta and Tanana Rivers.

Big Delta was established as a military station in June 1942 upon the arrival of an advance detachment of 15 men from Company "E," 138th Infantry Regiment. The present installation was constructed, and Big Delta was operated as an Army Air Field until it was reduced to caretaker status in the summer of 1945.

The reservation was used as the base camp for "Exercise Yukon" during the winter of 1947-48. Each reinforced rifle company spent a training period at Big Delta prior to being air lifted to the location of its particular exercise. This training included a simulated attack and defense of the Big Delta air strip.

"Exercise Yukon" was completed in March 1948 and Big Delta Air Force Auxiliary Field was transferred to U. S. Army, Alaska, and redesignated as an Army post effective 1 May 1948.

The Big Delta area is ideal for arctic training and testing during all seasons of the year. It combines the rigorous climate of the arctic interior with a greater variety of terrain than is found in any similar area in Alaska. On or easily accessible to the reservation are found examples of all geographical features found in the arctic and subarctic; mountains, plains, forests, muskeg, tundra, glaciers, rivers, lakes and swamps.

The climate is similar to that found elsewhere in the interior of Alaska characterized by wide ranges of temperature often accompanied by high winds.* The temperature at Big Delta ranges from a low of around −60°F. in the winter to a high of about +90°F. in the summer. Winds up to 60 miles per hour are not uncommon. Snow cover is also typical, varying from none on wind-swept areas to from 3 to 8 feet in the heavily timbered and mountainous areas.

The garrison and airfield area cover about 1,200 acres of the reservation. The airfield is equipped with four-directional, hard-surfaced runways. All construction on the post is composed of temporary wooden or quonset type buildings.

Winter of 1948-49

Following the transfer of Big Delta to Department of the Army, units were activated at the station with the primary mission of supporting the activities of the Army Arctic Indoctrination School. The following units were activated and continued in operation through the winter of 1948-49:

1. Headquarters Detachment, U. S. Troops, Big Delta was activated to furnish station level support for the activities at the post. It served as the station complement for Big Delta.

2. The Arctic Training Company served as school troops for the Army Arctic Indoctrination School and also assisted in the testing of equipment for the various test detachments which were on temporary duty at Big Delta during the winter.

3. The Army Arctic School Detachment consisted primarily of enlisted instructors for the school.

Staff planning for the conduct of the first courses at the school was accomplished under the direction of the Director of Organization and Training, Headquarters, U. S. Army, Alaska. Also, the first school commandant, Lt. Colonel Walter A. Downing, Jr., GSC (FA), and two of the officer instructors, were members of the Organization and Training Division of Army Headquarters.

An instructor course was conducted from 9 to 19 December 1948 during which enlisted instructors were chosen and trained. During the first winter the Arctic Training Company and Army Arctic School Detachment were manned almost entirely by volunteers from the 23d Infantry Regiment, 2d Infantry Division. The majority of these men had some previous cold weather experience but few were experienced enough to instruct in the subjects to be taught at the school.

By the end of the year preparations had been completed for the conduct of the officer courses during January and February 1949. The mission of the school had been outlined as follows: "To provide officers of the ground arms and services with a sound basic knowledge of arctic winter conditions to include terrain and weather, survival, movement, logistics and minor field operations."

The first officer course was conducted at the Army Arctic Indoctrination School during the period 3-28 January 1949 and the second from 7 February to 4 March 1949. A total of 142 officers from the Zone of the Interior and 43 officers and enlisted men from U. S. Army, Alaska, attended

*a. Lowest temperature recorded at Big Delta −63°F. (30 Jan. 47).
b. Highest temperature recorded at Big Delta: +90°F. (28 May 47).
c. Highest wind velocity recorded at Big Delta: 95 miles per hour (March 1949).

the courses. Included among these students were selected officers from the Air Force, Navy and Marine Corps.

The program of instruction for these courses was substantially the same as for the courses conducted during the winter of 1949-50 which will be discussed in more detail.

Winter of 1949-50

The experience gained during the conduct of courses the first winter indicated that several changes in the organization and operation of both the school, and the Arctic Indoctrination Center itself, would be desirable.

It was decided to authorize a permanent group of instructors to the school, and Lt. Colonel Donald J. Woolley, Inf, arrived in August 1949 to assume the position of school commandant. There are now 8 officer instructors authorized for the school.

A plan for the reorganization of the units at Big Delta was prepared by Colonel William N. Taylor, GSC (Inf), Director of Organization and Training, Headquarters, U. S. Army, Alaska. This plan was effected in July 1949 concurrent with the arrival at Big Delta of the Arctic Test Branch, Army Field Forces. The new organization was as follows:

1. The Army installation at Big Delta Air Force Auxiliary Field was redesignated The Army Arctic Training Center, and Headquarters Detachment, U. S. Troops, Big Delta was redesignated Headquarters and Headquarters Company, Army Arctic Training Center. The mission of the Commanding Officer, Army Arctic Training Center, was to furnish station level support of the units at Big Delta.

2. The Arctic Training Company and the Army Arctic School Detachment were inactivated and in their place the Army Arctic Indoctrination School Detachment was activated. The Commandant of the Army Arctic Indoctrination School was placed directly under the command of the Commanding General, U. S. Army, Alaska. It was planned to utilize the personnel of the school for the testing of equipment and for reconnaissance work in addition to their other duties.

Department of the Army directed that the courses be retitled "field exercises," and an instructor field exercise was conducted during the period 14 November to 17 December 1949. It was attended by enlisted men from other units of U. S. Army, Alaska, as well as by the instructors of the school.

The two officer field exercises were conducted from 9 January to 3 February and from 13 February to 10 March 1950 and were attended by a total of 165 officers of which 146 were from the Zone of the Interior. The number of students from U. S. Army, Alaska, was reduced because of the heavy commitments for other training exercises.

The program of instruction was revised considerably from that of the previous winter. This was due to the experience which had been gained the year before and also to the comments and criticisms offered by students and other observers. As it had from the beginning, the program of instruction stressed movement and survival, and true to the motto of the school, "There is no substitute for experience," the great majority of the instruction consisted of practical work in the field. The program as presented included the following subjects:

1. Alaskan Geography, Weather and Climate, Eskimo Life, Cold Weather and Experimentation, Supply and Logistics.
2. Preventive First Aid and Field Evacuation.
3. Cold Weather Clothing and Equipment, Including Care and Cleaning.
4. Ski Training, Including Ski Marches, Ski Joring, Care and Waxing.
5. Oversnow Vehicles (Weasel, Bombardier, Penguin).
6. Sleds: Loading and Lashing and Marches.
7. Tents, Stoves, Rations, Backpacking.
8. Lean-To's, Fires, Bivouacking in Forests.
9. Snow Caves and Igloos.
10. Snowshoes and Marches.
11. Sled Dogs and Mushing.
12. Land Navigation and Survival Techniques.
13. Winter Roads, Reinforcing Ice, Trail Breaking.
14. Mine Fields and Winter Fortifications, and Infantry Weapons in Cold Weather.
15. Cat Train Freighting and Demonstration.
16. Air Supply Conference and Demonstration—Aerial Photography.
17. Communications in the Arctic.
18. Airborne Attack and Defense of an Air Base (Map Exercise).
19. Finnish and Russian Winter Tactics, Long Distance Patrolling, Organization of Infantry Battalion in the Arctic, Security of Marches.
20. Four-Day Map and Terrain Exercise.

In addition to the above, conferences were conducted by personnel of Headquarters and Headquarters Com-

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Pulling a loaded sled cross country is hard work. Officer students take a short break during a field exercise.

pany, Army Arctic Training Center, and of the Arctic Test Branch, Army Field Forces, on the problems and programs of their respective organizations. The students were also given the opportunity to inspect the activities of the other units stationed at Big Delta.

The instruction is pegged, to a great extent, at the individual and small unit level, and is composed primarily of infantry subjects. This has caused comment from some of the officer students. However, due to the time limitation and the inexperience of the majority of students in cold weather training, it is believed to be impossible to broaden the scope of instruction at this time.

Future Plans

A constant effort is being exerted to improve and expand the activities of the Army Arctic Indoctrination School. Comments from students and other observers are studied carefully and where advisable changes are made in the program of instruction. It is significant that nearly all of graduates have been enthusiastic about the conduct and scope of the school.

This year a summer field exercise for officers was conducted. The conduct of summer operations in the arctic and sub-arctic would present many problems, such as difficulty of cross-country movement, which, in some respects, would be at least as great as those encountered in the winter. It is believed that the experience gained in summer field exercises will be invaluable both to the students and to the Army as a whole. As has been stated previously, Big Delta is an ideal location for the conduct of summer as well as winter training.

As part of the preliminary preparations for the conduct of summer field exercises, personnel of the Army Arctic Indoctrination School conducted training on the waterways in the vicinity of Big Delta from 9 to 19 August 1949.

A four weeks' instructor field exercise was conducted in June for the training of instructor personnel of the school and selected enlisted men from units of U. S. Army, Alaska.

An officer field exercise was conducted from 24 July to 19 August 1950, which was attended by approximately 100 officers of which 75 were from the Zone of the Interior. The subjects covered during the field exercise included the following:

1. Alaskan Geography, Weather, Economy and Signal Communications.
2. Care and Use of Special Equipment.
3. First Aid and Field Sanitation.
4. Interpretation of Arctic and Sub-Arctic Aerial Photographs.
5. Rations and Cooking.
6. Mountain Rock Climbing.
7. Glaciers and Ice.
8. Movement on Waterways.
9. Land Navigation.
10. Survival Techniques in Winter and Summer.
11. Logistics Problems.
12. Map and Field Exercises.

Conclusions

On the basis of past experience in the conduct of the school, it is believed that students at the field exercises should have the following qualifications:

1. They should, if possible, be volunteers for attendance at the school. Because of the rigorous and specialized nature of the field exercises, it is desirable for the students to be interested in the subject matter to be covered. The majority of students in the past have been volunteers.

2. Students should be under 40 years of age and be in excellent physical condition since operations in the Arctic demand the utmost in stamina.

The value of the Army Arctic Indoctrination School to our postwar Army is well summarized by the following quotation from *Officers Call*, in an issue devoted to "The Arctic and Our Security": "The problems of Arctic warfare are many and the solutions have not all been reached, but the work of the Army Arctic Indoctrination School is providing valuable training and is increasing greatly our store of knowledge in this generally unfamiliar field."

Company Punishment

PART II

by DEAN E. RYMAN

At the preceding session there was consideration of the nature of "Company Punishment," who is permitted to summarily penalize military personnel and the procedure he must observe, who can be thus punished and for what sort of offense, and the basic principles which control the selection of any authorized penalty. This conference deals with the specific punishments and with the recording and enforcement of the order.

Admonition or Reprimand

Some commanders admonish with more vigor and sharpness than others when they reprimand: there is no sure way to distinguish one from the other. Either is employable to compare unfavorably the action of the accused on a particular occasion with that which he ought to have taken, and sometimes to inform him what a repetition of his misconduct will bring about. However, the words that officer writes or speaks always constitute instruction rather than punishment, unless he has first taken the requisite action to summarily penalize the person to whom they are addressed.

No particular language is required for either an admonition or a reprimand, but each rebuke ought to fit both the culprit and his offense. It is to be spoken or written calmly, without terms that are equally applicable to any misbehavior—at least without many of them, without profanity or vulgarity in any case—regardless of the mentality of the offender, and without using the identical comments (however pertinent) that the commander has recently used for rebuking others, and without (of course) using words and phrases which the accused may easily identify as from a form book.

Every wise commander will personally administer the admonition or the reprimand, and always do it privately and with sincerity. Neither of these punishments can have any appreciable corrective power unless so given. He will rarely use either against any enlisted man, except now and then one of those in the three highest grades. The others hear comments every day that are hard to distinguish from an admonition or a reprimand, though actually intended as instruction. He will use this sort of penalty against an officer or warrant officer with great reluctance, because it has to be in writing for each such case and eventually shows up in the AG-201 file of the offender, perhaps to adversely affect an earned promotion or a desired assignment long after the incident which brought about the penalty has been utterly forgotten.

Withholding of Privileges

Only one privilege can be taken away at the same time for a single offense, as the law now stands, but the accused can be deprived of several consecutively within the prescribed period of seven days. The new law doubles the period but requires the punishing commander to select a single privilege for a single offense and to refrain from withholding more than one privilege consecutively within that time. At least, that seems to be a proper construction of the new law, for it expressly directs that he must choose "one of the following disciplinary punishments."

If he would use this penalty effectively, the commander must know the habits of the culprit well enough to select a privilege the loss of which will actually discommode the offender. There is no deterrent power in a punishment order which forbids a soldier to do something that he would not particularly care to do anyway.

The punishing commander must also decide whether the optional act he is about to forbid is a privilege or a right, unless he chooses to rely on the improbability that anyone will raise the question at all in view of the short period of the deprivation, or unless he considers a "right" so "similar in nature" to a "privilege" that the soldier may be deprived of either lawfully. Practically every attribute of one is also pertinent to the other, and people are prone to use the two words interchangeably. There is, however, a satisfactory "rule-of-thumb" for those who wish to be cautious. Any optional act the enjoyment of which the culprit does not have to earn is a privilege, while a right is an optional act in which the soldier cannot indulge until he has won the right to do so by accomplishing some extra work or by performing some regular duty in an exceptionally praiseworthy manner, after knowledge of what the reward will be.

Restriction to Specified Limits

It has long been of the essence of discipline that all officers and soldiers shall always be in a designated place (sometimes a fairly large one) known to at least their immediate superiors; to the end that each can readily be contacted upon a sudden need therefor. Disciplined persons are ever alert for that which may transpire but seldom does occur. During an older generation, military personnel expected to be told where to go and understood that they were to "stay put" until told to go elsewhere. But as communication facilities have become more rapid and easier to use, soldiers have grown resentful of almost every dimunition of their supposed "right" to go where they please when no duty presses, just as in civilian pursuits.

Most of our people appear to support this attitude, and so Congress has chosen "restriction to certain specified limits," in enacting both the 104th Article of War and Article 15 of the UNIFORM CODE OF MILITARY JUSTICE, as a suitable penalty for misconduct; though it can be used also as an administrative measure when the commander has reason to want his unit (or some portion of it) quickly available for a specific duty that is anticipated in the immediate future. The new law declares that a restriction imposed as a punishment may be "with or without suspension from duty" which is no more than a declaration of the present practice. Every wise commander will make his order clear on that point, because a restriction (however given) is presumptively a relief from any duty which cannot be fully performed while within the limits specified. He will also define the place to which the culprit is restricted with sufficient particularity that the offender cannot make a mistake as to what spots are beyond the limits set. Suitable provision for messing, bathing, and use of latrines must also be declared when such facilities are not within the area to which the culprit is restricted.

Unless strictly enforced, a punishment order which restricts an offender to a stated place, or one that deprives him of a privilege other than that of going where other soldiers may proceed, is worse than a disregard for the misconduct thus penalized. But enforcing it requires some careful thought. Each commander ought to rely on his officers and his NCO to either compel compliance or report the culprit's violations, in their discretion, and this necessitates suitable steps for informing them whom he has restricted as well as the periods and the places. He should sharply discourage reports of violations by those inferior in rank to the offenders: listening to persons whom the other members of his unit will soon come to regard as "tattletales" invariably weakens the commander's ability to control his men. Setting a particular person (regardless of rank) to watch one or more of those restricted, requiring culprits to report at stated periods—hourly or otherwise—to a charge-of-quarters, or housing them in a special barracks designated for the occupancy of those under restriction are all measures of doubtful value. An expression to the culprit by word or act, of confidence on the part of the commander that the punished man will obey the order which imposes the penalty, plus a trial by a special courtmartial when any superior of the offender discovers that he has disobeyed, is by far the better course in the long run.

Compulsory Labor

Extremely difficult work at exceptionally early hours as well as unusually late at night—or even during normal duty hours for protracted periods—is the lot of all soldiers on frequently recurring occasions, depending on the military situation which the command is then facing. But no such task, even if preceded or followed by verbal (or other) indications of the commanding officer's displeasure, constitutes "Company Punishment" unless the commander so states before the same is directed, and unless he shall have first taken the steps which must precede the imposition of a penalty summarily.

Two sorts of involuntary work, as a summary punishment, are now known: "extra fatigue" and "hard labor without confinement." The new code provides only one sort: "extra duties" limited to two hours a day, and possibly identical with what is now called "extra fatigue."

The last mentioned penalty consists of more than the culprit's normal share, during a specified period, of the ordinary labor then being required from all members of his unit, either daily or as their turns come on a roster kept to apportion tasks of that nature among them. Such a punishment is usually enforced now by entering the offender's name on more rosters, or more often on the same roster, than the names of his fellows, to the end that he will be caught up on details more frequently than they. This method will work badly (if at all) after 31 May 1951, when the new code goes into effect, because it provides no practicable way to limit such punishment to the therein specified maximum of two hours each day.

"Hard labor without confinement," now an authorized penalty, is commonly understood to be any necessary or useful work, regardless of how unpleasant its accomplishment may be, which requires more than ordinary physical exertion and is not in the daily or other regularly periodic routine for all members of the command. It is a more severe punishment than "extra fatigue" and is not ordinarily considered "similar in nature" thereto. It is best enforced by utilizing a "Hard Labor Pool" (whatever the local or official name), a semipermanent group or detail established by a separate battalion or a regiment, to which those thus punished and those similarly penalized by a court-martial are reported daily for assignments. Such a "pool" can be so operated that it will not constitute confinement or duty under guard and one can be made so distasteful to its ever-changing personnel that there will be no "repeaters." This requires continuing supervision by well trained personnel, of course. The widespread view that this penalty merely requires labor after Retreat is without any real foundation. That is but a makeshift scheme which grew out of an inaccurate understanding of several too-briefly phrased regulations concerning what is to be deemed "hard labor" and about the precedence of military duty.

A commanding officer who chooses to utilize compulsory labor as a summary punishment must frequently survey the locality where his unit is stationed, and create opportunities for "hard labor." After the new code becomes effective, unless "extra duties" are limited by the forthcoming regulations to what we now know as "extra fatigue," that need will still exist. The new code does not expressly authorize "hard labor" as a penalty to be summarily imposed; neither does it forbid the same. A bit of ingenuity, plus sound judgment, is required; and he must always bear in mind that a futile task, like carrying a heavy weight to a distant point merely that the bearer thereof may be required to bring it back again, is still forbidden.

"Hard labor," whether it is so called or known as "extra duties," can always be made when there is a real need therefor. Nothing else being available, there are invariably roads and paths to be constructed or improved, or repairs to be made to buildings. There is no inherent rea-

son why such work cannot be directed as "extra duties," even with the two hours' daily limit. It does not matter that materials must come from quite far away without good transportation facilities, or that the available tools can scarcely be considered labor saving devices, or that the work is not really urgent, or that a contractor could do a better job at a lower cost. The basic idea is that men already at hand who cannot be dismissed and must be paid anyway, shall be made to work so hard that they will mend their ways rather than risk being again required to do either "extra duties" or "hard labor." Wise commanders do not bluff when using any form of compulsory labor as a penalty; nor do they permit their NCO to make a farce of the enforcement of such a punishment.

New Penalties

The new UNIFORM CODE OF MILITARY JUSTICE, which is really only a first faltering step toward uniformity in a phase of the activities of the armed forces where the need for uniformity is not free from doubt, contains (in its Article 15) some provisions which the Army clearly will not use at the outset—in fact, cannot utilize until there shall have been substantial changes in other relevant laws and regulations. Among these are the new penalties to be summarily imposed on enlisted persons: reduction in grade and confinement—the latter on a bread and water diet even.

Need for a summary imposition of confinement—just plain confinement, without "hard labor" or "extra duties" and presumably on full rations—is not manifest, even for misbehavior on shipboard. Its authorization is a sharp reversal of the Army's long-established policy in that respect. And for the Army, confinement on bread and water of minor offenders (the law applies only to them) seems the revival of a relic of a barbarous past happily almost forgotten. We think of that penalty as one for hardened recalcitrants already in confinement. It is plainly out of harmony with the considerate treatment of accused soldiers directed at so many places elsewhere in the new code.

The anticipated regulations authorized by this new law, regulations readily capable of being so worded for each of the armed forces as to make the touted uniformity of military justice a mere pretense, will doubtless clear up many questions concerning the cited provisions (and others) that are now bothering thoughtful officers. Commanders will do well to keep open minds until those regulations are published.

profile

Wilfred J. McNeil, Assistant Secretary of Defense . . . civil background in banking, automobile merchandising, newspaper circulation . . . Rear Admiral, Supply Corps, U. S. Naval Reserve in WWII . . . Fiscal Director of Navy Dept until appointment as Administrative Assistant to the Secretary of Navy in 1947 . . . Special Assistant to Sec/Def Forrestal and Johnson from February 1947 to present appointment in 1949 . . . Upon his appointment as Assistant Secy of Defense he was designated as Comptroller of the Department of Defense, effective date September 12, 1949.

Forfeitures

Except "in time of war or grave public emergency," all summarily imposed forfeitures of pay were forbidden for many years, and detentions of pay were considered unlawful because "similar in nature" to the prohibited forfeitures. Even in such periods, a forfeiture could be so ordered only against a Lieutenant or a Captain; never against officers of higher rank, or against enlisted men or warrant officers. That this was sound policy was reaffirmed by Congress in the summer of 1947, though the pay of soldiers had been more than trebled since the policy was first adopted and there had been large increases in the numbers of young warrant officers and of men having field grades but only a few years military experience, many of them receiving then higher pay than they had ever theretofore earned at any other occupation.

Within a year thereafter, Congress did a complete about-face, as far as officers and warrant officers are concerned. It enacted, not as a war or emergency measure but as a day-in and day-out regulation, that —still for "minor offenses" only— one-half of the pay per month of any officer up to and including the grade of Colonel could be forfeited summarily for a period of three months. A prominent Congressman told his colleagues that "a far greater restraint on officers will be the inevitable result," and a noted commentator on military law publicly chuckled that now the "boy majors" would have to toe the mark. This iniquitous provision, no longer limited to officers below the rank of Brigadier General, is in the new code; but much of its evil effect has been nullified by a provision that the forfeiture against an officer or a warrant officer shall be limited to one-half of one month's pay. It still remains applicable all the time rather than only "in time of war or grave public emergency."

The Army has still not had enough experience with forfeitures of pay as a summary punishment for senior officers—or for juniors as a regular peacetime disciplinary method—to be entirely certain how they will work. But there are many disquieting indications that, as to misbehavior which is really "minor," there has been created the virtual equivalent of a Police Violations Bureau, where an offender is invited to pay a predetermined sum and depart with absolution for his wrongful act —even if without the commander's blessing. That is a scheme which is needed only when lawlessness in relatively small matters and utter lack of self-discipline are prevalent. Such conditions are invariably destructive of military efficiency. The mere existence of an easy way to

avoid well-deserved consequences is not helpful to any commander who sincerely desires to be able to put his unit exactly where its striking power is urgently needed at the very moment of that need. Nor can the regular use of such a scheme give him any justifiable confidence that his command and every member thereof, when there, will always do precisely what he directs—neither more nor less, and never something else.

It is still quite possible also, due to the absence of a clear definition of the term "minor offenses" in current regulations, to summarily punish with a moderate fine a grave misdemeanor that ought to cause the offender to be ousted from the Service. That a superior of the punishing commander will nevertheless direct a trial for the offending officer's misbehavior, thus declaring the forfeiture a nullity because the misbehavior is not "minor," is most unlikely: it is a very rare occurrence.

On the other hand it is equally easy to summarily mulct a normally well-disciplined senior, because of a lone minor offense, in a sum ordinarily considered just retribution for only the most reprehensible misdemeanors known to either the civil or military law. Although this possibility will be a bit lessened after 31 May 1951 by reason of the then reduced forfeitures, such a senior officer will still be in serious danger unless adequate safeguarding regulations are published.

No such regulations now exist, and whoever seriously asserts that it is perfectly safe to leave such matters to officers having general court-martial jurisdiction knows not whereof he speaks. The authorized appeal in nonjudicial punishment matters is usually futile; and the alternative (trial by court-martial) is a hard choice for senior officers—since it carries the risk of a separation from the only means they have for earning a living. Furthermore, there is no certainty yet that even that avenue of escape will be available after the new code becomes effective.

Here and there one may find a major command wherein the present and contemplated forfeiture provisions against all officers and warrant officers—as a day by day disciplinary method, rather than as something exclusively for the abnormal conditions of war or grave public emergency—have been given a hearty approval. In a few of them, that is due to the exceptionally sound judgment with which the commander has used the law; but in most of them discipline has reached a lower mark than is tolerable. From whatever viewpoint one looks at the present forfeiture provision for officers, a conclusion that it is fundamentally unsound is inescapable; and nothing better can be said for the one in the new code than that a little less harm can be done thereunder.

It is true, of course, that the dawn of that day when discipline can be attained, and kept, with punishing power vested elsewhere than in commanders is not yet discernible. No one can be certain that there ever will be a time when the imposition of penalities will cease to be a necessary command function; and manifestly undue restraints upon the freedom of a commander to punish as he deems proper diminish his ability to keep his unit efficient. However, there is abundant proof that commanders are not invariably just as well as stern, and modern Military Justice legislation consists largely of efforts to curb them and to foster for soldiers the same opportunities to avoid punishment which have been thought needed by an average civilian. In the midst of this process of preventing commanders from doing their followers any injustice, Congress has suddenly subjected one class of military personnel to a more unrestrained power to summarily punish severely than any American commander has exercised at any time in over a half century—and the class thus selected is one which is supposedly made up of those fighters who are the least in need of any such curbing. Few who know the truth really believe the behavior of that group was ever such as to warrant action of the sort taken, and apparently a return to approximate normalcy impends.

One finds difficulty in imagining a more potent means than the forfeiture provision of the 104th Article for developing an officer corps that will be either servile or contemptuous of the time-tested standards for discipline and respect for law which have made our Army unbeatable. Commissioned officers are still chiefly responsible for its discipline and efficiency—and no one has ever yet discovered a practicable way for putting that responsibility elsewhere. Such men make (or break) Military Justice as "due process of law" for soldiers. The system—even with the remote control provisions of the new code—cannot be operated successfully by either toadies or scofflaws, nor even by those who are neither but are deficient in disciplining themselves. Some folks who are definitely not prone to hysterical outburst each time an event they do not like or understand occurs have been gravely concerned, and are still not convinced that the reason therefor will cease on 31 May 1951, nor that irretrievable harm will not be done meanwhile.

Notice and Record of the Penalty

Current regulations direct that "the accused will be notified of the punishment as soon as practicable and at the same time will be informed of his right to appeal." No particular words or method for communicating the notice are required, except that when the commander's notice of intent to summarily punish is written, this one must be by an indorsement thereon. The commanding officer's decision, his punishment order, and notice thereof to the culprit are usually simultaneous, oral, and personal; but, in any event, the penalty is imposed and the punishment period begins the day on which the offender actually sees or officially hears what the punishing commander's order contains.

When higher authority than the immediate commander orders a penalty, written notice to the accused is expected to go through a military correspondence channel which includes the unit commander, so he may properly enter it in his "company punishment book" and begin the required enforcement. Notice of a forfeiture to the disbursing officer who ordinarily pays the accused is not required. An officer who fails to enter it on his next voucher violates the 94th Article, one which has real teeth. There is no way to shift the responsibility for collection or to excuse the immediate unit commander from seeing that collection occurs.

It is required by the regulations

which implement AW 104 that the immediate commander of the accused shall cause a record of each penalty to be made in his office; and Appendix 15b of the current Manual for Courts-Martial contains a form therefor—a recommended rather than a mandatory one. The required record is of little concern to anyone, as far as any particular punishment is concerned, for that is usually an accomplished fact before the ink on the record is dry. But superior commanders are legitimately concerned with how their subordinates use their summary punishing power and have been known to require their Inspectors-General to examine the records and report thereon. Every wise unit commander will keep a notebook which shows at least as much as the cited form suggests, and he will enter each case with sufficient detail so it will be more than a mere memory prodder. There is an excellent chance that he may become very unhappy if an inquiring superior is unable to draw any worthwhile conclusions from the record which the subordinate maintains.

Appeals

Any person subject to "Company Punishment" may appeal to "the next superior authority"—never higher—but only on the ground that his punishment is unjust and disproportionate to penalties visited upon others for like misconduct. He will not be heard to deny his guilt, unless he first convinces the higher commander that he did not know of his right to demand a court-martial trial. The culprit must appeal within a "reasonable time" and the officer to whom the appeal is addressed determines whether he has done so with enough promptness, all the circumstances considered.

On the appeal no witnesses are heard, but the culprit may attach affidavits or statements, and so may the unit commander. No specific words are required to initiate an appeal, but (as in all military correspondence) the facts on which the appeal is based ought to be set forth concisely and to the point. The commander to whom the appeal is addressed can do nothing as to any part of the penalty already executed. He cannot increase the severity of the punishment or substitute some other penalty, with the possible exception that he may substitute one "similar in nature" if he knows what those words signify; the regulations are not very clear on that point. For the ordinary case, he can merely mitigate or remit, though he seldom has enough pertinent facts to warrant doing either. The Commander in Chief has made it clear that he intends to rely on the judgment of those commanders to whom he has entrusted summary punishing power, and that is apt to control the disposition of an appeal.

Article 15 of the UNIFORM CODE OF MILITARY JUSTICE contains practically the same provision for appeals as is to be found in the 104th Article of War. To what extent the implementing regulations will differ remains to be seen.

Clemency

The 104th Article of War authorizes "the commanding officer who imposes the punishment, his successor in command, and superior authority" to "mitigate or remit any unexecuted portion of the punishment." The same words were used in the 1920 version of that Article. Under each, the implementing regulations gave him authority to "suspend the execution of such punishment and to vacate such suspension." In the 1949 regulations, such power is expressly granted to "any officer exercising general court-martial jurisdiction over the command," who would normally be included in the "superior authority" upon whom the statute confers clemency powers. In the new law, a part of the same paragraph which deals with appeals as well as clemency, there is to be found: "The officer who imposes the punishment, his successor in command, and superior authority shall have power to suspend, set aside, or remit any part or amount of the punishment, and to restore all rights, privileges, and property affected." Another illustration of the basic purpose of the UNIFORM CODE OF MILITARY JUSTICE to substitute remote control in all disciplinary matters for the heretofore approved policy of putting the control in the same individual who must carry the responsibility for a failure to maintain discipline.

An Evaluation

Summarily imposed penalties are intended to instantly discourage the relatively unimportant misbehavior of those who cannot (or will not) take a man's part in the Army's normal group activities, or who yield frequently to the same inclination for prohibited action which is not inherently evil. The idea is to quickly repair the little leaks—before seriously dangerous ones develop. Such punishment should not be expected to do more; nor should there be resort thereto very often.

It is ordinarily poor judgment to impose "Company Punishment" on the same person more often than once a month or more than thrice in any calendar year. If that, plus one or two summary court-martial sentences, does not bring him into line, it is a waste of time and effort to retain him in uniform. Many commanders of major units are even less tolerant of "minor offenses" than what I have indicated; and, of course, unit commanders will respect their superiors' policies.

Each punishing commander ought to select a penalty in each case that is both appropriate to the offense and likely to deter its repetition. A punishment which will bring one soldier up standing, stinging him into a decision to mend his ways, will merely arouse anger in the mind of another. The idea that all who commit a listed misdeed must be treated alike is completely untenable, especially in the Army; and publishing a schedule of predetermined penalties is but an aggravation of the mistake of having one at all.

Verily, a commander actually possessed of the wisdom long attributed to King Solomon can use the present 104th Article to advantage. Whether Article 15 of the new code—with its more severe penalties, its failure to guarantee a court-martial trial, and its authority to a superior to upset all that the commander has tried to accomplish—can be likewise used remains to be ascertained. No one can know to what extent "Non-judicial Punishment" differs from "Company Punishment" until the regulations authorized by the new law appear. Let both eulogy and condemnation be withheld for the present.

A distinguished historian analyzes a single technological change in the United States Navy and draws some significant conclusions in an article which should provide encouragement for junior grade personnel in all of the services.

A CASE STUDY OF INNOVATION*

by ELTING E. MORISON

IN the early days of the last war, when armaments of all kinds were in short supply, the British, I am told, made use of a venerable field piece that had come down to them from previous generations. The honorable past of this light artillery stretched back, in fact, to the Boer War. In the days of uncertainty after the fall of France, these guns, hitched to trucks, served as useful mobile units in the coast defense. But it was felt that the rapidity of fire could be increased. A time-motion expert was, therefore, called in to suggest ways to simplify the firing procedures. He watched one of the gun crews of five men at practice in the field for some time. Puzzled by certain aspects of the procedures, he took some slow-motion pictures of the soldiers performing the loading, aiming, and firing routines.

When he ran these pictures over once or twice, he noticed something that appeared odd to him. A moment before the firing two members of the gun crew ceased all activity and came to attention for a three-second interval, extending throughout the discharge of the gun. He summoned an old colonel of artillery, showed him the pictures, and pointed out this strange behavior. What, he asked the colonel, did it mean? The colonel, too, was puzzled. He asked to see the pictures again. "Ah," he said when the performance was over, "I have it. They are holding the horses."

This story, true or not, and I am told it is true, suggests nicely the pain with which the human being accommodates himself to changing conditions. The tendency is apparently involuntary and immediate to protect oneself against the shock of change by continuing in the presence of altered situations the familiar habits, however incongruous, of the past.

Yet, if human beings are attached to the known, to the realm of things as they are, they also, regrettably for their peace of mind, are incessantly attracted to the unknown and to things as they might be. As Ecclesiastes glumly pointed out, men persist in disordering their settled ways and beliefs by seeking out many inventions.

The point is obvious. Change has always been a constant in human affairs; today, indeed, it is one of the determining characteristics of our civilization. In our relatively shapeless social organization, the shifts from station to station are fast and easy. More important for our immediate purpose, America is fundamentally an industrial society in a time of tremendous technological development. We are thus constantly presented with new devices or new forms of power that, in their refinement and extension, continually bombard the fixed structure of our habits of mind and behavior. Under such conditions, our salvation, or at least our peace of mind, appears to depend upon how successfully we can in the future become what has been called in an excellent phrase a completely "adaptive society."

It is interesting, in view of all this, that so little investigation, relatively, has been made of the process of change and human responses to it. Recently psychologists, sociologists and cultural anthropologists have addressed themselves to the subject with suggestive results. But we are still far from a full understanding of the process, and still farther from knowing how we can set about simplifying and assisting an individual's or a group's accommodation to new machines or new ideas.

With these things in mind, I thought it might be interesting and perhaps useful to examine historically a changing situation within a society; to see if from this examination we can discover how the new machines or ideas that introduced the changing situation developed; to see who introduces them, who resists them, what points of friction or tension in the social structure are produced by the innovation, and perhaps why they are produced and what, if anything, may be done about it. For this case study, the introduction of continuous-aim firing in the United States Navy has been selected. The system, first devised by an English officer in 1898, was introduced into our Navy in the years 1900-1902.

I have chosen to study this episode for two reasons. First, a navy is not unlike a society that has been placed under laboratory conditions. Its dimensions are severely limited; it is beautifully ordered and articulated; it is relatively isolated from random influences. For these reasons the impact of change can be clearly discerned, the resulting dislocations in the structure easily discovered and marked out. In the second place, the development of continuous-aim firing rests upon mechanical devices. It, therefore, presents for study a concrete, durable situation. It is not like many other innovating reagents—a Manichean heresy, or Marxism, or the views of Sigmund Freud—that can be shoved and hauled out of shape by contending forces or conflicting prejudices. At all times we know exactly what continuous-aim firing really is. It will be well now to describe, as briefly as possible, *what* it is.

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The governing fact in gunfire at sea is that the gun is mounted on an unstable platform—a rolling ship. This constant motion obviously complicates the problem of holding a steady aim. Before 1898 this problem was solved in the following elementary fashion. A gun pointer estimated the range of the target—ordinarily about 2800 yards. He then raised the gun barrel to give the gun elevation to carry the shell to the target at the estimated range. This was accomplished by turning a small wheel on the gun mount that operated the elevating gears. With the gun thus fixed for range, the gun pointer peered through open sights, not unlike those on a small rifle, and waited until the roll of the ship brought the sights on the target. He then pressed the firing button that discharged the gun. There were, by 1898, on some naval guns, telescope sights which naturally enlarged the image of the target for the gun pointer. But these sights were rarely used by gun pointers. They were lashed securely to the gun barrel and, recoiling with the barrel, jammed back against the unwary pointer's eye. Therefore when used at all, they were used only to take an initial sight for purposes of estimating the range before the gun was fired.

Notice now two things about the process. First of all, the rapidity of fire was controlled by the rolling period of the ship. Pointers had to wait for the one moment in the roll when the sights were brought on the target. Notice also this: There is in every pointer what is called a "firing interval"—the time lag between his impulse to fire the gun and the translation of this impulse into the act of pressing the firing button. A pointer, because of this reaction time, could not wait to fire the gun until the exact moment when the roll of the ship brought the sights onto the target; he had to will to fire a little before, while the sights were off the target. Since the firing interval was an individual matter, varying obviously from man to man, each pointer had to estimate, from long practice, his own interval and compensate for it accordingly.

These things, together with others we need not here investigate, conspired to make gunfire at sea relatively uncertain and ineffective. The pointer, on a moving platform, estimating range and firing interval, shooting while his sight was off the target, became in a sense an individual artist.

In 1898, many of the uncertainties were removed from the process, and the position of the gun pointer radically altered, by the introduction of continuous-aim firing. The major change was that which enabled the gun pointer to keep his sight and gun barrel on the target throughout the roll of the ship. This was accomplished by altering the gear ratio in the elevationg gear to permit a pointer to compensate for the roll of the vessel by rapidly elevating and depressing the gun. From this change another followed. With the possibility of maintaining the gun always on the target, the desirability of improved sights became immediately apparent. The advantages of the telescope sight, as opposed to the open sight, were for the first time fully realized. But the existing telescope sight, it will be recalled, moved with the recoil of the gun and jammed back against the eye of the gunner. To correct this, the sight was mounted on a sleeve that permitted the gun barrel to recoil through it without moving the telescope.

These two improvements—in elevating gear and sighting—eliminated the major uncertainties in gunfire at sea and greatly increased the possibilities of both accurate and rapid fire.

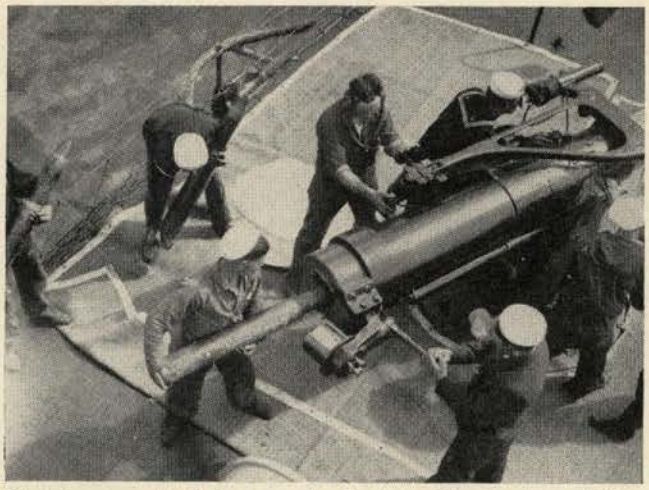
You must take my word for it that this changed naval gunnery from an art to a science, and that gunnery accuracy in the British and our Navy increased about 3000 per cent in six years. This doesn't mean much except to suggest a great increase in accuracy. The following comparative figures may mean a little more. In 1899 five ships of the North Atlantic squadron fired five minutes each at a lightship hulk at the conventional range of 1600 yards. After twenty-five minutes of banging away, two hits had been made on the sails of the elderly vessel. Six years later one naval gunner made 15 hits in one minute at a target 75 x 25 feet at the same range; half of them hit in a bull's-eye 50 inches square.

Now with the instruments (the gun, elevating gear, and telescope), the method, and the results of continuous-aim firing in mind, let us turn to the subject of major interest: how was the idea, obviously so simple an idea, of continuous-aim firing developed; who introduced it; and what was its reception?

Introduction of an Idea

The idea was the product of the fertile mind of the English officer, Admiral Sir Percy Scott. He arrived at it in this way, while, in 1898, he was the captain of HMS *Scylla*. For the previous two or three years he had given much thought, independently and almost alone in the British Navy, to means of improving gunnery. One rough day, when the ship, at target practice, was pitching and rolling violently, he walked up and down the gun deck watching his gun crews. Because of the heavy weather they were making very bad scores. Scott noticed, however, that one pointer was appreciably more accurate than the rest. He watched this man with care and saw, after a time, that he was unconsciously working his elevating gear back and forth in a partially successful effort to compensate for the roll of the vessel. It flashed through Scott's mind at that moment that here was the sovereign remedy for the problems of inaccurate fire. What one man could do partially and unconsciously, perhaps all men could be trained to do consciously and completely.

Acting on this assumption, he did three things. First, in all the guns of the *Scylla,* he changed the gear ratio in the elevating gear, previously used only to set the gun in fixed position for range, so that a gunner could easily elevate and depress the gun to follow a target throughout the roll. Second, he rerigged his telescopes so that they would not be influenced by the recoil of the gun. Third, he rigged a small target at the mouth of the gun, which was moved up and down by a crank to simulate a moving target. By following this target as it moved, and firing at it with a subcaliber rifle rigged in the breech of the gun, the pointer could practice every day. Thus equipped, the ship became a training ground for gunners. Where before the good pointer was an individual artist, pointers now became trained technicians, fairly uniform in their capacity to shoot. The effect was immediately felt. Within a year the *Scylla* established



Continuous-aim firing on the Cruiser Birmingham, 1913.

records that were remarkable.

At this point I should like to stop a minute to notice several things directly related to, and involved in, the process of innovation. First, the personality of the innovator. I wish there were space to say a good deal about Admiral Sir Percy Scott. He was a wonderful man. Three small bits of evidence must suffice, however. First, he had a certain mechanical ingenuity. Second, his personal life was shot through with frustration and bitterness. There was a divorce, and a quarrel with the ambitious Lord Charles Beresford—the sounds of which, Scott liked to recall, penetrated to the last outposts of empire. Finally, he possessed, like Swift, a savage indignation directed ordinarily at the inelastic intelligence of all constituted authority—especially the British Admiralty.

There are other points worth mention here. Notice first that Scott was not responsible for the invention of the basic instruments that made the reform in gunnery possible. This reform rested upon the gun itself, which as a rifle had been in existence on ships for at least forty years; the elevating gear, which had been, in the form Scott found it, a part of the rifled gun from the beginning; and the telescope sight, which had been on shipboard at least eight years. Scott's contribution was to bring these three elements, appropriately modified, into a combination that made continuous-aim firing possible for the first time. Notice also that he was allowed to bring these elements into combination by accident, by watching the unconscious action of a gun pointer endeavoring through the operation of his elevating gear to correct partially for the roll of his vessel.

Scott, as we have seen, had been interested in gunnery; he had thought about ways to increase accuracy by practice and improvement of existing machinery; but able as he was, he had not been able to produce on his own initiative and by his own thinking the essential idea and modify instruments to fit his purpose. Notice here finally, the intricate interaction of chance, the intellectual climate, and Scott's mind. Fortune (in this case the unaware gun pointer) indeed favors the prepared mind, but even fortune and the prepared mind need a favorable environment before they can conspire to produce sudden change. No intelligence can proceed very far above the threshold of existing data or the binding combinations of existing data.

All these elements that enter into what may be called "original thinking" interest me as a teacher. Deeply rooted in the pedagogical mind often enough is a sterile infatuation with "inert ideas"; there is thus always present in the profession the tendency to be diverted from the *process* by which these ideas, or indeed any ideas, are really produced. I well remember with what contempt a class of mine, which was reading Leonardo da Vinci's *Notebooks,* dismissed the author because he appeared to know no more mechanics than, as one wit in the class observed, a Vermont Republican farmer of the present day. This is perhaps the result to be expected from a method of instruction that too frequently implies that the great generalizations were the result, on the one hand, of chance—an apple falling in an orchard or a teapot boiling on the hearth—or, on the other hand, of some towering intelligence proceeding in isolation inexorably toward some prefigured idea, like evolution, for example.

Chance and Development

This process by which new concepts appear, the interaction of fortune, intellectual climate, and the prepared imaginative mind, is an interesting subject for examination offered by any case study of innovation. It was a subject that momentarily engaged the attention of Horace Walpole, whose lissome intelligence glided over the surface of so many ideas. In reflecting upon the part played by chance in the development of new concepts, he recalled the story of the three princes of Serendip who set out to find some interesting object on a journey through their realm. They did not find the particular object of their search, but along the way they discovered many new things simply because they were looking for *something.* Walpole believed this intellectual method ought to be given a name—in honor of the founders—Serendipity; and Serendipity certainly exerts a considerable influence in what we call original thinking. There is an element of Serendipity, for example, in Scott's chance discovery of continuous-aim firing in that he was, and had been, looking for some means to improve his target practice and stumbled upon a solution, by observation, that had never entered his head.

It was in 1900 that Percy Scott went out to the China Station as commanding officer of HMS *Terrible.* In that ship he continued his training methods and his spectacular successes in naval gunnery. On the China Station he met up with an American junior officer, William S. Sims. Sims had little of the mechanical ingenuity of Percy Scott, but the two were drawn together by temperamental similarities that are worth noticing here. Sims had the same intolerance for what is called spit-and-polish and the same contempt for bureaucratic inertia as his British brother officer. He had for some years been concerned, as had Scott, with what he took to be the inefficiency of his own Navy. Just before he met Scott, for example, he had shipped out to China in the brand-new pride of the fleet, the battleship *Kentucky.* After careful investigation and reflection he had informed his superiors in Washington she was not a battleship at all—"but a crime against the white race."

The spirit with which he pushed forward his efforts

to reform the naval service can best be stated in his own words to a brother officer: "I am perfectly willing that those holding views different from mine should continue to live, but with every fibre of my being I loathe indirection and shiftiness, and where it occurs in high place, and is used to save face at the expense of the vital interests of our great service (in which silly people place such a childlike trust), I want that man's blood and I will have it no matter what it costs me personally."

From Scott in 1900 Sims learned all there was to know about continuous-aim firing. He modified, with the Englishman's active assistance, the gear on his own ship and tried out the new system. After a few months' training, his experimental batteries began making remarkable records at target practice. Sure of the usefulness of his gunnery methods, Sims then turned to the task of educating the Navy at large. In 13 great official reports he documented the case for continuous-aim firing, supporting his arguments at every turn with a mass of factual data. Over a period of two years, he reiterated three principal points: First, he continually cited the records established by Scott's ships, the *Scylla* and the *Terrible,* and supported these with the accumulating data from his own tests on an American ship; second, he described the mechanisms used and the training procedures instituted by Scott and himself to obtain these records; third, he explained that our own mechanisms were not generally adequate without modification to meet the demands placed on them by continuous-aim firing. Our elevating gear, useful to raise or lower a gun slowly to fix it in position for the proper range, did not always work easily and rapidly enough to enable a gunner to follow a target with his gun throughout the roll of the ship. Sims also explained that such few telescope sights as there were on board our ships were useless. Their cross wires were so thick or coarse that they obscured the target, and the sights had been attached to the gun in such a way that the recoil system of the gun plunged the eyepiece against the eye of the gun pointer.

The Response in Washington

This was the substance not only of the first but of all the succeeding reports written on the subject of gunnery from the China Station. It will be interesting to see what response these met with in Washington. The response falls roughly into three easily indentifiable stages.

First stage: no response. Sims had directed his comments to the Bureau of Ordnance and the Bureau of Navigation; in both bureaus there was dead silence. The thing—claims and records of continuous-aim firing—was not credible. The reports were simply filed away and forgotten. Some indeed, it was later discovered to Sims' delight, were half eaten away by cockroaches.

Second stage: rebuttal. It is never pleasant for any man to have his best work left unnoticed by superiors, and it was an unpleasantness that Sims suffered extremely ill. In his later reports, besides the accumulating data he used to clinch his argument, he changed his tone. He used deliberately shocking language because, as he said, "They were furious at my first papers and stowed them away. I therefore made up my mind I would give these later papers such a form that they would be dangerous documents to leave neglected in the files." To another friend he added, "I want scalps or nothing and if I can't have 'em I won't play."

Sims Gets Attention

Besides altering his tone, he took another step to be sure his views would receive attention. He sent copies of his reports to other officers in the fleet. Aware, as a result, that Sims' gunnery claims were being circulated and talked about, the men in Washington were then stirred to action. They responded—notably through the Chief of the Bureau of Ordnance, who had general charge of the equipment used in gunnery practice—as follows: (1) Our equipment was in general as good as the British; (2) since our equipment was as good, the trouble must be with the men, but the gun pointer and the training of gun pointers were the responsibility of the officers on the ships; (3) and most significant —continuous-aim firing was impossible. Experiments had revealed that five men at work on the elevating gear of a six-inch gun could not produce the power necessary to compensate for a roll of five degrees in ten seconds. These experiments and calculations demonstrated beyond peradventure or doubt that Scott's system of gunfire was not possible.

Only one difficulty is discoverable in these arguments; they were wrong at important points. To begin with, while there was little difference between the standard British equipment and the standard U. S. equipment, the instruments on Scott's two ships, the *Scylla* and the *Terrible,* were far better than the standard equipment on our ships. Second, all the men could not be trained in continuous-aim firing until equipment was improved throughout the fleet. Third, the experiments with the elevating gear had been ingeniously contrived at the Washington Navy Yard—on solid ground. It had, therefore, been possible in the Bureau of Ordnance calculation, to dispense with Newton's first law of motion, which naturally operated at sea to assist the gunner in elevating or depressing a gun mounted on a moving ship. Another difficulty was of course that continuous-aim firing was in use on Scott's and some of our own ships at the time the Chief of the Bureau of Ordnance was writing that it was a mathematical impossibility. In every way I find this second stage, the apparent resort to reason, the most entertaining and instructive in our investigation of the responses to innovation.

Third stage: name calling. Sims, of course, by the high temperature he was running and by his calculated overstatement, invited this. He was told in official endorsements on his reports that there were others quite as sincere and loyal as he and far less difficult; he was dismissed as a crackbrained egotist; he was called a deliberate falsifier of evidence.

The rising opposition and the character of the opposition was not calculated to discourage further efforts by Sims. It convinced him that he was being attacked by shifty, dishonest men who were the victims, as he said, of insufferable conceit and ignorance. He made up his mind, therefore, that he was prepared to go to any extent to obtain the "scalps" and the "blood" he was after. Accordingly he, a lieutenant, took the extraordinary step of writing the President of the United States, Theodore Roosevelt, to inform him of the re-

markable records of Scott's ships, of the inadequacy of our own gunnery routines and records, and of the refusal of the Navy Department to act. Roosevelt, who always liked to respond to such appeals when he conveniently could, brought Sims back from China late in 1902 and installed him as Inspector of Target Practice, a post the naval officer held throughout the remaining six years of the Administration.

With this sequence of events (the chronological account of the innovation of continuous-aim firing) in mind, it is possible now to examine the evidence to see what light it may throw on our present interest—the origins of and responses to change in a society.

First, the origins. We have already analyzed briefly the origins of the idea. We have seen how Scott arrived at his notion. We must now ask ourselves, I think, why Sims so actively sought, almost alone among his brother officers, to introduce the idea into his service. It is particularly interesting here to notice again that neither Scott nor Sims invented the instruments on which the innovation rested. They did not urge their proposal because of pride in the instruments of their own design.

The Engineer and the Entrepreneur

The telescope sight had first been placed on shipboard in 1892 by Bradley Fiske, an officer of great inventive capacity. In that year Fiske had even sketched out on paper the vague possibility of continuous-aim firing, but his sight was condemned by his commanding officer, Robley D. Evans, as of no use. Instead of fighting for his telescope Fiske turned his attention to a range finder. But six years later Sims took over and became the engineer of the revolution.

I would suggest, with some reservations, this explanation: Fiske, as an inventor, took his pleasure in great part from the design of the device. He lacked, not so much the energy as the overriding sense of social necessity, that would have enabled him to *force* revolutionary ideas on the service. Sims possessed this sense. In Fiske we may here find the familiar plight of the engineer who often enough must watch the products of his ingenuity being organized and promoted by other men. These other promotional men, when they appear in the world of commerce, are called entrepreneurs. In the world of ideas they are still entrepreneurs.

Sims was one, a middle-aged man caught in the periphery (as a lieutenant) of the intricate webbing of a precisely organized society. Rank, the exact definition and limitation of a man's capacity at any given moment in his own career, prevented Sims from discharging all his exploding energies into the purely routine channels of the peacetime Navy. At the height of his powers he was a junior officer standing watches on a ship cruising aimlessly in friendly foreign waters. The remarkable changes in systems of gunfire to which Scott introduced him gave him the opportunity to expend his energies quite legitimately against the encrusted hierarchy of his society. He was moved, it seems to me, in part by his genuine desire to improve his own profession but also in part by rebellion against tedium, against inefficiency from on high, and against the artificial limitations placed on his actions by the social structure, in his case junior rank.

Responding to Change

Now having briefly investigated the origins of the change, let us examine the reasons for what must be considered the weird response we have observed to this proposed change. Here was a reform that greatly and demonstrably increased the fighting effectiveness of a service that maintains itself almost exclusively to fight. Why then this refusal to accept so carefully documented a case; a case proved incontestably by records and experience? Why should virtually all the rulers of a society so resolutely seek to reject a change that so markedly improved its chances for survival in any contest with competing societies?

There are the obvious reasons that will occur to everyone—the source of the proposed reform was an obscure junior officer 8000 miles away; he was, and this is a significant factor, criticizing gear and machinery designed by the very men in the bureaus to whom he was sending his criticisms. And furthermore, Sims was seeking to introduce what he claimed were improvements in a field where improvements appeared unnecessary. Superiority in war, as in other things, is a relative matter, and the Spanish-American War had been won by the old system of gunnery. Therefore, it was superior even though of the 9500 shots fired, at varying but close ranges, only 121 had found their mark.

A less obvious cause appears by far the most important one. It has to do with the fact that the Navy is not only an armed force; it is a society. In the forty years following the Civil War, this society had been forced to accommodate itself to a series of technological changes—the steam turbine, the electric motor, the rifled shell of great explosive power, case-hardened steel armor, and all the rest of it. These changes wrought extraordinary changes in ship design, and, therefore, in the concepts of how ships were to be used; that is, in fleet tactics, and even in naval strategy. The Navy of this period is a paradise for the historian or sociologist in search of evidence of a society's responses to change.

To these numerous innovations, producing as they did a spreading disorder throughout a service with heavy commitments to formal organization, the Navy responded with grudging pain. It is wrong to assume, as civilians frequently do, that this blind reaction to technological change springs exclusively from some causeless Bourbon distemper that invades the military mind. There is a sounder and more attractive base. The opposition, where it occurs, of the soldier and the sailor to such change springs from the normal human instinct to protect oneself and more especially one's way of life. Military organizations are societies built around and upon the prevailing weapon systems. Intuitively and quite correctly the military man feels that a change in weapon portends a change in the arrangements of his society.

Think of it this way. Since the time that the memory of man runneth not to the contrary, the naval society has been built upon the surface vessel. Daily routines, habits of mind, social organization, physical accommodations, conventions, rituals, spiritual allegiances have been conditioned by the essential fact of the ship. What then happens to your society if the ship is displaced as the principal element by such a radically different

weapon as the plane? The mores and structure of the society are immediately placed in jeopardy. They may, in fact, be wholly destroyed. It was the witty cliché of the 20's that those naval officers who persisted in defending the battleship against the apparently superior claims of the carrier did so because the battleship was a more comfortable home. What, from one point of view, is a better argument?

This sentiment would appear to account in large part for the opposition to Sims; it was the product of an instinctive protective feeling, even if the reasons for this feeling were not overt or recognized. The years after 1902 proved how right, in their terms, the opposition was. From changes in gunnery flowed an extraordinary complex of changes: in shipboard routines, ship design, and fleet tactics. There was, too, a social change. In the days when gunnery was taken lightly, the gunnery officer was taken lightly. After 1903, he became one of most significant and powerful members of a ship's company, and this shift of emphasis naturally was shortly reflected in promotion lists. Each one of these changes provoked a dislocation in the naval society, and with man's troubled foresight and natural indisposition to break up classic forms, the men in Washington withstood the Sims onslaught as long as they could. It is very significant that they withstood it until an agent from outside—outside and above—who was not clearly identified with the naval society, entered to force change.

This agent, the President of the United States, might reasonably and legitimately claim the credit for restoring our gunnery efficiency. But this restoration by *force majeure* was brought about at great cost to the service and men involved. Bitternesses, suspicions, wounds were caused that it was impossible to conceal or heal.

Now this entire episode may be summed up in five separate points:

(1) The essential idea for change occurred in part by chance, but in an environment that contained all the essential elements for change, and to a mind prepared to recognize the possibility of change.

(2) The basic elements—the gun, gear, and sight—were put in the environment by other men; men interested in designing machinery to serve different purposes, or simply interested in the instruments themselves.

(3) These elements were brought into successful combination by minds not interested in the instruments for themselves, but in what they could do with them. These minds were, to be sure, interested in good gunnery, overtly and consciously. They may also, not so consciously, have been interested in the implied revolt that is present in the support of all change. Their temperaments and careers indeed support this view. From gunnery, Sims went on to attack ship designs, existing fleet tactics, and methods of promotion. He lived and died, as the service said, a stormy petrel, a man always on the attack against higher authority, a rebellious spirit.

(4) He and his colleagues were opposed on this occasion by men who were apparently moved by three considerations: honest disbelief in the dramatic but substantiated claims of the new process; protection of the existing devices and instruments with which they identified themselves; and maintenance of the existing

William S. Sims as a four-star Admiral—1919.

society with which they were identified.

(5) The deadlock between those who sought change and those who sought to retain things as they were was broken only by an appeal to superior force; a force removed from and unidentified with the mores, conventions, devices of the society. This seems to me a very important point. The naval society in 1900 broke down in its effort to accommodate itself to a new situation. The appeal to Roosevelt is documentation for Mahan's great generalization that no military service should or can undertake to reform itself. It must seek assistance from outside.

Now with these five summary points in mind, it may be possible to seek, as suggested at the outset, a few larger implications from this story. What, if anything, may it suggest about the general process by which any society attempts to meet changing conditions?

There is, to begin with, a disturbing inference half concealed in Mahan's statement that no military organization can reform itself. Certainly civilians would agree with this. We all know now that war and the preparation of war is too important, as Clemenceau said, to be left to the generals. But military organizations are really societies—more rigidly structured, more highly integrated than most communities, but still societies. What then if we make this phrase to read, "No society can reform itself"? Is the process of adaptation to change, for example, too important to be left to human beings? This is a discouraging thought, and historically there is some cause to be discouraged.

This is a subject to which we may well address ourselves. Our society, especially, is built, as I have said, just as surely upon a changing technology as the Navy of the 90's was built upon changing weapon systems. How then can we find the means to accept with less pain to ourselves and less damage to our social organization

the dislocations in our society that are produced by innovation?

A primary source of conflict and tension in our case study appears to lie in this great word I have used so often in the summary—the word, *identification*.

This purely personal identification with a concept, a convention, or an attitude would appear to be a powerful barrier in the way of easily acceptable change. Here is an interesting primitive example. In the years from 1864-1871 ten steel companies in the country began making steel by the new Bessemer process. All but one of them at the outset imported from Great Britain English workmen familiar with the process. One, the Cambria Company, did not. In the first few years those companies with British labor established an initial superiority. But by the end of the 70's, Cambria had obtained a commanding lead over all competitors.

The Bessemer process, like any new technique, had been constantly improved and refined in this period from 1864-1871. The British laborers of Cambria's competitors, secure in the performance of their own original techniques, resisted and resented all change. The Pennsylvania farm boys, untrammeled by the rituals and traditions of their craft, happily and rapidly adapted themselves to the constantly changing process.

How then can we modify the dangerous effects of this word *identification?* And how much can we tamper with this identifying process? Our security, much of it, after all, comes from giving our allegiance to something greater than ourselves. These are difficult questions to which only the most tentative and provisional answers may here be proposed for consideration.

If one looks closely at this little case history, one discovers that the men involved were the victims of *severely limited* identifications. They were presumably all part of a society dedicated to the process of national defense, yet they persisted in aligning themselves with separate parts of that process—with the existing instruments of defense, with the existing customs of the society, or with the act of rebellion against the customs of the society. Of them all, the insurgents had the best of it. They could, and did, say that the process of defense was improved by a gun that shot straighter and faster, and since they wanted such guns, they were unique among their fellows—patriots who sought only the larger object of improved defense. But this beguiling statement—even when coupled with the recognition that these men were right, and extremely valuable and deserving of respect and admiration—cannot conceal the fact that they were interested too in scalps and blood. They were so interested, in fact, that they made their case a militant one and thus created an atmosphere in which self-respecting men could not capitulate without appearing either weak or wrong or both.

It appears, therefore, if I am correct in my assessment, that we might spend some time and thought on the possibility of enlarging the sphere of our identifications from the part to the whole. For example, those Pennsylvania farm boys at the Cambria Steel Company were, apparently, much more interested in the manufacture of steel than in the preservation of any particular way of making steel. So I would suggest that in studying innovation we look further into this possibility: the possibility that any group that exists for any purpose—the family, the factory, the educational institution—might begin by defining for itself its grand object, and see to it that that grand object is communicated to every member of the group. Thus defined and communicated, it might serve as a unifying agent against the disruptive local allegiances of the inevitable smaller elements that compose any group. It may also serve as a means to increase the acceptability of any change that would assist in the more efficient achievement of the grand object.

There appears also a second possible way to combat the untoward influence of limited identifications. We are, I may repeat, a society based on technology in a time of prodigious technological advance, and a civilization committed irrevocably to the theory of evolution. These things mean that we believe in change; they suggest that if we are to survive in good health we must become an "adaptive society."

We are not yet emotionally an adaptive society, though we try systematically to develop forces that tend to make us one. We encourage the search for new inventions; we keep the mind stimulated, bright, and free to seek out fresh means of transport, communication, and energy; yet we remain, in part, appalled by the consequences of our ingenuity and, too frequently, try to find security through the shoring up of ancient and irrelevant conventions, the extension of purely physical safeguards, or the delivery of decisions we ourselves should make into the keeping of superior authority like the state. These solutions are not necessarily unnatural or wrong, but historically they have not been enough, and I suspect they never will be enough to give us the serenity and competence we seek.

If the preceding statements are correct, they suggest that we might give some attention to the construction of a new view of ourselves as a society which in time of great change identified itself with and obtained security and satisfaction from the wise and creative accommodation to change itself. Such a view rests, I think, upon a relatively greater reverence for the mere *process* of living in a society than we possess today, and a relatively smaller respect for and attachment to any special *product* of a society—a product either as finite as a bathroom fixture or as conceptual as a fixed and final definition of our Constitution or our democracy.

Historically such an identification with *process* as opposed to *product*, with adventurous selection and adaptation as opposed to simple retention and possessiveness, has been difficult to achieve collectively. The Roman of the early republic, the Italian of the late fifteenth and early sixteenth century, or the Englishman of Elizabeth's time appear to have been most successful in seizing the new opportunities while conserving as much of the heritage of the past as they found relevant and useful to their purpose.

We seem to have fallen on times similar to theirs, when many of the existing forms and schemes have lost meaning in the face of dramatically altering circumstances. Like them we may find at least part of our salvation in identifying ourselves with the adaptive process and thus share with them some of the joy, exuberance, satisfaction, and security with which they went out to meet their changing times.

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THE DESERT FOX: MASTER OF MOBILE WARFARE

ROMMEL. By Desmond Young. Foreword by Field Marshal Sir Claude J. E. Auchinleck. Collins Press, London. 288 pp. $3.00.

Reviewed by

BRIG. GEN. P. M. ROBINETT

The annals of war are highlighted by extraordinary characters whose brilliance, leadership, energy, force, and enthusiasm are stamped upon friend and foe alike. The men of this type have not always been on the winning side. They have all, however, been at home with troops and their just renown rests upon the true test of a soldier—troop leadership. None of the lengthening list achieved fame polishing furniture at a great headquarters.

The Author

Brigadier Desmond Young served with the British Forces in World War I. In World War II he was in the thick of the fighting in the Desert Campaign against Rommel when he was taken prisoner. Following his escape he served on the staff of Field Marshal Auchinleck.

The Subject

Field Marshal Erwin Rommel

In this at least history seems justly partial to those who have shared the trials and hardships of their men and have known the tense moments when fate had success or defeat in the balance.

Field Marshal Erwin Rommel, who would have earned the approval of our own great field commander, General William T. Sherman, by commanding the hearts as well as the feet of his men, has won a place among the immortals, if Brigadier Young's evaluation of him is added to the history of his campaigns. There seems to be no doubt about the objectivity and accuracy of Young's evaluation for he learned the Rommel legend at firsthand in Africa and faced the man as a prisoner of war. Later he followed up with an "on the ground" investigation in Germany after World War II. That he should have taken the pains to present an enemy general to the English-speaking world at a time when intolerant individuals are still insisting that all Germans are wicked proves that vindictiveness is not universal. He is not the only "old-fashioned person who regret(s) that chivalry should be among the casualties of total war."

The book itself shows that Brigadier Young is not the only witness to prove that chivalry is not dead. Field Marshal Sir Claude J. E. Auchinleck, who battled Rommel in the western desert with poor and obsolete equipment, and psychologically as well, in a foreword to Young's book has paid his opponent and himself a handsome compliment in the following words:

> "If . . . I salute him as a soldier and a man and deplore the shameful manner of his death . . . it implies no more than recognition in an enemy of the qualities one would

The Reviewer

Brigadier General P. M. Robinett commanded Combat Command B of the 1st Armored Division in the bitter fighting against Rommel about Kasserine Pass in the Tunisian Campaign. Upon his return to the States he commanded The Armored Center. Now retired, he is Chief of the Applied Studies Division in the Office of the Chief of Military History, Department of Army.

Above: Rommel *(left)* in World War I.
Right: Rommel a few days before his death.

Field Marshal von Rundstedt reads Rommel's funeral oration.

Rommel's son Manfred and Frau Rommel at his funeral.

wish to possess oneself, respect for a brave, able and scrupulous opponent and a desire to see him treated, when beaten, in the way one would wish to be treated had be been the winner and oneself the loser."

In Rommel, according to Young, we find all the soldierly virtues, few of the failings, and none of the vices. He was a professional officer of Spartan simplicity who demonstrated outstanding combat leadership in World War I, winning the highest German award for courage and bravery. Although not a large man, he was capable of prodigious physical and mental effort. To these attributes and a quick, imaginative, and originative mind, he joined a keen understanding of psychology, tactics, and terrain. These traits, improved by study and reflection, made him the success he was in World War II. His exploits with the 7th Panzer Division in the Campaign of 1940 fixed his reputation as a truly great division commander. His work in Africa established his claim to pre-

A feature exclusive with ARMOR

eminence in mobile desert warfare. His views on the importance of the Mediterranean and on the defense of the Atlantic Wall raise a doubt in the minds of some as to Rommel's strategic ability. He seems, however, to have had a better appreciation of the importance of the Mediterranean and of the effect of air power on the defense of a coastline than his detractors. Judged in that light history will probably be partial to him.

Marshal Rommel's dealings with Hitler and his Socratean death prove that he possessed moral courage of a very high order. He could put his duty as a German and his loyalty to Germany above his oath as an officer and his loyalty to a regime. He could even sacrifice his life for others. No wonder it is that he was beloved by his troops, respected by his foes, and forced to his death by direction of a wicked mass-leader. The story of his life and death should be a lesson to those who follow in the train of a tyrant.

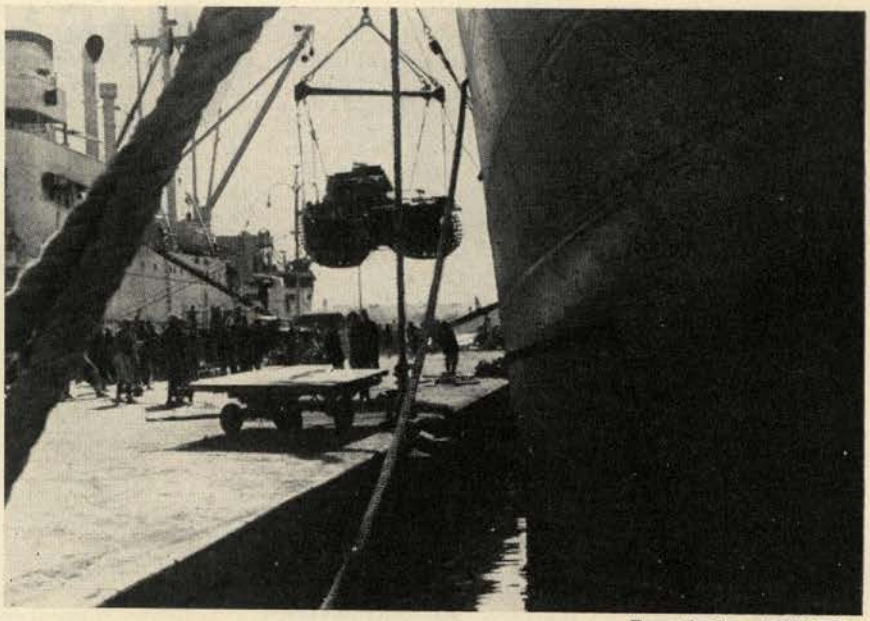
Marshal Auchinleck has written that "Rommel gave me and those who

served under my command in the Desert many anxious moments." He continued to give others great concern until near the end of the African Campaign. The demolition charges in the supply dumps at Tebessa, placed there after his sucessful drive through Faid Pass, is ample proof of the way the American command in Africa reacted to him. In spite of these anxious moments, the Americans and British who faced Rommel on the battlefield have nothing but respect and admiration for him.

Young men of talent of the Western World who will be compelled to battle for policies and causes inherited from a fouled-up political leadership, and who aspire to troop command, the highest role in war, can learn much by studying Brigadier Young's book. Those who belong to Armor will find it especially valuable for it deals with one of the greatest exponents of mobile warfare, which is not dead in spite of some recent pronouncements to the contrary.

Harper and Brothers, Publishers, will publish an American edition of *Rommel* on January 3, 1951.

The work is essentially a biography or character study although there is a sketchy treatment of campaigns and battles in which Rommel participated, much of which is understandably from a British point of view. For these reasons it is not a definitive book. The simplicity, lack of pretension or bombast, forthrightness, clean habits, and willingness to command from the front, proved by the numerous times he was wounded, mark Rommel as the subject for many more works. The record of the campaigns and battles is the canvas upon which any complete treatment of him must be painted. Fortunately, he appears to have had a strong historical sense, and much untapped material, saved by his faithful aide-de-camp, Captain Aldinger, still exists, awaiting the treatment of skilled hands. These, directed by Liddell Hart, are apparently already at work. When their task is completed it is hoped that the book will be fully documented. Brigadier Young or his publisher has omitted much documentation in *Rommel*.



From the Jarrett Collection

Prelude to things to come. The first Pz. 1 reaches the dock at Tripoli.

Rommel, Capt. Lang and General Speidel in The Desert.

From the Jarrett Collection

German armor of the 15th Panzer Division in the attack around the British left flank at Bir Hacheim, May 1942.

MAGAZINE ROUNDUP

There are several items of interest in the July-August issue of ANTIAIRCRAFT JOURNAL. Armor personnel will find value in the treatment of *Antiaircraft Defense For The Infantry and Armored Divisions*, by Major E. W. Fitzgerald. Another feature put under way in this number is an identification series titled *Know Your Friendly Aircraft*, a photo feature.

In the ARMED FORCES MEDICAL JOURNAL Maj. Gen. Raymond W. Bliss, Surgeon General of the Army, writes on *Field Training of Medical Officers*. Examining history, Gen. Bliss notes that wars occur about every quarter century and last from 2 to 4 years, with the result that most doctors may well experience two wars in a lifetime of practice. In order to properly train medical officers for war, the Surgeon General describes a course for Medical Dept. Company Officers to start this fall.

The Command & General Staff College's MILITARY REVIEW for September has an article on *The Soviet Economic System* by Lt. Col. R. H. Bryant, who describes the emphasis being placed on Russia's heavy industry in her program to level out her military-economic potential. Major J. J. Shoemaker describes the Gothic Line campaign in Italy, indicating the importance of small unit actions in mountain campaigns. The Foreign Military Digests feature covers a broad range of subjects.

In its September-October issue SIGNALS has an industrial roundup covering some of the top firms in the communications field. There's a story on AT&T called *The Bell System in Peace and War*. In the Como line there is *The Big Noise That Launched The RCA*. From Remington-Rand is an article on *Electronic Accounting*. And from Ray-o-Vac a story on *A Billion Batteries*.

The September issue of COMBAT FORCES JOURNAL, successor to Infantry and Field Artillery magazines, has a timely article on guerrillas, titled *Get Guerrilla-Wise*, by Maj. Robert Rigg. There is a humorous and close-to-home article on *How To Serve Under An SOB*. In armor there is an article by Capt. Henry R. Heyburn titled *Forward Observer With Tanks*. And Sam Marshall follows along with the closing half of his article on *Mobility and the Nation*.

TRANSPORTATION JOURNAL very properly gets into things in its July-August issue with a background on its new status as a basic branch of the Army. Maj. George Willey of the Office of the Chief of Transportation covers the subject. Reproduced in the issue is an article extracted from a chapter of C. C. Wardlow's forthcoming book *The Transportation Corps: Functions, Organization and Operation*, one of the U. S. Army in World War II series. This article, *The Magnitude of the Task*, describes the background of the transportation problem in the recent war.

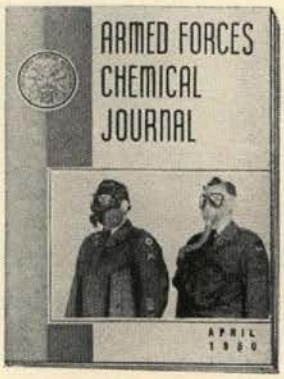
THE MILITARY ENGINEER has an article *Korea—Scene of Action*, that digs into some of the critical background on roads and bridges, water supply and sewage disposal, electricity, fuel, construction, labor and their relation to the occupation prior to the conflict. There is also *Highways for Progress and Defense* by A. C. Clark of the Bureau of Public Roads, a story on our road system over a period of years.

THE QUARTERMASTER REVIEW for July-August, running to a whopping 152 pages, covers in its lead article the Air Force end of logistics. There is an interesting article on the C-124 Globemaster, which figures in air transport as well as air supply. Several other articles go into the details of Logex 50, the recent logistical exercise held for the benefit of Quartermaster personnel.

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

The September issue of the NAVAL INSTITUTE PROCEEDINGS leads off with an article on the Mediterranean Sea, titled *Sea of Decision*, and a most timely item now when we must not take our attention away from a critical area when things are happening at the other door. There is a *Report On China, 1950* by Capt. C. D. Smith, who was on the scene there at the time of Shanghai's occupation by the Chinese Communists.

ORDNANCE for September-October has a lead article by Maj. Gen. J. F. C. Fuller, the British military analyst, on the subject *Why World Wars?* On the basis that war is an expression of civilization, and civilization is changing, Fuller feels that preparations for war must change. He feels that the anti-Communist nations must add psychological attack to their economic defense to be successful against threats to liberty. ORDNANCE also carries an *Evaluation of Armor* by a French Armored Cavalryman.



The quarterly publication of the ARMED FORCES CHEMICAL JOURNAL, the July issue, has an article on *Atomic Energy Indoctrination Training in the U. S. Army in Europe*, by Col. D. H. Hale. There is also another article by the same author on *Physics in the USSR*. Leland Doan, President of Dow Chemical, is author of another piece titled *12 O'clock Noon*.

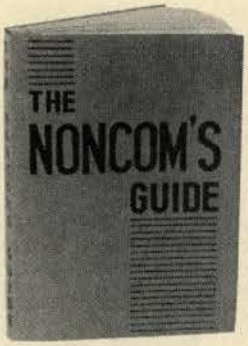
In its Summer issue THE MILITARY CHAPLAIN carries a roundup of the Annual Convention, with excerpts from addresses of speakers and from messages. Two of the items include the addresses of Rabbi Solomon D. Freehof, titled *This Downhearted World*, and Dr. Mordecai W. Johnson, President of Howard University, titled *America's Religion and Its Negro Minority*.

The September issue of MARINE CORPS GAZETTE has a feature article on *A Soviet Satellite* by Sqdrn Ldr John Gellner, RCAF, in which Czechoslovakia is the center of attention. Another article by Lt. Col. J. D. Hittle, based on his book of 1949, concerns *The Military Commissar—An Enigma*. There is also an article on *The Problem of Post-war China* by Bertram Vogel. And in an area where increasing thought is concentrating, an article on *Atomic Bomb In Tactical Warfare*.

THE NATIONAL GUARDSMAN Magazine is interested in mobilization in its September issue, covering the subject in a Washington Report and on The President's Page. Picking up from the August number is Part II of Lt. Col. Peter O. Ward's piece *Let's Give The Queen of Battles A Better Break*.

THE RESERVE OFFICER heads into the big bugaboo of the day with a lead article by a former Estonian Army Officer named Arnold Purre, titled *I Saw My Country Sovietized*. There is also a roundup of legislation and an article by Col. William Gross on ground support in the *Jet Era*.

AIR FORCE, in its September issue, embarks upon a series of questions which add up to the ultimate in questions, *Where Do We Go From Here, Boys?* The article concerns the effects of the Korean war on strategy of intercontinental war, the aviation industry, raw materials and so on. There is another piece on the Strategic Air Command's *"Flyaway Kit,"* the Mobility Plan of fast action.



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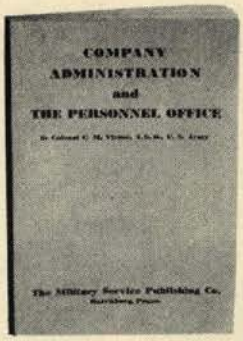

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by Col. C. M. Virtue
A.G.D., U.S. Army

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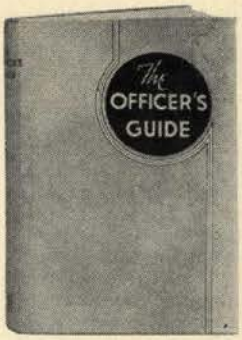

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EVERY OFFICER, SOLDIER, AND CITIZEN SHOULD READ THIS BOOK

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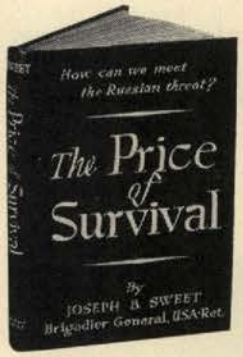
*A clearly marked course to avoid the mounting Communist threat.



THE PRICE OF SURVIVAL

By Brig. Gen. Joseph B. Sweet, USA-Ret.

Today we stand face to face with the military colossus of modern history, knowing that he has the intent to destroy us. The chances of total war are high, and mounting. The issue before us is no less than life or death. The threat of total war is so great, and the destructive power of new weapons so terrible, that American citizens are bewildered and seek a clearly marked course which will avoid the desperate and growing dangers which lie ahead. This they find is THE PRICE OF SURVIVAL.

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by Toshikazu Kase

American-educated Toshikazu Kase—twenty years in the Japanese foreign service, friend of the U.S. and opponent of war, close associate of Prince Konoye, Matsuoka, Foreign Minister Tojo—gives the whole background of U.S.-Japanese relations.

He tells of the secret decisions that were made, the struggles for power that went on inside the Japanese government in the ten years from the "Mukden incident" to the surrender on the deck of the U.S.S. *Missouri*.

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Lee Miller, Ernie's closest friend, has written *The Story of Ernie Pyle*. And, in his Foreword, he says, "I come to the stand, in this chronicle of his life, as a biased witness, since he was my friend for more than twenty years, during the greater part of which he worked under me. It may be that I have been overscrupulous in trying, because of this acknowledged predilection, to keep out deductions of my own. But it has seemed preferable to let the story tell itself, as far as possible, through the letters and recollections that a number of his friends and kinsmen generously made available."

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FROM THE BOOK DEPARTMENT

. . . the story of

a master of mobile warfare . . .

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by Brigadier Desmond Young

With a Foreword by Field Marshal Sir Claude Auchinleck

What begins as a straightforward account of Rommel's youth and of his career as a dashing young subaltern in World War I, ends in Roman tragedy, with a touch of modern Chicago . . . There are many fascinating aspects to this book, but not the least must be the chance it affords us to see the picture from the other side, to realize how often and how near Rommel himself was to disaster, even to surrender; how he was starved both of supplies and reinforcements and, above all, of recognition of the potential importance of his command . . . The Rommel who emerges from Brigadier Young's book is a professional soldier, who fought for his country with single-minded if somewhat narrow purpose . . . a man of iron will, iron nerve, and iron physique, with fantastic powers of endurance, and yet not lacking the common touch.

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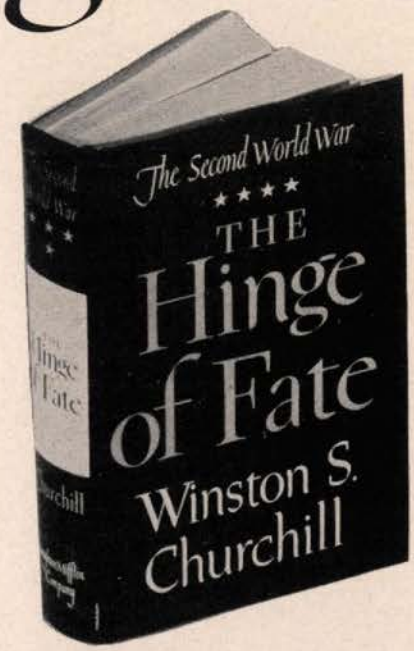
ARMOR

A STORY TOLD

NOVEMBER-DECEMBER, 1950

★ ★ ★ ★

THE Hinge of Fate



Winston S. Churchill

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FROM THE BOOK DEPARTMENT

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ARMOR

Continuation of THE CAVALRY JOURNAL

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CIRCULATION
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BOOK DEPARTMENT
Mildred F. Puterbaugh

ASSISTANTS TO THE EDITOR
M Sgt. J. William Joseph
Sgt. John A. MacDonald

Volume LIX NOVEMBER-DECEMBER, 1950 No. 6

CONTENTS

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LETTERS to the EDITOR

Men and Machines . . .

Dear Sir:

It was with intense interest that I read what the various fighting men had to say about "What I Want in a Tank." To me they are the men whose suggestions we should seek and evaluate with deep thought and reflection. They are proven representatives of the great army of men who will some day operate great fleets of tanks in bitter combat. Therefore we should continue to listen when they speak and heed their word—or else we may break faith with the backbone of our fighting forces.

To their basic suggestions of courage, speed, power, maneuverability and armament I would like to add my belief that serious consideration should be given to developing a tank gun which is automatic throughout. Its magazine is loaded before departure on its mission and refilled upon return. No human effort should be required to load in the heat of battle. This should be a "push-button" matter. Likewise the tank driver must be brought where he can help aim the gun by placing the tank. Just as a fighter pilot places his plane the driver can place his tank if he too can see the target along with the tank commander. Such teamwork would result in fulfillment of General Crittenberger's often spoken axiom that "a tank victory goes to the tank that gets in the first aimed shot." Carrying our armored force theorizing one step further our armor planners should visualize tank sweeps with fighter tanks—and build around that speed, power, mobility, fire power, surprise, shock and communication.

I compliment you on this new department.

COL. JOHN K. WATERS
West Point, N. Y.

. . . Machines and Men

Dear Sir:

It has occurred to me that ARMOR and the Armor Branch may be making a mistake in their apparent total emphasis on the machine with a concomitant neglect of the man.

The problem of man and machine is an old one. In our industrial development initial emphasis was placed on the machine. Today, however, one finds that the operator (man) has become a very important part of the production team. Much research has been and is being done on selection, training, and placement. But what is the case in Armor and its publication ARMOR? One would get the impression that they have yet to fully realize the potential reward in personnel research.

I am sure you will agree with me that not every soldier can be a good "tanker." Nor can every tanker be a good gunner or tank commander. Have we spent one-tenth as much time on personnel research as we have on machine design? When I say research, I mean research by qualified investigators utilizing sound experimental techniques.

As an example of the differences that will be found among even highly "selective" men, and how to discover these

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Advertising: ARMOR is the professional magazine of the United States Armor Association; a nonprofit, noncommercial educational publication. We DO NOT accept paid advertising. Such advertising as does appear in ARMOR is carefully selected by the Editor and concerns only those items which may be considered an adjunct to a professional career.

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.

differences, look at pages 22-25 of the September-October issue. By an analysis of these personal documents any one of us could place these men on a continuum of "aggressiveness." That's just one of the many systematic approaches that could be made to the problem of the right man for the right machine.

N. B. WINSTANLEY, JR.
West Lafayette, Ind.

• *Personnel research is a fundamental of administration in our armed services. From the Committee on Human Resources of the Research and Development Board on down through induction and processing centers and through final assignment at squad level, personnel problems are major items. All along the path to a man's assignment there are way stations concerned with his maximum use based on capabilities. ARMOR agrees with Reader Winstanley that not every soldier can be a good tanker, nor every tanker a good gunner. On the other hand, ARMOR points to the identical article as proof that these men constitute a continuum of effectiveness, the result of sound personnel management in putting the right men in the right assignments. ARMOR also feels that it has demonstrated its interest in the man by making available its pages as a medium of expression for, by and about men.*

Induction, processing and training centers are personnel research centers. Among our most qualified investigators are the squad and platoon leaders and company and battalion commanders who work at first hand with the man. *There is the level where we fit the man to the machine.*

Something on Red Armor

Dear Sir:

I would like to request a special article in ARMOR. In one of the next several issues could we possibly have a detailed description of the Russian tanks now being encountered in Korea?

Specifically I would like to see pictures of the different types of tanks, along with the details on muzzle velocity of their guns, the weights of the projectiles, the thickness and type of armor, the weights, the horsepower of the engines, the ground pressures, and any factors affecting agility or mobility. And, of course, a description of the communications facilities.

In addition, could we have some information on the antitank weapons being employed?

CAPTAIN JAMES M. HUDDLESTON
Fort Riley, Kans.

• *Reader Huddleston will be glad to know that we have several contacts on the scene in Korea, and hope to present this material in a coming issue. Meanwhile, there is much value in the material in this issue along the lines mentioned, and the Garrett Underhill series on* The Story of Soviet Armor *in previous issues gives much of the detail on the Russian T-34 tank—backbone of North Korean armor—lacking only such information as may still be classified (see index for 1950 on page 62).*

* * *

ARMOR appreciates letters of comment with thoughts on published articles, or ideas for other articles. Let us hear from you.—THE ED.

THE COVER

In the last few years our tank program has been in a postwar slump. Whatever else may be said about it, Korea provided the necessary shot in the arm for armor. A glance at the selected headlines which make up the cover montage shows a story. That story is the recognition of the place of the tank in war, along with the inspiration for a realistic tank program, which fortunately is now under way.

reconnoitering

NOT long ago a disappointed author whose manuscript we had rejected suggested that we could go begging for his subscription until such time as we saw fit to carry out the announced purpose of our publication—of offering material ". . . representing the personal views of the author . . . published to stimulate interest in, provoke thought on, and provide a free forum for the decorous discussion of military affairs."

As we recall his article, we could agree that the views expressed were personal (nobody could have shared them); the article was certainly provocative (and how); and this is certainly a free forum for discussion (not cussin'). Somewhere in there the qualification ended. However, the outcome of the rejection, in combination with a number of other things from other places, left us in a thoughtful mood. Apparently the moment was at hand to say a few things, to set some people straight.

IF you look at our reason for being, you will find that this magazine is intended to further the aim and purpose of the Association, which is "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, the point of control for the above, so far as the magazine goes, is the Editor. He's the person who must hold the line from all sides, to assure that the magazine reaching the reader is objective and worth while, and that it serves a real purpose. He must set the standard and rule on his product from start to finish. With that in mind, here is a review of some ideas which may help if you intend to "hit" ARMOR with material for consideration for publication. Some of these thoughts have a connotation more peculiar to the military than the commercial publishing field. Careful review now may save embarrassment later.

WE are not in the business of promoting the careers of individuals through the pages of this magazine, by means of photos, repeated mention, or authorship.

We are not a public relations medium or outlet for any organization or unit or individual.

We are not engaged in the cultivation of those in high places.

It is the quality and appropriateness of an article, not the rank or position of an author, that draws acceptance of a manuscript. ARMOR is not automatically open to anyone.

Material that comes from a personal friend gets a doubly severe screening.

BEING a member of the Association or a subscriber to ARMOR, or a sponsor of promotion, does not carry with it any special privileges such as assurance of publication of your writings.

We are not a mouthpiece of official policy.

This is not the source for personal crusades, for recrimination or for moralizing.

The above are only a few things which need mention. There are more, but these are among the

most important. If ARMOR is to serve a real purpose, these must be heeded. For a service magazine falls in the critical area between purely official and wholly commercial sources, and is an important medium of great professional value. It is not the place for personal interests; it is not the place for teaching technical subjects designed for the FMs; it is not the place for the highly commercial "now it can be told" stuff.

ONE thing that makes this magazine a bit different from others is the fact that we do not pay for our material. So far as we know, we are the only service magazine that falls in this classification. On the surface it may seem that this is a tremendous disadvantage. In some respects that may be true. But the compensation in other areas is much to our advantage. For example, we point with pride to the long series of name authors whose contributions have appeared in ARMOR. They are citizens interested in national defense, and have assisted ARMOR in carrying out a carefully designed program of benefit to military personnel. In this respect, their contributions have been made to a non-commercial, educational publication run by and for military personnel, with an active duty staff. Actually, these contributions could not be bought. The active duty staff, the non-profit organization and the non-commercial aspects with no paid advertising and with notice and sale of educational items for careers only—all of this adds up to something.

OF course, there's more to it than that. The editorial end must be carefully drawn, and the magazine must be worthy of such distinguished company. That is a prime requisite, one which we like to feel is fulfilled.

WE look to balance as a most necessary thing. It is insurance of meeting the diverse tastes among our field. Thus you will find in each issue some general military material, something general on armor, something technical on armor, something historical, something current, something on training, doctrine, organization, something on literature, something on personalities. In the latter instance, we, perhaps more than any other source, make personalities known to you, especially within our field, for, after all, the man is the important cog in the machine.

We recall having mentioned this before, and it will do no harm to repeat it. Remember—we are not a newspaper. We are a long-range magazine outlet. Put your material to this test before you send it along. Will it be of interest and value beyond you and your outfit? Would it be acceptable to readers in Trieste, Fort Hood, Korea, Fort Knox, Germany, Fort Meade, Alaska, Washington?

OBVIOUSLY, if we undertook to publish all of the unsolicited material that comes our way we would perhaps wind up pleasing some dozen or so authors on the one hand, while on the other hand we would alienate hundreds of our readers. And we'd have to publish a weekly magazine instead of a bimonthly.

If the reasons set forth above fail to convince a recalcitrant few, we must take recourse in one higher authority. That authority stems from a source which must be final. And who, you may ask, is this autocrat? Why, you must have guessed! Yes, of course . . .

The Editor

TANKS in KOREA

- *Do U. S. officers appreciate cross-country mobility of tank?*
- *Is our tank-infantry teamwork effective?*
- *Do tanks come in numbers—or in units?*
- *Is every soldier a tanker?*
- *Should Armor have "ground crews" for maintenance?*
- *What is the best system of battlefield recovery of tanks?*
- *Has the rocket firing airplane spelled the doom of the tank?*
- *Has the super bazooka spelled the doom of the tank?*
- *How are our communications working?*

by LIEUTENANT COLONEL GEORGE B. PICKETT, JR.

BEFORE the North Koreans jumped off and started the present fighting, the terrain estimates by most of our officers indicated that large-scale tank operations in the rugged Korean terrain were next to impossible. In spite of these estimates the NKs spearheaded their drives with tanks, specifically the T-34/85. Not only were they successful; but they drew the remark from one of our General Officers that "they don't go anywhere without their tanks." Subsequent events certainly proved the accuracy of his statement; for after the NKs ground the last of their tanks to bits trying to force the Naktong, their later attempts to secure Pusan by massed infantry attacks, similar to the old Jap Banzai, failed miserably. Also it was only after the UN forces achieved armor superiority that the September break-

out from the perimeter was a possibility.

One of the first lessons which can be learned from tank employment, both friendly and enemy, in Korea is the lack of appreciation on the part of the average American officer of the cross-country mobility of tanks. On numerous occasions, even after the NKs had overrun the bulk of Korea with tanks, U. S. Officers insisted that our tanks could not maneuver through the rice paddies, couldn't climb the hills, and were restricted to roads in a country where there are only a few roads, most of which are very poor. This is the same lack of appreciation of tank mobility that led to both German breakthroughs in the Ardennes.

When Task Force Dolvin made its magnificent breakout from Chinju on September 26th, the route from Chinju to Hamyang to Namwon was a defile through high mountains almost the entire 65 miles. The road meandered along steep slopes and wound its way through the edge of the Chiri-San, the highest mountain mass in South Korea. The twisting road and commanding ground gave the NKs every opportunity to mousetrap the column; but by sheer determination and good leadership, Dolvin got through to Namwon and broke the back of the resistance in the 25th Division zone. The actual loss in tanks is still classified information but it was amazingly small.

TF Dolvin consisted of the 89th Medium Tank Battalion (– 2 companies, which left two in the task force), two rifle companies, a heavy mortar platoon, and a platoon of engineers. The infantrymen rode on tanks except when actually fighting.

Armored reconnaissance units also displayed their versatility in operating over adverse terrain. Task Force Torman of the 25th Division, consisting of the 25th Recon Company and a depleted light tank company, broke out southeast of Masan on September 24th and in 36 hours, drove 40 miles to seize the ford across the Nam River at Chinju. It was Torman's rapid drive which set the stage for Dolvin to take over and complete the run from Chinju to Namwon in 48 hours. Later TF Dolvin advanced on up to the Kunsan-Iri area, but this phase was an anticlimax, for the rugged terrain of the Chiri-San ended at Namwon. Rugged terrain and a determined and well equipped foe can make tank operations in the mountains extremely difficult, but not impractical. On the other hand terrain alone will not protect us from enemy armor.

The second lesson learned from the recent operation is the necessity for teamwork between infantry and tanks. Not all tank employment in Korea was as well planned and conducted as the operations of Dolvin and Torman. Unfortunately the tried and tested doctrine of infantry-tank teamwork so laboriously developed at Knox and Benning during the past five years has not permeated the rank and file of our officer corps. Tankers are still being told that "All I've got on is a field jacket and you are hiding behind 3 inches of steel"; and they are still being sent out by "ones" to "Go shoot up that village." One commander was very vehement about the fact that one of his tanks "deliberately ran over a mine." Still another sent a tank down a road alone and couldn't understand why it never came back. The commander of the advance detachment of a British tank regiment en route to Korea was horrified to find that some of our commanders had put single tanks on road blocks at night without infantry support. So were we! Summed up, these incidents only tend to show that the team concept of infantry-tanks-artillery is not as fully appreciated as it must be.

A detailed analysis of tank operations in Korea by the Chief of the Armored Section, IX Corps.

A third lesson involves a common misconception that tanks are measured in numbers instead of units. On one occasion an order was issued attaching "5 tanks to the —— Infantry Regiment." What are 5 tanks? A platoon? A depleted company? A jackpot strike? Of course the tank battalion commander sent a full strength platoon, but he would have been completely justified in sending any 5 tanks picked at random from his battalion. No one has issued an order (to my knowledge) attaching 203 riflemen to a tank battalion; but by the same token as attaching "5 tanks" to a regiment it appears a possibility. A little research shows that some of our World War I officers became accustomed to "accompanying guns" in France in 1918; there are no "accompanying guns" in Korea in 1950, but tanks have been used as such.

A fourth lesson involves training. Most of the tank units surviving in Korea left the ZI in a terrific rush. When overseas orders arrived the battalions were way below strength and were filled up with men without tank training just to fill up "spaces" for POM requirements. It showed in Korea. What actually happened proved the versatility of the American soldier; but it also cost unnecessary tank and personnel casualties. This condition might happen again. Put yourself in the place of a tank company commander whose gunners have never fired the tank gun, and you are on a ship headed for the Korean police action. You would certainly have had very little opportunity to train after you hit the Pusan perimeter.

A fifth lesson involves maintenance. Actually it fits in very closely with lesson four. Inexperienced crews equal poor maintenance. As a result of experience with tanks in Korea some ordnance officers are thinking in terms of "combat crews" and "ground crews" similar to the Air Force maintenance system. Sounds costly in manpower? Actually those officers maintain that conditions in Korea indicate that such a system would be a saving in manpower and would keep more tanks in operation. Needless to say the terrific demands of continuous combat with limited time for maintenance imposed a real burden on tankers in Korea. For example one tank battalion on October 2d had twenty-six M26s of which only six were operational, the rest were deadlined for maintenance. There were many contributing factors such as lack of time, lack of experienced personnel, and very rugged terrain that taxed vehicles to the utmost. A "ground crew"-"combat crew" system would have kept 13 tanks in operation instead of 6, more than twice as many. Compute the cost of tanks, add to it the man-hours lost from inoperative equipment, the cost of tanks lost purely due to inadequate maintenance, and the reduced combat

Lt. Col. George B. Pickett, Jr., has been a regular contributor to ARMOR. He is Chief of the Armored Section of IX Corps in Korea, where he has been on the scene since mid-August.

efficiency of the unit and you can visualize the necessity for improving the present system of maintenance. The writer believes that one ground crew for each combat crew is an impractical luxury.

Still another small group of tank and ordnance officers believes that the best way to render ordnance maintenance support in terrain such as Korea is to employ mobile ordnance maintenance teams along the axis of advance to repair the tanks in place. This system requires some heavy equipment but has the advantage of not blocking roads with heavy retrievers. Battlefield recovery of tanks in southwest Korea was a tremendous problem. The necessary ordnance companies and retrievers were available but couldn't be used for they would have blocked the MSRs. This problem existed, of course, since almost every passable road became a division MSR. Another real problem in battlefield recovery was the inability to leave crews with disabled tanks. For example, in TF Dolvin the rate of advance was so rapid that the TF was miles away from each disabled tank in a matter of minutes or hours. The surrounding hills were still full of NKs, making it foolhardy to leave a group of five men with a broken-down vehicle. As a result the follow-up echelons of Americans stripped the disabled tanks. Our Army still is full of souvenir hunters. It's probably a national tradition; but it's rough on a battlefield recovery system.

Great publicity has been given to the effect of the Air Force on the NK armor. Of the estimated 300 NK tanks at the outbreak of hostilities, over 80 of them were destroyed by the Air Force alone! The Air Force did prevent the NKs from moving tanks in rear areas during daylight. However, we can learn lesson number seven from the NK tanker. He became very adept at camouflaging his tanks by day in roadside hovels, in tunnels, in villages, and by using numerous other stratagems. He kept his losses from air attack down much lower than did the Germans in World War II. In one ten-day period for a given area our Air Force claimed thirteen enemy tanks definitely destroyed. The only two NK tanks found in that area when overrun during the recent UN offensive were two T34s knocked out by the 89th Tank Battalion, 25th Infantry Division. Maybe the NKs bothered to drag off the 13 hulls and hide them. Air power can immobilize tanks in rear of the actual area of fighting; but to say that "The rocket firing airplane spells doom for the tank," as recently intimated by one of our leading scientists, has been proven wishful thinking by events in Korea.

Lesson number eight is the effectiveness of the 3.5-inch rocket launcher on enemy armor. The shaped charge does present a real problem to the tank designer. However, the "super bazooka" is super mostly for infantry morale. The ballyhoo surrounding the "super bazooka" did have the effect of giving our own infantry a greater sense of security when facing enemy armor. To illustrate this point, the IX Corps surgeon was riding the hospital train from Miryang to Pusan after the attempted breakthrough by the 105th NK Armored Brigade near Changnyang. One young soldier was recounting his recent combat experiences, and as usual the discussion settled on the weapons that the average doughboy fears most—tanks and mortars. The young soldier beamed; "Well I know of two tanks that won't bother nobody any more; I got one and my buddy got the other." The surgeon asked him how he destroyed the tanks and the quick reply was "With a super bazooka." However, continued questioning showed that the two NK tanks had been driven off the road into a gully by tank fire from an American M26 and were unable to move because of the presence of U. S. tanks. In addition the NK tanks were operating without infantry support, as they so often did, enabling our two doughboys to crawl up to the edge of the gully and let fly at point-blank range. Doesn't FM 17-33 say "Infantrymen armed with rocket launchers assist tanks in destroying enemy armor when terrain permits"? What the man was describing was a bit of good-but-accidental infantry-tank teamwork.

The super bazooka does have the wallop. However it still has a low muzzle velocity, a high trajectory like a short-range howitzer, and the resulting inherent inaccuracy. The NK infantry-tank teamwork left much to be desired; and many tanks knocked out by our bazookas would have been saved by the presence of supporting infantry. Our FM 17-33 states that "The infantrymen of the team protect the tanks from enemy personnel armed with rocket launcher type weapons." The enemy could have profited by this doctrine in Korea.

The difficulty of FM radio communication in high hills and mountains was brought home as lesson number nine in Korea. As a result of these communication difficulties, CW sets were placed in the tank company headquarters sections to provide AM communications. Radio communication in Korea is a function of the SCR 506 unless all of your tanks are in the same defile or valley.

There are several other miscellaneous facts about tank fighting in Korea. The T34/85 is the combat superior of the M24 and M4A3E8; but the M26 and M46 both are superior to the T34/85. Even a good light tank such

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Worthy opponents. An M-26 passes a knocked-out T-34.

Statement on Armor

by BRIGADIER GENERAL RILEY F. ENNIS
INSPECTOR OF ARMOR

Juan Guzman

IT is difficult to define "Armor" but it could well be a mixture of steel, gasoline and daring. Its creators are skilled engineers who work many years to develop its weapons; imaginative officers who train the crews and plan their employment; and men of courage who lead the finished product against the enemy.

The rapid growth and increased effectiveness of this youngest combat arm is directly attributable to men of vision from many nations. Winston Churchill, when First Lord of the Admiralty, started tank development as a naval project when the British Army failed to grasp the possibilities. By 1928, recovering from their initial oversight, the British possessed a mechanized brigade and had developed the technique for mass employment of armor.

Leadership, however, passed to the Germans, who with a handful of "evolutionary pattern" divisions rapidly overran Poland, Western Europe, the Balkans, and most of European Russia. Rommel, that wily tactician, used the desert as a great chessboard when armored armies met for the first time in history. He added intriguing chapters to the thin book of armor employment, even while operating with greatly inferior numbers. In Europe, in 1944 the Allies used large masses of armor, supported by tactical aircraft, for lightning-swift smashes which penetrated far into the vital rear zone of the enemy.

This skillful use of tanks in World War II restored mobility once more to the battlefield, resulting in a state of fluidity equalling that established by the Mongol Cavalry of Genghis Khan in their relentless sweep through Asia and Eastern Europe. The individual courage, initiative, and dash exhibited by those superb horsemen has been bequeathed through the centuries to the cavalrymen of the American Army and finally to the tankers of today.

The pendulum of armor employment theory has swung from the World War I view that it was only an infantry support weapon to the early World War II concept of armor as an independent entity. Now it is between both extremes largely as a result of increased antitank resistance and the near equal strength of opposing armored forces. The so-called European "Armored Armies" have faded as have the armored corps, and their units have become more closely integrated with the other arms.

Today, each United States infantry division has its own tank units while the armored divisions have been strengthened and made more self-sufficient. Armor now forms a hard core in our Army which extends in depth through all of the major tactical units. With this close integration it was logical that a new arm be created—Armor. It is a concrete symbol of armor joining the infantry and artillery as an equal partner.

The new arm includes personnel from the infantry and artillery, joined to the cavalry, who have merged their traditions and heritages to develop newer and better doctrines and techniques. The infantry-armor-artillery combat team with supporting services is a complex tool and if it is to be used skillfully, the officers of the other arms must have a firmer appreciation of the role of armor and the techniques of its employment. Conversely, it is equally important that Armor officers have a similar appreciation of the other arms.

In the future, it is entirely likely that more powerful antitank weapons will make their appearance, but it is more than likely that they will face much-improved tanks. A major breakthrough will be accomplished by proper coordination with the other arms and tactical air, while exploitation will not depend upon the ability of one arm but upon the ability of *all* arms to work and fight together.

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as the M24 cannot support infantry when outgunned and outarmored by enemy tanks. This situation existed when light tank companies came from Japan to Korea early in July and were used as regimental tank companies. The net result was almost complete destruction of those light tank companies. However, when used to serve the purpose for which it was intended, the M24 was an excellent tank. For example TF Torman made its 40-mile dash with M24s on a security mission which developed into a flanking sweep.

As always there will be conflicting views and opinions coming out of Korea. The views in this article are a consensus of the majority of tankers contacted by the writer, along with personal observations from early September to the completion of the breakout in early October. Each official report, wild tale, story, gripe, and complaint has been evaluated using the well-known G-2 system of evaluation and creditability of the source. Knocked-out tanks, both NK and UN, have been examined for causes and effects, and the tactical operation analyzed. In spite of most adverse conditions, tanks made the difference in Korea.

Is the tank subject to continuing improvement? Do its characteristics originate with the user? Are we receptive to new ideas? What about liaison with industry, testing, costs? The Chief of Procurement in the Office of the Assistant Chief of Staff, G-4, discusses some of the fundamentals essential to

Effective Development and Use of Armor

by MAJOR GENERAL JOHN K. CHRISTMAS

AS the readers of ARMOR have been, and are continually being, fully informed as to the tactical use of tanks by many officers with outstanding combat experience, this article will not attempt to touch that subject. Further, with respect to the types of tanks and other armored vehicles with which the United States Army is currently equipped, is producing, or is about to produce, not only this magazine but the rest of our excellent and very free Press is continually giving the Public all the information which is not classified. Therefore, I, because of twenty years' experience in the design, development and production of armored vehicles, intend to discuss some things about which I presume to know something. I intend to treat of certain fundamentals which are considered essential to the most effective development and use of armor in our Armed Forces.

However, before considering these fundamentals which I believe are essential, I think we should consider whether armor has a future and what that future might be. I say this because my friends, knowing my interest in armor, joke with me about the tank being obsolete. Here we are, of course, in the realm of speculation, prophecy and inductive reasoning. The reader knows that there already have been expressed many differences of opinion on this subject in the public press. Therefore, please bear in mind that this forecast, as well as the rest of this article, represents my personal opinions and in no way are these the official Department of the Army policies.

My view may be very simply expressed as follows: *Armor* (and this includes tanks) *is here to stay as the backbone of our ground fighting forces.* Further, *its use will have to be expanded* because of our relative inferiority in manpower to our potential enemies. In this regard we are somewhat likely to be misled by our own semantics; that is, we have come to use the easy term "armor" as a handy term for all tanks and related tracklaying vehicles carrying guns and/or armor. Actually the more descriptive, inclusive and original word for the concept we are discussing is "mechanization." But it is a long word and we seem to have dropped it. The older reader will recall that this was the word used in the 'twenties and 'thirties for the concept which is now embraced by the shorter and much handier word "armor."

If we consider that what we are talking about is a track-type vehicle which will transport any weapon, its ammunition and its crew substantially anywhere on land, it can be seen that the concept of armored vehicles is as fundamental to land warfare as ships are to warfare at sea. Adding to the tracklaying motor vehicle—which can move substantially anywhere on land carrying a weapon of any sort, and its crew—the idea of giving the crew as much armor protection as practicable, we are back to the more modern name "armor." However, the armor might very well be, and usually is, third in importance; that is, armor comes after the choice of a weapon and the choice of a vehicle properly to transport it.

The fact that there exists on the modern battlefield a weapon (or several) which will penetrate the armor of any given vehicle does not in itself vitiate the idea of the armored vehicle, because protection is entirely relative. At one end of the scale the infantryman, except for the partial protection of his steel helmet, is entirely unprotected on the battlefield when he is moving, *i.e.,* attacking. Similarly, at sea no armor is carried by a destroyer, and in the air few, if any, airplanes carry any armor. Still all three of these classes of fighters do go into battle, do often succeed, and many survive. At the other end of the scale of protection it will probably never be possible to apply much armor plate to an aircraft; a battleship can carry a considerable amount of protection, but the land vehicle has the greatest advantage. Provided funds are available, technical knowledge now exists to build tanks with a very high degree of protection, and a much higher degree of protection than any that have been built to date; that is, if there be a tactical need for such tanks.

The next subject that comes to mind, with respect to the future of armor, is whether there will be developed weapons of such high penetrating power that the armor of an ordinary tank can readily be penetrated by a weapon *carried by an individual enemy soldier,* or otherwise widely dispersed on the battlefield. This problem is exactly comparable to the competition between the ships and the torpedo. While most ordinary vessels,

including many naval vessels, may be sunk *by one well-placed torpedo shot,* it is a matter of record that a combination of tactics and of defensive and offensive measures on the ship have made it possible to date for the majority of our ships to cross the oceans in war without being sunk. I therefore think it possible to decrease the vulnerability of our tanks to new weapons, such as "hollow charge" projectiles, by developing new tactics and new designs. This leads me to think that, just as our Navy, according to the Press, gives major attention to measures to defeat enemy submarines, we must pay heavy attention to measures, both tactical and technical, to defeat all new antitank weapons, including those using "hollow charge" ammunition. To me, the alternative is to accept a stalemate on the battlefield of the future, because if both sides employ hollow charge weapons and no effective countermeasures are developed, then offensive warfare employing "mechanization" will be impracticable.

Since in any prolonged war we would be outnumbered in manpower but would have eventual production superiority of munitions, including armor, it is my opinion that the defeat of the hollow charge weapon is of much greater importance to us than to our potential enemies. The war in Korea to date has certainly shown that the enormous manpower of the Orient, with only limited mechanization, can only be defeated by the West's quantitatively inferior manpower through the widespread use of mechanization, including armor. In this connection it should be remembered that while an enemy infantryman can readily penetrate the armor of one of our tanks by getting very close to it with a hollow charge weapon, he can just as readily wreck with one such shot any piece of our artillery if he gets equally close to it with a hollow charge weapon. The hollow charge is not only the enemy of the tank *but of all forms of machinery employed on the battlefield.* I therefore conclude that our collective major problem is to devise means, both tactical and technical, with which to defeat or curb the effect of hollow charge weapons, in order that America's enormous technical and production superiority may continue to count on the battlefield, as it has in the past.

The first fundamental, which should always be borne in mind, is that the tank is not only an extremely complex mechanism, but is, like the airplane, continually subject to improvement. Since the inception of its use by our troops in 1918, the design, development and manufacture of tanks have largely been a matter of a series of uncoordinated stops and starts in different directions—periods of feast and periods of famine—both technically and financially.

Let us take a fairly complex item with which we are all familiar, the automobile. Do you think we would have the good automobiles that we have today, at reasonable prices, if the automobile manufacturers had followed the following policies: (a) Did

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Maj. Gen. John K. Christmas, Chief of Procurement, G-4.

not put any automobile into production until it was near perfect; that is, until they had met most of the complaints of the public, which constitute the Service Test Boards in the case of automobiles? (b) If the manufacturers of automobiles had stopped making automobiles actively for periods of five years, or longer? (c) If the manufacturers of automobiles had made automobiles without regard to the ability of the public to pay for them?

All of the above hypothetical questions with respect to our very successful automobile industry have, in the case of our armored programs, been real rather than hypothetical. This was probably because until recently motor cars meant more to most of us than tanks. I conclude, therefore, that to have successful armor for our Army there must be a continuous, day-to-day, year-by-year program for the manufacture of tanks. In other words, and to summarize clearly, we must with regard to our armored vehicles have a small but stable and continuous production program, regardless of so-called yearly "requirements." As with the automobile, it is only by *making* tanks daily and by *using* them daily, year in and year out, that we can achieve in them the same high degree of perfection and reduced costs that we have in many mechanical articles of our daily life, such as the automobile, the electric icebox and the telephone. I consider a corollary to this such a stability of our procurement policies that we may continue to work year in and year out with leading industrial firms in their respective fields in the production and improvement of our tanks and their complex components, such as engines and transmissions.

My second fundamental relates to the military characteristics of tanks. We have long labored under the illusion that the user writes the military characteristics. Then the designer, be it Ordnance or Industry, or both, designs the vehicle to meet the military characteristics. This is absolutely not in accordance with historical facts. In order to prove this, let us look at the airplane. In this case the Armed Forces did not go to the Wright brothers and hand them a set of military characteristics and ask them to develop a flying machine. Rather the reverse took place. The Wright brothers, driven by some fundamental urge of the human spirit, developed a machine that would fly. Later, the Armed Forces, and, it must be said, somewhat reluctantly, showed some interest in the airplane and found some use for it.

With respect to armor, in particular, it is historically demonstrable that armored vehicles were technically available in many cases before most fighting men would accept them. Perhaps one example will suffice. Satisfactory, workable self-propelled artillery was produced about thirty years ago. However, to took World War II to make it generally acceptable to the combat arms, and even today there exists some opposition to this form of artillery. This leads to the suggestion that instead of having all the research and development funds tied to a strict ap-

"Armor is here to stay." Patton tanks in Seoul, Korea.

proval on the part of the customer, a certain amount of it should be expended freely. That is, let it be spent by a relatively few people in the technical services who *may* have that same urge to do something new as in the case of the Wright brothers. If you think this sounds ridiculous, consider what would have happened to anybody who had walked into the Munitions Building in 1939 and asked for money to make a V-2 rocket such as the Germans fired at London. I doubt that any reader will question that the inventor would have been over in the nearest mental ward as fast as the then available World War I ambulance would have taken him there. There isn't much that can be done about this, except to encourage those relatively few and generally younger spirits who, because of some inner urge, have new ideas. This is perhaps particularly important among us military men because the very nature of the military profession tends to extreme conservatism in all directions. This is by no means a new idea, as it was discussed seriously by Admiral Mahan in his classic work *The Influence of Sea Power Upon History* (published 1890), where in discussing new tactics he said: "He will observe also that changes of tactics have not only taken place after changes in weapons, which necessarily is the case, but that the interval between such changes has been unduly long. This doubtless arises from the fact that an improvement of weapons is due to the energy of one or two men, while changes in tactics have to overcome the inertia of a conservative class; but it is a great evil. It can be remedied only by a candid recognition of each change, by careful study of the powers and limitations of the new ship or weapon, and by a consequent adaptation of the method of using it to the qualities it possesses, which will constitute its tactics."

The next fundamental has to do with the reception accorded new ideas, and therefore in part overlaps the previous paragraph. I believe it was Judge Patterson, when he was Under Secretary of the Army in World War II, who stated that an Army officer should not be afraid of anything, not even a new idea. While the Wright brothers were no doubt driven by an intangible inner spirit about which we do not know too much, they were also human, and motivated at least in part by a desire for honor, or even a desire to make a decent living for themselves and their families. Within the framework of the military services the recognition that can be accorded the successful implementer of a new idea is of necessity limited but there are rewards which can be accorded the kind of nonbattlefield courage referred to in the quotation accredited to Judge Patterson.

Adding mobility. In Korea, a 75mm recoilless mounted on M32 vehicle.

Another fundamental is that we must, in the case of armor, have very close liaison with industry. This liaison is important for many reasons, among which the principal ones are the following: (a) Industry operates in a relatively unfettered atmosphere as compared with most military and other Government personnel, so they may be the source of valuable fundamental knowledge not available to the Army itself; (b) Industry must produce these armored vehicles in wartime, and they must produce them quickly and as cheaply as possible. Both quantity production and low cost production are the bases of our highly successful American enterprise system. We can only fully include these important elements in our armored vehicle designs if we work closely with and rely heavily on industry to help us with our programs in peace. While the Army has made great strides in this direction, there is always the danger that this will be lost. It may be because business is too prosperous to bother with Government contracts; because Government contracts in peace are hedged about with so many restrictions, or because individual members of the Army may believe they can do a better job than industry. You may be sure that if we could get three large firms in America to make a certain type of tank for sale to the public the price of tanks would certainly come down remarkably and the quality would improve rapidly. While we cannot create such an ideal situation we can at least point toward this as a goal.

Another fundamental has to do with our pilot model and prototype tests. A pilot model is taken to Aberdeen and subjected to every conceivable abuse that can be thought of, including many to which the tank might never be subjected in warfare. The same pilot vehicle, or another one, is sent to a Service Board where the combat troops test it to see whether it meets their tactical demands. Both of these tests are desirable to a limited degree, but have considerable shortcomings: (a) The test personnel, both civilian and military, become rather expert as compared to the wartime soldier, and therefore they can make a pilot operate where and when the average soldier cannot. (b) The tests themselves are of necessity artificial and hypothetical; they include not only tests which the tank would never have to meet in combat but they omit things which the tank might meet in combat. It is true that we cannot in time of peace even come near duplicating real war because of the casualties involved but we can at least accept the idea that the accepta-

As with automobiles, tank production must be continuous.

Tank operation must be simplified. Tankers can't all be college grads.

bility of an armored vehicle should be judged finally by whether the average soldier can handle it. This average soldier has no test in mind; he is just carrying out a prescribed drill or maneuver. If the average soldier cannot operate the tank, or if the type of soldier that can be made available as a tank operator in war cannot operate it, then the tank is of limited value to the Army.

In the case of a comparably complex item, the airplane, the original solution of our flying service was to have the airplane operated by a group of college graduates. World War II showed that no matter how desirable this might be, it was impracticable to do so. A mechanism as complex and as costly as a tank would justify an operator comparable in intelligence, manual dexterity and training to the pilot of an airplane. However, with the many demands on our manpower resources, both by industry and by the Armed Services, it is not practicable to equip our tank with such crews. Since everything in the manpower problem points to this we should consider designing the tanks for automatic or almost automatic operation. This fundamental has application, not only to the operation of the tank, but also to its servicing and maintenance. A crude and not wholly comparable illustration is to say that a person who has just become interested in photography should not use a five-hundred-dollar Leica camera but should be content with something like a Brownie.

The last fundamental has to do with the cost of our armor. Experience in Korea, as well as our Tables of Organization as revised as a result of World War II experience, indicate that tanks and related armored vehicles will appear, and must appear, in practically all fighting units—as armor, as such, is the backbone of the Army, both in offense and defense. If this be so, then obviously we must have a great many of them. The present cost of tanks is, of course, greater than their cost in World War II because of the general rise in prices. However, by far the greatest factor in increasing the cost of our tanks lies in the addition of complex communications, fire control and other mechanisms. We therefore have the following condition: Since the Congress can give us (in peace) only what the country can afford; and since we can make in war only a given dollar value of tanks, it is for the tactical man to decide whether he can win better with ten perfect tanks per division, or with thirty less perfect tanks per division. If the tanks are to engage in individual gladiatorial combat, obviously the perfect tank with all of the fanciest accessories will beat the cruder and less fancy enemy tank. However, if the enemy has ten crude tanks for every one of our perfect tanks, it is not

Close liaison with industry. K. T. Keller of Chrysler with Gen. Somervell and Gen. Quinton.

unlikely that while our perfect tank is putting out of action three or four of the enemies' crude tanks, the remaining undamaged crude enemy tanks would put our perfect tank out of action. Let us take an extreme case for an example. There can be no doubt that a man equipped with a Garand rifle should be able to do away with an opponent equipped with a bow and arrow. However, if one man equipped with a Garand rifle is attacked by 100 men with bows and arrows it is not unlikely that he will end up dead, with some of the bow-and-arrow enemy surviving. This complex tactical question cannot be figured out by any manual or any mathematics known to me, but it does bring up the question of whether or not we should always consider the unit cost of a perfect weapon in relationship to how many of them we need; what is tactically called dispersion of the weapon.

While we are on the matter of cost, there is for further consideration the fact that it has been demonstrated repeatedly and can again be demonstrated that in the Army, just as in industry, manpower is the most expensive element and it pays to use machines to replace manpower. This question of manpower seems to be very much to the fore in the newspapers and magazines these days and certainly calls for an industrial type analysis of our military organizations in such a way that all costs, both present and prospective, are considered. Added to these tangible factors is the intangible of the high regard for human life and suffering which is embodied in the American tradition and the American spirit, while exactly the opposite philosophy is that of our potential enemies. We have here a potent argument for the more widespread use of armor and other mechanical equipment over and above that of demonstrating a commensurate saving in dollars and manpower.

In closing this article I wish to make it very plain that although the ideas presented here are my own, I do not wish to leave the impression that none of the many questions raised herein are being seriously considered by the Army. In fact, most of these problems are currently being most seriously considered by the Army, and some of them are even being discussed in public, as is our normal democratic way to settle problems. It is my hope that this article will summarize for the reader who has not the time to follow military problems the fact that the Army is greatly interested in and concerned with its armor and is putting a mighty effort into the task of perfecting it.

Expert testing may cover things never encountered in combat.

PORTRAIT OF A SOLDIER

HAMILTON S. HAWKINS, Brigadier General, Retired, died in the afternoon of 19 October 1950 at Walter Reed General Hospital, and was buried at West Point on the following Monday. In the words of the chaplain, thus ended the march of a great soldier. He was a distinguished, kindly gentleman, too, and a devoted husband and father; but of all things he was most particularly a professional soldier.

General Hawkins was never shaken in his sincere conviction that the military profession was the highest to which a man can aspire. The arts and sciences of war were of consuming interest to him, and while he had other diversions (particularly horsemanship, in which he excelled) they were strictly auxiliary matters serving to further the main effort of his life.

He was a student of leadership during a period when that commodity was a neglected art. He preached it, and he most earnestly practiced it. He was steadfast in adversity and disappointment, loyal both to his superiors and subordinates. On the rare occasion that he had to, he was capable of absorbing the goadings of his seniors while dealing fairly and wisely with his subordinate command. In times of difficulty or dissension his course was dictated by his own native integrity, and he followed its dictates without thought of personal loss or advantage.

In the first World War he served with distinction as Chief of Staff of the 35th Division during its period of heavy fighting in September and October of 1918, and for a short time commanded a brigade of that division in the absence of the regularly assigned commander. In these capacities, by his personal example and energy, he contributed greatly to the battle effectiveness of the division in a very strenuous campaign. He was awarded the Silver Star for "gallantry in action and brilliant leadership" near Bauguois, Balny, France. He had won the citation twice previously for gallantry during the Philippine Insurrection, as a first lieutenant.

He was especially devoted to the study and teaching of small unit leadership, and to the principle of the independence of the subordinate commander within the mission of the higher unit. This last we now speak of, somewhat less accurately, as the principle of decentralization of command.

General Hawkins was profoundly interested in tactics, and was convinced that in minor tactics and leadership lay the key to battlefield success. He understood the true value of mobility, and how it might be attained: to him mobility meant quick decisions, quick movements, surprise attack with concentrated force; to do what the enemy does not expect, and to constantly 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. He believed that no leader who thinks or acts by stereotyped rules can ever do anything great, because he is bound by such rules.

He was one of the few who appreciated the necessity for quick recognition of the effect of new weapons on the course of battle, and for consequent changes in technique. He believed that constantly changing, ever-new technique must be reflected in drill; he therefore taught the theory of "drilling as you fight"—practice in type battleplays, which accustomed his troops to at least part of the feel of combat during peacetime training. He attached tremendous importance to the role of the noncommissioned officer, placing heavy responsibilities on his shoulders while seeking always to augment his authority and prestige. These schemes and practices were adopted and followed during World War II by some of our most successful division commanders, who were generous enough, incidentally, to render full credit to their teacher.

General Hawkins' own ability in the art of commanding mobile troops was spectacularly demonstrated shortly after his assumption of command of the 1st Cavalry Brigade in 1929, at Fort Clark, Texas. In a series of two-sided maneuvers against an infantry division he handled his troops with great skill, now opposing the infantry columns with a full regiment and again with a single platoon, while enlivening the situation periodically with a savage attack on the flank or rear of his adversary. In the opinion of some qualified observers, his troopers were prevented from inflicting complete disaster only by the absence of ball ammunition. In these exercises, as well as in others after he succeeded to the command of the whole First Cavalry Division, he gained great advantage from the utilization of highly mobile general staff officers—"gallopers," as he called them—which, operating under his personal direction, carried on the control system made famous in the Civil War by Forrest and Bell. He was thus able to complete in a very few hours division exercises which occupied contemporary divisions for a matter of days. The Cavalry Division became eminently battleworthy, even in those bygone, peaceful times, and although its officers were of a rather strong opinion that Hawkins, on the occasion of actual hostilities, would have expended the division pretty rapidly, they were equally convinced that it would have done a vastly greater damage to the opposition.

It would not be wise to overstate the case, but there is little doubt that some of the spirit imparted by Hamilton Hawkins carried through the years and sustained the Cavalry Division in its magnificent campaigns of World War II, and in Korea. He could impart to his troops, largely through his beloved noncommissioned officers, genuine battle élan. His enthusiasm and devotion, and his profound understanding of military matters, are of enduring influence on the land combat forces of this country.

He leaves behind him a tradition of dash, and brilliance, and gallantry. May we hope for others like him, to carry on the "ever living mission of the Cavalry."

Military History for Commanders

"It is only the pettifogger who fearfully and pedantically searches the pages of military history for forms, but the great spirits discover in those pages the spirit of military history, and it is this that makes it of practical use to them."

by GUENTHER BLUMENTRITT

Trained in the Danzig Officer Candidate Training School, Guenther Blumentritt fought on the eastern and western fronts in World War I as platoon, company and battalion commander. Following postwar service in a volunteer corps in Munich, Saxony and Silesia, he was assigned to the 15th Infantry Regiment. In 1920-22 he attended the War Colleges at Stuttgart and Berlin, and in 1932-33 continued his studies on history, political science and national economy at Berlin University.

Promoted Oberst in 1938, Generalmajor in January of 1942, Generalleutnant in December of that year and General der Infanterie in April 1944, Blumentritt held many important assignments in the late war, including Operations Officer of Army Groups in Poland and France in 1939-40; Chief of Staff of Fourth Army during the drive on Moscow in 1940-41; General Staff Officer on the Army General Staff in Russia in 1942; Chief of Staff West in 1942-44; Acting Commander of XII SS Corps in 1944-45, with the temporary rank of SS Obergruppenfuehrer and General der Waffen SS; Commander in Chief of the Twenty-fifth Army in Holland in March of 1945; Acting C-in-C of First FS Army in April of 1945, and of Blumentritt Army from April to the end of the war.

Introduction

THE ideas presented in these pages are my own personal views crystallized from experience gained in active service from 1911 to 1945, studies at the War College prior to World War I, the three-year course at the Military Academy between the two World Wars, a year at the Berlin University, and two years of service as instructor in tactics and military history at the Military Academy from 1933 to 1935.

Chiefly, however, these views have resulted from experience gained in two world wars, for the military profession is founded on practice which in turn must be based on a firm scientific foundation. The art of military leadership at high level cannot be acquired but it can at least be perfected by learning from experience, by common sense, and by serious study. But for this purpose objective military history is essential, not military history written from a subjective viewpoint.

Great soldiers and military leaders have often emphasized how important the study of military history is for those in high military command positions. Frederick the Great of Prussia and Napoleon I placed special stress on the value of military history.

Let us now examine this value as far as we can do so in a short article.

The Value of Tactical Military History

Tactics is the science of employing troops in battle, in actual combat. Accordingly, tactics depends upon weapons, technology, and the resulting changes in methods of combat. A study of the field of tactics in the military history of all times is of interest to the historian and to the professional officer. From it one can learn how tactics has evolved from the earliest times of antiquity through the middle ages and more modern times up to our present day. It enables us to trace the steady modernization of weapons and the growing range of firearms, and to learn why the principles of tactics and the forms of modern warfare have developed in accordance with the advance of technology. Above all it enables us to learn valuable lessons in the extremely important field of wartime troop psychology.

However, a study of the tactical field of military history is not essential. Its practical value is too low. Why? Because tactics change too rapidly. What was up-to-date in 1914-18 was already outdated in 1939-45, and today, in 1950, tactics has once more changed in many respects since 1945. A study of the battle of Austerlitz in 1805, the battle of Sedan in 1870, the battle of Mukden in 1905, or the battle of Tannenberg in 1914 is undoubtedly interesting, but not very much can be learned from it that would be of practical value in our days. It is only natural that more can be gained from the study of a tactical battle fought in World War I than from the study of an eighteenth century battle.

The Value of Operational* Military History

For the high levels of command a

*In modern German military terminology a clear distinction is made between *Strategy* and *Operation*, strategy involving all political, economic, psychological, propagandistic, etc., considerations and the assignment of strategic missions to the operational level. At operational level all planning is done to bring about a decision in battle, *i.e.*, at tactical level. In this article the term "operational" may be considered as part of the American concept "strategic."—*Translator.*

study of the operational field of military history is of far greater value and also remains more modern. The following are a few examples:

a. The operational plan of Napoleon I for his campaign of 1805-09 is still modern today. Let us in our mind's eye replace the French cavalry and infantry corps with modern armored and motorized divisions! The high level commander of armored forces in 1950 can learn an inestimable amount from these operational campaigns of Napoleon I.

b. The operational military history of the interesting American War of the Secession of 1860-65 provides an abundance of educational examples for training in operational thought and action. The movements conducted by the great generals Lee, Grant, and Sherman could just as well have been carried out with armored forces.

c. A study of the operational military history of the German side in 1914-15 in the East and in 1916 in Rumania is without doubt most fruitful even for high level commanders of our present day.

d. A study of the operational and tactical military history of the German side in Poland in 1939, in the West in 1940 and in the East in 1941-42 provides an abundance of practical lessons. Hence, I consider that a study of the operational field of military history is of far greater practical value for high level command and particularly for motorized forces than a study of bygone tactical battles.

How is Military History to be Studied?

Under no circumstances should an attempt be made to read military history as one would read a detective story in which the reader hopes to find the culprit as soon as possible. If it is to be profitable the study will be laborious. The following is an example: A study is to be made of the operational phase of the history of the German campaign of 1914 in South Poland. First it will be necessary to study the national, geographic, ideological, and economic circumstances existing in Germany and Russia in 1914. Then it will be necessary to acquaint oneself with the political fundamentals of those days. Only after this preliminary work can a start be made at studying the military phase, e.g., who were the top-level leaders on both sides? Von Hindenburg, Von Ludendorff, Von Mackensen, Von Hoetzendorf, the Grand Duke Nikolayevich, etc. What type of character did they have, what were their ideas, their strong and their weak points? What were the troops like in respect to morale, training, armament, etc? What was the initial situation in the autumn of 1914? What was the mission that had been assigned to Hindenburg? Now is the time to close the book; it is essential that at this point the reader himself should endeavor to form his own decision on the basis of the data gathered and to work this decision out in writing. It is in this way that one operational phase after the other must be studied. There is no sense in simply reading how things came about. We know from history how things happened but we wish to teach ourselves and to train our intellects. Unfortunately it is not possible in this short article to outline the technique or the system of this type of study. At any rate military history should under no circumstances be merely read but must rather be studied.

The Dangers of Military History

If wrongly conducted, the study of military history harbors grave dangers. There are extremely industrious officers who study campaign after campaign, from Alexander the Great, through Hannibal and Julius Caesar, Wallenstein and Frederick the Great, to Napoleon I, and all the major wars! They appear to be very learned and cultured, and they impress the layman by their vast fund of knowledge. In the German services I never once observed during the wars of 1914-18 or of 1939-45 that this type of officer did exceptionally well in high command positions. This is so because of the very grave danger that these officers, from their reading of military history, will envisage so many defeats, mistakes, doubtful issues, and so forth, that they will fail to see the forest for

PERSONALITIES IN THE NEWS

To Deputy Secretary of Defense

Hon. Robert A. Lovett

To First Army

Lt. Gen. Willis D. Crittenberger

To Retirement

Lt. Gen. Geoffrey Keyes

the trees. In every situation that arises their minds immediately recognize an apparently similar situation from the wars of the eighteenth century, so that, owing to their wrong method of studying military history, they cannot arrive at any clear-cut decisions. Their wills are paralyzed by thick volumes of wrongly understood military history.

Accordingly, only a few characteristic campaigns should be studied, but these should be studied thoroughly.

The General Value of Military History

For the Scientific Training of Officers

A cultured man must have a good knowledge of history, and a cultured officer, a cultured general, must comprehend the meaning and the essence of military history. There is no longer any such a thing as the "soldier's trade." War and the conduct of war in ever increasing measure call for scientific fundamentals, and these include military history.

For Practical Application

The purpose of a properly conducted study of military history is to train the intellect, to develop the sovereign freedom of thought, but not to teach formalism. There is no such thing as a rigid system, method, or school of thought in operational command. All great military leaders were free in mind and in act. Constantly they produced new ideas, new surprises for the enemy. At no time did they cling to old forms. This can be learned from the operational campaigns of great generals. Above all, however, military history points up the importance of the human qualities, the features of character. War calls for a firm will, great tenacity, a strong philosophy. It calls for men of action and men with an understanding of human nature. All this military history reveals to us in a profusion of examples.

It is only the pettifogger who fearfully and pedantically searches the pages of military history for "forms," but the great spirits discover in those pages the spirit of military history, and it is this that makes it of practical use to them.

Military History as Only a Part of General History

Even the responsible politician must have at least an understanding of military history. Without a knowledge of military history it is impossible to understand general, political history. Cultural, religious, moral, economic, and military history, together with the history of art, combine to form history as such. The soldier is an instrument of the politician, who alone is responsible, and the soldier must therefore be able to think along the lines of his government. However, it is just as essential that the leading politician should learn to understand the peculiarities and difficulties of military leadership. For this reason a good statesman must understand the spirit of military history.

Conclusion

"Military leaders deserve more sympathy than is generally thought. Without a hearing they are condemned by everyone. The newspapers hold them up to ridicule and out of the many thousands who revile them perhaps not a single one knows the first thing himself about commanding even the smallest military unit."—*Frederick the Great of Prussia.*

Marshal Berthier was a very good chief of staff under Napoleon I. Together with his emperor he conducted many campaigns. Nevertheless, he had learned nothing in the operational sense and when alone did nothing but make operational mistakes. Exactly the same thing applies to the value of military history for high ranking military commanders. It is necessary to exercise the intellect in the manner in which it is to think. Modern warfare in particular, with its armored forces operating in broad open spaces, calls for firm, flexible, and bold command. The motors in the tanks run, the motorized units roll ahead; and they do not wait for the hesitant, fainthearted leader. A proper study of military history will lift the veil and reveal that the free intellect, the eternally new idea, is what makes the great general, but never a system and even less so rigid forms..

All photos U. S. Army

To 2d Armored Division

Maj. Gen. Williston B. Palmer

To 5th Armored Division

Brig. Gen. Claude B. Ferenbaugh

To 6th Armored Division

Brig. Gen. Frederic B. Butler

THE FIRST FIVE MONTHS . . . .

ANNUAL MEETING

The Sixty-second Annual Meeting of the United States Armor Association will be held at the Army and Navy Club in Washington, D. C., on Monday evening, 15 January 1951, at 8 p.m.

These meetings of the association concerned with mobile warfare have been necessarily small in past years in view of the assignment of the members around the world. This leaves the magazine as the principal tie. However, it is desirable that as many as possible attend, not only to assure a quorum for the carrying out of business, but to join in the discussion of things of interest to the branch.

Following the meeting refreshments will be served.

With five months of war in Korea behind us, reports are filtering in, lessons are being drawn, the military story is taking shape. Although it is perhaps early to form conclusions, some of the picture will bear a hard look.

From the standpoint of armor, things are interesting. What may we say as a result of Korean action to this moment?

With no idea of minimizing the political implications, intensity, bravery, misery or losses, Korea has been a small war. In comparison with World War II—or any possible general conflict to come—Korea is a back-yard struggle.

When Korea was appraised as "unsuitable tank terrain," the estimate was not entirely wrong against a consideration of the late global war, when armor operated on a grand scale. In that sense, perhaps, Korea is unsuitable for tanks. But along certain lines of employment, armor did well there. In the early stages, Red armor was effective by virtue of the primary fact that nothing was on hand to buck it. In later stages, U. S. armor went far toward turning the tide.

It must be remembered that *no armored division* has been committed in Korea. Battalion units have been supplying the punch, and the action has been predominantly on the platoon and company level, and, by the very nature of things, along lines much different from what we know and teach as the fundamental employment of armor.

It therefore seems apparent that we should judge Korea with great care where armor is concerned. For while we may well become involved in other wars of similar scale, this is by no means the common denominator of war and of the employment of armor. Lessons will be learned, but we should be careful where tactics and doctrine are concerned lest we feel the urge to modify our basic design for a back-yard spat, at the expense of what is required for a major contest on the main playing field.

One of the most valuable areas of study to come out of Korea already appears to be that of tank-infantry operations, and the employment of armor in the infantry division. Some of the comments appearing in a report from a tank battalion operating as a component part of an infantry division are pertinent. The report, prepared under the supervision of Major George R. Von Halban, an Armor officer, represents a consensus within the battalion, based on combat lessons, although not specifically applying to the terrain or military situation in general in Korea. Herewith some quotes:

> There is a general feeling that the word "section" should be stricken from the armor vocabulary. It has done more harm than good. In some instances during this campaign a single tank or a section of tanks (2 to 3 tanks) were given the mission to furnish local security to unit command posts, to guard road blocks or to support infantry in the attack or defense. Thus, single tanks or tanks in small groups are thinly spread over much terrain.
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> * * *
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> Only a certain number of men can be carried on the deck of a

tank. More than once it happened during this campaign that the infantry showed suspicion of mounting tanks; once they were mounted, they overcrowded the entire tank to an extent where the efficiency of tanks and crews was greatly reduced. The next problem was to make them dismount at the proper time when hostile artillery, mortar or small-arms fires landed in the area. The majority kept hugging the tanks; the few who did dismount crawled underneath the tanks, eliminating maneuverability. This faulty procedure was caused through lack of instructions from junior officers and noncommissioned officers and resulted in considerable casualties.

* * *

A combined arms team must have one leader to direct the necessary planning for an action and to be the central agency to coordinate the action.

A contemplated action can be classified by the type of mission, the terrain and the proportionate strength of the personnel involved. Under this assumption it can be said that, normally,

An infantry commander should be in command if a limited objective is the target.

An armor commander should be in command if a distant objective is the target.

* * *

It has been noted in this campaign that many noncommissioned officers of branches other than armor have little or no knowledge of the use of tanks. During times of confusion or when their officers became casualties it was, on several occasions, up to NCO's to assume temporary command of a small unit. Due to their ignorance of basic tactics of other branches of the service, combined operations of this kind were sometimes unsuccessful and resulted in heavy casualties.

* * *

Aside from the normal basic training every soldier has to go through, a tank crew man must become a specialist in three subjects to be able to fill any position of the crew.

a. Tank maintenance (including tank driving).
b. Radio operator (including voice procedure, operation of tank radio sets and 1st Echelon radio maintenance).
c. Direct fire gunnery (including maintenance of tank armament).

To fill these requirements it is believed that a tanker should receive more extensive, longer training than the rifleman of a rifle company. It is further believed that the AGCT score should be raised for draftees desiring service with armor to enable the men to absorb the variety of technical subjects taught by armor.

* * *

The above report, in company with Colonel Pickett's article *Tanks In Korea* (see page 6) and *Tie-in In Korea* (see page 34) represents ARMOR's detailed coverage on American Armor in action today, tying it in with other phases of the armor picture, the whole combining in a story which is perhaps best summed up by our front cover on this issue.

One other factor is dominant in this issue, and attention is invited to the pattern. It concerns the tie between men and machines. This theme is the undercurrent in material from Korea. It is touched upon in Letters to the Editor (see page 2). It comes to the fore in General Christmas' article (see page 10) and crops up in Captain Freedman's piece (see page 42). In some degree it runs through the entire issue. It is important. It deserves the attention of everyone.

SO SORRY

Last year we published a roster of all officers on active duty with Armored Cavalry as a supplement to the last issue of the year. The response was overwhelming, and we decided to make it an annual thing. However, as we went into the preliminaries of the huge task this year we ran into the matter of security, and publication of the roster was ruled out as a security violation. We well recognize the implications in this, and we want to let the readers know that we had good intentions. With Korea still going on we must hold a closer line. Let's hope for next year.

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.

Comments concerning communications, clothing, cavallos and careers.—THE EDITOR.

Shoot, Salute, and Communicate

"Give me some men who can shoot and salute," growled General John J. Pershing when somebody asked him what he wanted most in the replacements for his World War I AEF. Today, Lt. General Walton H. Walker might well change that requirement by making from Korea the more practical, if less euphonious, comment: "Give me some men who can shoot, salute, and communicate"—especially when the infantry in Korea is using tanks for its Sunday punch.

And General Walker might very well insist on this when he gets ready to cock his Sunday punch in the form of an armored division.

There are more radios in the armored division than in any other division in the Army—and there are more radios in an armored division than there are tanks—2,748 radios, 373 tanks; one radio for every 5.8 men.

Why?

A single word will answer. Control.

Without control, you can't shoot. And control in the Armored Division—or any of its relatives, like the tank elements of our infantry divisions committed in Korea—is the quintessence of Armor's battlefield success.

Okay, you say, everybody knows that. What's the beef?

Simply this—Armor's backsliding on training and we're fast approaching a point where, come mobilization, we're not going to be able to shoot because we can't communicate—and even if we can salute, you don't lick North Koreans or equivalent with the hand extended alongside the right eye.

Somewhere, we have commanders marked for failure; the cosmic schedule lists battles that'll turn to routs, and what's worse, there are American soldiers slated for death—all because we aren't training for communications.

How come?

Look at the facts. The Armored School offers a course for communications officers—those key staff officers at battalion and combat command who can translate the commander's tactical plans into unqualified success, because regardless of the factors of training, leadership and fire power, it still takes communications to control the elements involved so that all factors are welded into a useful fighting unit.

Who wants a commissioned radio operator? That's a commander talking. *Why should I go there and spend my time twiddling dials?* That's a lieutenant talking, somebody who's overlooking the fact that communications training—particularly The Armored School's communication officers course—is one of the best career foundations a young officer can have.

Commissioned radio operator? The course teaches only enough key-pounding to permit the graduate to train radio operators without doing it blind. Twiddling dials? Only one-fifth of the course is devoted to instruction on sets.

The course is designed on the basic premise that a communication officer is a staff officer. He is adviser to his commander on communications—on control. The officer that takes this course learns tactics first—he learns the requirements, capabilities, and limitations of tanks, armored infantry, reconnaissance, artillery—everything that the commander has to know. Then he learns how communications equipment as it exists today in the armored division turns tactical elements into powerful battle forces. The communication officer of today has to be a tactician first and a communication officer second.

The course is organized to set up a classroom discussion of armor unit by unit, followed by communication instruction, unit by similar unit. The combination of units into combined arms teams is then taken up—followed by the development of communications support for everything from the reinforced company to the combat command. And it isn't just done in the classroom (though 10% of the course is spent in doing indoor practical work) but the final month of a four-month course is spent in realistic field work, putting communications to work under tactical conditions.

The end product—a Communication Officer 0200—is a well-rounded staff officer, not a high-ranking brass-pounder. He knows organization, employment, concepts, trends, and current doctrine of armor; he has as fine a grounding for a career as a service school can provide.

The trouble?

Not enough people know about the course to let quotas be filled. A single armored division needs two dozen Communication Officers 0200, the type field Army needs seventy-five for its Armored Divisions alone. In the past two years the course at The Armored School—sole training ground for these Armor specialists—has graduated five U. S. officers from the complete course.

What's the answer? What can you tell an officer—an officer in the grade of captain or below with credit for the branch Basic or Associate Basic Armored course who meets the prerequisites of the course, but who says, "Hell, who wants to get stuck in communications?" Can you tell him that 25% of the Armored Division Commanders in World War II were Communication Officers at some stage of their careers? That to be a Communication Officer is a sure way to advancement? Maybe, but that's bait—and

negative bait at that. Tell him instead, that communications gives him the training in leadership, tactics, and battle drill that makes him suitable for any job in Armor. Better yet, let Career Management determine the personnel requirements for Armor Communications; let the course of instruction be publicized so that somebody knows the instruction is available. Pass the word that here is a sixteen-week course in command control. If we don't do this, if we continue to fill only one-fifteenth of our communication officer training requirements—there are commanders scheduled to fail, battles to be lost, and American soldiers to die.

MAJOR FRANKLIN M. DAVIS

• • •

Weather Forecast—Cold and Rainy

Whatever became of the old combat suit?

That little phrase asks a question in the minds of about three-fourths of our veteran tankers plus those others who were fortunate enough or energetic enough to procure one during the late war. There is many a smooth, flawless buttock in the Army which might otherwise bear the ugly scars of frostbite but for the efficacy of the combat suit. The jacket has gladdened the hearts of countless people, normally attired in Uniform "S," who have the additional alternatives of freezing with no jacket, shivering gently in a Jacket, Field, M1943, or being grimly corseted in a field jacket with pile liner, complete. Beaten, patched, stained, and obviously ancient, the combat jacket still has a definitely doggy flare—the air (and frequently the aroma) of the veteran tanker. This does wonders for the morale.

In all seriousness, whatever became of the old combat suit? When anyone asks, he is usually told two things. First, large existing wartime stocks were depleted when Fifth Army found it necessary to procure them for the rain-sodden and frozen doughs climbing up the Italian boot. Second, someone decided that the difficulty of exposing the aforementioned flawless buttocks at certain critical times outweighed the other virtues of the suit. The accuracy of these answers is not vouched for by the writer but he wonders whether the trend to layer-type garments is going to simplify or complicate the problem.

The requirements for clothing a tanker for cold-weather operations in the temperate zone are fairly clear-cut. They are not dissimilar to air-crew requirements except that great temperature extremes are not encountered. The tanker requires, first of all, warmth. This can be obtained as it was in the combat suit, by a loose, baggy effect, allowing for air circulation; a gathering at the neck, wrists, and ankles; a layer of insulation, be it spun glass or conventional wool; and a wind-resistant outer layer. The tanker requires a water-repellent garment, obtained by chemical treatment of the outer layer. He requires freedom of movement for he must not only ride in his vehicle but fight it, fight from it, and work on it. He requires clothing which is not liable to catch or snag on protrusions common to the fighting or driving compartments of a tank. Flap pockets, outside buttons, button loops, or individual equipment carried on belts are taboo. He requires looseness so that he can carry a pistol in a shoulder holster *under* his garment, add other warm clothing underneath in very cold weather, and, as is frequently necessary, carry his binoculars under his jacket. If possible, the tanker's clothing should still allow for uniformity and some smartness of appearance. Uniformity alone gives an impression of some smartness. However, clothing issued in many layers inevitably gives rise to a weird assortment of outer garments, particularly in an expanded wartime army. Everyone has seen, at one time or another, sweaters, M1937 field jackets, M1943 field jackets, pile liners with either the pile side or the fabric side out, combat jackets, or cold weather field jackets being worn as outer garments.

It is the writer's contention that the combat suit meets all the above requirements, including that of uniformity. It lends itself to uniformity because it includes the most convenient and comfortable jacket to wear, one which is not too warm for mild weather but which can protect from the cold, particularly when reinforced by the bib-topped trousers; and it can be worn over almost anything, but nothing can, with comfort, be worn over it except the field coat, and that is perfectly acceptable. It has other merits, too, which deserve consideration. The combat suit presents no intricate fitting problem because, due to its nature, four basic sizes are sufficient for any normal body of troops. It is certainly no more expensive to procure than present garments and should be cheaper (fewer sizes, no buttonholes, etc.). Lastly, based on the experience of Fifth Army, it should be an ideal winter garment for all types of troops. (It is rumored that tankers aren't the only people who get cold and wet in the field.)

There is one further characteristic, desirable but not essential, which could be included in any new development along this line. The outer fabric should be OD, shade 51, to harmonize with the oil and grease stains it will inevitably acquire, and the fabric should be nylon, which would not absorb oily materials. The cleaning problem would thus be greatly reduced.

By the way, whatever became of the old combat suit?

CAPTAIN DOUGLAS G. YOUNGER

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Pardon Me, I Said A Squadron of Horse

War is no longer the nostalgic business of bright battle flags and deeds of derring-do. Neither has it reached the stage forecast by the penny dreadful science fiction writers who see behind every battle a sinister figure clad in a scientist's white smock. Somewhere between the two extremes—and let's give the edge to the scientist—we shall find the battlefield atmosphere of the next war.

That is what is called being realistic about warfare, and talking that way may gain you the reputation of being a hardheaded, down-to-earth modern soldier. Probably such a reputation should be sought by all who make a vocation or an avocation of the business of soldiering in the Atomic Age.

But if realism consists of facing facts then let's face them and not shy away from them because our actions might lay us open to the horrid charge of being a romanticist. Let us not be like the wartime newspaper

caption writer—to do him justice he may have written with tongue in cheek—who wrote under a desert warfare picture that the British had discovered a new method of reconnaissance and had mounted soldiers on horseback to ferret out the location of the enemy.

No, this is not an appeal for the return of horse cavalry to the United States Army. If such a return there ever is it will be under the force of circumstances that are foreseeable only as a remote possibility at the present time.

However, let us admit that despite what *we* do there is a possibility that in the next war a mere horse may have the temerity to poke his nose into the open on some future battlefield.

For years we accepted the highly unrealistic fiction in maneuvers, field exercises and map problems that the enemy was a highly accommodating character known as Red who had organized his fighting forces exactly as our own were organized. This attitude was bashed in the head by the creation of our new maneuver enemy, Aggressor. This innovation has now been tried in field maneuvers and has received the plaudits of all who have had experience with it. In the organization of this problem enemy we have included a certain amount of cavalry, the kind that rides horses.

The wartime War Department pamphlet on the Red Army also recognizes the existence of horse-mounted troops. It tells how the Russian Army employs large units of horse cavalry organized in corps, divisions, regiments and squadrons and which are sometimes combined into cavalry armies. Supported by aviation, tanks and artillery, including rockets and mortars, this cavalry force was effective in large-scale operations over difficult terrain and in bad weather. It was used as a substitute for motorization, not armor, when conditions called for it and often filled a need which could not be met by any other arm. In the extensive areas of Eastern Europe it was often used in mass with decisive results.

We don't have to overwork the crystal ball to surmise that there may be a horse in our future even if we are not riding it. There is no indication that a nation that found horse cavalry of inestimable value during the recent war has followed our own actions in abolishing it. And yet all the horses in our maneuver enemy forces are paper horses.

Doesn't it sound logical and realistic that we include in our Aggressor Army at least a squadron of real flesh and blood horse-mounted cavalry? Certainly it would not wreck the budget. It would make maneuvers more realistic and it would give us a practical yardstick to measure the capabilities and techniques of a possible future enemy in this all but forgotten means of securing battlefield mobility. It would give us a cheap and minimum cadre laid by against the day when we might, in some obscure field of operations, have to use a horse or two ourselves.

MAJOR PRENTICE G. MORGAN

• • •

Something Is Wrong!

You are finished when you have attended the Command and General Staff College, for as a reserve officer on EAD your military schooling is out when you reach that level. Forget about the Armed Forces Staff College, the Army War College, or the National War College, for under the system that has prevailed since the end of World War II, reserve officers are not permitted to attend these higher institutions of military learning.

There is no career management for reserve officers even though they be on extended active duty. This is a little strange considering that there were 2,251 Armor reserve officers on EAD before the conflict broke out in Korea, as against some 1,655 regular officers in the same arm. However, don't blame the officers in the Career Management Group for they are most cooperative and have long demonstrated that they will help you along as best they can. Even if you are just a reserve officer they'll treat you like a professional and go to bat for you—but they operate under the restrictions of an antique policy. It is with the narrowness of that policy that the writer feels he must take issue.

We've had five years of uneasy peace—so uneasy that the army has integrated thousands of officers into the regular establishment and retained many thousands more on EAD. In war there was no distinction. The reserve officers spilled their entrails on the battlefield just as often as the regulars, and in those years of combat there was a policy that allowed both officer groups equal opportunity for schooling. Came peace, with its era of more leisurely and more thorough military education, and your reserve officers were excluded from the higher schools by a policy that has proved utterly unrealistic and out of key with the seriousness of world tension.

If you put it another way, the reserve officers held down assignments which freed the regulars to attend military colleges. There is no harm in this. I won't argue for rewards, but I will argue future needs of the army. Some day there will be complaints from a joint command or staff as to "Why in hell Colonel 'Speed-and-Violence' doesn't know what is expected of him in his job on a high level?" The answer will be that years back when Colonel S&V wanted so badly to go to school, they wouldn't let him. So in war our earnest but militarily ignorant Colonel makes a sad mistake. The monuments to military mistakes by leaders are acres of white crosses.

It is high time that we take note of the word professional. It should be applied to officers of any component who meet the standard. Your field grade reserve officer on EAD today is as much a professional as the regular, granting their years of service are about the same. In most cases they are. Your average reserve officer of field rank has fought in one war—he may be in Korea now—and certainly he stands ready to lead many uncalled men if the crisis widens. Let us term and treat these officers for what they are—professionals. Granted that the perfect peace we seek would result in the unemployment of these professionals, don't believe for a minute that such a peace would relieve all other categories.

The professional army officer isn't necessarily seeking security, or if he was he'd have chosen another line of endeavor. He moves his family, and he leaves his family on sudden call. He is devoted to his military life and knows that he'll probably never own a penthouse. Your nonintegrated professional is certainly in the least secure position of the two groups. In effect the army allows him to "reenlist" by signing a category statement, and even

Radio Club at Norwich

The Signal Corps ROTC unit at Norwich University located in the heart of the Green Mountains of Vermont reports the following progress in signal communications made by the Corps of Cadets of this 132-year-old military college.

During the academic year of 1949-50, the cadets organized the Norwich Radio Club which is now known the world over through the use of their amateur radio station W1QZE. During the past semester, the cadets talked with other amateurs from all states of the Union and some fifty foreign countries. Radio contacts have been made with at least one radio station from each continent. Station W1QZE has scheduled broadcasts with such faraway places as Ireland, England, France, Germany, Italy, Brazil, Japan, Russia and many others.

The cadets have been designated by Headquarters, First Army, Governors Island, New York, as the Net Control Station for the Military Amateur Radio Station (MARS) for the state of Vermont. MARS has served as a means of training the cadets in military and amateur radio operating, as well as serving as an emergency communication system in event of a local or national disaster. The cadets have been glad to help the local civilians during emergencies. Over three hundred radiograms were sent in one week to servicemen through the MARS station.

The radio itself is composed of a high-powered radio transmitter and several stand-by receivers. Antennae are arranged in such a way as to beam radio signals in any direction. The Norwich Radio Club is located in one of the large buildings on the campus. A spacious lounge room is available for study and relaxation. The walls of the clubroom are decorated with colorful amateur cards sent by other amateurs from all corners of the world. The Club's radio shop adjoining the clubroom is used for experimentation in radio, electronics, and television.

Other outstanding accomplishments of the cadets have been the design and construction of television and FM antennae. They are now receiving television from a station some 150 miles away, becoming the first to receive FM and television in this section of the state. Some club members designed and built their own television sets. Others are experimenting with miniature radio receivers and transmitters. One cadet has constructed a radio receiver in an aspirin case and another in a standard fountain pen. Still another cadet built his amateur transmitter into a cigar box. This unit has all the necessary parts for transmitting on voice or Morse code. It radiates about two watts and has been heard by 20 different states at this writing.

Progress is being made toward establishing a broadcasting station on the campus through the use of a carrier system. Some of the universities throughout the country have had much success with this type of training. It is believed that Norwich will be the first small institution of its type to adopt this system.

At present the Norwich Radio Club is composed of some 40 members from the Cadet Corps. The Club itself is operated under the supervision of the Military and Engineering Departments of the school. Det No. 3, 1127th ASU is largely responsible for the success of the Club. Use of the equipment of the Military Department enables members of the Club to conduct experiments in radio, television, and electronics.

SFC Robert D. Sweeney

with this document he can never be certain when he will be relieved at the convenience of the government. Even though he is passing a long interim in the service he has no guarantee of a future in it, but he stays on in confidence and good humor. He is not growing younger, he is losing important time away from his civilian profession, but he is a man who despite the uncertainties and lack of security has confidence in himself. Theoretically, the officer offered the most security and permanence of employment makes the best officer. But does he?

Let us at least compliment this spirit by a little recognition. Regard him as a professional by giving him the military education of one.

For the past few years no nonregular officer of over 30 years of age can be integrated into the Regular Army. An officer beyond his twenties is regarded as too old to become a regular, regardless of what his talent and ability may be. The official reasoning behind this is that the officer will not be able to give the army any great length of service, yet his past years of active service seem to be regarded as so much eyewash. The future is overweighed; the past service ignored. It is understandable that the army cannot upset its long-range program by integrating a large number of aged regulars, but it could gain considerable military talent, and at least improve the morale of the nonregulars by giving them some hope, if a competitive system of integration existed. There is such a program for the younger officers.

The need for reserve officers is growing. Victory is hard and costly to purchase in this age where the implements and technique of combat are intricate and require much in the way of education. Even in the false peace of the past few years the reserve officers have been a large segment of the leadership corps. Now they stand to outnumber the regulars. Are they to be thrown into combat without proper military education? The answer lies in the Pentagon, or perhaps on Capitol Hill.

Lt. Col. Robert B. Rigg

Advanced TANK GUNNERY

by COLONEL LOUIS A. HAMMACK

Tank action is sudden. First-round hits are a key to complete success. If the first isn't "in there" the second one better be—always assuming it can be got under way. Along with such factors as terrain, movement and stabilization, there is an item called teamwork. Tank gunnery is based on teamwork. Teamwork stems from training.

FOR the first time, the Armored School is teaching advanced gunnery methods for the adjustment of direct fire from tank guns. This does not mean that the School has abandoned the other methods of adjusting tank fire. A gunner must, first, learn the preliminary methods of adjusting tank fire; after he is proficient in this, he is then ready for advanced gunnery.

Tank gunnery must be simple. Firing tank guns, in combat, is a race against time; you must shoot quickly and accurately. Therefore, any method of fire that is complicated and leads to confusion among the crew members must be eliminated. The optimum fire power of a single tank can be achieved only through timely, coordinated fire by a well-trained tank crew. Advanced gunnery methods cannot be attempted until this vital teamwork is accomplished.

The objective of all military training is success in combat. To obtain this objective, armor must, and will, play a decisive role. It is most difficult to visualize a war, in the foreseeable future, with an enemy who does not possess armor in large quantities. This armor must be destroyed before we can expect victory. Enemy tanks can be destroyed most effectively by tanks; in other words, it takes tanks to fight tanks. For our tanks to defeat other tanks, of approximately the same capabilities, it is necessary to secure an advantage, and this advantage lies in the ability of our tank crews to deliver more rapid, accurate, and effective fire. To get this most effective fire, we must use advanced gunnery methods.

Preliminary Gunnery

First, let us review the preliminary methods of adjusting direct fire from tank guns. High explosive ammunition is adjusted in a horizontal plane using bracketing procedures; that is, the target is enclosed by bursts over, and short of, the target and the bursts are moved back and forth on the ground within this bracket until the desired effect is obtained on the target. This is done because high explosive ammunition contains no tracer and normal targets are area targets that have little or no vertical profile which makes range estimation extremely difficult. Armor-piercing ammunition is adjusted in a vertical plane by observing the tracer *at the target*. The tank commander notes where the tracer falls short of, or passes over, the target and then gives commands for the appropriate range and deflection corrections to obtain a target hit.

Advanced Gunnery Methods

The procedures used, in adjusting direct fire from tank guns in advanced gunnery, are exactly the same as an experienced tank gunner would use in combat. After the tank crew has been well trained in the basic principles of preliminary gunnery and is proficient in adjusting both high explosive and armor-piercing ammunition, it is ready to learn a method of rapidly destroying an enemy. This is called advanced gunnery or combat firing and is predicated on the fact that the tank commander-gunner team has been adequately developed, and all tank crew members have confidence in their guns, in their tanks, and in themselves. When this development occurs, is difficult to define, but the unit commander, by constantly observing the progress of his unit, can determine when tank crews have reached this state of training.

In advanced gunnery, we are again concerned with the adjustment of high explosive and armor-piercing ammunition. However, the methods of adjustment are exactly the same,

EXAMPLE OF INITIAL FIRE COMMAND

GUNNER
HE
HOUSE
ONE FIVE HUNDRED
FIRE

Fig. 1.

INITIAL FIRE COMMAND

1. ALERT
2. AMMUNITION (Fuze if necessary)
3. TARGET DESCRIPTION
4. RANGE
5. COMMAND OF FIRE

Fig. 2.

Colonel Louis A. Hammack is Chief of the Weapons Department of The Armored School, Fort Knox, Ky.

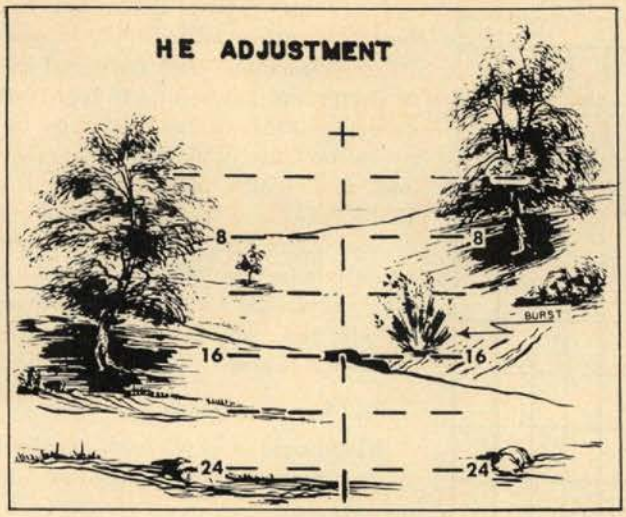


Fig. 3.

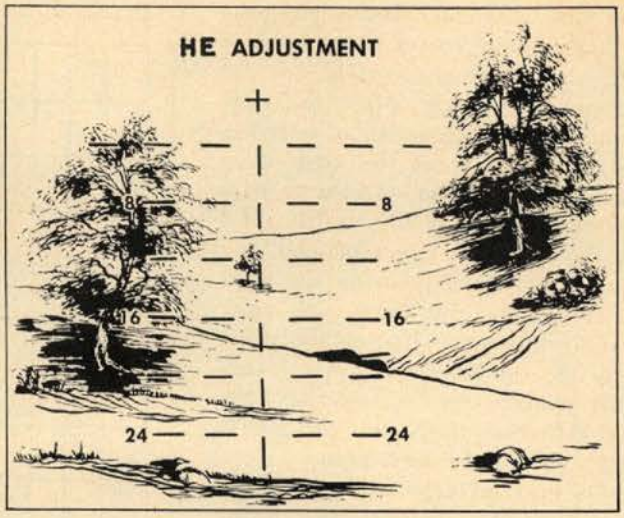


Fig. 4.

with one exception; and that is, in adjusting high explosive ammunition, the gunner observes the burst of the projectile and in adjusting armor-piercing ammunition, the gunner observes the tracer, or the strike of the projectile, if the tracer is not visible, and moves this point on the reticle to the center of the target.

The tank commander gives the initial fire command to engage a target. This is the same initial fire command used in preliminary gunnery except the direction element is normally omitted.

The ALERT warns the tank crew of impending action. The AMMUNITION and fuze element tells the loader what type ammunition will be fired. Normally, the tank commander points the gun at the target by means of his traversing control handle and vane sight. (If the turret is not in power traverse, he must give a direction command.) The TARGET DESCRIPTION element tells the gunner what the target is, and as soon as the gunner picks up the target, he announces IDENTIFIED. The RANGE element gives the gunner the range to the target to the nearest 100 yards. The tank commander gives the COMMAND TO FIRE and then becomes a silent observer. The gunner takes over the firing, observes the bursts on tracer, and applies the necessary corrections to hit the target. He continues firing until he receives a command from the tank commander to CEASE FIRE. The tank commander still has control and supervision of the firing and may, at any time, issue an order or make corrections if he believes the gunner is making errors.

Let us look at an example of an initial fire command to fire high explosive ammunition at a house 1,500 yards away.

Sensings are exactly the same as for preliminary gunner, except they are mental sensings made by both the gunner and tank commander. The tank commander is always ready to correct any errors the gunner makes.

Subsequent fire commands are not used, since the gunner makes his own corrections. If it becomes necessary for the tank commander to make subsequent corrections, the commands are

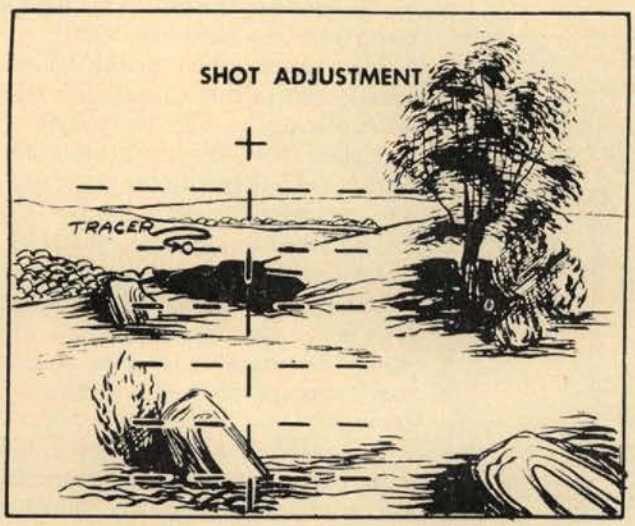


Fig. 5.

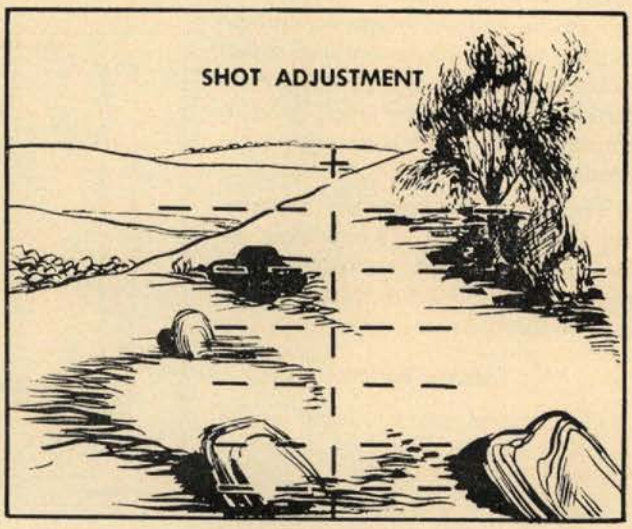


Fig. 6.

the same as in preliminary gunnery.

If the initial round is not a target hit, the adjustment made by the gunner attempts to place the next round on the target without resorting to commands from the tank commander. This method of adjustment is known as "BURST ON TARGET." In the burst on target method, the gunner notes the point on the sight reticle where the burst, or tracer (strike) appears and moves this point onto the center of the target. This shift compensates for both elevation and deflection errors, and will give a target hit on the next round.

The burst on target method is much faster than preliminary gunnery methods, but requires a thorough knowledge and understanding of the sight reticle and extreme care in locating the burst, or tracer (strike), on the sight reticle.

When firing armor-piercing ammunition, at moving targets, the gunner uses burst on target techniques while he continues to track the target.

When firing the coaxial machine gun, in advanced gunnery, the gunner adjusts the fire by observing and manipulating the tracer stream. He does not refer to the sight reticle after sighting the gun for the first time.

Whenever possible, the tank must be positioned so that the gun is pointed to the front of the tank. This presents the smallest silhouette to the enemy and affords the tank crew the maximum armor protection. This is done with voice commands by the tank commander to the driver whenever a target appears. Maximum coordination and teamwork must be performed by the crew at all times. The tank commander must be prepared to correct the gunner, instantly, and direct fire to new targets without delay.

These methods of gunnery, when perfected, will insure target kills in minimum time and ammunition expenditure.

There are no short cuts to training the tank crew. They must be thoroughly trained in preliminary gunnery and trained to work together as a well-coordinated team.

Terrain Board

This method may be taught by the use of a Terrain Board as described below.

A painted 6′ x 4′ board is placed on folding camp tables so that the near edge is about 30″ above the floor and 45 feet from the telescope guard of the tank or tank trainer. The telescope sight of the tank, or trainer, is laid so that the center line of the dash pattern reticle is on the longitudinal center of the board. The rear edge of the board is then raised until the length of the board appears in the sight reticle as follows:

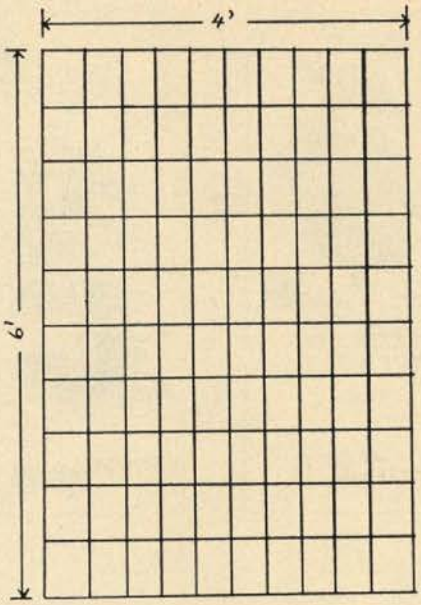
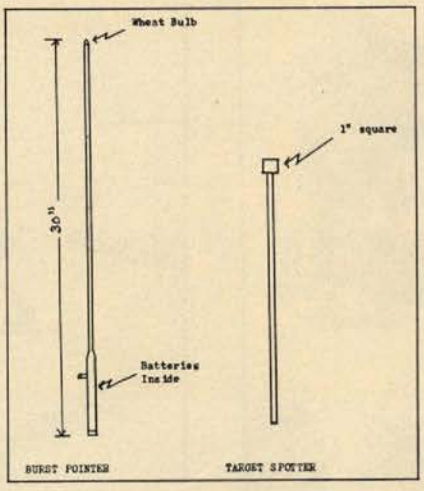


Fig. 7.

For 76-mm or 90-mm gun telescope sights; the rear, or far edge, of the board appears on the 800-yard range line, and the near, or front edge, of the board on the 2,800-yard range line. For 75-mm gun telescope sights; the rear edge appears on the 800-yard range line, and the near edge, on the 2,000-yard range line.



Figs. 8 and 9.

Lines are *lightly* drawn on the board to correspond to 5, 10, 15, and 20 mils deflection, both right and left of center and range lines to represent each 200 yards or range change between the limits of 800 yards, far edge, and 2,800 yards, near edge, of the board. *NOTE: These lines should not be visible through the telescopic sight when conducting the exercise. This is accomplished by rotating the eyepiece of the telescope until the reticle is plainly visible.*

Additional equipment required:

Blackboard 4′ x 4′ with standard dash pattern reticle painted on one side.
Burst pointer.
Target spotter.
Targets. Miniature antitank guns, truck, or tanks, should be constructed to scale.

Conduct of exercise:

The student firing the problem takes the position of gunner in the tank or tank trainer; another student acts as the tank commander.

The instructor, acting as the terrain board operator, assigns a range value of 800 yards to the near edge of the board and 2,800 yards (2,000 yards for the 75-mm gun) to the far edge of the board and designates the target, placing the target on the board at a deflection and range line intersection.

The tank commander gives the initial fire command and the gunner takes the correct sight picture for the command announced. Then, the gunner places the target spotter on the blackboard reticle to show the instructor his sight picture.

The instructor calls, "ON THE WAY," and marks burst on the terrain board with the burst pointer.

The gunner then makes an adjusted sight picture through his telescope, placing the "burst on the target," and again shows the instructor on the blackboard reticle with the target spotter his corrected sight picture.

The instructor, by noting the blackboard reticle and target spotter, and referring to the deflection and range lines he used on the terrain board, can readily determine whether the gunner has corrected his sight picture accurately.

The problem should be varied, and with a little ingenuity, the instructor can reproduce almost any situation his men may face on the battlefield.

In Korea the recoilless rifle and the super bazooka have been mounted upon vehicles in the desire to exploit their effectiveness fully by adding mobility. The development of all of our ground weapons must pair the two

WEAPONS AND MOBILITY

by RICHARD M. OGORKIEWICZ

THE complexity of many problems frequently calls for a judicious concentration on the main issues at the expense of the less important ones. And, it will immediately be said, it is only logical to try and get an insight into the principles before becoming too engrossed in the details.

To attempt, therefore, to look occasionally beyond the ever changing forms, which abound in military histories, and the details of everyday problems to the main trend of military development should be well worth while; not only to retain a better perspective of events past and present, but also, through an insight into the underlying ideas, to be better equipped to face new problems.

Carried to its logical limit, the problem of military development reduces itself, irrespective of age, to that of finding a weapon which would completely dominate the enemy. In its absence, as is generally the case, however, it becomes that of finding the most effective way of using such means as are available.

In all contests the more mobile and agile of the opponents always has the advantage of being able to seize and keep the initiative. Thus when some 3000 years before our era the first horse drawn chariots were used, they not only offered new means of striking power through the momentum of the charging horses and vehicle but also a means of mobility far beyond that provided by man's feet, which was to serve for a long time the conquering nations of the Middle East. After a time the chariot gave way to the more adaptable horseman, but the mobile troops begun to establish themselves firmly as the decisive arm. Their swift and violent intervention at the decisive moment and place was a type of manoeuvre with which the slower foot troops could not compete, any more than with their capacity for decisive exploitation.

The development was by no means uniform and was subject to, then as it is now, geographical, economic and social conditions as much as purely military ones. Often, as was the case for a time with Roman armies, the existing methods and means gave a sufficient margin of superiority over the enemies. While such battles as Carrhae, where in 53 B.C. a Roman army was annihilated by Parthian cavalry, were the exception rather than the rule, the necessity for further development was not very urgent. Also, economic and other questions apart, another reason why frequently mobile troops could not displace all others was the lack of suitable organization and tactics for a holding action. While it was a comparatively simple matter to array men on foot in a solid body and either launch

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Imperial War Museum

1. British lights and mediums maneuvering in the late '20s.
2. British infantry tanks sacrificed mobility for armor.
3. Infantry needs used tanks as wire and machine-gun destroyers.
4. With a good gun, tank is effective in proportion to mobility.

them against a similar body of the enemy or let the enemy charge it such methods were of small use with men on horse back. It required a discipline and organization of the highest order before suitable methods could be evolved, but when they were achieved, as in the case of the Eastern Roman Empire and the Mongols of Genghis Khan, the infantry could be entirely dispensed with.

Under the impact of the barbarian horsemen, with whom foot troops could not cope, the cavalry became the principal arm and the social system which in Western Europe followed the disruption of the Roman Empire and perpetuated the ascendancy of the mounted man.

To the mediaeval knight, however, the horse was not so much a means of tactical mobility as a means of conveyance over the roads of the period and of carrying his heavy equipment. The decline in military organization led inevitably to the degeneration of battles into head-on clashes and as long as the knight met nothing more dangerous than his like he ruled supreme. Individual prowess and equipment, particularly armor, contributed mainly to his victories and it is not surprising that he strove to improve it as much as possible and was quite willing to sacrifice his mobility for greater protection and slow down his movement which at best was slow and ponderous.

Formidable as he was in individual combat, when confronted by superior tactics, indeed almost any tactics at all, his armour did not save him from defeat at the hands of his better organized enemies. The more mobile Saracens at Hittin in 1187 for instance and the Mongols at Liegnitz, in 1241, were able to fight it out and win on their own terms. The latter particularly, under Genghis Khan, by combining the traditional mobility of the nomadic horseman with a highly developed military organization evolved what was probably the most successful expression of that age of muscle power and as shown by the battlefields of the 13th century greatly superior to the ways of all their opponents.

In Western Europe too, the knights met more than a match once the infantry organized itself and as they refused to draw any lessons and did nothing to exploit their mobility, they spent themselves in vain charges and forfeited their leadership. The position of the infantry was further strengthened by the introduction of fire arms, which slowly but steadily begun to displace all muscle propelled weapons. As a result battles, even then, tended to become more and more fire fights and attempts were made in the 16th and 17th centuries to combine the fire power of the musket or pistol with the mobility of the cavalryman. The attempts did not prove successful and the cavalry reverted to the methods of a much earlier era and charged home, sword or lance in hand, relying on speed for protection from the slowly developing fire arms.

By the 18th century a pattern clearly established itself with the infantry, combining the mechanical power of the musket and the muscular methods of the bayonet, as the main component of every army. At one end of the scale its efforts were supported by the cavalry, which relying almost entirely on the *arme blanche* and speed compensated for the infantry's lack of mobility: at the other end of the scale by artillery, which based its action entirely on the fire power of its weapons and which completed the trinity—an order of things which came to be regarded, even down to our day, as "fundamental."

However, as fire arms improved, the importance of the physical struggle declined and the muscle based tactics of the cavalry had to give way and in spite of many gallant, but foredoomed, attempts to uphold the traditional ways the cavalryman had to fight more and more like the infantryman—rifle in hand—employing the horse as a means of transportation off the battlefield. Similarly in the case of the infantry the importance of the bayonet charge gradually dwindled away while the power and importance of the artillery increased by leaps and bounds. None other than Napoleon pointed out this process when he spoke on St. Helena that "the artillery decides the fate of armies and nations."

While the evolution of fire arms displaced all earlier muscle powered weapons by mechanical ones, there was for a long time no corresponding development in the field of motive power, and movement still depended on the muscle of men and horses. Under such circumstances a slow estrangement of striking power and mobility was inevitable and shifted the advantage to static defence, while the attacker could only with the greatest difficulty combine the two essentials of offensive action: striking power and movement. The infantry, for instance, could still advance—when suitable methods such as those of the German infantry in 1918 were evolved—but the rifle was no longer the principal source of fire power, its place having been taken by the gun whose movement was very restricted. It was not until the advent of the mechanical prime mover and of the automotive vehicle that muscle power was replaced and fire and movement could again be successfully combined.

Slowly at first and greatly hampered by mechanical difficulties automotive fighting vehicles, first of the wheeled and then of the tracked variety, begun to make their appearance and reached their first place of prominence with the British and French tanks of 1916-18. Their immediate conception and employment were largely dictated by the needs and methods of the older arm, the infantry, which they were called upon to support—as barbed wire crushers and machine gun destroyers. But once they showed on the battlefield, even in their imperfect state, they reintroduced that element of movement which had so largely been lacking since the decline of the cavalry.

Some of the potentialities of the armoured fighting vehicle and of mechanized forces were—as shown by the writings of Gen. Fuller and Gen. Estienne—recognized by a few even before the end of the First World War. But generally, outside a small circle of enthusiasts, the tactical and strategic potentialities of mechanized mobility met with little understanding during the more immediate post-war period and any move towards their development had to contend not only with the technical limitations of the equipment but also the inertia of the established system, which only very reluctantly recognized the tank arm. Nevertheless even a partial emancipation of tanks from the tutelage of the older arms made possible a move towards the development of new forms of mobile warfare in keeping with the techno-

logical advances and in the late twenties and early thirties the British Royal Tank Corps set the ball rolling. The Germans followed up and were the first to put the new methods—based on age old principles—into practice in their highly successful "Blitzkrieg" campaigns.

The initial success of tanks during the First World War—apart from the psychological effect of any novelty, whether it be the chariot, battle elephant or tank—was mainly due to their invulnerability to small arms fire, which had been one of the chief factors contributing to the failure of many offensive actions. It is not surprising therefore that the obvious success of armour protection should have made a strong impression. It was armour protection rather than mobility, which in any case was restricted by mechanical difficulties, which the early tanks going forward to pave the way for the infantry exploited.

In France for instance, where for almost a quarter of a century tanks remained as the infantry's auxiliaries, the development stopped at this stage. Thus the whole underlying philosophy never moved from the advantages of armour protection to the even more important advantages of mechanized mobility. And French ideas were to a greater or lesser extent copied by many other countries, including the United States. In Britain also, the doctrine of close infantry support, which for a time fell out of favour, was taken up again in the mid-thirties with the corollary reappearance of armour as the dominating factor.

British "infantry tanks" provided a very striking example of the results of such ideas: they concentrated first and foremost on armour protection and not only sacrificed mobility but at the same time neglected armament. The latter particularly made them compare unfavourably with the heavy fighting vehicles of other armies, German or Russian for instance, which tried to be more powerful all round and not merely better armoured. After all, a shield of armour is a purely passive attribute, and since the aim in fighting is to knock out the opponent, it can only be effective if combined with some effective means of striking power.

The emphasis on armour protection led inevitably to pessimistic conclusions that armoured fighting vehicles were becoming obsolete every time a more effective armour piercing weapon was introduced and many a swan song has already—and prematurely—been sung. But while at times the picture of an invulnerable armoured colossus might have appeared to be more than a dream, at best it was only a fleeting one. Losses will always come and any search for invulnerability can only lead to a reductio ad absurdum in armour protection.

Together then, the concentration on armour protection and the tying of tanks to the pace of the infantry made little use of the combination of movement and fire which the tank made possible—in fact both are almost identical symptoms of the lack of understanding of the potentialities of mechanized mobility. But one need not conclude from this that infantry-tank cooperation under suitable circumstances is to be precluded or that the infantry, as long as it exists in its present form, should not benefit from mechanization. As regards the latter, however, a much sounder approach would seem to be in terms of a mobile source of fire power more powerful than the infantry's own weapons rather than a heavily armoured steam roller.

On the other hand moves towards the development of the potentialities of mechanized mobility were not without their pitfalls. When carried to the extreme they tended to make mobility an end in itself instead of, on the tactical plane at any rate, a means of making weapons more effective. In practice it manifested itself in tank designs which strove to improve mobility but sadly neglected armament. Various light tanks of pre-war days—economic questions apart—were a good example of this category.

The great value of tanks in exploitation and the view that the primary object of tanks is destroying enemy unarmoured troops, and that tanks are not meant to fight tanks, were partly responsible for this. Without denying its great importance it must not be forgotten however, that exploitation is turning something to one's account—but this something must be there first if it is to be exploited. And as the prerequisites of success often have to be won the hard way mobile troops must be able to play their part in this if their effectiveness and usefulness is not to be very limited.

The successful mobile forces of the past, the Mongols for instance, were always able to, and when circumstances demanded did, fight out the necessary initial conditions which they then exploited to the full. Had they lacked this ability to strike, their drives would have been more like the raids of so many other nomadic tribes—of considerable nuisance value but generally lacking in decisiveness. Thus while inheriting among other things the cavalry exploitation role it is important that the mechanized forces should not inherit at the same time the weaknesses of such raiders and of the cavalry of the 19th century—their lack of striking power.

As for the dictum that tanks are not meant to fight tanks, with the appearance of large numbers of fighting vehicles on all sides the necessity, however unwelcome, of engaging enemy tanks will arise on more than one occasion. Therefore if our tanks are not to find themselves powerless every time they encounter enemy tanks they must be capable of fighting them—although this does not mean that the recommended method of employment is to be a slugging match between the opposing tank forces.

Summing up, since mobility is a means of making the most of other qualities to ensure full effectiveness it should not be wasted on inadequate striking power. Weakness in armament can only partially be compensated by greater mobility, but given adequate armament its effectiveness will be proportional to the mobility of the fighting vehicle on which it is mounted.

Invulnerable tanks have not been nor can they hope to be, though they can and did increase their armour protection. But they remain the only means of combining on the ground effective fire power and mobility and it is there that their greatest importance and value lies. No fighting unit is technically better than its weapons, but whatever the form of the armament of the day may be—machine gun, high velocity gun or rocket launcher—the automotive fighting vehicle gives it by virtue of its mobility greater effectiveness both tactically and strategically.

MISORIENTATION

by MARSHALL ANDREWS

WITH the current increase in the Nation's army will come a consequent growth in "services" to the fighting man, at a great and senseless cost in time, effort, money and manpower.

These "services" by whatever names they are called, are but window dressing to the dirty business of making war. That they accomplish aught of value to the fighter is questionable; it is demonstrable that they do distract his attention from the work at hand and may enhance his tendency to the "fatigue" which too often is a euphemism for fear and distaste for his job.

In general these "services" tend toward enlarging the effort to duplicate in the army the civilian standard of living. That is to say, at a time when men must be hard they are deliberately softened; when they should be conditioned to accept the trials of war they are reminded of the ease they have left behind; when they have been called upon to undergo a difficult process of shifting standards, loyalties and points of view, the old ones are constantly and officially dangled before them. That these "services" are well meant is not enough, since it is with their effect and not their intent that the soldier must grapple in those moments when his life depends upon his morale and his hardihood.

It is a strange contradiction that the purpose of these "services" is to increase the very morale they tend to destroy. For this contradiction there may be two explanations:

1. By the time an officer has reached a position where he makes policy he has forgotten that morale is a personal thing and that each man must attain it in his own way according to his own nature.

2. The army has surrendered to public clamor, including that of its fledgling soldiers themselves, that military service be made as painless as possible.

In either case, the soldier himself is the sufferer. What he gains in ease he pays for over and over again in needless stress and danger when the chips are down. And if, in the end, he pays with his life, then he has bought his evanescent comfort dearly indeed.

One among these costly "services," and perhaps the least justifiable, is the system of "orientation" (or Troop Information, if you like) whereby the soldier presumably is taught what he is fighting for. The very implication that a man called upon to render the most fundamental obligation of citizenship prepares to do so with no conception of its validity is, of itself, a disquieting indictment of a way of life held up for emulation before the world. It is, in fact, exceedingly doubtful that any man, undergoing a total reversal of his standards of human value and being trained in a multiplicity of things new and strange to him, could ever be supplied at the same time with so basic a concept if he had not entertained it before.

In the narrower sense, the army's effort to "orient" its soldiers to their duties is foredoomed to failure, as it failed in World War II, because it ignores the fundamental nature of man and is therefore technically unsound. The fact that a man accepts without question the process which has yanked him into the army at the turn of a card denotes of itself his faith in the rightness of his country's cause. What must follow, if he is to be made a useful fighting man, is not reiteration of what he already has accepted but something tangible and understandable to him upon which he may fix his loyalty and his pride.

Chief among these things, in a military organization, is the unit of which he is a part. The Marine Corps recognizes that truth and has achieved a morale unmatched in any other service and has done it without sugar paps and featherbeds and "orientation" courses. In any service a man

Great amounts of money and time are spent on various services to personnel in the Armed Forces. Do these services meet the purpose for which they are intended? Should we spend more time on "hardening" rather than "softening" factors? A top Washington military correspondent and analyst thinks so.

cherishes above all else the good opinion of the men who serve by his side, and if he and those other men constitute an outfit which stirs his emulation and his pride, no one need bother about the state of his morale. The basis is there.

In the entire process of building military units worthy of pride, no single influence can be greater than that of the junior officer. And yet, in its preoccupation with stratospheric concepts and big-picture operations, the army has attempted to substitute for the junior officer's influence a pedagogue's dream of standardized mental and moral conditioning. The fact that the pedagogue so consistently fails in four dedicated years at what the army tries to do as a sideline in a few months should constitute sufficient warning that it might not work.

While great effort and large sums of money are spent in this endeavor, officers upon whose competence the soldier's welfare ultimately depends are poured out of training camps like mullets from a fisherman's net. Perforce, they assume command when no time has been granted to determine their fitness for command. They leave upon impressionable young minds a personal definition of the term "officer" which, for better or for worse, likely will remain indelible. They go from training into combat, where their final measure is taken, or they disappear along the way, leaving behind them whatever damage their ineptitude may have wrought. Their shortcomings, great or small, cannot wholly be charged to them, for they are products of the same civilization which produces their men. If a sense of responsibility and dedication are not naturally theirs, it must be remembered that those qualities are not inherent in man's bone and sinew but have been created by man's intelligence for his own purposes.

For indoctrination and orientation to be of any use to the soldier and his country, they must be aimed not at him in shotgun blasts but directly at his leaders. And they must not concern themselves with abstractions of geography and politics, but with the realities of human nature. Above all, they must bring home to young men chosen for leadership the stern truth that the responsibilities of command are to its privileges as 1000 to one, and that the qualities men cherish in a leader are not condescension and patronage but consideration, fairness, rectitude and competence.

In training junior officers for the new army, time should be found for enough of this sort of indoctrination to turn out officers prepared to settle all questions of morale by their own example. If time cannot be found for this in officer training as now conceived, then the period of officer training must be increased so it can be done. In any event, the theory that a man who needs a year of training can be led by an officer whose training is encompassed in 13 weeks seems somehow vulnerable.

Without this change in emphasis on the target and the type of "orientation" it is likely that the army's always pressing problem of morale and aggressive spirit will remain no nearer solution than it was in the last war. There seems to be no reason to expect the system which failed then to succeed now.

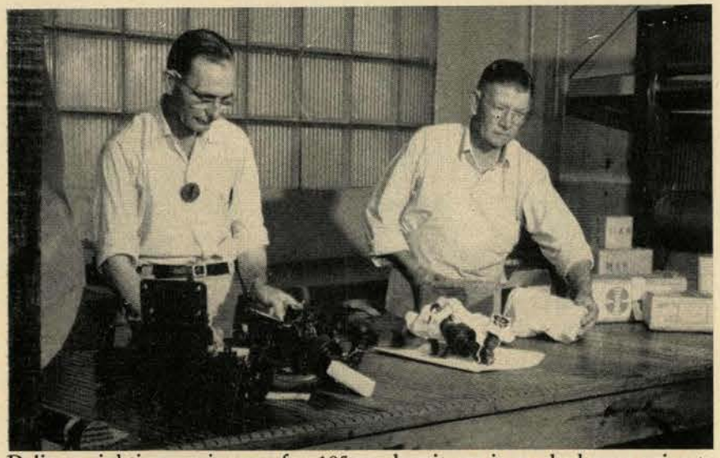
And nothing in the present system can be counted upon to forestall the thoughtless outcry against all officers which follows every war and which inevitably works to the soldier's own disadvantage in the next.

Long rows of truck tractors share a portion of forty-four acres of concrete parking area at Red River Arsenal.

MDAP

As the Defense Ministers of the North Atlantic community carry along their meetings to weld the West into a force for peace, the tools necessary to put backbone into the Mutual Defense Assistance Program have been coursing out through the veins of the transportation systems to many parts of the world. With a fiscal 1950 Congressional authorization of 1¼ billion dollars backing the program, U.S. equipment has been and is being readied and shipped to Belgium, Denmark, France, Italy, Luxembourg, The Netherlands, Norway, the United Kingdom, Greece, Turkey, Iran, Korea, the Philippines and the Southeast Asia area. On these pages is a picture story of one phase of MDAP in operation. Under supervision of the Ordnance Department the Red River Arsenal in Texas is one link in the chain of supply that comprises the Arsenal of Democracy.

A tank is transferred from a transporter to a flatcar for shipment to a port and an overseas destination.



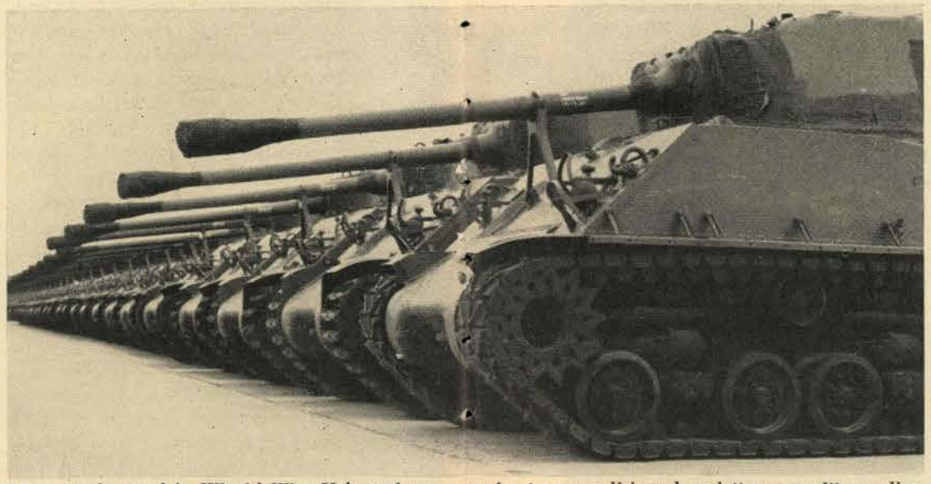
Delicate sighting equipment for 105mm howitzers is worked over prior to shipment. It is cleaned, recalibrated and rebuilt.

Tanks undergo a complete rebuild at the base shops, come out as good as new.

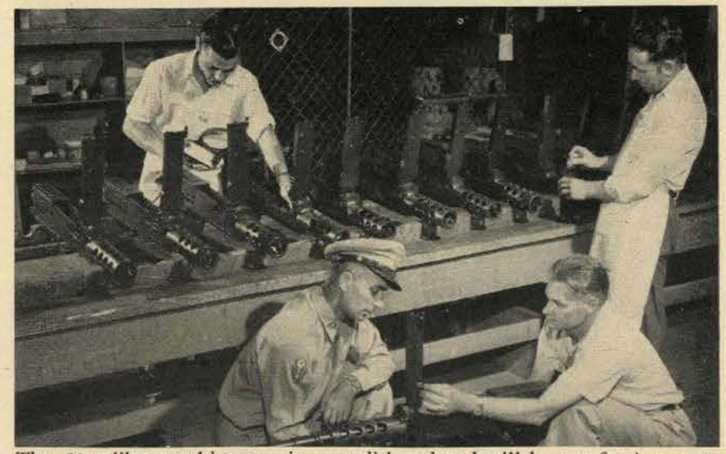
Ammo for the weapons. The original paint is sandblasted off, a new coat and stencils go on.

All weapons, from the smallest to the largest, are reconditioned. BARs are assembled, will be test-fired before shipping.

A final coat of paint goes on a 105mm howitzer. Piece was torn down and completely rebuilt at Red River.



Many tanks used in World War II have been completely reconditioned and "cocooned" pending their "recommissioning." They are inspected periodically.



The .50 caliber machine gun is reconditioned and will be test-fired prior to shipment on the MDA Program.

TIE-IN IN . .

On September 15, 1950, a United Nations armada, making a wide sweep through the Yellow Sea, descended upon the port of Inchon, some 150 miles behind enemy lines. Across the peninsula South Korean troops made other landings. Meanwhile, far to the south, U.N. troops in the beachhead around Pusan went over to the attack. On the First Cavalry Division front, the Commanding Officer of

THE 7th Cavalry Regiment's 1st Battalion took Tabu-Dong, some dozen miles north of Taegu, in the early evening hours of September 20th. It then established contact with its sister regiment, the 8th, thus preparing the way for the organization of a special mobile task force to take up the pursuit of an enemy who appeared on the point of collapsing.

Lt. Col. William A. Harris, Commanding Officer of the 7th Cavalry, had issued a warning order during the afternoon hours to Lt. Col. James A. Lynch to organize a task force around the nucleus of his 3d Battalion. To constitute the force, the 3d Battalion was to be reinforced by two tank platoons (totaling 7 M-4 tanks); the Regimental Intelligence and Reconnaissance Platoon; an Engineer Company (with dozer); a 4.2 Chemical Mortar Platoon; the 77th FA Battalion (less one battery); and an Air Control Party for air cover.

Colonel Lynch moved his battalion into a perimeter defense just west of Tabu-Dong, closing by 2230 hours. The staff began the planning for the mission, with the jump-off scheduled for 0630 on the 21st.

At 0400, some 2,000 North Koreans, trapped between the 7th and 8th Cavalry Regiments, selected the 3d Battalion area as an escape route to the north. Confusion reigned for several hours while the battalion stood off repeated Banzai attacks, and until the action shifted to the west. A delay of several hours resulted.

Task Force Lynch cleared at 0800 on the 21st, the I & R Platoon on the point, followed in order by the two tank platoons, the engineer company, the Command group, Company L, Company K, Headquarters Company, Company M, Company I and the FA Battalion(—).

The territory to be penetrated was held by elements of the 1st and 3d North Korean Divisions, which had been badly mauled by the 1st Cavalry Division and the 1st ROK Division in the preceding ten days of fighting around Waegwan, Tabu-Dong, and the Walled City, Kasan.

Task Force Lynch moved about five miles before meeting enemy resistance. The point then came under small-arms fire and deployed to return fire. Colonel Lynch ordered them to mount up and push on through anything except the most determined resistance, placing the tanks on the point to spearhead the column, with the I & R Platoon moving in behind them.

With General Gay, the Division Commander, accompanying it, the column pressed forward so rapidly and aggressively that the enemy had no time to mine the road. Several miles ahead the air patrol was on the fleeing enemy columns with good effect.

As the tanks rounded a bend of the road at Naksong-dong, the lead tank was hit by fire from two antitank guns several hundred yards up the road. The tanks moved in, eliminating the guns, and the column proceeded.

Several miles along, the I & R Platoon became involved in a grenade fight with some North Koreans holed up in a culvert beside the road. A ten-minute exchange of grenades and the culvert was quiet.

By late afternoon Task Force Lynch was 25 miles into enemy territory and on its original objective. With night coming on, Colonel Lynch pulled in his column to a perimeter, only to receive verification of a previously air-dropped order to proceed on to a new objective, Naktong-Ni, ten miles to the north, and to secure the river crossing at that point.

As the sun went down the column pushed on. A bright moon assisted the move. Several miles further along the troops began to pass burning villages. In another few moments the task force was into the rear of the retreating enemy column. Instead of opening fire on a number of now tractable "gooks," they were started to the rear with their hands on their heads and with no guards.

The lead tank, arriving at the bluff overlooking the Naktong River, came upon an enemy column, and opened fire, exploding an ammo truck and lighting up the entire area, to disclose abandoned vehicles—field pieces, trucks, tanks—and a foot column several hundreds strong crossing the river on a sunken bridge. The task force opened fire, taking a heavy toll.

It was now 2300 hours, and Colonel Lynch had a sizable fire block to reduce before continuing on across the river to fulfill his mission. It was possible only to guess at the continuation

. . . . KOREA

the 7th Cavalry Regiment issued a warning order on September 20th to his 3d Battalion Commander for the organization of a task force to seize and secure a crossing of the Naktong River at Sonsan, some 25 miles to the northeast. This story of a typical cavalry action is based on a report of the operation written by Lt. Col. James H. Lynch, who commanded the Task Force.—The Editor.

of the road from the far bank. To add to the difficulties the assault boats were at the rear of the column on a jammed road.

The dozer having broken through a bridge back down the road, the engineers went forward and, in conjunction with the tanks, in several hours' time managed to clear the road, salvaging a bag of about 50 usable trucks, many still bearing the markings of American Divisions. Meanwhile, an Engineer reconnaissance party was sent across the river to investigate the crossing, along with an I & R squad to reconnoiter the far bank.

Colonel Lynch now planned his crossing, setting 0430 hours of the 21st as the time, K Company to lead, followed by I Company, with L Company to secure the high ground on the near bank in view of POW reports of a battalion of enemy which dispersed on the near bank upon the approach of the American troops. Also, there were still large numbers of the enemy to the south who might come up from the rear to use the crossing as an escape route.

The tanks and mortars took up positions on the bluffs to support the crossing with fire. The machine-gun sections were attached to the crossing companies and the 75mm RR Platoon took up blocking positions on the near bank astride the road.

Reconnaissance verified the capabilities of the sunken bridge to cross foot troops about waist deep. The location of the road on the far side was reported, and guides who had made the reconnaissance were assigned to I and K. At 0430 the lead company entered the icy water.

An ammunition pile at the far end of the bridge took that moment to start burning and exploding. The troops had to dodge around it, but by 0530 both lead companies were across. The TF Commander radioed back to regiment—"Mission Completed."

Task Force Lynch had now penetrated 36 miles in 23 hours, captured 5 tanks, 50 trucks, 20 field pieces; made a night river crossing, secured a division bridge site, and killed or captured some 500 enemy.

On September 23d the 1st Battalion passed through the task force to occupy Sangju, ten miles to the north. Task Force Lynch closed on Sangju by daylight of the 24th, and shortly before noon Captain John Flynn took Company K with Company M attachments and a platoon of tanks to push forward to Poun, 30 miles to the northwest, securing the town by late afternoon with only minor opposition.

It was at this point, on the morning of the 26th, that Task Force Lynch received orders to strike north immediately to effect a junction with the 7th Infantry Division at Osan, which was 55 air miles and 102 road miles distant. Before noon the head of the column—one I & R squad and three M-4 tanks—moved out.

The column rolled for miles with no opposition, greeted only by cheering crowds of liberated South Koreans. 1730 hours came along and the column had not joined. Cans of gas were collected from all of the trucks in the convoy, providing enough to service three of the six tanks in the force, when a fortunate thing happened. A North Korean maintenance convoy of three trucks bumped into the head of the column. The drivers bailed out, and the Americans examined the contents. Aboard was enough fuel for the other three tanks.

Colonel Harris, Regimental Commander, who was with the column, decided upon a bold move, authorizing Colonel Lynch to proceed with lights at his own discretion.

The several-miles-long convoy wound northward, its lights a provocative sight in enemy-held territory. With orders to move aggressively to Osan and thence to Suwon, if necessary to make contact with the 7th Division, the three lead tanks shortly outdistanced the slower moving truck column, despite attempts to control them by radio.

The TF Commander, seeing groups of North Korean soldiers in increasing numbers, put out another point—a platoon of infantry in trucks, with a 3.5 bazooka and a .50 caliber MG on the ring mount.

Ten miles short of Osan, with increasing action against small, isolated groups of North Koreans, Colonel Lynch decided that the parade was over and ordered lights out. From up ahead came tank or artillery fire.

Just short of Habang-ni, and about 20 yards off the road, sat an enemy tank, its tube pointed in the direction

Following the tie-in Col. Lynch, *center,* confers with Col. Harris, *left,* CO of the 7th Cavalry Regt., and Col. Sommers of the 31st Infantry.

of the road. Ducking under the line of fire, Colonel Lynch made a jesting remark to his S-3, taking it to be an Air Force "kill," as had been others along the road.

At that moment, the voice of Captain Johnson, Commanding the Regimental Mortar Company, came over the radio: "Don't look now, but to our right is a T-Three Four." Almost simultaneously the tank opened up with machine-gun and cannon fire. The column pulled over and hit the ditch. A second T-34 joined in, sending fire up and down the road.

The Battalion S-2, Lieutenant John Hill, pushed ahead to pull in the infantry platoon on the point, with its precious rocket launcher, and with the FA Liaison Officer, organized an attack on the tank area with the platoon.

The bazooka team knocked out one tank, but the other moved out and started down the unarmored column, running over several vehicles, then moving off several hundred yards to take the column under fire. Major Halden, Executive Officer of the 3d Battalion, had organized some anti-tank action at the center of the column. A 75mm RR stopped the tank's movement, but not its fire. A bazooka team under Captain James Webel, Regimental S-3, and Lieutenant Woodside of Company L closed with the tank and destroyed it, Captain Webel administering the coup de grace with a can of gasoline dumped into the engine. It exploded, blowing him off the tank, but he suffered only minor burns.

While this was going on, the situation at the head of the column was still confused. Soon the roar of tank mortars could be heard to the north. The three point tanks must be returning! A moment later two enemy tanks appeared over a hill some 700-800 yards away. Colonel Lynch ordered the lead truck of the task force placed across the road to block it, a job which fell to his driver, Corporal Howard, who bailed out when the tanks were less than 100 yards away.

The two tanks pulled up short of the truck and a voice inquired in Korean the equivalent of "What the hell goes on here?" The Americans opened fire with small arms to button them up, and the machine-gun and cannon response sent the 2½-ton truck up in flames.

From the rear of the column the three M-4 tanks moved forward to take on the T-34s. They closed to a matter of yards, slugging it out, but it was an uneven battle from the start. The M-4s moved off after accounting for one enemy tank, of a total of ten now on the scene.

One of the Red tanks carefully picked its way down the column firing machine-gun bursts into the vehicle radiators. Thinking the tank was a friendly one, Captain Robert McBride

Maj. Gen. Hobart R. Gay, Commanding General of the First Cavalry Division, which has done a top job in the Korean fighting.

got out in the road to dress down the driver for running over his Jeep. The answer was a burst of machine-gun fire which creased him. Captain McBride gave up traffic control. The tank proceeded down the column, only to have its turret blown off at a range of 35 yards by a 105mm howitzer of Captain Wardlow's C Battery of the 77th FA, which had gone into hasty position.

The tank fighters had been active. Under the personal direction of Captain Webel and Lieutenants Woodside, Hill and Nicholas, the tanks were knocked out with a combination treatment of bazooka, grenade and gasoline.

Colonel Harris having decided to hole up on position, Colonel Lynch organized a perimeter defense. Taking stock of the damage, Task Force Lynch had lost 2 men killed, 28 wounded, plus 2 tanks, and 15 other vehicles. The fight had lasted about two hours.

In early morning of the 27th the force was organized for a foot approach to Osan, running into another T-34, which the point 3.5 accounted for. Moving along without further incident, contact was made at Osan with the 31st Infantry. The 1st Cavalry Division had made its tie-in with the 7th Infantry Division. The enemy was split in the middle by this juncture between United Nations I and X Corps troops. Task Force Lynch had covered 102 road miles in 21 hours, destroying or overrunning 13 tanks.

. . . since we're well into the subject . . .

. . . are you a subscriber . . .?

Strategic AIRBORNE NOT Strategic AIR

by MAJOR ARTHUR G. VOLZ, JR.

SOLDIERS today must look beyond the mere technical effectiveness of their weapons. They must view and evaluate their impact on society and politics. Should the modern soldier fail to do so he will be judged by history and by future generations as having failed in the execution of his duty.

Today the soldier has a variety of modern arms of immense destructiveness. The future promises to enlarge this arsenal. A problem of what arms to use, and how to use them, has now come up. This problem is especially acute in the choice of roles for the three major branches of the armed forces, the Army, the Navy, and the Air Force. In this the United States faces a strategic dilemma of the first order.

American strategic troubles are far deeper and far older than they appear to be on the surface. The air force atomic bomb fanatics cannot primarily be blamed for the present muddy thinking. American strategists have tended to view war as a purely military act of physical destruction, without much regard for the political consequences of that act in a potential postwar world. Americans have fought wars efficiently and cleanly from a purely military point of view. But from the politico-military point of view, necessary for effective strategy, the United States has pulled some awful boners.

When the sole enemy forces to be dealt with were army and navy, the emphasis on the physical destruction of the enemy was not unsound. The phrase "destruction of the enemy" was actually qualified to mean "destruction of the enemy's army." Today, however, the advent of air power has made it possible to deal directly with forces other than armies and navies.

Since cities and industries actually form the basis of military power, the modern air force interpreters of Clausewitz have transferred the destruction of the enemy army into destruction of enemy economy. For them it was a logical step to shift the center of military gravity from organized armies to industrial centers and urban complexes. The radical form of this idea has appeared in the "destruction of the enemy industry by atomic bombing, without landing fighting," school. Talk is even heard of the 30 days war.

Is Destruction Desirable?

Under favorable circumstances it is quite possible that such a strategy might well succeed in literally wiping out the major industrial and urban centers of a great continental power. It is also possible that these attacks might well result in the dissolution of the enemy armed forces and of the entire enemy state apparatus. On the other hand it is also quite possible that, under unfavorable circumstances, such attacks would fail.

However, the question is not one concerning our capacity for destruction. The real problem facing American strategists today is whether or not such a strategy of destruction is desirable.

Military forces exist to provide the nation with an armed instrument in its dealings with other powers. The decision to use this instrument is a political decision. Unless the armed forces and the military strategy are in harmony with the political aims of the nation, these armed forces, and the strategists have failed in their basic duty. This fact must be borne in mind by those who shape the weapons and strategy of the nation.

Regardless of the method of its initiation, any future war in which the United States might be engaged against a rather obvious potential enemy would be politically regarded as a war of liberation. Wars of liberation can only be won by offensive action, resulting in a change in the enemy political and economic system. Seen from this point of view our enemy would not be a people, or a culture. Our enemy would be a political and economic system. After military victory our aim would certainly be the development of a free life for these once enslaved.

As we have found in the post-World War II world, free life is intimately connected with satisfactory living conditions. Free life cannot be built in a desert of ruined cities, inhabited by starving millions, plagued by the banditlike guerrilla remnants of the enemy armed forces. For this reason, political and social, we cannot wage a war of sheer physical destruction of industries and cities *per se*. The world as a whole cannot afford economic and social deserts. Such deserts have an insidious habit of spreading to fertile areas.

What then are we to do?

We are at present relying on the development of atomic weapons and on a strategic air force capable of delivering such weapons. The other military arms have been moulded around the atomic-armed strategic air force.

A change in strategy would therefore mean a change in the structure of our armed forces, especially the air force. Our strategy should be attuned to our political aims. Our armed forces should be adjusted to our strategy. Fortunately many of the technical developments useful for the strategic air force can also be useful for a new strategy.

Seize—Don't Destroy

In place of a strategy of industrial destruction we ought to develop a strategy of industrial seizure and paralysis. This of course is not a simple Supermanlike 30-day blitz. It would entail large forces and heavy battles. It would necessitate the neutralization of the enemy armed forces by their destruction in battle or by their capture. However, in place of bombing the great industrial centers for destruction, the new strategy would aim at their seizure by means of vast airborne landings. By this means the production, and other useful activities of these centers would be denied to the enemy as thoroughly as if they had been destroyed by atomic bombs.

To accomplish this shift from bomb dropping to troop carrying, the air force should be changed from a strategic bombardment arm into a troop transport arm. The present research and effort that go into developing a strategic air force should be diverted and placed into the development of a strategic airborne force. With such an effort we could solve many of the present airborne problems that today appear almost impossible.

In the future the air force should regard its role as similar to that of the navy. The navy has the mission of securing the command of the sea so as to safeguard the water communications of the army. All naval operations are directed to this final goal. The air force's real mission is to secure the command of the air—not so as to bomb—but so that it can safeguard the air communications of the army. The ground army remains the basic and truly offensive combat weapon in the strategic sense. Just as in the last war the navy made possible the large-scale use of seaborne landings, so in the next war the air force would make possible the large-scale use of airborne landings.

In addition to replacing the function of the strategic air force, the strategic airborne force would also be the modern form of the second front. Just as the enemy in World War II was hard pressed and beaten when he was faced first with a conventional land front, and then with a seaborne "second" front, so would be the enemy in another war, faced with conventional ground and tactical air forces, and then with the airborne "second" front of the strategic airborne forces. In this the strategic airborne forces would accomplish a dual mission which the strategic air force cannot accomplish. It would accompany its economic strangulation (not destruction) with a truly strategic envelopment in the third dimension.

Tactical Use of the 60mm Mortar . . .

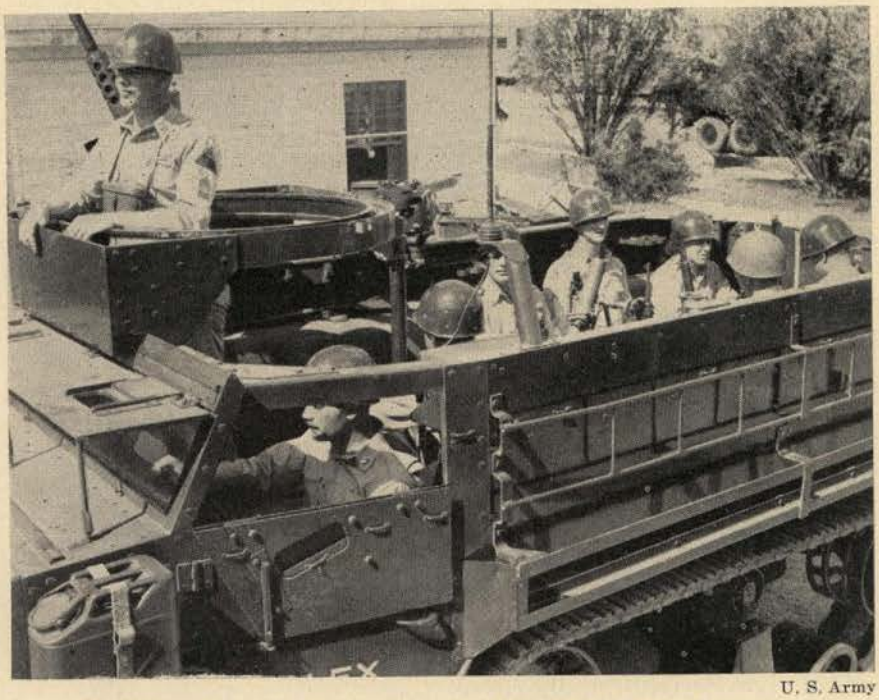
by CAPTAIN EUGENE C. CAMP

THE Armored Infantry Company of the Armored Infantry Battalion, Armored Division is characterized by mobility and fire power and provides the protection of light armor for troops while mounted in the half-track. The company is organized and equipped for direct support of and employment with tank units and is frequently employed to "mop-up" enemy positions by-passed by tank units and to seize and hold objectives overrun by tank units, such as key road junctions, towns, bridges, and terrain features. On such missions the mobility and rapidity of action of organic support weapons is of the utmost importance.

The 60mm mortar platoon of the Armored Infantry Company is organized in three squads of one 60mm mortar each and is capable of and available for direct and indirect support of the company. The 60mm mortar squad is transported in one half-track along with the 60mm mortar and ammunition and is controlled by 528 radio netted in the platoon net. Upon contact with the enemy the men and support weapons of the company can be rapidly dismounted to occupy positions favorable to the support of the company. The 60mm mortars may be fired from the vehicle when the pressure of action dictates such rapidity of action.

In order to more fully utilize the capabilities of the mortar platoon of my company, I have mounted the three 60mm mortars in the half-tracks in which the weapons and crews are normally transported. It was conclusively demonstrated by numerous tests that by mounting the 60mm mortar semi-permanently in the half-tracks of the mortar squads of the armored infantry company, the mobility and fire power of the company is increased materially.

The 60mm mortar is a smooth bore, muzzle loading, high angle fire weapon and is used for close-in and continuous fire support of the other weapons of the company in most of its combat missions. By being mounted in the half-track, the 60mm mortar is immediately available for action without loss of time required for the mounting of the weapon in a ground position. This factor is especially valuable when the company is engaged on advance guard or security missions. When the company is engaged on the latter type missions the ammunition handlers and riflemen of the squad are available for other duties in a bivouac or for perimeter security of the half-track, as ammunition is readily available in the half-tracks. Conversely, the improvised mount permits the 60-mm mortars to be speedily dismounted for ground action, if the situation so requires.



U. S. Army

The Mortar Squad, Mortar Platoon, Armored Infantry Company.

Material For Mounting

The recommended and tested material for mounting the 60mm mortar in a half-track is as follows:

1. Board, 2″x6″x22″—Two each
   To be used to hold the sandbags which form the support for the base plate of the mortar. They are placed 28½ inches apart on the floor of the half-track.
2. Board, 2″x4″x51″—Two each
   (Metal braces of suitable strength may be used.) These boards form the channel for the feet of the bipod. They are placed two inches apart, across the width of the half-track.
3. Sandbags
   As many as necessary to fill the space between the 2″x6″, forming a support for the base plate of the mortar.

Mechanics of Operation

The 60mm mortar may be fired from the mortar half-track singly or

. . . by the Armored Infantry Company

under the control of the mortar platoon leader in a battery of 2 or 3. It may be traversed 150 mils with an additional 100 mils gained either to the right or left by moving the bipod of the mortar. A full 360 degree field of fire for the mortar may be attained by shifting the position of the half-track on which the mortar is mounted. Mortar aiming stakes may be either painted on the back of, or fastened to the inside of the half-track rear door. Also the rear door of the half-track, in which the mortar is mounted, may be left open, and the 60mm mortar sighted on an aiming stake driven into the ground, as is normal when the mortar is fired from a position on the ground. Elevation and range for the 60mm mortar mounted in the half-track are the same as when the weapon is fired from the ground.

Summary of Advantages

By having the 60mm mounted in the half-track it can be brought into operation faster because the weapon does not have to be unloaded from the half-track and assembled prior to firing. Mounted in a half-track the weapon is ready for operation and only requires "laying in" before firing. By firing directly from the half-track, it eliminates the ammunition supply line since a large quantity of ammunition may be carried in the half-track. The base plate of the mortar can be "seated" prior to the time the enemy is engaged, thus facilitating the immediate achievement of accurate fire, and it does not have to be "seated" each time the mortar is displaced as is true when firing from a ground position. The mortar can be displaced rapidly by movement of the half-track to alternate positions without dismounting the crew or the weapon and the crew is given a limited amount of protection from enemy small arms fire and shell fragments. The mortar can still be fired in battery by use of radio communication under the control of the mortar commanders or forward observers and loses none of its advantages.

The mortar is less likely to be damaged as it is strapped in position in the half-track and not subjected to repeated manhandling. The half-track can be moved and the weapon fired from a new position in approximately one-third the time it would take to dismount the mortar from the vehicle and mount it in position for firing.

Communications

During movements of an Armored Infantry Company, control of the 60mm mortars can be exercised by use of an SCR 528 in the mortar platoon leader's ¼-ton vehicle. Also each rifle platoon in the Armored Infantry Company has a mortar observer equipped with an SCR 536 for use in contacting the 60mm mortars. When employed on close support missions the squad leader can control, observe, and direct fire from the ring mount in the half-track or direct fire by employing the rifle platoon observers. In permanent and semi-permanent positions wire communications may be used between selected observation posts and mortar positions.

Conclusions

The mortar platoon of an Armored Infantry Company, which is composed of three mortar squads each armed with one 60mm mortar and transported in a half-track, is the organic supporting fire power of the Armored Infantry Company. The mortar platoon leader mounted in a ¼ ton truck is in radio communication at all times with his three mortar squads. No permanent alterations of mortar squad half-tracks are necessary in order to mount the 60s. The materials used, once made to specifications, can be installed or removed from the half-track in a matter of minutes and are inexpensive. Armor is characterized by its mobility, armor protected fire power and decisive shock action and every means should be exploited to improve these characteristics. By mounting a 60mm mortar in a firing position in each of the half-tracks of the mortar platoon, the mobility and fire power of the weapons are enhanced and the light armor protection of the vehicles is provided for the crews while firing.

U. S. Army

View showing the 60mm mortar mounted in half-track.

HUMAN ENGINEERING

by CAPTAIN SAM FREEDMAN

THE multimillion-dollar medical department Field Research Laboratory at Fort Knox, Kentucky, is one of only two general-research units run by the Medical Corps. It seeks to fit machines to men nad men to machines. Radiation damage and weather effects are problems now.

Some nations have an apparent advantage in war because their soldiers are expendable. The United States has no such advantage. The American GI definitely is not expendable.

And nowhere is this attitude more strongly reflected than in the work of a little-known group of men at Fort Knox. These men compose the staff of the Medical Department Field Research Laboratory.

They call their work "human engineering."

In many ways, according to Lt. Col. F. J. Knoblauch, M. C., who commands the research unit, man's engineering has forged far beyond his ability to cope with the devices he produces.

"Designers of new war machines, for instance, have concentrated on the technical factors of their problem to the point that that there is danger such devices would require supermen to operate them," Colonel Knoblauch declared.

"We don't have many supermen in the Army," he continued. "Wars are fought by average men with the usual collection of human frailties and limitations."

This is where the research men come into the picture. Their engineering chore is to help fit the machines to the average men who must operate them. And, if possible, help men adjust to the machines and their dangerous jobs.

A typical problem is in the designing of a tank. The engineers may be so concerned with the adding of armor, mounting of larger guns, expansion of fuel tanks or installing of new devices of various kinds that they lose sight of the men in the tank upon whom its efficient operation depends. At this point, the research men take over. They measure the average soldier's body and its capacity to function efficiently in the new tank. Size, intelligence, psychological reactions, dexterity and many other factors must be taken into account. It may be necessary after the researchers' work is finished to sacrifice some desirable devices. But, the scientists say, this is preferable to producing a machine that cannot be operated efficiently.

The work at Fort Knox ranges from the study of shoes to ease the aches of the foot soldier to the consideration of radiation damage, limit of endurance in cold, and the chemical changes taking place in the body during shock. In short, anything that affects a soldier in the performance of his job is open for study there.

Two problems which are occupying the center of attention now are the effects of cold weather on the soldier and damage to the soldier from radiation. These studies point up the practical nature of the work being done in the laboratory. The cold-weather research underlines arctic warfare, while the radiation studies are concerned, among other things, with possible injuries from atomic bombs.

Dr. George W. Molnar, *right*, a graduate of Oberlin and Yale, and Mr. Carl Booth, *left*, a graduate of University of Louisville, chemist, shown in Physiology Laboratory for Basal Metabolism and other subjects, Army Medical Department, Field Research Laboratory, The Armored Center, Fort Knox, Kentucky. The instruments in the background are used for the study of basal metabolism, body cooling process, changes in circulation and heat production, as due to exposures to cold or heat on man. When present studies on two civilian subjects are completed these scientists plan to study physiological changes in military personnel, and this will be followed by field studies in the Arctic.

The laboratory at Fort Knox was established in 1942 as a part of the Armored Force. It was concerned then with relieving the special stresses, both mental and physical, to which a tank soldier was subjected in combat.

In 1946, the laboratory was reorganized under the command of Colonel Knoblauch, and the scope of its work was expanded greatly. It became a part of a loose network of laboratories such as the nutrition unit in Chicago, a surgical group at Fort Sam Houston, Texas, a tuberculosis-study branch at Fitzsimons General Hospital, Denver, and another general-research laboratory at the Army Medical Center, Washington.

When Colonel Knoblauch reported to his new assignment as chief of the Field Research Laboratory at Fort Knox, he found a few officers and enlisted men staffing a small laboratory with little equipment. The colonel is not a man to sit around and wait for the next move. He plunged into the new work with plenty of enthusiasm and energy.

He obtained a group of nondescript barracks to house his organization. Then he went to work to find the organization. This took some doing. For two years, Colonel Knoblauch and his director of research, Dr. Ray G. Daggs, spent most of their time on the road in search of the best men available for research work.

"While our approach was not quite as secretive as that of a saboteur, it had to be pretty cautious," Knoblauch said. "If an organization knew we had an eye on one of their men, salary went up, and other considerations were added, to the point where we could not compete."

"But some men got good raises in pay because of our mistakes," he added with a twinkle.

Apparently there were not too many mistakes, however. The two conspirators managed to recruit from this country and Europe a staff of 125 men, including some of the top men in the fields of physiology, biochemis-

Technological progress has been so rapid that we must face a consideration of weapons outrunning the capabilities of those who may use them. We can't very well make a college degree the prerequisite to becoming a tanker. This is a subject that must have our thoughts, is having our thoughts. Here is the story of equalization, centered in a small group whose job is to fit machines to men and men to machines.

try, biophysics, psychology, physics, biology, radiobiology and roentgenology. The list of degrees and professional honors among them is awe-inspiring, to say the least.

It was only after each research man reported to Fort Knox and decided his own needs that anything was done about the plant itself. Equipment was purchased, built or modified, and facilities were arranged according to the specifications of the men who had to use them. The result is a plant which, while still nondescript as far as its exterior is concerned, is a model of ingenuity, arrangement and equipment.

Colonel Knoblauch is understandably reticent about the value of the equipment in the laboratory. But the place is crowded with imposing machines with names calculated to give the tongue a hard time. And their cost is equally rough on the budget. It could be called a multimillion dollar project.

Research Unit's Range Is Wide

The following is little more than a sampling of the intricate and highly important research work being done at the Laboratory.

In the biochemistry branch, a great deal of work is being done on protein chemistry. The effect of radiation on the enzyme system is occupying an important part of the work. Since the enzyme system is involved with the digestion of food, it is of something more than passing interest to the soldier. Then, too, there are studies being carried on to discover the effect of shock upon the enzyme system, and the effect of changes in the enzyme system upon shock.

In addition to other awe-inspiring gadgets, the biochemistry section possesses a specially built ultracentrifuge which can whirl at a speed of 60,000 revolutions a minute.

Built of thick steel, set in a heavily reinforced concrete foundation and surrounded by heavy concrete retaining walls, the ultracentrifuge is capable of creating a terrific pull. For example, a "G" is a unit of measurement of the pull of gravity against a body. A human being is capable of withstanding 12 G's, slightly more if he is braced specially for the pull. Well, the ultracentrifuge is able to turn up 265,000 G's.

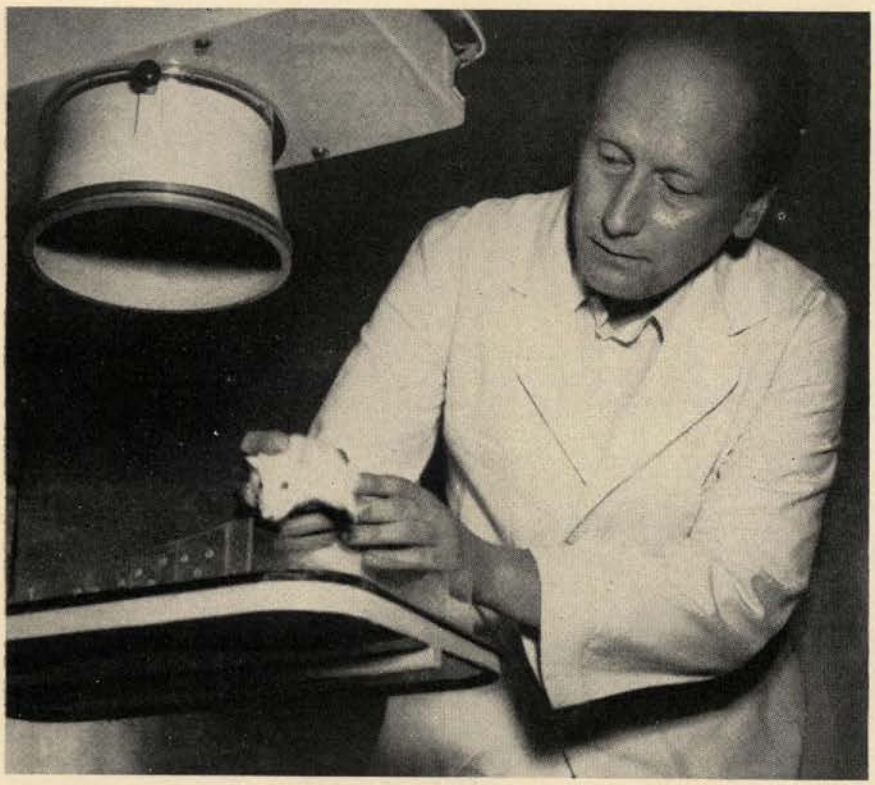
In the psycho-physiology section is being done some of the important study of the soldier's ability to operate the machines made for him. At the moment, concentration is on the placement of tank controls with relation to the average man's manual dexterity and psychological ability to function efficiently. This study is carried on through dummy controls of many types. The speed and precision of the soldier and many other factors are taken into consideration.

An idea of what actually is accomplished can be obtained from a study which was made on a fine pack radio for the Signal Corps. It was found that in cold, the machine could operate efficiently far beyond the power of the soldier to operate it. It was a matter of manual dexterity. Suggestions were made for changes in the placement of dials on the set for improved operation.

In the cardiovascular physiology section, Dr. Donald Gregg and his associates are concerned about the large number of young men falling victim to heart attacks. Since the lifeblood of the Army is young men, the study is a vital and practical one.

The approach to the problem is through an attempt to create heart disease artificially in animals—high blood pressure and hardening of the coronary vessels. Dr. Gregg has developed his own device for measuring blood pressure and flow in the vessels. Verily, it is an imposing and confusing-looking arrangement.

For the scientists who wish to fashion their own machines, there is an electronics shop where an expert la-



Dr. Wolfgang Luther, Ph.D., University of Marburg, Germany, now research scientist, Army Medical Department, Field Research Laboratory, The Armored Center, Fort Knox, Kentucky. Dr. Luther is shown in the newly completed Isotope Laboratory at Fort Knox. Photo shows part of 250,000 volt X-ray machine for study of Radiological effect on living tissues.

bors at making and modifying instruments to specification. There are two machine shops, one of which is small and is designed for the scientists themselves, who may wish to fashion parts without recourse to the larger shop manned by machinists. Two small darkrooms are provided for the researchers who may want to develop film swiftly for a check on the progress of their work without sending it to the large photographic section.

In the studies concerned with the peripheral nervous system, there has been a great deal of attention to nerve injury from radiation. The peripheral nervous system is the part of the network of nerves in the body which picks up and transmits sensations like pain and touch or carries the impulse which makes the toes wiggle. The principal part of the work, which is in a state of suspended animation now, has been with the frog.

There is another amazing device in this section. At least it's amazing to a stranger in those parts. It is called a dual-beam cathode-ray oscillograph, and it does everything but wash the dishes. It stimulates a nerve swiftly and with as much regularity as the operator desires. It measures reactions to a very fine point. Not only that—but it has a camera attached which photographs the reactions as they are shown on the cathode-ray tube, while the researcher attends to other work, or steps out for a cup of coffee.

In the renal physiology section under Dr. Robert Clarke, research is being conducted to fill the missing details on how kidneys rid the body of waste products without harming the state of hydration-water content.

Research in environmental physiology now is concerned with the soldier's ability to fight in the cold. This section operates several "cold rooms," which are refrigerators of varying size. And it has kept in close touch with several operations in the field, two of which were conducted by American troops in the frigid climate of Northern Canada.

The larger of the cold rooms at Fort Knox, which is under the direction of Dr. G. W. Molnar, is capable of housing a large tank. It is equipped with a treadmill—to provide the human guinea pig with a reasonable facsimile of work—and a wind tunnel. The tunnel is important because of the effect of wind in cold.

In the smaller of the cold rooms, work is done primarily with animals. And the results of some of the studies have been very important. For instance, in the study of the ability to adjust to cold weather, rabbits have been used. Previously it was believed that 35 degrees below zero Fahrenheit was a lethal dose of cold. But the research men kept one big bunny, which answers to the name Hot Shot, in 60-below temperature for eight hours without serious harm. Hot Shot's only complaint is that he lost a tiny wedge out of his ear. One group of rabbits has occupied a cold room at 20 below zero 20 out of 24 hours since June 15. And each rabbit remains alert and in good condition.

The X-ray and photographic section, under A. W. Carpenter, is entitled to the gratitude of many an infantry soldier. It is in this section that a study of feet was made which has resulted in the Army's decision to discard the old Munson last on which Army shoes have been fashioned for quite a spell. X-ray motion pictures were taken of average feet taking steps in Army shoes to complete the study.

Right now, the section is concerned with improvements based on what can be seen by X-ray. There is a search for a method of taking three-dimensional X-ray pictures.

Sunshine is a friend to man—up to a certain point. At the moment, sunshine is occupying the attention of the biophysics section. The problem is to observe the effect of sunlight just short of sunburn. An integral part of the equipment for these observations is the spectrophotometer, which is a large machine capable of recording changes in color, however slight, on skin of any hue, no matter how dark.

In the central nervous system section—the brain and spinal cord—Dr. Allen Keller is directing research into the portion of the brain which controls heat. This is another facet of the laboratory's intense study of cold weather, what it does and what to do about it. Another study in this section is devoted to brain tissues and how injuries to the brain may be treated.

The radiation and isotopes laboratory is the site of several extremely important studies in this day of fear of the atomic bomb. But, although a great deal of attention is being given to the injurious qualities of radiation, the men in this group also are concerned with its beneficial characteristics. Observations are being made on the effect of radiation on cancer. The functioning of the thyroid gland is being probed through the use of radioactive iodine as a tracer.

The building which houses this work is literally packed with high-priced, unusual machines—some of them dangerous. There is a big X-ray machine whose capacity is 250,000 volts. It is situated in a small room lined with a quarter-inch sheet of lead.

There are instruments for detecting radioactivity, some of whose names are familiar. There is a fluorescent microscope, which uses ultraviolet light and a special stain, called acridine orange, to detect radiation damage to cells. Tissue which has been subjected to radiation is treated with the acridine orange. Then the manner in which each cell in the tissue has been affected is detectable immediately under the flurorescent microscope.

Then there is the amazing little gadget called the micromanipulator. A cell of the body is a pretty small item, and the nucleus, or heart, of the cell is somewhat smaller—50,000 of them could fit on a pinhead. With the micromanipulator, it is fairly simple—for a trained man—to pluck the nucleus from the cell and replace it. The device makes use of small probes, or hooks, which must be fashioned under a miscroscope.

And the laboratory has a precision-instrument maker who is adept at that work. He recently made some screws so small that it was necessary to place them under a microscope to see their threads.

The laboratory makes use of many types of animals in its work. There are human beings, rabbits, rats, tadpoles, dogs—even a conger eel, which is valuable in blood studies because its blood cells are so large. The greatest of care is taken with the subjects of the experiments—humane treatment in every way possible is stressed.

Some of the animals, as well as the human beings, involved in the experiments have a rough time of it occasionally. But the goal, the scientists declare, is worth it.

Napoleonic Sidelights

by DR. ROGER SHAW

On another page is Guenther Blumentritt's article on the value of military history for commanders. Here is military history in perhaps a different vein, history in a racy, zestful style, history brought to life by a facile pen. Professor of International Relations at Trinity College, Dr. Shaw has been a regular contributor to ARMOR. We want to keep it that way.—THE EDITOR.

OUTSIDE of the Great Elector (1620-88) and Frederick the Great, the Hohenzollern Clan has contained very few interesting personalities. One of these was the great Frederick's nephew, Prince Louis Ferdinand, born in 1772. Louis was eminently a human being, a dashing Byronic figure, reckless, gallant, and unhappy.

Louis was at heart a radical, and he hated Bonaparte bitterly, but *not* because the Corsican was a radical. On the contrary, the Prussian Prince considered him a rank reactionary and not nearly as forward-looking as his celebrated Uncle Fritz. He had been mad to enter the war against the French long before Prussia finally did so in the ill-fated 1806 Jena campaign. With unquestioned military talents, he was forced to bide his time and to work upon the King, his own nephew, who was lukewarm to the idea of fighting Bonaparte. Of the latter, Louis wrote: "This comedian has not even the constancy and dignity as a Freethinker which even a Bastard of the Revolution ought to show. He, the former Jacobin general, coquettes with the Church, and so becomes the murderer of one great achievement of the Human Race after another."

But Louis collected piles of books when he was not dabbling in politics, and he popularized Beethoven's "Eroica," which at first had been ill-received by the public. Music was like a fierce tonic to him, as was the verse of the poet Goethe. He was involved in many love affairs—Pauline Wiesel, Henrietta Frommel, famous others—and though unmarried, he was the father of children, two by Henrietta. But Bonaparte was ever in his thoughts, that Corsican despot who had turned the glorious French revolt against feudalism to his own ambitious ends. Again he wrote: "I could restrain my indignation if I saw that this lawyer's son, the artillery lieutenant risen to be Emperor, had spread the great ethical conceptions of the French Revolution abroad among the peoples, if he had propagated the beliefs of that moment as the apostles of Christianity once preached its doctrines . . . That noble upward sweep which in the last, the Eighteenth Century, seemed to be lifting mankind above its earthly accidents, its earthly limitations, has been completely crippled by this scorner of his race." Here spoke Freemasonry!

Early in the Jena campaign came the battle of Saalfeld. Prince Louis was there, in "a blue coat with a red collar and facings; on the facings, eight golden knots with hanging tassels; the coat cut away in front and fastened back to show the greater part of a white waistcoat, and open at the neck where the shirt-frill emerged from the black cravat; white breeches and silk stockings; lastly, the three-cornered hat of a general, looped up with braid three-fingers wide, and an ostrich feather buckled to the brim."

He had helped push Prussia into the war of 1806 with Bonaparte, too late, or else too soon. At Saalfeld this Byron among the stodgy Hohenzollerns received two saber cuts across the head, and a thrust through the breast. He was one general that did not die in bed. An agile French quartermaster had done that for him. *Kaput!*

Louis' great friend was the beautiful young Queen of Prussia, Louise. He had met her on her honeymoon with his nephew, who became King Frederick William III. Louise was unhappy with her prudish consort, and a strong attachment sprang up between Louis and Louise. He was as romantic and debt-ridden and attractive as the dull monarch was precise and boresome. Whether he was the father of her first child or not, has never been decided. But together, Louise and Louis forced Prussia into the Jena war amid the cheers of the Junkers and the Prussian Guard.

Louise was an attractive flapper type from northerly Mecklenburg, with an equally attractive sister. Her sister's name was Fredericka. The girls were brought up by their nice old grandmother, who dearly loved religion and gossip. Her young charges were a handful, merry and carefree. They called their father "bestest pop" and both were married Christmas Eve, 1793, while the Terror raged in Paris and George Washington wished he had never been elected President. Fredericka espoused Frederick William's younger brother, so it was a double field-day with brothers marrying sisters. Fredericka afterwards made quite an amatory record for herself: with England's Butcher Cumberland, with Austria's Prince Metternich, with polyglot others.

But Louise became more dignified as time passed. She would dance all night not long before the birth of a child, but also she would nurse her sorry husband when he came down with the quinsy. She did not read French very well, which was uncultured of her, but she studied the philosophy of Herder and the poetry of Schiller. And she had nine children in between times, none of whom she thought were very pretty. In short, she was a "rare and golden Queen" —human like her Byronic friend, Prince Louis. Her subsequent deifica-

tion as a sort of Virgin, reminds one of the near-contemporary elevation of the worldly American Washington. One has only to read a few of her letters to test her mettle. One of them begins "Green, green parsley and lettuce!" as a salutation.

That crusty old patriot, Stein, regarded Louise as a "silly little woman," but Bonaparte held her in considerable regard. He called her the Prussian Helen of Troy when she tried to persuade him to modify his hard peace terms after Jena. But, with all her charm and a modish low-plunging bosom, she could do nothing with the Italic Frenchman. He insisted on talking about her clothes, while she thought that he looked like a Roman Caesar instead of the "off-scouring of Hell" she had formerly pictured. Women never could wheedle Bonaparte.

After Jena the King and Queen lumbered off to Memel, far away in East Prussia then, in the Soviets now. It seemed at the end of the earth, but they coasted and sleighed and swam in the Baltic and sat on the sand and made the best of things, with the French in Berlin. Then she died, in 1810, while Prussia was still in the dark, a client state of France. It was an inflammation of the lungs which she got on a visit to her good old grandmother, who had brought her up. She made the trip in great excitement without taking along a doctor. Her joy had been too great to bother about such things.

She was a lovely blonde, blue-eyed, with a pleasant voice. She had big hands and feet and neck, and liked to carry a green silk purse. Her foolish consort remarried a young Countess Harrach, in no way her equal. Also, in 1814, when things were going better, he founded the Order of Louise to be awarded "for distinguished patriotism and humanity." It was limited to a hundred Prussian subjects, and was afterward revived (c. 1914) for women who had done distinguished war work in care of wounded soldiers. The Order of Louise was an appropriate memorial, it is true. But more important, Louise was the beloved mother of a boy called William. He later had bushy side whiskers and a stern sense of duty, and became the first Emperor of Bismarck's united Germany in 1871.

His father, husband of Louise, dragged on in office for thirty years after the death of the "priceless" one, whom he had tried countless times to hush and suppress. Countess Harrach, for all her cutie good looks, was in no way a substitute.

A word on the man Ludwig Beethoven, whom Louis Ferdinand (the romantic blade sabered at Saalfeld) publicized so enthusiastically. The "unsurpassed master of instrumental music" was two years older than his Princely admirer, and a native of Bonn on the Rhine. He moved to Vienna, and was sponsored by an artistic descendant of Wallenstein, profit-maker extraordinary of the Thirty Years War. Beethoven wrote only nine symphonies to Haydn's 104 and Mozart's forty, but more important to us is his attitude toward the spirit of the times.

AWARD OF SILVER STAR

Sergeant First Class ARCHIE A. WARREN, RA19294238, Armor, Medium Tank Company, 5th Infantry, United States Army. During the withdrawal of a battalion supply train from an enemy ambush near Chinju, Korea on 12 August 1950, enemy machine guns set fire to a gasoline truck. Sergeant First Class Warren, who was covering the withdrawal, moved his tank up to the burning vehicle which blocked the narrow mountain road and shoved it out of the way. Having rescued the two men from the destroyed vehicle, he maneuvered his tank back into a position from which he succeeded in destroying hostile machine-gun nests. By his valor, quick thinking and resourcefulness, Sergeant First Class Warren enabled the train to continue without mishap. Entered the military service from North Carolina.

In 1796, the fat and fun-loving royal father-in-law of Louise invited him to settle in Berlin, and then died promptly. His son, Louise's spouse, had little interest in music of the radical Beethoven variety, despite the appreciation of Prince Louis Ferdinand. By the time of Louis' death, Beethoven was famous. In 1808 King Jerome Bonaparte was bidding against the Hapsburgs for his musical services, and for once the Hapsburgs defeated the Bonapartes! The composer had written his "Eroica," or Third Symphony, in 1803 in praise of Napoleon, but withdrew this dedication when the Corsican turned himself into an Emperor. In general he tended, like Goethe, to sympathize with the Revolution but, like Louis Ferdinand, disliked its Napoleonic course. In fact, after Bonaparte's catastrophic defeat at Leipzig in 1813, he celebrated the event (other liberals were celebrating too) by his "Battle Symphony" which is, in a sense, his political apology for the "Eroica." Nor was Beethoven finished politically. While the Congress of Vienna (1815) danced and flirted after the long wars, his opera called "Fidelio" was selected as the gala piece—the Congress theme-song—in honor of the visiting monarchs swarming in for a good spree. The Czarina was so delighted by the red republican from Bonn, beloved of potentates, that she give him a fat tip. This was in 1814, and Queen Louise and Louis Ferdinand were dead. They would have laughed. Perhaps they did.

Part and parcel of the Prussian reorganization of 1813 was the Iron Cross, probably the best known of all military decorations. The idea of this distinction was Gneisenau's as he mapped and planned ways for the overthrow of Napoleonic supremacy and the liberation of his country, in 1811. He suggested to King Frederick William that Prussian patriots should receive a black-and-white scarf or some sort of national cockade to do them honor. The King almost preferred the Corsican ogre to his own democratic patriots, but nevertheless he gave in. After all, he must keep up with his Austrian rivals, and Maria Theresa had instituted the Order of Maria Theresa, "for distinguished conduct in war," as far back as 1757. It was one case in which military Prussia was behindhand.

Frederick William III suggested that the new Prussian decoration should consist of two pieces of black and white ribbon, sewed on the breast in the shape of a cross. Black and white were the Prussian colors, and the cross would symbolize the medieval Teutonic Knights, Augustinian crusaders in East Prussia. But sewing proved inconvenient, and the cross was instead made of iron: iron because the Prussian state was impoverished by its indemnities to the

French. It had to be earned on the field of battle, and was to be striven for equally by private or field marshal.

In the Prussian War of Liberation in 1813—the answer to Jena in 1806—the new Iron Cross made its first full-fledged appearance. It was to reappear in 1870, and 1914 and 1939. "Those were iron days, and Gneisenau applied iron measures. He was advocating the principle that each citizen was bound to spill his blood in defence of his country, and therefore urged that no young man should be allowed to inherit property unless he had served in the army, that he should not be allowed to give testimony in court, or even to take the Holy Communion with his neighbors."

At this time Gneisenau was receiving $36 per week from the King, but he had become Prussia's "Lazare Carnot." The Eisernkreuz originated by this ex-Hessian mercenary is perhaps his best memorial. Much later, it was to appear on the German war flag, along with Hitler's Hakenkreuz, combining old and new for 1939.

Whereas the Prussians, after Jena, showed an awakening spirit of popular patriotism which rebuilt Army and State, in Austria the only nationalistic manifestations came from the mountainous Tyrol, where the action was isolated and weak and dreaded even by the Hapsburgs.

After the battle of Austerlitz (1805), Tyrol had been separated from Austria by Bonaparte, and turned over to Bavaria. The local peasants—noblest specimens of the Teutonic species—had not been consulted as to the transfer, and they were actively discontented, sending deputations of protest to a helpless Vienna which could not aid them. The Tyrolese were fonder of the Hapsburgs than the Hapsburgs were of the Tyrolese, and it was not until 1809 that a great popular rising occurred down among the Alpine ranges. In that year, war broke out again between Austria and France, and the mountaineers struck out against Bonaparte's Bavarian allies of the Confederation of the Rhine.

While far to the north, Prussian conscripts were secretly drilling under Scharnhorst and Gneisenau, a big, bush-bearded peasant named Andreas Hofer led the southern rustics. He was then 42, and had served in the unfortunate campaign of 1805 when Tyrol had been lost. His first official proclamation ran: "Tomorrow, on the 9th of April, we are to shoulder our muskets for God, Emperor, and Native Land. Each one is called upon to make a plucky fight of it."

Hofer was simple, rough, and religious. He had inherited a little tavern in the Passeyr Valley, thirty-five miles southwest of Innsbruck, capital of Tyrol. His birthplace was a hamlet called St. Leonard. All he understood was direct action, and his followers were natural marksmen. After all, French and Bavarians were easier to hit than chamois.

AWARD OF BRONZE STAR

Private First Class WAYNE W. WILSON, RA 57320150, Armor, 25th Reconnaissance Company, United States Army. While proceeding on a mission near Pangjung-ni, Korea on 28 July 1950, the reconnaissance section was pinned down by heavy enemy fire from commanding ground. The track on the personnel carrier was hit so that the vehicle could not be moved. When one of his comrades was wounded before reaching cover, Private First Class Wilson went out into the area swept by hostile fire and helped remove the wounded man to safety. When he went forward again after another wounded man, he himself was wounded just before returning the wounded man to cover. Private First Class Wilson's selfless courage reflects great credit on himself and the military service. Entered the military service from North Carolina.

Two days after his proclamation, Hofer beat the Bavarians at Sterzing. A month later he beat them again near Innsbruck, and drove them out of Tyrol. Meanwhile, the Hapsburgs had abandoned Hofer, following the French victory over the Austrians at Wagram, in which each side lost close to 30,000 men. Bonaparte sent three armies against the Tyrolese, who regarded him as the "enemy of Heaven and earth." At this point Hofer's two chief staff officers were a Capuchin monk and a chamois hunter, Haspinger and Speckbacher, sturdy fellows who did not care a snap for either French revolutionaries or Napoleonic despots.

The Tyrolese leader concealed himself in his native valley, where his little tavern lay, but issued forth to defeat the French and Bavarians, under Marshal Lefebvre, at Berg Isel or "Mountain Island." (Lefebvre's wife was the original "Madame Sans-Gene," so they say.) Hofer now maneuvered the French out of the country. It was his high point of success.

Tyrol was free for two months and Hofer acted as Chief-of-State for the Hapsburgs who had deserted him. Then the French and Bavarians poured in again with reinforcements and the peasant leader was compelled to hide in his own mountains while he rallied the guerrillas. For two months he stayed concealed in an abandoned cabin amid the ice and snow, while a priest brought him his meals. This priest, Donay, sold him to the French at last.

Hofer was captured. "On through the valley, through snow and ice, he tramped beside his captors. The friends of his youth, the peasants who loved him as their devoted champion, old women and children—for the rest had been killed—all pressed around him. They kissed his hands, his clothes; they begged for a blessing, and followed him with wet eyes and lips that trembled with a prayer for his deliverance. He passed through Meran, then Botzen, down through the magnificent Brenner Pass, and was finally locked up in Mantua."

After a summary trial, Bonaparte had him shot. Just before his death he wrote: "Farewell, ungrateful world. Dying comes so easy to me that my eyes do not even moisten. At nine o'clock, by the help of all the Saints, I set out on my journey to God." And the tough but so sentimental Berliners smoked, in his honor, pipes with the face of Hofer on them.

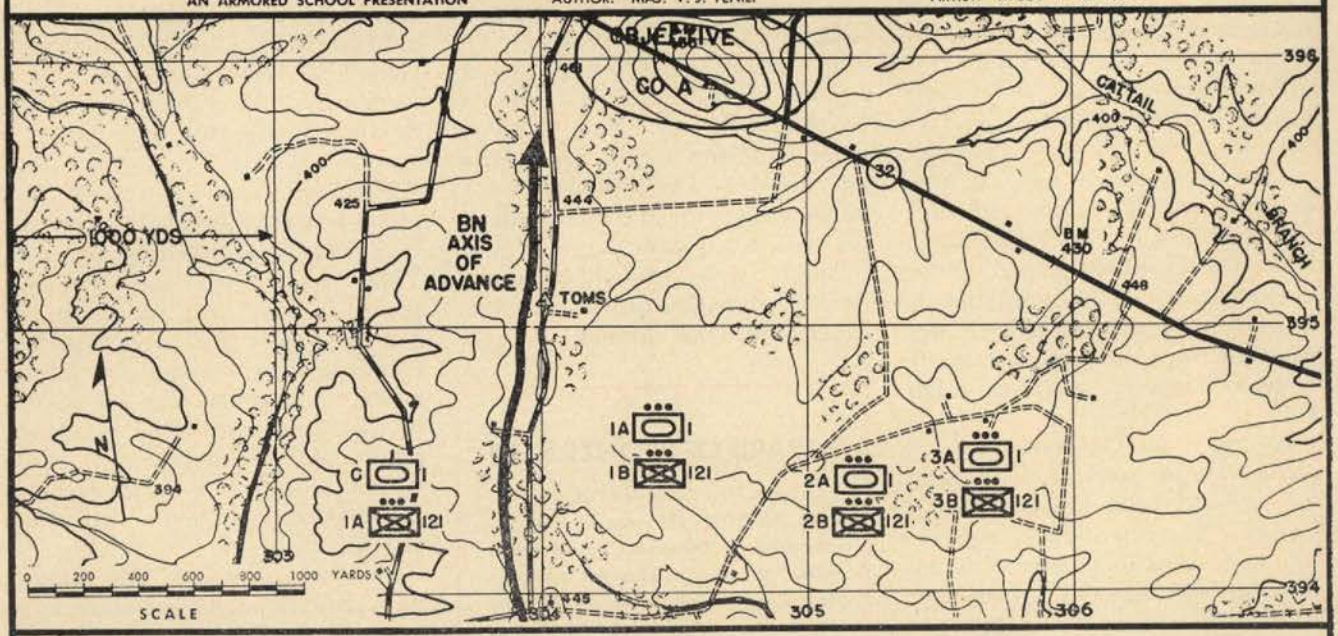
It was not until 1818 that the miserable Hapsburgs got around to indemnifying the destitute family of an Austrian patriot who had died for them. They distrusted patriots. But they ennobled Hofer's son at last, and Immermann and Auerbach wrote tragedies about it all. Today in Tyrol they are still singing about Hofer, perhaps more than about Hitler, or Stalin, or Truman.

"Zu Mantua in Banden,
"Der treue Hofer war."

HOW WOULD YOU DO IT?

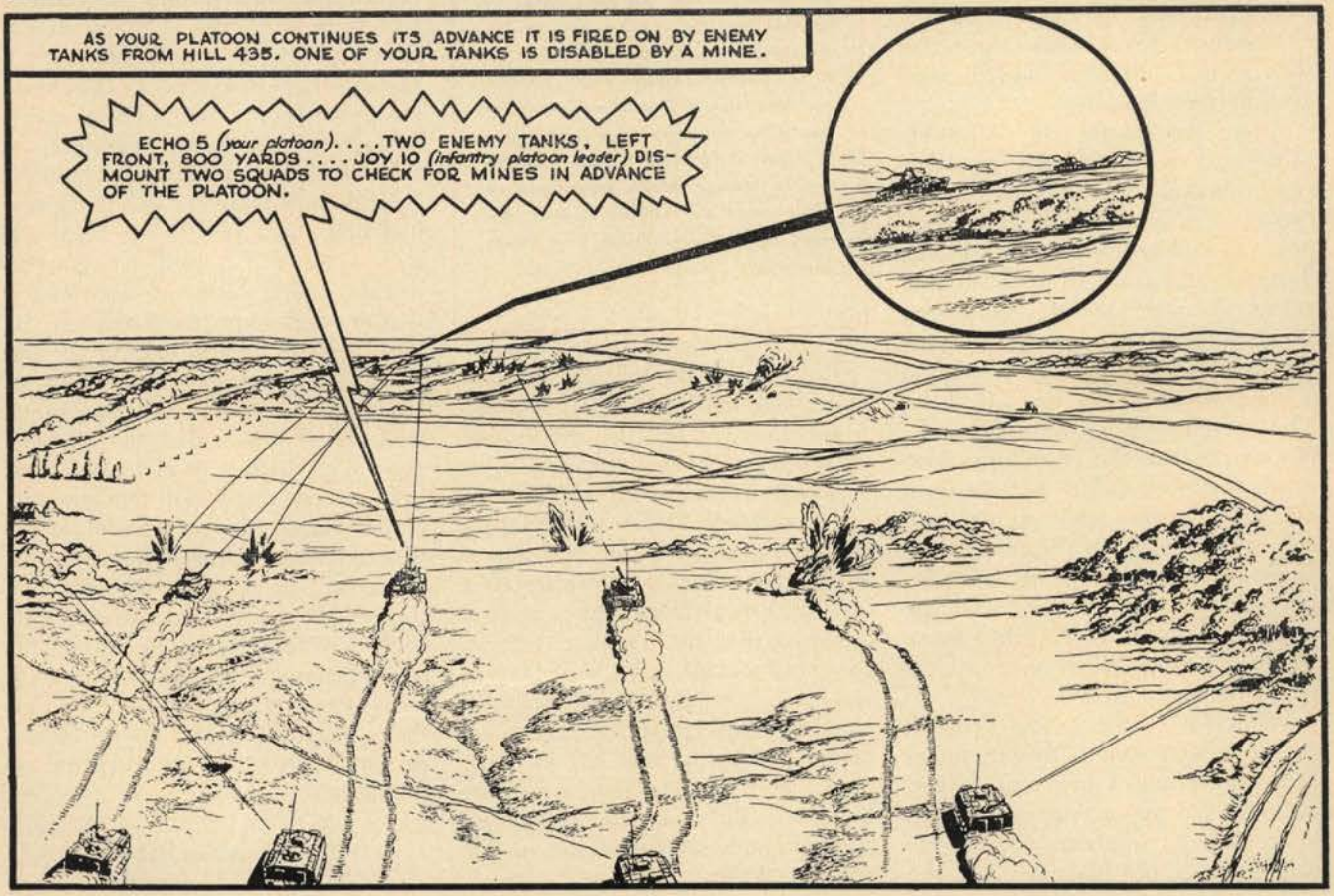
Continued from September-October, 1950, Issue

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



SITUATION:

COMPANY A, 1ST TANK BATTALION, REINFORCED, IS ATTACKING NORTH ON THE RIGHT OF THE BATTALION AXIS OF ADVANCE TO SEIZE OBJECTIVE AT 045960. YOU ARE PLATOON LEADER OF THE 1ST PLATOON, COMPANY A, REINFORCED. YOUR PLATOON HAS DESTROYED TWO ENEMY STRONG POINTS AT 046933 AND 047950 (SEE SEP—OCT, 1950 ISSUE). YOUR PLATOON LOST ONE OF ITS TANKS FROM THE PREVIOUS ACTION APPROXIMATELY 10 MINUTES AGO. FIVE ENEMY TANKS AND A COMPANY OF ENEMY INFANTRY, REPORTED MOVING SOUTH ALONG THE ROAD, HEAD OF COLUMN AT 054950, ARE NOW BEING ATTACKED BY THE 2D AND 3D PLATOON TEAMS. TWO OTHER ENEMY TANKS YOUR PLATOON FIRED ON HAVE JUST WITHDRAWN TO VICINITY HILL 435 AT 041960. YOUR PLATOON IS CONTINUING ITS ADVANCE TO SEIZE LEFT PORTION OF THE COMPANY OBJECTIVE AND IS NOW AT 045946 (SEE MAP).



YOUR TANKS ARE FIRING ON THE ENEMY TANKS. THE INFANTRY IS CHECKING FOR A MINE FIELD....

ECHO 6 *(company commander)*. THIS IS ECHO 1... ONE TANK DISABLED BY MINE.. INFANTRY CLEARING LANE... PLATOON ENGAGING TWO ENEMY TANKS. ... WILL CONTINUE ADVANCE WHEN LANE CLEARED.

YOUR PLATOON HAS JUST DESTROYED THE TWO ENEMY TANKS. YOUR ARMORED INFANTRY HAS CLEARED A LANE THROUGH THE MINES. YOU CONTINUE FORWARD TO THE OBJECTIVE....

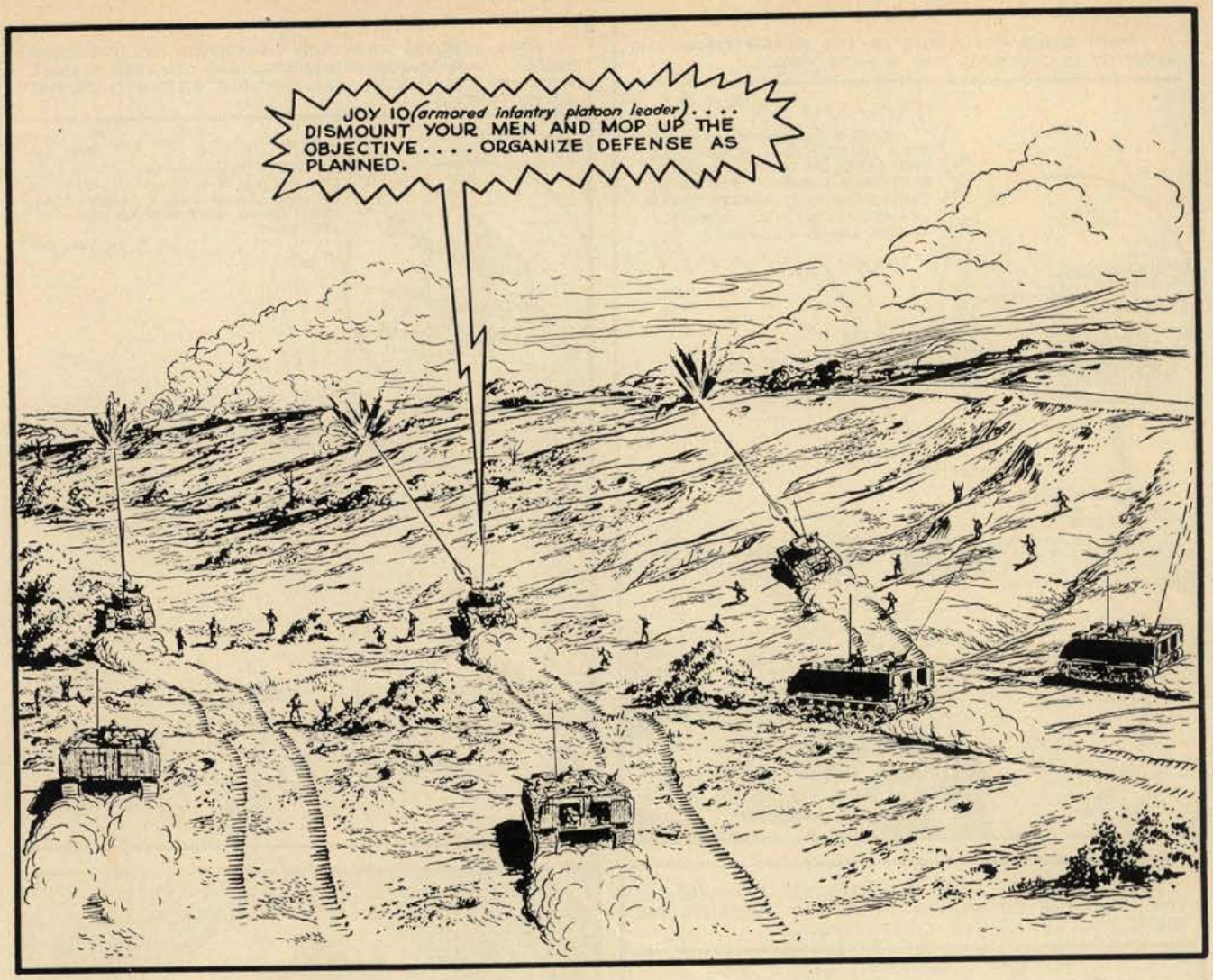
ECHO 5 *(your platoon)*..... FOLLOW ME IN COLUMN... JOY 10 *(infantry platoon leader)*... MOVE OUT WHEN TANKS HAVE PASSED THROUGH THE GAP....

THE ARTILLERY FIRE IS LIFTED FROM THE OBJECTIVE, AND THE 2D AND 3D PLATOONS ASSAULT THE RIGHT PORTION OF THE OBJECTIVE....

ECHO 5 *(your platoon)*....PLACE YOUR FIRE ON THE LEFT PORTION OF THE OBJECTIVE..... KEEP MOVING..... JOY 10, I WANT YOU TO.....

WHAT WOULD YOU DO

SEE NEXT PAGE FOR SOLUTION



DISCUSSION

As the reinforced platoon reaches the objective you should order the infantry to dismount and move up through the tanks to clear the objective of the enemy. After the enemy resistance on the objective is mopped up, you should have the tanks take up defiladed positions from which they can cover probable avenues of counter-attack. Personnel carriers are placed in defilade to secure the flanks of the objective. The armored infantry platoon leader should make proper disposition of his dismounted armored infantry with their individual and automatic weapons to adequately defend the objective against enemy counterattacks. You should obtain a report of personnel and vehicular casualties. This information should be consolidated and reported to the reinforced company commander. Reorganization on the objective must take place quickly as this is a critical period of the attack. Furthermore, the platoon team must prepare to resume the attack as quickly as possible or to support the action of the rest of the company as ordered by the reinforced company commander.

A Six-Day Training Schedule for a Five-Day Training Week

by **CAPTAIN JOHN K. BRIER**

IN a small army such as ours it is imperative that the maximum effectiveness be gained from each and every training hour. Poor planning or lack of planning wastes time. We all realize that a civilian contractor utilizes his labor to the fullest extent in all types of weather, including unexpected rainy weather. In the army we should do likewise. We should realize that our men are drawing their pay come rain or shine, so why not make them work for it just as they would in civilian life?

The purpose of this article is two-fold. First, it is desired to show how the full five-day training week, 40 hours, may be fully exploited in spite of unexpected inclement weather. Secondly, it is desired that the reader be impressed with the necessity of exploiting the full training time available.

The article is limited in scope to discussion of the training schedule for the line platoons, within a tank battalion only. Further, the program outlined is an emergency measure; the author expects that normally S-3s take cognizance that certain seasons of the year are bound to contain much bad weather, and will arrange a preponderance of indoor instruction on the regular schedule during these "normally miserable seasons."

As infantry officers we know that some day we most probably will have an opportunity to influence or outline the training schedule for the divisional tank battalion, either as a commander or a staff officer. In that case all of us will be able to apply the basic principles of constructing a sixth —or rainy day—schedule. These principles are outlined below.

The six-day training schedule makes possible in unexpected inclement weather a substitute training schedule for a tank battalion that within thirty minutes cancels regularly scheduled training for one-half or a whole day and within the same thirty minutes puts all line platoons indoors learning subjects which are:

(1) applicable
(2) basic
(3) complete
(4) adaptable

Let us see how the six-day schedule might be applied. In Table 1 we see a regular five-day training schedule for the battalion with some of the administrative details purposely omitted. A brief examination of this schedule shows that the training is pointed toward a mounted road march on Friday and hints of pistol marksmanship on the range during the coming week. Further we note there is much practical work (PE) outdoors calling for active participation by the students.

Assume that you are the battalion commander on your way to work at 0718 hours on Thursday; you hope to arrive at the battalion drill field in time to see the companies start their scheduled close order drill. But it starts to rain cats and dogs. It would be sheer stupidity to send the men out to do right and left face in this weather; outdoor work of the type called for on the regular schedule would be unprofitable. (However, the author does *not* advocate cancelling hikes and field problems because of poor weather.) Now if your battalion had a sixth day of training planned, such as shown in Table 2, you could direct the S-3 to cancel regular training immediately and by 0800 hours have the battalion profitably employed indoors following the sixth day's schedule.

Let us examine the preparation necessary to produce the sixth day's schedule.

First note that the S-3 has selected subjects for this "sixth day" which are *applicable* in that they supplement instruction planned on the regular schedule. That is, the subjects on the sixth day tie in with the regularly scheduled subjects; for example, map reading on the sixth day contributes to the probable success of the road march on Friday. Further, the subjects selected are applicable to the needs of the students; *i.e.*, tank drivers are not burdened with detailed gunnery instruction.

Subjects on the sixth day's schedule are *basic*. As many officers have learned, success in combat often depends on individuals performing basic duties with coolness and rapidity that come only from repeated practice. Therefore it appears that the rainy day is an opportune time to review such basic things as voice procedure, safety devices on the pistol, assembly of packs, etc.

Further, subjects selected for this

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extra day's schedule must be *complete;* that is, usable as given without further instruction. Rainy days come rather infrequently, fortunately, hence no follow-up on the subjects taught on this rainy Thursday may be possible for several weeks. The subject taught in this emergency must be of such a nature that it requires less than 60 minutes to teach, for the minute the weather lets up you want to hurry your battalion outside and put it back on the regular schedule. A review of general orders is a good "complete" subject.

Lastly, plans for this sixth day must be *adaptable* to the resources available. Normally the only indoor training space will be the company barracks—the area between the bunks and the main aisle in the center of each floor. For this reason the subjects such as map reading, voice procedure, use of first-aid packs, etc., which allow the men to sit on the bunks, are chosen.

Consideration must be given to the training aids that are available; there must be enough to be spread around to the small groups dispersed within the company barracks. For instance, in this case the S-3 avoided 81mm mortar instruction, as the number and size of the mortars within the tank battalion preclude that instruction. But he does schedule assembly of packs; every man has a pack. Lastly, among the resources, comes the large problem of sufficient instructors.

There are two basic solutions to the instructor aspect of the problem.

Of the 12 line platoon leaders in the battalion, three—one per company—should be available each week to *supervise* the preparation and giving of the sixth day's instruction. Of the 18 NCO tank commanders and 20 tank gunners in each company, 6 NCO instructors should be available to each platoon leader who is elected to supervise the sixth day's instruction. Thus A Company with Lt. Victor as an instructor supervisor is able to furnish a team of 2 NCO instructors to teach each company—assembled in its own barracks—safeties of the pistol. Likewise, other instructor teams are formed and each company undertakes the same subject at the same time as the other companies. It is upon this plan that the sixth day schedule in Table 2 is based.

This solution, to the instructor problem, as well as the next, utilizes the NCO instructors—a vital step toward the development of NCO leaders and also a vital step toward developing further prestige for the NCO.

If a limited number of NCO instructors is available a modified county fair system might be used. Here at 0800 Lt. Victor and two NCO instructors from A Company are teaching chain of command and general

TABLE 1

Date Day of Week	Area of Instruction Time	Place	Attendance	Subject and Nature of Instruction	Instructor, or Unit Furnishing Instructor
Mon.	0730-0800			PT (PE)	A Company
	0800-0830			Drill (PE)	Company commanders
	0830-1030		Tank Comdrs. & drivers.	Arm & hand signals (C,PE)	B Company
			Tank gunners bogs, loaders.	Snake board (C,PE)	C Company
	1030-1130			Breaking tracks (C,D)	B Company, Motor O
	1230-1430			Breaking tracks (PE)	B Company, Motor O
	1430-1630			Motor Stables (PE)	Company commanders
Tues.	0730-0800			PT (PE)	A Company
	0800-0830			Drill (PE)	Company commanders
	0830-1030			March Discipline (C,D)	B Company
	1030-1130			Personal cleanliness in the field (C, D)	Battalion Surgeon
	1230-1430			Grenades (C,D,PE)	B Company
	1430-1630			Motor Stables (PE)	Company commanders
Wed.	0730-0800			PT (PE)	A Company
	0800-0830			Drill (PE)	Company commanders
	0830-0930	Theater No. 1		I&E (C)	Lt. Smith
	0930-1130			Motor Stables (PE)	Company commanders
	1230-1430			March Security (C,D)	B Company
	1430-1530			Preparation for parade (PE)	Company commanders
	1530-1630			Retreat parade (PE)	Battalion commander
Thurs.	0730-0800			PT (PE)	A Company
	0800-0830			Drill (PE)	Company commanders
	0830-0930			Pistol-trigger squeeze (PE)	C Company
	0930-1030			Crew drill (PE)	B Company
	1030-1130		Tank Comdrs. & drivers.	1st echelon checks (C,PE)	B Company
			Tank gunners bogs, loaders.	Reduction of machine gun stoppages (C,PE)	C Company
	1230-1430			Motor Stables (PE)	Company commanders
	1430-1630			Athletics (PE)	Capt. Jones
Fri.	0730-0800			PT (PE)	A Company
	0800-0830			Drill (PE)	Company commanders
	0830-1030			Security at halt (C,D)	B Company
	1030-1130			Dry run range procedure (C,PE)	C Company
	1230-1430			Practice mounted road march (by companies) (PE)	Company commanders
	1430-1630			Motor Stables (PE)	Company commanders

NOTES: 1 Uniform F, except for Wednesday parade when it will be A.
2 Carry side arms to all classes except athletics.
3 Company commanders will refrain from detailing Lieutenants Victor, Xray and Yoke as instructors in above scheduled subjects.
4 .....

PE—Practical exercise (work)
C—Conference
D—Demonstration

TABLE 2

Date Day of Week	Area of Instruction Time	Place	Attendance	Subject and Nature of Instruction	Instructor	Individual Equipment	Unit Equipment
6th or Rainy Day	½ hour	Co. barracks	All	Safeties on pistol (PE)	Lt. Victor A Company		
	1 hour	Co. barracks	All	Voice procedure & interphone operation (PE)	Lt. Xray B Company		
	1 hour	Co. barracks	All	Map reading—signs (PE)	Lt. Yoke C Company		
	1 hour	Co. barracks	All	Map reading—symbols (PE)	Lt. Yoke C Company		
	1 hour	Co. barracks	All	Assembly of packs (PE)	Lt. Xray B Company		
	1 hour	Co. barracks	Tank Comdrs. & loaders, gunners.	Tank gunnery—terrain board (PE)	Lt. Victor A Company		
		Co. barracks	Drivers, bogs	Nomenclature of tank engines (PE)	Lt. Xray B Company		
	1 hour	Co. barracks	All	First aid—splints, slings, compress bandages (PE)	Lt. Xray B Company		
	1 hour	Co. barracks	All	Chain of command, General Orders (PE)	Lt. Victor A Company		

NOTE: 1 Each company assembled in its own barracks with each unit of instruction taught concurrently to each company.

orders to B Company. At the same moment Lt. Xray and two NCO instructors from B Company are teaching assembly of the pack to C Company. At the end of the hour the instructors would rotate, but the men would remain in their own barracks.

The S-3 must, in either solution, check the availability of the officer supervisors, and NCO instructors, by checking initially with the S-1 for a possible conflict in scheduled duties for the officers. Then the S-3 makes a note, such as note 3 in Table 1, on the regular schedule to prevent a conflict in duties (this later goes out as an official order). The S-3 should follow through with staff coordination to prevent double or triple duties being assigned to these valuable (and usually scarce) officer supervisors. He must include in his supervisor procurement plan a system of rotating the instructor supervisor jobs among all the available officers in the battalion.

Having designed the sixth day's schedule, the S-3 must check the state of preparedness of the program, recalling that he has only one-half hour in which to implement the schedule. All units of instruction should be previewed by the S-3 or his assistant—the communication officer. An inventory of the training aids must be made —these aids should be stored in a central location for no time is available for running to another part of the station for charts, or paper compasses, or the like. Training areas—inside the barracks—must be inspected. A recent change in interior arrangement may upset plans to use the space normally available in the center of each platoon room.

Another precaution: avoid upsetting the normal schedule. Looking at Table 1, if it rained Monday do not take Lt. Smith's I&E from Wednesday and have it given Monday. There are a number of reasons; Lt. Smith's training aids may not have arrived yet, he may not be able to obtain Theater No. 1 on Monday and may have been counting on using the sliding panels available at Theater No. 1. It harasses the instructor to change his time or place of instruction (he likes to make plans, too). And by moving him from Wednesday to Monday you create a problem of what to do with that hour that is now blank on Wednesday. In short it is better to cancel training rather than juggle it.

In summary, the principles involved in construction of a sixth day's training schedule, such as in Table 2 are:

(1) S-3 selected subjects which were:
- applicable —map reading and road march
- basic —pack assembly
- complete —general orders
- adaptable —first aid

(2) availability of instructors was checked.

(3) preparedness of program was checked.

(4) S-3 avoided upsetting the normal schedule.

If at Thursday noon the rain threatens to continue, the S-3 must make plans for Friday's instruction being indoors, too.

Training time is limited and valuable. It is not something to waste.

The Quartermaster Battalion of the Armored Division

SINCE the birth of our Army the Quartermaster Corps has played a principal role in the supply and service of our combat troops. The Quartermaster Corps has kept abreast of the demands of modern war and has provided mid-twentieth century cavalry with a unit fully capable of meeting the necessities of the armored division. This unit is the quartermaster battalion organic to the armored division. Its mission is to support the division and attached units by providing food, all fuel and lubricants, quartermaster clothing and equipment, limited bathing and laundry facilities, and graves registration service. This is an impressive mission, indeed, and affects every individual of the division.

The officer charged with the responsibility of directing the accomplishment of the quartermaster mission is the division quartermaster. He is a lieutenant colonel and serves as both the quartermaster battalion commander and the quartermaster representative on the division special staff. As the battalion commander he is charged with all responsibilities inherent in command and as a special staff officer he advises the commander and all affected staff officers on quartermaster matters.

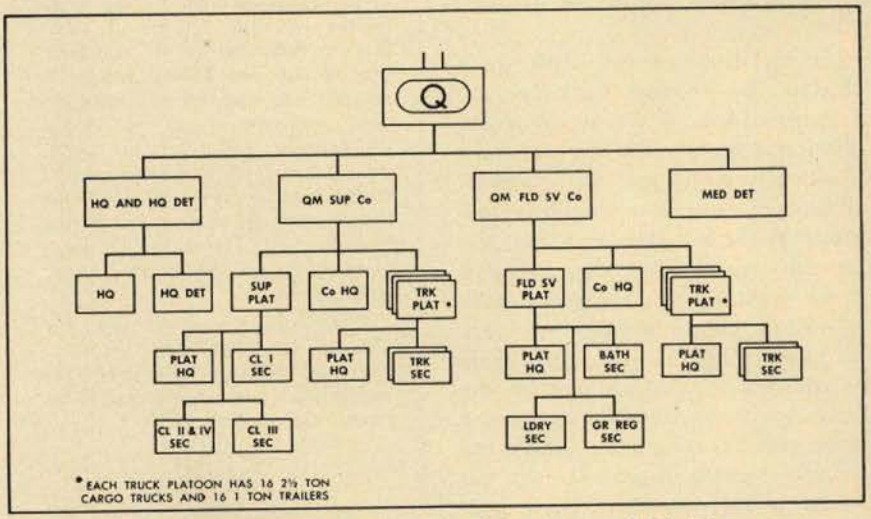
The command, planning, and supervisory group is contained in the headquarters and headquarters detachment of the battalion. The headquarters includes the office of the division quartermaster (ODQM) and the battalion headquarters. The ODQM constitutes the division quartermaster planning and supervisory staff. The officers of the ODQM are the division quartermaster supply officer, an assistant quartermaster supply officer, a food service warrant officer, and a purchasing and contracting officer. The quartermaster supply officer is really the assistant division quartermaster, advising the division staff when the quartermaster is not available. He assists in planning the quartermaster supply program for the division and processes requests for Class I supplies and quartermaster Class II and IV supplies. The food service warrant officer supervises the preparation and serving of food in the division, conservation of food, and mess management, but is not concerned with the actual procurement and issue of rations. The purchasing and contracting officer's function is to procure local materials and property for the division and he is also designated as the division graves registration officer. In addition to these functions he is charged with planning and supervision of the division laundry and bath services. The headquarters and staff which execute the missions as planned by the officers of the ODQM is the battalion headquarters.

The agency which physically procures and distributes quartermaster supplies for the division is the supply company. The quartermaster supply company has a company headquarters, a supply platoon, and three truck platoons. The supply platoon has a section for every class of supply provided by the quartermaster—Class I, Class III, and quartermaster Class II and IV.

The Class I section, consisting of 26 enlisted men, operates the Class I distributing point, draws rations from the supporting army Class I supply point, and breaks them down for issue to division units. For transportation, the section uses trucks and trailers of the truck platoons.

Class III supplies, consisting of fuel and lubricants, are handled by the Class III section. The 19 men making up this section draw from the supporting army Class III supply point by exchanging empty drums for full drums, and distribute to division units through the supply point operated by the section. As organic equipment, the section has 6,009 5-gallon drums, four gasoline pumps, and two motor oil pumps. Normally 40 trucks and trailers from the truck platoons are used to mobilize this supply point.

The Class II and IV section, consisting of 14 enlisted men, draws and issues the quartermaster Class II and IV supplies for the division. Quartermaster Class II supplies consist mainly of clothing and other prescribed quartermaster equipment. Class IV items are miscellaneous materials for which no allowances are prescribed. Issues to division units are made periodically, but critically needed supplies are issued when required. The section usually carries a reserve of individual equipment, and minor spare parts. Class II and IV supplies are obtained



The Quartermaster Battalion of the Armored Division.

Captain Jeoffrey Forsythe is a member of the Command and Staff Department; Captain John J. Norris of the Training Literature and Reproduction Department of The Armored School, Fort Knox, Kentucky.

from army quartermaster depots. In addition to handling of Class II and IV supplies, salvage, another important quartermaster function, is performed by this section. The section has no organic salvage, repair, or reclamation equipment, but operates a collection point which forwards to army collecting points all salvage materials of the division except certain items of ordnance, signal, and chemical equipment. Collected materials which can be used without repair are returned to service. Those items which are unserviceable are segregated according to technical service and are evacuated in division transportation to army collecting points. Army quartermaster repair facilities are used extensively to restore clothing and equipment to a serviceable condition. The repair of clothing and shoes is a major concern of the division quartermaster.

The three truck platoons in the supply company are each organized as a headquarters and two truck sections. Each platoon has a lieutenant platoon leader, 28 enlisted men, a ¼-ton truck and trailer, and 16 2½-ton trucks with 1-ton trailers. The 48 2½-ton trucks and trailers are used throughout the quartermaster battalion and the division.

In addition to providing the armored division with vital supplies, the quartermaster provides several needed services. Most of these services are furnished by the field service company of the quartermaster battalion. This company has the usual headquarters, a field service platoon, and three truck platoons. As in the supply company, the headquarters performs the company administrative, mess, maintenance, and supply functions. The field service platoon provides the bathing, laundry, and graves registration facilities for the division with sections for each.

The bath section, consisting of 16 men, can accommodate 4,000 men in a normal 8-hour day. The equipment consists of four mobile shower units complete with water tank, pumps, heater, and a 24-showerhead system, each capable of servicing separate major units of the division. Bathing is scheduled every day possible. Priority is given to combat troops during rest periods until their requirements are satisfied.

The laundry section, consisting of 24 enlisted men, can establish two complete laundry units for the division, each composed of a two-trailer-type laundry. In the two-trailer-type laundry, one trailer is equipped with water heater, water pump, and washing machine, and the second trailer is equipped with a tumbling dryer unit. Each of these laundry units can wash and dry approximately 110 pounds of laundry an hour. If an individual's laundry consists of a shirt, a pair of trousers, socks, drawers, undershirt, and a towel—5½ pounds—the section can service approximately 4,500 men a week by operating 16 hours a day continuously. Since this is insufficient to satisfy the division requirements, laundry is usually limited to very light articles such as handkerchiefs, underwear, and socks. In this way the section can service approximately 6,000 men per week. An army quartermaster laundry company sometimes supports the laundry section. To ensure maximum continuous operation, the laundry facilities should operate from one installation as long as possible and should remain intact.

The graves registration section, consisting of 10 enlisted men and supervised by the purchasing and contracting officer in the office of the division quartermaster, processes and evacuates the division dead. The section provides the basic administration for conduct of the division graves registration program and for the training of division personnel in graves registration procedures. The section operates as a unit; it is too small to supplement the graves registration activities of the division units. Division units must evacuate their dead to the division collecting point operated by the quartermaster graves registration section. The section processes the dead and their personal effects, confirms or establishes identification, and evacuates the dead to army cemeteries or army graves registration collecting points. If the division is authorized to establish a division cemetery, the section will be furnished additional labor from other sources.

Three truck platoons complete the organization of the field service company. These platoons are identical to those of the truck platoons of the supply company, making a total of 96 cargo trucks in the six platoons of the quartermaster battalion. These trucks constitute an organic cargo transportation pool for use by the entire division. Quartermaster truck platoons carry the division supply reserves and provide the transportation for the mobile supply points. Transportation requirements in a division are heavy and varied, requiring detailed planning and coordination by the division quartermaster and G-4. Transportation corps truck companies are sometimes available to supplement the cargo transportation furnished by the truck platoons.

The headquarters and headquarters detachment, supply company, and field service company complete the strictly quartermaster elements of the battalion. However, a medical detachment consisting of one officer and six enlisted men is organic to the battalion. In addition to servicing the battalion, this medical detachment provides medical service for the division band, the replacement company, and headquarters and headquarters company of division trains.

As a division staff officer, the division quartermaster works frequently with the general and special staff. In other words, quartermaster activities affect directly almost every phase of operations and planning in which the division is engaged. Principal among the staff officers with whom the division quartermaster works is the G-4. With him, the quartermaster arranges the procurement and distribution of all quartermaster supplies, location of supply installations, allocation of truck transportation, maintenance of supply reserves, and service

functions such as bathing, laundry, and salvage. A harmonious relationship is absolutely essential between the division quartermaster and the G-4.

Although the division quartermaster is principally concerned with the G-4, many of his activities affect the G-1, G-2, G-3, ordnance officer, surgeon, and other special staff officers. The G-1, whose office maintains the ration strengths of division units, is primarily concerned in the morale services offered by the quartermaster —bathing, requisition of decorations, distribution of cigarettes, candy, and toilet articles. Graves registration is a staff responsibility of the G-1; this requires close coordination with the quartermaster. The G-2 is involved in the intelligence training of the division quartermaster personnel and in quartermaster technical intelligence matters. The G-3 is concerned with the tactical training of quartermaster battalion and the logistical support available for tactical operations of the division. The division ordnance officer requires quartermaster transportation to haul ammunition when the division is authorized to establish a mobile ammunition supply point. The division surgeon is interested in the issue of medical supplies such as atabrine and salt tablets through Class I channels, in bathing and fumigation facilities, disposition of clearing station dead, and death certificates.

Supplying 15,973 men and approximately 3,300 vehicles is no small task in garrison, but the tactical employment of the division in combat poses many additional logistical problems. The actual employment of the battalion is directed by the battalion commander, the division quartermaster, but he must work closely with the G-4 who coordinates the logistical activities of the division. The division quartermaster is responsible for the operation of the Class I and Class III supply points and furnishes the trucks to operate Class V supply point under the control of the division ammunition officer. The quartermaster is responsible for the movement and security of the division supply control point (DSCP) and the three mobile supply points usually located nearby. The DSCP is a control installation under the direction and supervision of the division G-4. Its function is to inform and advise supply traffic and to disseminate supply information. To facilitate the direction of supply traffic, it is usually located on the main supply route (MSR) just forward of the division supply points. The division quartermaster establishes and operates the installation with an officer and three or four enlisted assistants. The remainder of the quartermaster battalion is normally located with the division trains.

In offensive actions, the division supply control point and the three supply points will be well forward on the division MSR ahead of division trains. The number of trucks allocated to transport each class of supply will be designated by G-4. The division quartermaster will normally issue rations from the division Class I distributing point early in the afternoon to subordinate units to enable them to issue to companies that night. As a rule, the division is on a supper cycle. Rations consumed in the offensive will vary as to type, depending on the capability of feeding hot meals. The quartermaster usually carries a small reserve of combat type rations for emergency issues.

Fuel and lubricants are issued on a drum for drum basis, division drawing from the designated army Class III supply point. In slow-moving offensive action the division Class III supply point, transporting approximately 40,000 gallons of gasoline, is capable of meeting demands. As trucks are emptied they are dispatched to the army Class III supply point preferably in convoy to ensure control. Normally the division draws gasoline in 5-gallon drums; however, on occasions 55-gallon drums are issued and the division Class III section transfers the fuel to 5-gallon drums using the portable pumps. On rare occasions division might draw from tank cars or a forward pipe-line distributing point. In fast-moving offensive actions unit trucks under division quartermaster control often are dispatched to army Class III supply points when the division Class III supply point cannot meet demands. If combat commands are operating wide apart, separate gasoline truckheads for each combat command are established. These trucks, however, remain under quartermaster control and are not attached to the combat command unless absolutely necessary.

The quartermaster Class II and IV supply point remains back with the remainder of the battalion in division trains. Emergency issues are made when required, but normally II and IV supplies are issued periodically. This supply point usually carries individual clothing and equipment for 100 men. The Class II and IV section stores excess barracks bags and footlockers for the entire division in warehouses well to the rear.

The bath sections may remain intact with the quartermaster battalion in the division trains and operate for the division as a whole or bath units may be dispatched to combat commands when required. If the bath section is consolidated in the division trains area, a bathing schedule is published for the division. The laundry section will also remain with the battalion in the division trains area devoting the bulk of its work to socks and underwear. The laundry section will allocate quotas of amounts to all units and a schedule will be published by G-4, giving times for delivery and pickup as recommended by the quartermaster. The graves registration section will be with the battalion in the division trains area operating the collecting point for the division dead, and evacuating them to cemeteries or army collecting points.

In the mobile defense, as in offensive operations, the division supply points—Class I, III, and V—will normally be forward of the division trains area for best support of the division. In the sustained defense and in retrograde movements all supply points will normally be within division trains area operating with the battalion, and maximum advantage is taken of laundry and bathing facilities and the opportunity to replace Class II and IV supply shortages.

A study of the organization of the new quartermaster battalion, armored division, reveals the wide variety of essential supplies and services furnished. Provision of these supplies and services to the armored division is principally characterized by the huge volume of gasoline consumed and the logistical problems frequently created by the tactical employment of the division. The battalion, however, is organized and equipped to meet the division needs, Efficient use of its facilities is a major logistical goal and a prerequisite to successful operations.

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SOFT UNDERBELLY AND FORGOTTEN FRONT

CALCULATED RISK. By Mark W. Clark. New York: Harper & Bros. 494 pp. $5.00.

Reviewed by
Quentin Reynolds

The *Ancon*, headquarters ship, was steaming toward the Italian mainland accompanied by some four hundred other vessels when General Mark Clark called the four correspondents aboard to his quarters for a briefing. We figured we were heading for Sardinia or Anzio or Bari or maybe Salerno—we could guess, but the secret had been well kept and we didn't know. Clark told us it was Salerno. He outlined the whole operation for us on a blackboard and then said, "You boys got any questions?"

"Where is our air cover coming from?" a nervous voice, which I found to be my own, squeaked.

"It'll have to come from Sicily," Clark grinned. "It's a long way off, I know, but that's the best we can do. Of course if it rains hard tonight, the Sicily airfields will be knee deep in mud. Those fighter planes won't be much good to us then. So we'll just pray for clear weather in Sicily," he laughed.

"You're really betting on clear weather, then?" another correspondent suggested.

Clark nodded cheerfully. "That's right. It's part of the calculated risk. Look at that map. We're going to try to make the longest end run in history. We're going to need all the luck we can find. We're really sticking our head into the lion's mouth this time."

Clark was smiling, completely at ease. He talked about this operation as though it were a boating trip on the Thames. He noticed that I was wearing a wrist watch. "I hope you don't get that watch wet," he grinned. We four correspondents walked out of his quarters in very thoughtful mood.

"That guy has ice water in his veins," one of my colleagues said in awe.

"Calculated Risk," by the same Mark Wayne Clark, now General of the Army, gives a better and perhaps more anatomically sound answer. What Clark had at Salerno and in subsequent operations was a complete, unbounded confidence in himself and in his destiny. Salerno, of course, was the perfect example of a calculated risk, but once having made his calculations, Clark faced the issue with almost casual confidence. During the war this attitude of omnipotence occasionally became annoying to his American and British high echelon associates. Clark never admitted the possibility of failure; never for a moment entertained the thought that he might be wrong in his military and political judgments. The hell of it is that almost invariably Clark's optimistic estimate of his own infallibility was verified by results.

The weather did remain good in Sicily, and we did have adequate (if not overwhelming) air cover at Salerno. Most football coaches frown on the long end run—it leaves your ball carrier very vulnerable—but Clark got away with it at Salerno, and because the plan was for the most part his, the credit too must belong to him. His chapter on this operation is headed, "Salerno: A Near Disaster,"

The Author

Mark W. Clark took part in the planning and execution of the landings in North Africa and made a preinvasion visit by submarine to arrange some of the details with French officers. He commanded Fifth Army and Fifteenth Army Group in the Mediterranean Theater in World War II. He is now Chief of Army Field Forces.

The Reviewer

Quentin Reynolds is familiar to many as an Associate Editor of *Collier's*, a post he has held since 1932. Prior to that time he was on the *N. Y. Evening World* and a foreign correspondent for INS. He is author of *The Wounded Don't Cry, Dress Rehearsal* and *Officially Dead*. His most recent book is *Courtroom*.

U. S. Army

Ike lays down the law to Darlan.

U. S. Army

The Prime and the American Eagle.

and here he reveals (for the first time, as far as I know) how close that came to being another Dunkirk. Intelligent exploitation of its armor by the enemy would at one point have ended the assault on the Italian mainland.

> I saw eighteen tanks beginning to infiltrate our lines. For a moment I hoped they were ours, but studying them through binoculars I soon discovered they were German. It also was obvious that they had found a weak spot in our lines and that if they were merely the spearhead of a big tank attack, we were again in the utmost danger of being split apart and crushed. I could not imagine that Kesselring would fail to exploit this opportunity to rush up powerful armor and break through to the sea.
>
> I still can't understand why such an able general as Kesselring failed to carry through on that occasion with a stronger attack force, or why he used his plentiful armor—he originally had probably six hundred tanks at Salerno—in piecemeal fashion at critical stages of the battle. I can't understand it, but I can be thankful for it. Looking back, I often feel that this lapse on the part of Kesselring was all that saved us from disaster.

General Clark raises military issues in his book which can only be judged by experienced military men. No civilian book reviewer is competent, for instance, to judge whether or not Clark was right in launching the 36th Division against fixed German defenses across the Rapido River. The General has never been exactly popular in Texas since, but his argument as to the necessity of the attack in order to draw German forces away from the Anzio beachhead must be heard with respect. To a layman it seems convincing; a Texas military man might refute it.

Clark defends his tactics vigorously, and concludes,

> As for myself, I can only say that under the same circumstances I would have to do it over again—and if I am to be accused of something, thank God I am accused of attacking instead of retreating.

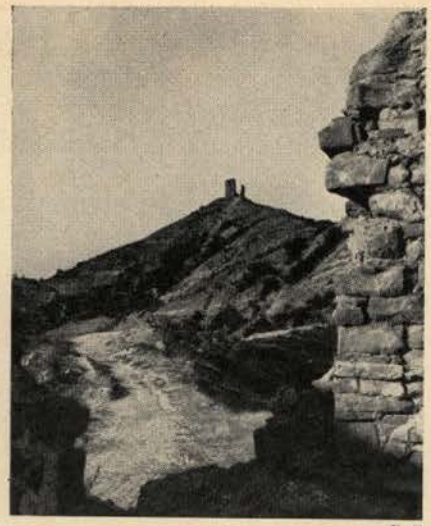
Should Monte Cassino have been bombed? Clark is vehement in his insistence that this was a grave mistake, productive of no military advantage. In fact, he argues that "the net effect of the attack was to confirm that aerial

U. S. Army

Salerno.

U. S. Army

American troops enter Rome.



Bell

Battle Mountain, North Apennines.

bombardment alone never has and never will drive a determined enemy from his position." (Take it from there, Air Force.) Clark condemns Lt. General Freyberg of the New Zealand Corps and General Alexander for ordering the air attack on the Abbey. As a matter of fact, Clark is often testy and critical of British leaders. His opinion of them is sharply at variance with that of General Eisenhower, who publicly and privately has given unstinted praise to men like Alexander. It must be noted that Clark displays little patience with those who disagreed with him on tactics or strategy. Clark always begins by assuming that he is right and the other fellow wrong.

Well, that's what makes horse races, and that's what makes a book stimulating and exciting, and "Calculated Risk" is both. Clark ducks no issue, no matter how controversial, and of course he invariably and rightly gives the viewpoint of the commander on the spot. He is a powerful self-advocate, and his frankness, his arbitrary conclusions and lack of any false modesty will prove refreshing to some and annoying to others.

Whether or not history will vindicate his political judgment in playing ball with Darlan, Nogues and other equally nauseous characters in the period following the Anglo-American landings in French North Africa in November, 1942 is debatable. His acceptance of the Vichy French and his rejection of hundreds who had helped us and who had risked their lives to fight Vichy and all it stood for, is blandly justified by Clark in the name of "military expediency." Others perhaps more objective have used an uglier word, "appeasement," and have claimed that our tolerance of collaborators in North Africa did a great deal to lower our political prestige in Europe and furnish ammunition to the Communists in their postwar campaigns in both Italy and France. It was the immediate military job that Clark was always concerned with, and it is obvious that long-range projection of American ideals meant little to him.

Very few people will agree with everything that Clark says in "Calculated Risk"—even fewer will be able to lay the book down once before finishing it. Incidentally, it is a beautifully written book. General Clark was wise enough to call in a real professional writing man, Joe Alex Morris, to help him with that end of it.

U. S. Army

Anzio.

Armored Cavalry Journal — ARMOR Index
Vol. LIX, 1950

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The true story behind a fabulous legend

Rommel

THE DESERT FOX

By BRIGADIER DESMOND YOUNG

Foreword by FIELD MARSHAL SIR CLAUDE AUCHINLECK

WINSTON CHURCHILL,
writing of Field Marshal Rommel in *The Grand Alliance*, said:

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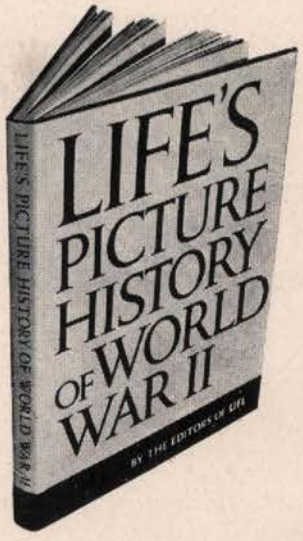

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