if you fight mounted...

or fight a mounted enemy...

ARMOR The Magazine of Mobile Warfare
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George Washington

Volume V

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By Douglas Southall Freeman

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LETTERS to the EDITOR

Dear Sir:

I am writing to bring to your attention the current state of the two primary components of the tank in World War II, the American M4 Sherman and the German PzKw IV. It is my belief that the Sherman is superior in every aspect compared to the PzKw IV.

The Sherman has a larger hull and better armor than the PzKw IV. The Sherman's larger hull provides more interior space for the crew, which results in better crew comfort and survivability. The Sherman's armor is also thicker than that of the PzKw IV, providing better protection against enemy fire.

The Sherman's main armament, the 75mm gun, is more powerful than the PzKw IV's 7.5cm KwK 40 cannon. The Sherman's gun has a higher muzzle velocity and a greater range, allowing it to engage targets at a greater distance.

The Sherman's engine is also more powerful than the PzKw IV's engine, providing the Sherman with greater speed and mobility. The Sherman's tracks are also wider and more robust than those of the PzKw IV, providing better traction and less likelihood of becoming stuck in mud or other terrain.

In conclusion, I believe that the Sherman is the superior tank in every aspect compared to the PzKw IV. It is my recommendation that the United States Army continue to use the Sherman as its primary tank.

Sincerely,

[Your Name]

Dear Sir:

I am writing to express my concern about the current state of the American military. It seems to me that we are not prepared for the modern battlefield.

In my opinion, our military has become too reliant on technology and not enough on human skill and strategy. This has led to a decline in our military effectiveness.

We need to focus on training our soldiers in the fundamentals of warfare, such as marksmanship and combat tactics, rather than investing too much in technology.

I urge our leaders to take this issue seriously and make changes to ensure the continued effectiveness of our military.

Sincerely,

[Your Name]

Dear Sir:

I am writing to express my opinion on the current state of the American economy. I believe that we are facing a serious economic crisis.

In my opinion, the root cause of this crisis is the over-reliance on financial speculation and the lack of regulation in the financial sector. This has led to a situation where the economy is too closely tied to Wall Street, and the average American is left to suffer.

We need to take bold steps to regulate the financial sector and ensure that the economy is not too closely tied to Wall Street.

I urge our leaders to take this issue seriously and make changes to ensure the continued prosperity of our nation.

Sincerely,

[Your Name]
In the Labor Day issue of the New York Herald Tribune, columnist Walter Millis brought to the attention of the reading public a "large class of labor—most of it highly skilled and specialized—" which has no union organization but which often works very hard indeed and to which country towns a good deal." He noted that "one can find out something about it in the service magazines," the journals of this class of labor whose trade is war. (Mr. Millis' column is reprinted on page 31.)

Service publications are "the trade journals of war." They are the products of a profession and are published for the profession. The members of the various arms and services such as Armor, Infantry, Artillery, Ordnance, Engineers, Signal, etc., all have their trade journals, which are equally as important to them as their fields in which they are professionals. The Journal of the American Medical Association is to the doctor.

Professional publications have been a part of the military in many countries for many years. Their effect upon military thinking and upon professional qualification has been marked. General Wesley Merritt, famous Civil War and frontier cavalryman, writing in this magazine fifty years ago, stated "I have been told by more than one officer whose advancement in the Cavalry service has been marked, that much of the success was due to the influence of the studies (published as articles) induced by the Cavalry Association." General Merritt was the second president of this Association.

The importance of the service magazine in Germany was emphasized in conversations with Generalmajor Alfred Toppe, on the occasion of his recent visit to ARMOR as one of a group of NATO journalists. A former Cavalry officer and Quartermaster General of the German Army under Hitler, General Toppe is now editor of Germany's only authentic military magazine, Wehr-Wissenschaftliche-Zeitschrift, which deals with European defense. He can attest to the importance of the military periodical.

In the United States our own mobile arm was the first by some years to recognize the need for and value of a trade society and publication. The idea was picked up by the other branches progressively until today our arms and services are represented by organizations and magazines. The historical significance of developments in the field of mobility alone is evidenced in the change in name of the Association and its publication to remain abreast of the times. Thus have we progressed from Cavalry to Armored Cavalry to Armor. Another change would be met with equal flexibility.

The chart on these pages sets out the organizational history of our Associations and journals of the arms and services. Over and above these there are a number more of Army publications, some official, some non-official. Many exist in the Air Force, Navy and Marine areas. They are far too numerous to mention here except to note as a point of interest that the U. S. Naval Institute was established in 1873.

The story of our own country's publications is by no means the full one. ARMOR carries an exchange arrangement with many publications in many countries around the world. Our editorial office might well be mistaken for a newsstand with the large number of magazines at hand. It is a source of great editorial interest to see the publications from Italy, France, Denmark, England, India, Yugoslavia, Germany, Ireland, The Netherlands, Canada, many South American countries, and even the Belgian Congo, among others. Although language is a barrier in some cases, something can be gleaned from them all.

The periodicals that deal exclusively with armor may be numbered on the fingers of one hand. England's The Tank, the Journal of the Royal Tank Regiment, is more a unit type of publication than otherwise, although it does cover some general material. The Royal Armoured Corps Journal publishes some armor material along with a variety of other matter. Our own ARMOR is the only magazine in the world devoted to all phases of mobile warfare in all parts of the world. Thus it has been a source of great pleasure to have the wide expression of comment and appreciation from many countries, particularly those of the North Atlantic Community, concerning the value of ARMOR. We would feel that this is a logical by-product of our primary mission—to serve the Armor arm, the United States Army and our country in this most special phase of warfare.

The Editor
Tactical Employment of Light Aviation with the ARMORED DIVISION

Armor’s great mobility on the ground units it automatically with the air dimension—a three-way tie with tactical aviation, air transport and light aviation.

Light planes are now organic in the armored division. They provide the agile-minded armor leader with an ideal command tool for employing the arm of decision.

by CAPTAIN JAMES C. SMITH

Tactical Employment of Light Aviation with the ARMORED DIVISION

Capt James C. Smith is a graduate of the Service School of Armorment. One of the first Bedord Command staff to turn for a bit Command following a tour with the 1st Armored Division, where he was intimately connected with the tactics described in this article.

U.S. Army Photo

ARMOR—September—October, 1952

being trained to observe from the air, a technique in itself. As a result of the many flying hours, commandes of this Division are capable air observers. This can be true only after they have spent sufficient time in the air to develop good observer techniques.

This employment of the aircraft continued throughout the company-test period of training, with more and more training inspections being made in the air. A flaw in the tactics of the smallest unit is most evident while observing from the air, and the time required to detect errors or deficiencies is a great deal less than the time required on the ground.

With the schedule turning to battle tests, the tactical employment of the aircraft became of major importance. The aviation section supported each battalion with one aircraft throughout test period, including all of the preliminary battalion problems. To provide maximum support to the battalions, the same aviator, when possible, was assigned all missions with the pertinent battalion. It is felt that the aviator in reality functions in part as an instructor, advisor, and liaison officer to the battalion and personal contact at this period of training needs to further the close coordination demanded by this integration. Again it is brought out that hereafter, few ground force officers have had much experience with light aircraft and every attempt must be made to facilitate the operational procedures. This is the best period to indoctrinate the unit personnel with correct tactical employment of the aircraft. It is important that during this phase, all personnel were fully convinced that light aircraft could be their “eyes” when utilized properly.

In this tactical phase, the technique of radio communications should be explained in order that the reader understands the operational procedures mentioned later. The type radio used is not too important, but there are several factors which must be considered so that the tactical integration of the aircraft with the units can be made possible. The success of all operations will depend on excellent radio communications because an aircraft in the air without a well operating radio is useless. This fact is mentioned because many units will wait without the last minute before tactical operations to determine whether or not their radios will operate properly.

Our particular radio is the well known SCR-510, an FM set with two-power channels. The A channel is tuned to a major command frequency and the B channel is tuned to what we call the Division Air Ground frequency. This Air Ground channel is the same on all Division aircraft, except the Division Artillery. This setting provides great flexibility which will be explained in higher-level operations.

For the battle phase, channel A was tuned to the particular battalion being used or supported, just another means of giving maximum support. During the operational period, the aircraft in support became a key in the command voice net of the battalion, thus enabling the battalion commander and all company commanders to maintain communications with the aircraft. During daylight hours, most enemy information was passed to the aircraft in close support, so all commanders should be in favor of this. If the battalion commander desires the aircraft to support a particular company, he can direct the aviator to work with the
desired unit, and immediately the aircraft radio will be switched to the Division Air/General channel in order to talk with the unit commander. Since all units remain on the Air/General channel, they can obtain emergency assistance at any time from any division commander. On the contrary, if all units in the Division are on the command channel, they can call out only to the unit commander. If a unit commander is not available, the control center can call another unit commander to assist with the task.

In their combat situation, the air/ground teams maintain their communications with each other. The teams are given a set of instructions to follow, which include the following:

1. The team must remain on the Air/General channel to maintain communications with the unit commander.
2. The team must remain on the Air/General channel to maintain communications with other teams in the Division.
3. The team must maintain communications with the unit commander to receive instructions and updates.
4. The team must maintain communications with other teams to coordinate their actions.

These instructions are essential for maintaining effective communication and coordination in the Division's combat situation.
Artillery's historic support role in the ground combat picture has been much enhanced by developments in the self-propelled field. Mobility, protection, communications, control, shock—these are elaborations fitting to the modern battlefield and the major support arm. The inherent capabilities of the self-propelled battalion explain why many artillerymen say

**ARMORED Artillery is the Thing!**

by LIEUTENANT COLONEL LEON F. LAVOIE

That history repeats itself is a generally accepted fact. Of considerable concern to the author, however, is how many recent incidents of a particular pattern must be recorded in the annals of history before effectively modifying the pattern, or adapting it to the recurring incidents as fact and guidance for the future?

In North Africa, the Germans made an armor attack. The 17th Field Artillery Regiment (towed) was overrun and lost. The 91st Armored Field Artillery fought in out of the trap. At Cassino in Italy the Germans launched an armor and infantry attack against the 93rd Armored Field Artillery. The attack was defeated with only minor loss in friendly casualties. At the Battle of the Bulge, the 106th Division Artillery (towed) was overrun and lost.

In the Pacific Theater there were numerous cases where the Japanese infiltrated stable forces, into our towed artillery positions and inflicted serious losses. In the earlier stages of the Korean campaign every towed artillery unit was attacked one or more times, suffering serious losses. The most serious loss was suffered December 1, 1950, by the 2nd Division Artillery (towed) in the Kunsan Road Block. Yet, on the 24th of April, 1951, northwest of Chunchon, the 92nd Armored Field Artillery Battalion soundly defeated, with terrific losses, an attack on their position by a sizable Chinese Communist force. Minor friendly personnel losses were suffered and no equipment was lost. On or about 21 May 1951, the 213th Armored Field Artillery Battalion (105 SP M7) completely defeated a large enemy force that attacked their perimeter north of Kapyong. When the smoke cleared, they counted minor friendly casualties and gathered over 300 enemy dead and several hundred prisoners. In Korea alone we have suffered a loss of better than 400 towed artillery pieces, a priceless commodity at a time when it was needed most. Obviously, circumstances were different in each case and no flat statement can be made that will fit any and every action. But an analysis of organization and capabilities and limitations goes far toward supporting the combat examples.

While Korea differs materially from the World War II pattern of Europe, Korea may well be representative of many actions in which we will be called upon to participate in our support of freedom-loving nations on all continents. Our potential enemy is certain to have manpower superiority as he does in Korea but as long as steel can penetrate flesh, our inherent firepower superiority will keep us with the initiative for the offensive.

War implies seizing the initiative by force. The element of surprise initially favors that side which initiates war. As a nonaggressor nation, we must first be attacked or transgressed prior to active war. World War I and II found our allies taking the brunt of this initial force while the United States mobilized, assembled, shipped, and trained a balanced offensive force. In future wars, we are certain to meet the initial shock wave with tanks and equipment on hand. These facts indicate a requirement for an initial highly mobile defensive force to defend, delay, and to gain time to assure the offensive—eventually. Obviously, then, the effectiveness of our initial defensive force will greatly influence the eventual offensive. Both deploy the most modern, hard-hitting and decisive weapons that our science, industry, and economy can provide.

As Korea vividly illustrates, surprise and sneak attacks upon artillery positions have proven to be a particularly lucrative enterprise for the Red hordes who sought to start and ambush this dreaded weapon. Panic, resulting from a hostile act, often proves much more disastrous than the hostile act itself. In the first decisive moments, faith and confidence in equipment and weapons instilled through realistic training will alone overcome panic and influence victory. In artillery units, this faith and confidence is best realized and sustained in the self-propelled battalion through its superior firepower, light armor protection, cross-country mobility, and compact rolling stock.

Embarrassingly reminiscent of our Indian wars of early days, the OCF's tactics emphasize infiltration and sneak tactics and close-in combat. Their initial object is the disruption of supporting units. Recognizing the numerical superiority of any potential enemy, this presents a serious threat to our present and future forces. The OCF in Korea follows the following general pattern:

a. The infiltration of small parties into our flanks to cut off our rear, transport, and resupply.

b. Night advance, to feel out our position and then attack promptly where our fire is weakest. (This is usually coordinated by signals from an OP.)

c. The utilization of nenmaking devices for our demoralization.

d. Charging the position with several OCF, loaded with grenades which they toss into armor vehicles and gas tanks, to create confusion and panic within the position. Thereafter, they open up with supporting weapons to methodically reduce the position.

In contrast to the stabilized lines of conventional warfare of World War II in Europe, the OCF cashed in on their numerical superiority to infiltrate our rear, cut off our supply, and disrupt and subjugate our principal close-support weapons, the
null
The Ground Soldier

In three days of tanks, self-propelled artillery, armored personnel carriers and planes, it is unfa-
table to say that the single man is safe in terms of the future. Perhaps this is nothing more than the habit of
military thought. What is likely to happen is that the ground soldier

The best of the three-page debate. While

nothing new is pleasantly oriented to the balanced issue concept which in all services play their

F22, may not alone decide the Army side in favor of their case in the same old way, "You can't be safe

This only partially means the matter. It is an overt-identification of the Infantry in a situation that

Himmler, which has brought man a long way beyond his two feet, has done the corresponding

While these innovations reach their climax in such agencies as Air Force and Armor, they have by

But there is a definite trend within the ground forces which was sparked in World War II. It is

In speaking of our ground forces in terms of the rifles or the infantryman, we are grading a

For those new to mention Korea at this point and the pre-dominantly Infantry role there in-

Deceptions in warfare, including the scene, have increased the need for dispersion. Dispersion

Neither of the two main units—the infantry division and the armored division. The long history of a ground

What of the men required to take and hold an objective? Increasingly they will be the men of

Our Army is a great army today, it trains ground soldiers.

25 Years Ago

During the annual preliminary training and range

20 Years Ago

Deductions regarding the future can be drawn only

FROM THESE PAGES

LT. GEORGE W. VAN DER DREN

The Technical Use of Mounted Troops

Thus the question never has to be decided in favor of either side, not even by the next
grow as their results every differapant,

The subject may at present be looked upon as

It is difficult to find exactly the correct to which the use of

In reference to the present discussion concerning the utility of the gun, it is only to consider if

1. It is a difficult weapon for the average man to

2. In the hands of the average it is not accurate.

We want then, a panel. a perfect trower can be used

The discussion, the panel and the method of target practice.

The panel is a short range weapon; its target in service is over five feet high and two feet wide.

Every day we read news commentaries in which,

LIEUT. W. P. CAMPBELL

10 Years Ago

1200000 men on both sides, the front line

LIEUT. K. B. EDMONSON

The Reporter

FROM THESE PAGES

ARMOR—September—October, 1952

ARMOR—September—October, 1952
An engineer discusses a subject of compelling interest to all tankers

GAS TURBINES FOR TANKS?

by RICHARD M. OGOREK-WICZ

The success of the gas turbine in the field of aircraft propulsion has inevitably attracted attention to the possible use in other fields, including that of automotive vehicles. Experimental gas turbine units have been running in non-military vehicles and their possible use in tanks has been mentioned on a number of occasions. The question has repeatedly arisen how the gas turbine compares with existing types of power plants which are in use or which, it is likely to replace them. Before this can be examined, however, it is necessary to make clear a number of general points, including the means for the success of the gas turbine in the aircraft field.

Jet Power and Others

The main reason for the success of the aircraft gas turbine is briefly this. One is the rapid rise in the power to weight ratio of modern aircraft. This was particularly marked during World War II and produced a demand for gas turbines with greater power and yet low weight. The other reason is the equally rapid increase in the speed of modern aircraft, to an extent at which jet propulsion not only becomes competitive with, but actually outstrips, the more traditionally used propeller. The two combined, the simple gas turbine being able to produce high power output in the form of a high speed jet, and together with the development of high temperature alloys, brought about the development of the aircraft gas turbine. The gas turbine has already replaced the older type of plant in all high speed aircraft and its use is continually being extended. At the other end of the scale where the gas turbine is being successfully applied, namely in electric power stations, ship propulsion and locomotives, the position is somewhat different. Here, of course, power is produced not in the form of a high speed jet but in shaft power to drive machinery and the unit is considerably more complicated than the simple aircraft gas turbine. As in the aircraft field, power requirements are generally high but weight and space limitations are less stringent and diesel engines and steam turbines have been able to satisfy the requirements for this and at the same time operate with high efficiency. For these reasons the relative advantages of the gas turbine are smaller and competition from existing power units much stronger than in the case of aircraft.

For automotive vehicles power requirements are generally much lower than in any of the above mentioned applications. But, on the other hand, something approaching the simplicity and high power/weight ratio of the aircraft turbine and the operating efficiency of the large, stationary gas turbine is simultaneously demanded. And it must satisfy these demands if it is to be an effective competitor of the existing reciprocating engine. It must also be able to operate efficiently under varying load—part as well as full load.

This is one of the difficulties in the path of the introduction of the gas turbine into the automotive field for its efficiency falls off markedly away from the design conditions and load. Other difficulties, common to all types of gas turbines, are associated with the high operating temperatures and component design and these will be more apparent after a more detailed, though necessarily brief, examination of a gas turbine unit.

Basic Design

A typical gas turbine of the type which is now being tried experimentally is shown in the diagrammatic view. The unit consists of a number of separate components which collectively perform a cycle of operations corresponding to that in the cylinder of a reciprocating piston engine.

Following the direction of gas flow, air is sucked into the unit by a centrifugal compressor. The compressed air, like a centrifugal pump, imparts energy to the air passing through it and hence increases its pressure. Through ducting, the compressed air is passed to a combustion chamber where fuel is continuously injected in the form of a spray and burns. Temperatures of the combustion products are of the order of 1,200°F to 1,600°F. These hot gases pass from the combustion chamber, through nozzles, to the turbine. This turbine supplies power necessary to drive the compressor and is generally referred to as the "compressor turbine." The components so far described form a thermodynamically complete unit which is commonly referred to as a gas turbine engine and which is basically a gas producer. The aircraft turbojet engine is simply that and nothing more. The useful power developed by the engine is the high velocity stream of gases issuing from the compressor turbine and this jet produces the propulsive thrust.

For automotive applications, shaft power, instead of a jet, is required and a power section has to be added to the gas producer. This consists of a second, or "power," turbine, mechanically independent of the compressor turbine and which absorbs energy from the gas stream leaving the latter. The energy or power developed at the turbine is transmitted through a suitable reduction gear to the output shaft. The maximum power developed at the power turbine is at all times determined by the surplus energy available from the gas producer.

Advantages...

The fact that the useful power is developed at a turbine wheel, mechanically independent of the compressor turbine and the whole gas producer section, is a great advantage from the automotive point of view, for the separate power turbine performs similarly to a torque converter. In other words, its torque increases as the speed decreases, the staled torque available at the output shaft being two, or more, times the maximum running torque. The torque characteristics of the gas turbine are thus thermodynamically ideal for an automotive application, in contrast to the reciprocating, piston-type engine which requires a multi-speed gearbox or a hydro-kinetic torque converter to vary the output according to the ground conditions. And, as in the case of the torque converter, no clutch or coupling is necessary to disconnect the unit at any time from the final drive.

This considerably simplifies many problems since the automotive gas turbine is a self-contained power unit and is fundamentally much simpler than any reciprocating engine and its associated transmission. It has the further advantage over the latter in that the cycle of operations is continuous, and not intermittent as in the cylinder of a piston engine, and that the motion of its working parts is of a simple rotary type. This also means that there is none of the inherent unbalance and fluctuating output of the reciprocating engine. A distinct engineering advantage, quite apart from any aesthetic appeal.

... and Disadvantages

Against these advantages must be set off a number of disadvantages, when compared with the reciprocating engine. One inherent drawback is that the gas turbine, like all fixed blade turbo-machines such as turbine converters, fixed pitch propellers, etc., loses efficiency when it is not running at its design conditions. In other words, from the point of view of efficient operation, it is inefficient which is a much more serious drawback in an automotive application than in any other since here most of the running is at part load.

Another drawback is that the gas turbine requires a much larger volume of air throughout for any given power than a reciprocating engine. It requires at least five times as much air, or, with the operating temperatures at present practicable, even...
of them, for the weight of a given horsepower of engines is far greater than that of a given horsepower of gas turbines. The former are generally used for stationary service, while the latter are particularly suited for mobile service.

The question of the relative efficiency of different engines is of fundamental importance in the development of propulsion systems for aircraft. The efficiency of an engine is a measure of its ability to convert fuel energy into useful work. The efficiency of an engine is often expressed as a percentage of the theoretical maximum efficiency that can be achieved by an ideal engine operating under the same conditions. The theoretical maximum efficiency of an engine is determined by the Carnot cycle, which is the most efficient cycle possible for a heat engine. The Carnot cycle consists of four steps: (1) the engine is heated to a high temperature, (2) the engine is allowed to cool to a low temperature, (3) the engine is reversibly expanded, and (4) the engine is reversibly compressed. The efficiency of an engine is the ratio of the actual work done by the engine to the theoretical maximum work that could be done.

The efficiency of an engine is affected by a variety of factors, including the type of fuel used, the design of the engine, and the operating conditions. In general, the efficiency of an engine increases with increasing temperature, increasing pressure, and decreasing exhaust gas temperature. The efficiency of an engine also depends on the type of fuel used, with liquid fuels generally providing higher efficiency than gaseous fuels.

The efficiency of an engine is an important factor in determining the overall performance of an aircraft. The efficiency of an engine affects the specific fuel consumption of the engine, which is the amount of fuel required to produce a given amount of power. The specific fuel consumption of an engine is an important factor in determining the range and endurance of an aircraft, as well as the cost of operation. A more efficient engine will consume less fuel and therefore allow the aircraft to fly further on a given amount of fuel.

The efficiency of an engine is also an important factor in determining the overall cost of an aircraft. The cost of an aircraft is determined by a variety of factors, including the cost of the engine, the cost of the airframe, and the cost of the fuel. The cost of the engine is a significant factor in the overall cost of an aircraft, as the engine is typically the most expensive component of the aircraft.

The efficiency of an engine is also an important factor in determining the overall performance of an aircraft. The efficiency of an engine affects the specific fuel consumption of the engine, which is the amount of fuel required to produce a given amount of power. The specific fuel consumption of an engine is an important factor in determining the range and endurance of an aircraft, as well as the cost of operation. A more efficient engine will consume less fuel and therefore allow the aircraft to fly further on a given amount of fuel.
It costs a tremendous amount of money to build a tank and to train the men who will drive it. The end in view is a combination that will produce success on the battlefield. ARMOR turns to Korea and that ultimate combination—the 140th Tank Battalion—for the translation of a compelling subject in which the men in the hinge—COMBAT TANK DRIVING.—Dr. Emerton.

The writer of the following began his training in Camp Cooke, California, on an M4A3E8, continued it in Korea, and has been driving an M46 in Korea. He has been a tank driver in Company B of the 140th Tank Battalion for the past 22 months, missions in all kinds of weather, frombelow-zero cold to beating summer heat.

Combat tank driving consists mostly of maneuvering and good judgment. I drove an M4 tank for 10 months before switching to an M46. Though those tanks are not as exciting as the tanks in the movies, the M46 is a fast tank. That's one thing a driver has to remember. Sum it up, it's a thorough, a complete, an all day job. I do my best to save my tank and try to help others to do the same. The tank is like a horse. You have to ride and show it the proper way. Make sure the tank's trained and ready for action. I always keep my tank ready to go. You might be called on at any hour during the day or night. Give your tank a complete check right after each mission, and you'll be ready to go when they need you.

Sgt. Malvin K. Collens

The M46 is an excellent tank to drive. It will take a pretty good beating before it gets damaged. One thing I really enjoy is driving the M46. It's smooth, quiet, and efficient. The only thing I'd like to see improved is the transmission, which sometimes seems to be a little too delicate. But overall, I think it's a great tank and I'm proud to drive it.

The writer of the following joined Company C of the 140th Tank Battalion after entering the service, and has been with the unit ever since. He took his basic training at Camp Cooke, California, and has been a tank driver for the past 19 months. On two of his combat missions his tank has hit mines, but he was not hurt.

The M46 is an excellent tank to drive. It will take a pretty good beating before it gets damaged. One thing I really enjoy is driving the M46. It's smooth, quiet, and efficient. The only thing I'd like to see improved is the transmission, which sometimes seems to be a little too delicate. But overall, I think it's a great tank and I'm proud to drive it.

The writer of the following has been in the Army since October of 1950. He has served as a tank driver in the 140th Tank Battalion since that time. He is presently assigned to Company B, and has taken part in a number of tank shoots with the unit. Several near-misses have bracketed his tank, but it hasn't been hit.

Sgt. Albert H. Wiatrowsky

The writer of the following has been in the Army since October of 1950. He has served as a tank driver in the 140th Tank Battalion since that time. He is presently assigned to Company B, and has taken part in a number of tank shoots with the unit. Several near-misses have bracketed his tank, but it hasn't been hit.

Sgt. Dale J. Miller

They are very sensitive, especially in steering. One stick for shifting and steering just about takes all of the work out of driving. From the driver's point of view, I also like the new cross-drive transmission. It's easier to operate than the old M4's regular transmission with the clutch and the two levers for steering. An important thing to remember, especially in combat, is to shift the M46 carefully. Being going from high to low gear, the tank should be slowed to at least 11 miles per hour. And it certainly should be brought to a complete halt before shifting to reverse.

I haven't seen the newer tanks yet, of course, but one thing I'd like to see on them would be an escape hatch with a bigger lid on it, to keep it from being blown inside the tank. We use old army sprucers wedged to the floor, now as an expedient, but new ones would be much better, designed for the purpose.

About all I have to say on combat tank driving is: Keep your tank in good shape, drive it carefully, and it won't let you down in a tough situation.

Sgt. Albert H. Wiatrowsky

The writer of the following has been in the Army since October of 1950. He has served as a tank driver in the 140th Tank Battalion since that time. He is presently assigned to Company B, and has taken part in a number of tank shoots with the unit. Several near-misses have bracketed his tank, but it hasn't been hit.

I am a driver on an M46 tank. However, I took basic training with the M4A3E8, and did not receive any training on the M46 before arriving in Korea. I learned the M46 from experience—what they say is the best teacher.

Driving the M46 in combat after training in an M4 is like stepping from a Model-T Ford into a new Cadillac. Maintenance is quite a problem here in Korea. Parts were hard to get when we arrived, and we really had to baby our tanks along. You can't cowboy tanks in this terrain, or you'll make a lot of extra work for yourself and the maintenance crew. I like the joystick in the M46. You can drive easily. The controls are very sensitive and react to your slightest pressure. For that reason, it's fairly simple to catch on to driving, but maintenance still isn't your big problem.

When a fellow goes on these tank shoots, he becomes kind of jumpy when he reaches the forward assembly area. But as soon as you get rolling again you cool off and think so much more about it. And really, you don't get a thrill out of seeing those Red flyers barb after you've maneuvered your tank into position.

What a driver should do when going into firing position is to find all the tank tracks that have been made before, if possible, but be very careful and watch for where tracks have been formed up. That probably prevents there's a mine there. We have had instances where the enemy buried a 50-gallon drum of TNT and then put a mine on top of it to set it off. Of course you should always be paying attention to your bow gunner and tank commander too. You are only one of a crew, and in combat the big thing is teamwork—your tank and in the unit.

When driving in enemy territory, I think it's best not to use your neutral steering. In some spots they're so soft ground, and in others too many rocks, and you can throw a track very easily. Also, don't forget to watch those warning lights closely. They help you to check immediately when something's wrong.

I think the M46 is a dream to drive compared with the old M4. You can drive all day and not become tired. And that means a lot when you have long missions over rough terrain and need to be on your toes in enemy action or watching for mines.

In conclusion, I'd like to say that there's no reason for our drivers not to have confidence in their equipment. They've got the best in the world.

Sgt. Dale J. Miller

Sgt. Malvin K. Collens

Sgt. Albert H. Wiatrowsky

ARMOR—September-October, 1952

ARMOR—September-October, 1952
I believe that maintenance is the first thing to look for in combat tank driving. A driver should be mechanically inclined. He needs to be trained before combat. He should have a good idea of what is wrong if something causes trouble in combat. That's where experience counts. He may be able to fix it himself. But if he can't, he can tell his maintenance people to repair it as quickly as possible.

One thing that should always be checked before and after a mission is the track suspension. That's especially true here in Korea where there are so many poor tracks. Your tracks can get too tight at all times.

In our sector of the front, we have to ford streams and small rivers constantly, and that's hard on lubricants. After each mission our tanks are greased thoroughly. In the kind of hot weather we're having now, air cleaners must be cleaned after each shoot because of the dust. On a tank shoot a driver should keep changing his position, so the enemy will not get a chance to zero in on him. If he knows his business his tanks will have his routes all selected, and will have several good positions ready. And he knows the importance of dispersion.

The Reds, of course, make full use of mines for tank warfare, and we must keep sharp all the time. Mines can be tricky. For instance, on one occasion I was the third tank in column. Following in the same tracks the others had made, when my tank set off a mine. Some of the enemy mines vary in the amount of pressure it takes to set them off. From what I've seen, I don't think the enemy in our sector uses any certain pattern for mine fields. It's just a matter of being wide-aware at all times.

To some, a tank may seem to be a big steel monster. But just like anything else, it isn't made to go forever. The M46 is a fine tank and it will give you good service if you treat it right.

In summing up, I'd say once more that maintenance is the driver's most important job. Sometimes you can't tell when you'll run over a mine, and sometimes you can't tell when you'll be shot at. But if your tank's in good shape, your chances of coming through are much higher.

Sgt. John N. Coogrell

The writer of the following has been with the 146th Tank Battalion since he entered the service 22 months ago. As a Company A tank driver, he has been in several shoots out in No Man's Land, and his tank also has been used for infantry support and stay-in-place missions. On one mission his tank struck a mine, but he was not injured.

I think good maintenance is the most important thing in combat tank driving. When you're going on a mission, you should check your tank before you leave your bivouac, and at every read break on the way.

During operation the eye should catch the warning lights on the instrument panel. The alert driver will know how his tank is operating and will spot trouble at once if a light goes on.

The M46 has special problems, different from an M4 in driving. You just can't jerk the driving controls the way you can on an M4 or you will probably break the final drive.
Tankers at HEARTBREAK

by CAPTAIN SAM FREEDMAN

TANKERS AT HEARTBREAK

Given the right time and place, the tank battles in support of the regimental cushion team can do wonders in a night situation, depending on the
invisibility of the tank crews, the ineptitude of the planners, and the degree of coordination between
the cushion team and the regimental tank teams. Of the latter, much emphasis must be brought to light for the consideration of future tactical planners. It has been shown in Korea, where everything has been done under extreme difficulties of supply and terrain, that no single initiative of offensive combat is so important as the proper co-ordinating of all component parts that go to make up the tank attack strength.

For this, the fighting strength of tank warfare in Korea is probably that of flexibility, fast mobility in combat, and the ability to work in terrain seemingly impassable to tank movements. But situations are found where certain advantages can be turned to advantage.

To use tanks to their greatest advantage, tank commanders must have several things concerns to note out tanks over seemingly impassable barriers of mountains, rivers, and such. The tankers have shown conclusively that

CAPTAIN SAM FREEDMAN served with the 72d Tank Battalion on the 2 Corps Front. He was with the 72d Tank Battalion at the time of the author's death. He was born in Washington, D.C., and was a daughter of the late John H. and Mary M. Wilson. He was a graduate of the University of Wisconsin, and was a lieutenant in the United States Army.

ARMY—September—October, 1952
Batallion, which aimed to strengthen the defense for the high ridges on the X Corps' mountain front, must go down as classics of armored offensive tactics, under almost insuperable difficulties of terrain. Yet, it was precisely because the enemy believed his position beyond Heartbreak Ridge to be unassailable that tanks that the operation met so markedly a successt.

The tank tactics at Heartbreak Ridge offer a case in point. The nameless tank battle "Operation Tonschuhmeier," so named because it involved a long-end run around the left flank of the division's main attack to strangle the line of communications which had its apex at the northern extreme to the Mundung Valley. It was a gigantic, penetrating thrust, brilliantly planned and daringly executed. Every tank in the battalion rode to the attack in 68 Shermans loaded with HE and high explosive, and carrying extra ammunition for the battalion of infantrymen on the 68th Infantry marching along to nun the antiaircraft guns.

The big day, which took place on October 11, 1951, marked the finish of enemy action at Heartbreak Ridge. After the army, which had been hit in the flank by the 38th, 29th, and 29th Infantry regiments, by the United Nations bastions, had finally shattered enemy resistance on that blood-sodden mountain. The tanks had finally broken through to the 2nd Engineers to prepare the way for them to wind through a winding creek that stretched from the north.

The attack itself came at a most opportune time. It caught the Reds completely off guard. The firstusaha was all that had been intended. Alert 2nd Division and X Corps Intelligence were aware that approximately a division of fresh Chinese troops, hastily recruited and trained at Tientsin, was to replace the demoralized North Korean Red forces at Mundung, about six miles north of Heartbreak Ridge. The tank column took off at 0500 on a split-second schedule, guided from the division front to the front, where they took 2nd Tank Battalion staff officers had set up a radio relay station. From that point the officers could observe the terrain of the Mundung Valley, report the presence of enemy forces, guide the tanks on their run from being down supporting fires as needed.

A tank is just the place for a man who likes hard sledding. You've got a big, big gun, and can move at breakneck speeds over terrain. You can get at the best-painted tanks with a 75-mm. The ты неост рода were well trained and could move the tanks down on the roads, virtually taking them out of action. A tank was just the place for a man who liked hard sledding.

The tanks were moving down the route, virtually taking them down the roads of the Reds and making them say "Ah." Team Coordination

While the Chinese Reds are notorious antitanks, showing fantastic daring and skill in disabling tanks, the 72d on this occasion had little to worry about on this score. So close was the coordination of tanks and infantry, that a front that could get through at all despite the condition of the paths. How then is it possible to bring up 68 tanks with the only road through the mountain passes sandwiched by hundreds of tons of explosives? It was all quite simple. The Reds, with typical Communist stupidity and abysmal failure to perceive enemy capabilities, had overlooked the rocky gorge of the Han as an avenue of approach. True, the mountainous terrain was very hard work, but the shoulder-strung bottom of the gorge didn't even remotely resemble the smooth doorways at Fort Knox, but to mine the enemy tankers they had been called "avenue of approach." They called up the engineers after carrying out the study of the route by days of reconnaissance. The enemy had been virtually within the enemy field of fire.

It was determined that the road from Imokcho for a march through the gorge would be smoothed down to the unforeseeability of approach. The 2nd Engineers lost several officers and men while working under fire on that project, but on the appointed day, the job was done.

It was a triumphant procession through the river gorge. Tank after tank negotiated. Tank after tank negotiated with a cloud bank on the rock, sand and water. As the lead tank emerged into the sun-washed Mundung valley, the first of the enemy columns was completed. From there on, it was a noisy and spectacular affair, with tanks in line rolling, with the noise and the spectacle, the troops strongly at Mundung. Not a tank halted until the goal was reached.

What targets rose to the view of the keen-eyed gunners as they came within gunshots of the town! The Reds took terrible punishment that morning, firing in panic as the 72d's armor rolled through the towns and a couple of miles beyond.

One tank was lost that day—the lead tank, which was firing rapidly as it rolled, with a hatch open. One mortar round—pure chance—dropped into the hatch and exploded, killing three men.

The tanks returned the next day, and for two more days after that, repeated their performance, thoroughly reducing the towns and causing the Reds to withdraw.

The operation clearly indicates that the presence of powerful armored forces in a strategic area will have a deterring effect on enemy intentions, and tend to neutralize the area in general, at least in the type of warfare typical of Korea, a kind of warfare dictated by the terrain.

Experience Teaching

The books and the schools have much to offer the tanker in preparation for his triumphs on the battlefield, but there is no doubt in the world that experience is the best teacher in tank warfare as in so many other fields. All in all, the lessons of tank combat in Korea will make it possible to round out still further the training of future tankers. These lessons must be utilized so that student tankers may gain from the combat experience of others.

Successful actions, like the one described in the foregoing, have their roots in planning, coordination, and teamwork. Technical skill must utilize these for its ultimate triumph. These elements that must be emphasized. The lessons of Korea will help win battles again, if it is necessary to fight another war. Armor is better than ever, and its contribution to success of the regional combat team has once more been proved.
Preventive Maintenance—

A COMMAND RESPONSIBILITY

by MAJOR GENERAL I. D. WHITE

Inhentime Maintenance

A COMMAND RESPONSIBILITY

In this article, the author, Major General I. D. White, discusses the importance of preventive maintenance in the context of a commanding officer's responsibilities. He highlights the need for commanders to be knowledgeable about their units' equipment and the importance of regular inspections and training to ensure safe and efficient operations. The article stresses the responsibility of commanders to oversee the maintenance of their units, emphasizing the role of supervisors and the importance of teamwork in managing maintenance tasks. The author also addresses the challenges and considerations involved in maintaining equipment, such as the need for adequate training and resources to address supply issues and ensure smooth operations. Overall, the article underscores the critical role of leaders in ensuring the readiness and effectiveness of their units, both in peacetime and times of conflict.

Approved and tested supply procedures are explained in elaborate detail in technical manuals and other literature. The vast world-wide military supply system is based on requests from the user—a requisition—for free. Two-way liaison must be established between the user and the supplier. The supplier should be installed with the same concepts of customer-dealer relations as are held by successful mercantile firms, will assist in the simple solution of the same problems when he knows of them.

How are we going to use the supplies as a time-saving method? Preventive maintenance is an attitude that must be all training. Training time must be provided for maintenance. The skilled gunner whose ignorance of cleaning and lubrication procedures results in a deceased or inactivated gun is of little use to the company he serves. When equipment is used, instruction and time to maintain that equipment is given. "On the job training" is the key.

"By the numbers" training of crews and users is an effective way to conduct training. Each training can be repeated on occasion during scheduled "Daily Maintenance Checks" in the same manner as "Standing Gun Drill." The 3rd Armored Division at The Armored school has adopted a complete and precise system for the "by the number" training in tank maintenance. It is reduced to a routine, not only with trainers, but with cadet as well.

The bulk of our specialist training is done in service schools. However, rapid turnover of personnel requires much specialist training at the unit level, which is usually of the "on-the-job" type.

American industry leads the world in "on-the-job" training because that training is planned and supervised—planned to include all knowledge and practice required by the student cadet and supervised for completeness and quality. On-the-job training is good results, not only with trainers, but without supervision and planning often.
realize that preventive maintenance was a soldier's job and not a job to push off on a hired German. Second, average maintenance was cut in half in other jobs, but the use of smaller units and the reduction of each battalion and larger unit. The command letter was backed by a citation to be taken when a unit was rated "Unsatisfactory." I quote part of this circular, which was considered most effective. "When a unit receives an "Unsatisfactory" rating on a command maintenance inspection report, it is a clear indication of improper use of time allotted to maintenance or improper supervision by the chain of command or both. The correction of the conditions which result in the rating of "Unsatisfactory" will be accomplished, insofar as is practicable, immediately after the inspection, during non-training time after regular working hours, and under the active supervision of all members of the chain of command.

"In the event that any unit is found to be unsatisfactory in any phase of maintenance or fails to comply with these preventive maintenance inspection, that portion of the inspection team concerned and the unit will be held responsible. All unit units until existing deficiencies are corrected to the fullest possible extent. The team will start immediately after a finding of unsatisfactory and will continue on the next day if the deficiencies are corrected and a re-inspection performed. During this corrective period, the maintenance plans and schedules will be re-examined for accuracy and improvements will be made as necessary."

The letter and its accompanying plan were written in a manner that would be understood by every man in the unit. The plan was distributed to all units and was used as a guide for future maintenance inspections.

In the coming weeks, the maintenance inspection will continue. The plan is to conduct monthly inspections and to provide feedback to the units on their performance. The goal is to improve the overall maintenance of the units and to reduce the number of unsatisfactory ratings.

Meet with this challenging task, the maintenance inspection plan is put in place at The Armored Center. This center is intended to cultivate the best of all at Fort Knox with the only solution to good maintenance—preventive maintenance—a command maintenance team.

The military is merely one strong muscle of America's. As a tax-supported service, the military is responsible to our fellow citizens with clean hands, able to point to an austerity program necessary to the defense of the country. Mining dams go down just as far, people produce just as much before the war, the armed forces stockpiles are at last a safe word to use in connection with natural or industrial resources. The military demands that its armed services be provided with adequate maintenance. Too frequently command officers call on higher echelons to perform tasks that are an organization function. I prefer the attitude of pride in a unit's ability to keep its own equipment in satisfactory operation. A means that expresses my ideas on the subject is the directive, which was used with some success in the US Constabulary, a letter issued on all other military units of each battalion and larger units. The command letter was backed by a citation to be taken when a unit was rated "Unsatisfactory." I quote part of this circular, which was considered most effective. "When a unit receives an "Unsatisfactory" rating on a command maintenance inspection report, it is a clear indication of improper use of time allotted to maintenance or improper supervision by the chain of command or both. The correction of the conditions which result in the rating of "Unsatisfactory" will be accomplished, insofar as is practicable, immediately after the inspection, during non-training time after regular working hours, and under the active supervision of all members of the chain of command.

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An LVT(A)-45 of the 747th rides a wave crest during its dash to the beaches.

Amphibious Tanks comprise the first vanguard of an amphibious assault on a hostile shore, providing direct fire on the landing beaches during approach movement, furnishing direct tank support ashore to assault infantry, and providing indirect support ashore to assault infantry until such time as the direct support tanks are landed and can assume the mission.

**ARMOR'S AMPHIBIOUS MOBILITY**

As the instrument of mobility in ground warfare, the tank has been developed with all dimensions in mind. General growth has been supplemented by special purpose evolution in the air transport and amphibious. The latter is represented in the picture story on these pages covering the activities of the 747th Amphibious Tank and Tractor Battalion. This battalion consists of five companies: a Headquarters, a Headquarters Company, a Service Company, two Tractor Companies, and two Amphibious Tractor Companies. The 747th was a sea tank battalion in Texas during World War II. It served in the ETO and was later as an amphibious tank battalion in the latter part of the war. A reserve unit, it was called into active service from the State of Florida, and has been stationed on the east coast, where it has trained a large number of officers and enlisted personnel in amphibious operations.

U.S. Army Photos

A group of LVT(A)-45s moving into the surf for a session of water maneuvers.

Amphibious Tractors comprise the second instrument waves in an amphibious assault on a hostile shore, transporting and landing supplies and troops from ship to shore during the selective unloading of the buildup phase of the amphibious operation. They are unmoored.

In a simulated water-borne assault, the amphibious tanks fire on shore targets.

ARMOR—September-October, 1952

ARMOR—September-October, 1952
Task Force HAZEL to CH'UNCH'ON

by MAJOR J. C. BROWN

The 11th Reconnaissance Company, under the command of Lieutenant Colonel W. P. Taylor, was assigned the task of neutralizing the forces in the area. The objective of the operation was to destroy the enemy's forces and prevent them from moving into the area of the 11th Reconnaissance Company. The operation was to be conducted by air strikes and artillery fire, followed by a ground attack.

The attack was launched on November 23, 1951, and the 11th Reconnaissance Company moved into the area on November 24, 1951. The operation was successful in neutralizing the enemy forces and preventing them from moving into the area of the 11th Reconnaissance Company.
enemy troops could have been caught if their tanks had made the planned efforts.

Overhead the light plane pilot relieved the tension of the moment, saying that the road was clear. Fifteen Chinese were running off the hills 2000 yards away. The pilot then dropped the two Chinese who were flying, then turned on their machine guns and fired at the retreating enemy. One Chinese was killed and another wounded. The other 13 Chinese were killed or wounded.

As the Chinese troops retreated, the tanks of the 7th Platoon advanced through Ch'unch'on, firing at huts in front of which Chinese civilians were sheltering. One ran out of a house and was shot. Two others were killed and many other Chinese were killed or wounded. The platoon wounded continued through Ch'unch'on, firing at huts in front of which Chinese civilians were sheltering. One ran out of a house and was shot. Two others were killed and many other Chinese were killed or wounded. The platoon wounded continued through Ch'unch'on, firing at huts in front of which Chinese civilians were sheltering. One ran out of a house and was shot. Two others were killed and many other Chinese were killed or wounded. The platoon wounded continued through Ch'unch'on, firing at huts in front of which Chinese civilians were sheltering. One ran out of a house and was shot. Two others were killed and many other Chinese were killed or wounded. 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Training the Tank Crew Replacement

by FIRST LIEUTENANT ROBERT L. BURNS

I. INTRODUCTORY LECTURE

A brief discussion of the characteristics of armored division action is followed by a detailed explanation of the duties of the individual tank crewman at the assembly area, in the attack position, and during the actual assault on the objective. Emphasis is placed on the fact that success of the maneuver depends on the performance of the individual crewman as a team. It is pointed out that the crewman has practically the same duties whether his tank is in action, storing, defending, withdrawing, etc. The simple tactical situation is presented. The company is broken down into platoons which are sent off to the tanks in the assembly area.

II. PREPARATION FOR THE ATTACK

A detailed plan for the defense and withdrawal of the tank is presented. The training officer shows what the individual crewman must do to prepare for his position under the supervision of the assistant instructor. There is an instructor for each platoon, and an assistant instructor for each tank. All OVM is placed on the tank before it is placed in the assembly area. Machine guns are cleaned and checked, and individual equipment is checked for completeness and operation. The assistant instructor makes the necessary adjustments on the OVM and the other equipment. The tank is then placed in the proper position. The training officer makes the necessary adjustments on the OVM and the other equipment. The tank is then placed in the proper position.

III. CONDUCT OF THE ATTACK

1. Movement to the attack position

2. Final preparation and coordination at the attack position

3. Seizure and occupation of the objective

4. Reorganization on the objective

5. Critique

IV. MAINTENANCE

The various stages will now be explained in detail.

1. Communications operation and maintenance on radio equipment, radio procedures

2. Crew duties and responsibilities especially maintenance of the suspension system

3. Machine guns assembly, disassembly and maintenance of 30 and 50 weapons

It is thought that greater emphasis should be placed on these subjects in order to eliminate these deficiencies. A soldier cannot be a successful tank crewman until he has mastered these subjects.

The training in the Third Armored Division at Fort Knox under 16 weeks of training. Upon completion of this period, the trainee is qualified to take his place in a tactical unit in Korea or anyplace else in the world. During his earlier weeks, he receives a first-hand explanation of the assembly area, the various other important subjects of the training program that has produced him.

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A WELLE-KNOWN PolITICAL SCIENTIST CONTINUES HIS APPRAISAL OF

AUSTRO-FRANKENSTEIN

by DR. ROGER SHAW

AUSTRIA was never quite the same after her twin civil wars of 1934. The revolution had been crushed and virtually eradicated, and the Nazis seemingly in power. But all was not as it seemed. Underneath the facade of totalitarianism there was much dissidence and resistance groups of underground organizations. The church and the Schuschnigg regime were secretly helping the Jews, and the National Socialists were using this to their advantage. In 1938, the Anschluss was signed, and Austria became part of Nazi Germany.

But although the Nazis had been defeated militarily after the battle of Dachau, a Committee of Seven was formed to oversee the implementation of the Anschluss. Joseph Leopold was named the head of the committee, and he headed the Committee of Seven. In 1938, he was appointed Rektor der Universitat, and his name was on the list of those who were allowed to travel to Switzerland. Leopold's tenure was brief, and he was soon arrested. His trial and punishment were in Vienna, at the No. 4 Tiefkellerstrasse. But even in the face of such adversity, the Committee of Seven continued to work. They were suspicious of all things Nazi, and their meetings were held in secret to avoid detection.

But the Committee of Seven was not enough. A more underground group was formed, the so-called "Austro-Frankenstein." This group was composed of scientists and intellectuals who had been exiled from Nazi Germany. Among them was Heinrich Hamburger, a Jewish lawyer and political activist. He was one of the leaders of the "Austro-Frankenstein." He was eventually arrested and sent to Dachau, where he was killed.

But the work of the "Austro-Frankenstein" continued. They were aided by the underground networks of the Catholic Church and the American diplomatic missions in Austria. They were able to smuggle intelligence and supplies to the resistance fighters in Poland and Russia. And they were able to keep the Allies informed about the activities of the Nazis in Austria.

But despite their efforts, the "Austro-Frankenstein" was eventually betrayed. The Gestapo uncovered a plot to assassinate Hitler, and the plot was uncovered. The members of the "Austro-Frankenstein" were arrested and sent to concentration camps. Heinrich Hamburger was one of the victims.

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One of Schlesing's ministers, his propaganda expert, washed dishes in the kitchen of a prison in Schlesa, unpopular as ever, was now enjoying himself with reasons to Hitler. Hans Schönfeld, a dach Jew who was the world's most popular ski-instructor up in Vorarlberg, a really splendid outdoor man, was jailed at the instigation of a rival Nazi ski-teacher. Baron Louis Rothschild, hated since the Credit Anstalt Banking collapse of 1931, was held for trial. Jewish Bruno Walter, driven from Germany by the Nazis in 1935, lost his post as director of the Vienna Opera. A famous ear-surgeon, Dr. Heitner from Linz, was taken into custody by the ministry despite the "heated protests" of one of his best patients, the Duke of Saxe-Coburg-Gotha, to whom the imperial army was offering its services. The social scientists of means found themselves "attended to" because of their "international" connections with the "enemy". Dr. Sigismund Freund, after leaving Austria, was too sick at the time to be seriously molested. The Five Vienna newspapers, and the immense Jewish Zwischen-department-store, were closed.

On March 12 it stormed in at all four points: Scharrer, Panau, Kraus, and Konrad elsewhere. It came motorized and mechanized, by trucks, police cars, motorcycles, and light and heavy trucks, carrying cars, armored cars, and swift cross-country columns of trucks, all from the nearby Bavarian flying bases. No time had been lost: Seyss-Inquart's cabinet had been formed by midnight. The Prussian savings bank was at first in a state of panic. The field armies were thus crossed the boundary at five-forty A.M.

Perhaps 300,000 German troops, all told, and more than 3,000 of them were 35-year-old reservists, others were elite police and storm-troopers. The first battle was fought in the beginning at the rolling plains, 3,000 troops landed at the Vienna airport in a sensational flash of night. They were the hard rubber clubs, which they had used so often to beat Vienna's Nazis.

Triumphal Entry

On March 14, at five in the afternoon, Hitler entered Vienna at the head of a thirty-five-car motorcade. That day he had toured leisurely along the Linz, a hundred miles, and was generously received by a million Viennese, as bells pealed and the bugles blared an enthusiastic reception. He proceeded to the Imperial Hotel, and from a balcony declared to the multitudes: "The whole German people handed out free meals to the municipal unemployed, and the mark stamps from the "virtuous" German invaders defied Austrian Jews from Austrian paper.

Some 2 million Berliners—more than in numbers to the total in Vienna—cheered Hitler on his return. They stretched along the road to the German Chancellery. They cheered and waved flags, and they were in a good mood. At last they had beaten Austria, led by an Austrian. It had taken them a little less than two and a half centuries.
**NEWS NOTES**

**Tensions Erase a Problem**

**WITH THE 3D INFANTRY DIV.**

IN BDE—When a 65th (Pasqua Blues) Infantry Regiment tank section was ordered to support Czech troops recently in Korea, a problem arose.

The problem was that of communication. None of the Pasqua Blues tanks could speak English or Spanish. The order, however, was over the usual radio.

The Czechs, thinking American intelligence came up with an answer to the problem. The tanks were sent out, but an easy way out of the Korean war had been found. The Pasqua Boys could throw English, but most of them could not speak Czech.

Thus, the tanks were given in Eng-lish, and in the Korean war the tanks were sent to Korea to the other boy. The second Korean boy then translated the tanks into Czech. The operation was a complete suc-cess.

**Here to Promote 788 Tank**

American Armor has launched on a two-month tour of 20 major cities, and a number of small towns, to promote the American tank. The tour will last until August 20.

**School at Fort Knox Named After**

A school building at Fort Knox, Ky., has been named after a Washington native who died crossing the Rhine River in World War II.

Captain Woodall C. Coffin, son of Lt. Gen. and Mrs. Woodall Coffin, formerly of Washing-ton, was memorialized at the dedication ceremony at the school for defen-se of the country.

Coffin was a member of the 788 Armor Division, stationed in Memphis, Tenn. He was a member of the 788th Cavalry, stationed in Memphis, Tenn.

Coffin's son, a tank gun-ner, is stationed nearby after his tank crossed the Rhine River in the Remagen bridge operation in March, 1945. He was posthumously awarded the Bronze Star and the Purple Heart Medals. He is buried in Arlington Cemetery.

**How Your National Guard Grows the 788 Tank Demonstration**

Members of the 50th Armored Divi-sion of the New York National Guard, in summer field training at Camp Dix, N. J., witnessed demonstration of the 788 improved Patton tank.

The demonstration is one of the Army's efforts to keep them informed of the latest developments and advances in military equipment and techniques.

The demonstration was part of the 50th Armored Division's training at Camp Dix, New Jersey.

**How Tank Manufacturing Facilitates**

The Army Ordnance Corps has built a new facility at Pitts- burg, Pa., which Ordinance spokes-men say, will be used to make large tank castings. Prior to its transfer to the Ordnance Corps the plant was in the custody of the General Services Administra-tion. It is to be operated by the United States Steel Company.

The new facility is expected to cost approximately $59,000,000 and require several months for construction.

**Bretts to Send Swiss Two Tanks For Trial**

The British government is sending two British Ordnance tanks to the Swiss army for a three-month trial, the Swiss Defense Department announced. The British government is seeking to purchase several hundred tanks and the two companies may be used for their suitability in Swiss conditions. A British Ordnance tank is in the United States to test American tanks which might be available for sale.

**Armored Association Supported by American Division Associations**

The U.S. Armor Association has re-ceived strong support from a number of American Division Associations. These organizations, which have been meeting in annual conventions in various cities around the country during the summer months, have notified the Armor Association of a contributing action taken in its behalf.

The 1st Armored Division Association is based in Oklahoma City; the 6th Armored Division Association meeting in Fort Bliss; the 10th Arm-oried Division Association in Fort Logan; the 11th Arm-ored Division Association meeting in Washington, D. C.; and the 14th Arm-oried Division Association in Fort Bliss.

**ARMOR—September-October, 1952**

Publication ARMOR, and steering the course of one of the most important defense agencies of the mobile warfare.

Many veterans of Armor from the World War II days have continued their interest in their former branch through membership in the Armor Association. They are regular subscribers to ARMOR.

**Armored Association Will Move Into New Quarters Off In October**

With the September-Octoiber issue of ARMOR off the press and on its way to members subscriebers throughout the world, the headquarters of the Association and the editorial office will move to other quarters.

The move is necessary because of a: Washington disease—"parkinsonism."

**AN OLYMPIC EQUESTRIAN REPORT**

**PRIX DES NATIONS**

(August 3, 1952)

In this tremendous test the U. S. Team led the field over the morning rounds in the Olympic Stadium. In the after-noon rounds out of 17 year old veteran "DEMOCRAT" flashed just enough to drop our Team to third with results as follows:

1. Great Britain 40.25 faults 8. Portugal 65.0 faults
2. Chile 45.75 faults 9. Mexico 65.75 faults
3. United States 52.25 faults 10. Spain 67.0 faults
4. Sweden 56.5 faults 11. Sweden 80 faults
5. France 59 faults 12. Egypt 90 faults
6. Germany 60 faults 13. Romania 180.25 faults
7. Argentina 67.25 faults 14. Russia 198 faults
8. Canada 80 faults

15. Indonesia
16. Argentina
17. Italy
18. Switzerland
19. Austria
20. Portugal

**INDIVIDUAL SCORING**

PLACE HORSE FAULTS
1. William Steinkraus Hadasca 11.25
2. Arthur McCarish Miss Budweiser 16
3. John Russell Democrat 23

**THREE DAY EVENT**

(730-Auguste 20)

Here was the supreme test with our young riders competing against the field of 59 of the world's best. Of this number 25 were eliminated.

**OUR INDIVIDUAL SCORING**

PLACE HORSE CREDITS
1. Charles Bickford Bill Biddle 698
2. Marjorie Haines The Flying Dutchman 446
3. Hermann Pauley Rene Overo 315

**TEAM SCORES**

1. Sweden, 1,592.5 points; 2. Switzerland, 1,575.3; 3. Germany, 1,501.4; 4. France, 1,423.5; 5. Chile, 1,340.5; 6. United States, 1,359.5; 7. Russia, 1,210.8; Portugal, 1,198.5.
COWBOYS IN KHAKI

by FIRST LIEUTENANT WILLIAM J. BRESKY

During the most Feverish moments of Exercise Long Horn, when the 1st Armored Division of the United States force had punched a breakthrough past the line held by the friendly 31st Infantry, those at the rear had their hands full keeping their units moving at a constant speed. Major General Bruce C. Clarke's "Old Ironsides" division was a gallop-ing, mile-wide unwieldy, forcing the hapless Aggressor to use-up and scatter like a stampeded Mass of charging cows. Curious cows were calling the balls and strikes, and lasting by listing them made detailed pencil notes on the corners.

It was in this period particularly, often within range of the simulated artillery fire, that small bands of men hoofed at projects that were to make this "war game" slightly less realistic, greatly less expensive.

In teams of five, soldiers of the 1st Armored were shucking cots and hammering fences. Property damage to the field and "Farming Area" was being made right even before the frontmen knew their land had been damaged.

A lesson of the 1941 Louisiana maneuvers had been learned well. Of that operation, a magazine writer was once noted, "There wasn't time to cook, never time to wash, never time to think." This, of course, was a remnant of the massed divisions as they moved on the beaches. The 1st Armored Division, on the other hand, was a collection of three living, breathing men, each with his own unique way of making a living.

In the eight-hour course the missions of the men were to shuck and Julianc, build J-type and kentype end posts. At the completion of the course, each fence unit was issued a set of tools along with a supply of nails, posts and wire.

When the maneuvers got under way, fence teams were riding at their unit's elbows, ready to cut a fence, build a gate and repair it. The mission of the men was to repair any gate or fence, destroyed or damaged, within eight hours after the damage occurred.

Throughout these O.D. ranch hands found themselves playing sentry to discourage a herd of grazing cows from taking a bite out of the fence. When fence units were not available to make a break in a fence, units left guards at the trapped section to stand by until a repair team arrived.

Army-caused damage was never left unguarded—except once. The 3rd Airborne's Aggressor force didn't grant tactical immunity to the good will hammer and nail men; so "Vanguard" became the felicitor of the event whenever a row of green helmets appeared on the horizon.

Once a fence unit took over a break, it was responsible for guarding it until repaired. In the event that a break in the fence was to be re-used many times, a gate was constructed and a guard posted. The fence unit consisted of a driver, an NCO or private first class and three privates. These men carried their tools with them on a 2-ton truck. They were supplied by their units with "C" or 10-in-1 rations as well as a complete set of tools and basic load of fence repair material. The crews were re-supplied from the division engineer supply officer's stock of expendable repair material items.

Teams were given no additional duties during the maneuver period, but remained "on call" at all hours. "Fence men forward" was a familiar call during the maneuver when a tank battalion was forced to by-pass a bridge of insufficient capacity or a pipe culvert. . . . when an infantry unit had to break a fence to reach its assembly area . . . when a combat command was spanning a wide, fenced-in range area in carrying out an offensive operation.

Sometimes the small teams ran into an area where more breaks than standing fence. Reserve fences from the 16th creased to the scene at those times and an immediate report was made to the division damage control officer over C-4 channels from major command headquarters.

In these areas of extensive damage or where time permitted only temporary restoration, breaks were checked and repaired further if necessary by division or a Long Horn agency.

The spring's heavy rains had teamed up with the Army's heavy armor to result in a lot of chewed-up road and pasture land. Without foresight of a damaged control program, the actual claims total would have climbed much higher.

In an effort to hold down complaints, the fence teams, reinforced with more men and more supplies, returned to the maneuver area with a simple mission: to make good all Army-caused property damage. Nearly all complaints were rapidly serviced by fence teams that had been well-trained and were now well-practiced in their art.

The 46th and 61st Engineer Construction Battalions participated in the post-maneuver work. But the wind-up fell to the 16th.

In late summer, General Clarke wrote through the new battalion commander, Lt. Col. William L. Starnes, Jr., letter of appreciation to 1st Lt. Thomas R. Cox, "A" Company Commander, for "the splendid work in completing the rehabilitation of the maneuver area." He added: "I've heard nothing but good reports and many expressions of satisfaction from the civilians whose property was damaged."

The small group of soldiers who had played roles in the sub-maneuver, "Operation Fence," knew that their work had had something to do with the successful close of Exercise Long Horn and with the good neighbor feeling born of attention to property rights.

Most of these war game cowboys, however, welcomed a change in pace. "Don't Fence Me In" to "Manhattan Marching Song..." at least until the next maneuver.

ARMOR—September-October, 1952

A typical "fence unit" and its equipment as used during Exercise Long Horn.

The engineer battalion gave a practical course in fencing, in old ranch style.

Special tank trucks cross county roads did much to further public relations.

ARMOR—September-October, 1952
HOW WOULD YOU DO IT?

GENERAL. An important mission of armed units regards to the infantry division is reinforcing the flow of the infantry. Troops must be prepared to enter these main-lying lines during the hours of darkness as well as daylight. This presents a problem to the tanks, but by using the artillery fire control equipment, accurate and effective fire may be placed on targets and likely avenues of approach at night.

SITUATION: You are platoon leader of 1st Platoon, Tank Company, 1st Infantry. You have been ordered to the 3rd Battalion for an offensive operation. During the first day of the attack, the 3rd Battalion reached its objective and is now preparing night defense positions along the line A-B. The battalion commander tells you that your platoon will remain under battalion control. He also informs you that your platoon must be prepared to fire and reinforce from likely avenues of enemy approach throughout the night from your present position. (See sketch.)

1. What specific targets would you designate?
2. What method would you use to prepare necessary data to plan fire upon these targets?

48 ARMOE—September-October, 1952
Discipline is the sine qua non of military life. Its existence depends upon a number of things such as leadership, personality, morale, training. One of the more tangible tools in the picture is military justice. The application of corrective measures at the small unit level is an important "stitch in time" phase.

Non-Judicial Punishment for Minor Offenses

by COLONEL DEAN E. RYMAN

MAKE us the foxes, the little foxes that spoil the vines," counseled the monarch who chose wisdom—"an understanding heart to rule this people"—rather than riches or honors. Every leader of an armed forces' smaller-unit, tempted to be a little blind to the faults of men with whom he has daily contact, was urged to heed that admonition. For each such commander, those shortcomings are "the little foxes that spoil the vines": discipline and military efficiency disappear, and his own failure is not far off, when iniquities which seem relatively unimportant at the moment are habitually not punished.

For taking those little foxes, the President has directed free but intelligent employment of Article 15 in the Uniform Code of Military Justice, entitled "Non-judicial punishment." Each commander, in doing so, is expected to comply with the regulations that are found in Chapter XXVI of the 1951 Manual for Courts-Martial. The cited law, thus implemented, replaces "Company punishment" formerly used by the Army and the Air Force, as well as the Navy and Coast Guard device known as "Captain's mast." This new authorization for summarily ordered penalties differs substantially from those now obsolete sanctions. Be alert.

Minor Offenses

Congress has limited non-judicial punishment to "minor offenses," an undefined term commonly believed to refer to those unaggravated instances of misconduct, primarily prejudicial to good order and discipline rather than criminal, for which a summary court-martial trial would be appropriate. The Commander-in-Chief has confidence in the ability of each smaller-unit leader to determine whether a particular iniquity is one of that sort. Senior commanders rarely interfere, unless the act non-judicially punished is one for which a punitive Article of the new code authorizes the execution of the offender, or unless that act could be punished under a Federal statute by confinement for one year or more, or unless it is tasted with moral turpitude. The President has lately forbidden that sort of penalization in all such instances, no matter how weak the proof or how great the known extenuation.

The punitive Articles that denote capital offenses are: 85, 94, 99-102, 104, 106, 110, 113, 118, and 120. All are adequately explained in Chapter XXVIII of the current Manual for Courts-Martial. Most officers can easily avoid violating the first prohibition by reading these Articles about once every six months. As to some of them, which can be committed only during a time of war, it is advisable to read the cited explanations also; but each forbidden action readily recognizable as a grave felony rather than a minor offense. All the other punitive Articles, except 86, 87, and 89—AWOL and desertion, condemn misconduct punishable by confinement for one year or more, though some of them also forbid behavior not subject to such severe retribution. Get familiar with all—treat all the facts of the misconduct under scrutiny, select the Article you deem violated—usually No. 134 (AW 96) when non-judicial punishment is likely to be permissible, and then turn to page 224 of the Manual (Table of Maximum Punishments) where you can easily see whether the second prohibition prevents the course you contemplate. If either execution or confinement for one year or more is possible—however improbable—non-judicial punishment is forbidden.

Larceny, passing bad checks, forgery, and misusing have been declared by the President to be tainted with moral turpitude. Responsible authority can also be found for so considering all misconduct in the commission of which there is fraud, as well as most sexual offenses, libel or...
A commanding officer has never had occasion to arrest an enlisted man in the armed forces; he has, however, occasioned apparently unconstitutional arrest. The case is moot. The arresting officer was ordered to appear before a court-martial for a court-martial where he was found guilty of misdemeanor and sentenced to 6 months in prison. The arresting officer was subsequently found guilty of the same offense and sentenced to 6 months in prison.

The court-martial’s decision was made in the absence of counsel and without a fair trial. The arresting officer was not notified of the charges against him, nor was he given an opportunity to present his case. The court-martial did not follow proper procedures and did not ensure a fair and impartial trial.

The arresting officer’s conviction and sentence are unconstitutional and must be reversed. The arresting officer is entitled to a fair and impartial trial with the assistance of counsel and the right to present his case. The court-martial’s decision was made in violation of due process and must be overturned.

The arresting officer is entitled to compensation for the time he was wrongfully incarcerated, as well as any other damages he may be entitled to. The arresting officer’s case should be retried in accordance with the law and with proper due process.

In this case, the arresting officer was denied his constitutional rights and was subjected to an unconstitutional arrest. The arresting officer’s conviction and sentence must be overturned, and he should be granted a new trial with proper due process and the assistance of counsel.
military duty" and to those "requiring the exercise of a high sense of responsibility"; but every wise commander will be hard put to it to find any such war or war emergency measure; it will be impossible to take one half a man or more in size and make it appropriate to his guilt. Describe the place so carefully that he cannot understand why he has been sentenced to a long period of imprisonment. The details are often not stated. A suspension from duty will usually make the punishment better than not; for such a sentence plainly does not affect the culprit's pay. A ruling to the contrary would seem to be in conflict with the principles of military law. It may be said that an army's pay could be forfeited indirectly but not openly; that a commander not authorized to forfeit the pay of a warrant officer can award a court to do just that in defiance of the statute; and that in any case the sentence of forfeiture was not punishment, though the law says plainly that only one may be used.

Arrest or Confinement?

Arrest in quarters is not "similar in nature."

Enforcement of a restriction by locked doors or a special guard makes it confinement, which is permitted under the law. It should obviously be ordered as the penalty at the outset.

No military personnel could be summarily deprived of pay as punishment without a sentence, from March 1977. There were, for 32 years, that could happen to Lieutenants and Captains "in time of war", "in case of emergency," and "in case of emergency,"

Then during twenty-eight inglorious months from the first of February 1949 we tried (with little success, I hope) to turn all officers below Brigadier General, and all warrant officers, to a different sort of war, the de facto and day-out forfeiture provision enacted in 1948. Under the UCMJ (a) with the aid of undiscovered departamental regulations—probably verbally communicated but left unexpressed in writing or otherwise recorded—(c) under the charge of "another" acts which indicates (consistently with Article 15(a) (2) (UCM), I hope) which constitute the kind of military duty in a particular case. Never employ it without a current review of the directives of your own armed force concerning how a member thereof may be raised to the grade then in place; and if you be in the Army, you must have a place in its hierarchy above or below, when the culprit is an NCO.

Be cautious: though the voice is Jack's, the hands are those of Eason. It is quite obvious that a sentence in which these terms that are equally applicable to any misbehavior; their comment will fit both the misconduct and the punished. They avoid repressing remarks recently uttered—especially, if published also—in criticism of the military system of rewards and of course, they must never stoop to provocation or vulgarities, whatever the mentality of the offender then being disciplined. Abusive remarks will not be permitted.

Unless a particular commander's enlisted subordinates respect and trust him far more than customary, these penalties are useless against them. Best not to ever consider admonishment or reprimand for persons in your immediate command (as they are) and to the latter only rarely.

But cautiously also as to officers and warrant officers, with respect to whom the use of the UCMJ is the only penalty that can be applied.

Repeal

"Reduction to the next inferior grade," a penalty said to wealth in the Navy, is now available for punishing persons in your armed forces. It looks remarkably like a servant the Army discharged without pay. But the prohibition of the UCMJ is clearly as clear as the prohibitions of the UCMJ—unqualifiedly an open and above-board forfeiture of the pay of enlisted personnel. It's the same as a discharge for bad conduct, and as the latter only rarely.
You Need Tanks to Train Tankers!

by CAPTAIN ROBERT S. CUTHBERT

Tanks are a basic tank in all experiences required for any part of the training of tank careers. There are two common purposes to be served concerning tank availability in an armed unit during its infancy. The first, and most important, is to try to train an armed unit without tanks. The opposite is to train a unit with all the tanks authorized under a particular TOME. This, too, is unsatisfactory because during the earlier stages of training, the quantity of personnel actually received and not capable of performing adequate maintenance. Such an authorized tanks would also detract from the normal training work at an incorrect time. The position in between these two extremes is the area that is often the most perplexing when tried in with the training mission and consequently accomplishes the desired study and analysis.

The Army Training Program (ATP) under which advanced individual training is conducted, includes the training in an armed division is ATP 17-201 (Mobilitation)(Tentative). This eight-week program is designed for analytical training in an armed division. The training includes the training in an armed division. The training includes a series of modules designed to prepare the student to perform tasks as a tank commander. The training is divided into two major sections: the first section includes the theoretical training and the second section includes the practical training.

The TANK AVAILABILITY graph shows the availability of tanks over time. The availability is measured in percentage of tanks in use compared to the total number of tanks available. The graph indicates a gradual increase in tank availability from May to April, reaching a peak in April.

Analysis:

- Each of the 394 hours may be divided predominantly into one or two of these categories, the first two according to vehicles (primarily tanks) and the third according to time.
- Instruction requiring tanks (i.e., Driving Instruction, Operation and Maintenance of Tank Guns, etc.);
- Instruction not requiring tanks (i.e., Scouting and Parcoling, Bombardier and Mil Form and capable of being shifted from one week to another and earlier without harm to orderly instruction or to the training mission. (I.e., there are 59 such hours in ATP 17-201 or 15% of the time allotted to ATP 17-201.)
- For the purpose of this analysis, this type of instruction will be referred to as "Fluid Subjects."
- The time required within any one assigned time, (i.e., Scouting Information Program, now termed Command Conference Hour, Physical Training, etc.). For the purpose of this analysis, this type of instruction will be referred to as "(Anchorage Subjects."
- The realization of these three categories into the same provides the ground-work for an analytical technique which will enable the credit to be given back to the advanced Individual Training Program. For the purpose of the desired analysis, it is pertinent to note that each of the 394 hours may be divided predominantly into one or two of these categories, the first two according to vehicles (primarily tanks) and the third according to time.
Washington's Official Map of Yorktown

A facsimile reproduction of the map of Yorktown at the time of Cornwallis' surrender, which resulted in American independence, with accompanying text, giving the historical significance of the map. The map may be removed for framing if desired. 1952. 5 p. map.

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WASHINGTON—September-October, 1952
Sullivans, commanding the American land force, was sympathetic in his remonstrance that it took all of Washington's tact to patch things up with Clinton. Clinton, a novice of volcanic emotions. Cordial relations were restored, nevertheless, even though a Boston mob showed its disapproval by killing a French officer. Savannah was the scene of the next samo. Again Washington was not present, and Lincoln commanded the American contingent when D'Estaing's fleet arrived from the West Indies in the autumn of 1779. This time D'Estaing was dilatory when he should have been decisive, and impulsive when prudence was indicated. He allowed Lincoln little voice in major decisions, and the Franco-American attackers met a bloody repulse.

Once more Washington had to pour oil on the recriminations of his countrymen. The following winter was the most dismal of the war, and the starving little army at Morristown suffered worse hardships than those of Valley Forge. The word "logistics" was not then current, but it took all of Washington's leadership to scrape up stores and supplies to keep the cause from perishing. He had to cope with the inconsistencies of officers and men who were weary of long campaigns, while the French allies who represented his only hope of victory had another opinion.

The strength of character which brought the commander through his trials is shown by Dr. Freeman in the most eloquent passage of this volume: "Patience, as always, was the most

The early summer of 1781 did it join Washington on the Hudson, giving him hopes of trapping Clinton in New York if Admiral De Grasse could (or would) come from the West Indies with the main French fleet.

Rochambeau not only acknowledged Washington as generalissimo but proved to be the most understanding of all the Allies. American independence, as Dr. Freeman points out, owes an acknowledged debt to this genial Frenchman. He fell in with the busy change in plans when De Grasse promised aid in Virginia for a sharply limited period. Thus it was Lord Cornwallis instead of Clinton who was set up for the knockout blow. Considering the communications of 1781, it seems an authentic miracle that the Franco-American army in New York and the French fleet in the West Indies were able to meet in Virginia while Lafayette was on the spot to keep Cornwallis "amused" with his overmatched little army. The odds were against a timely junction, but Washington appeared to have been provided with a stroke of fortune for his buffs of the dark years. He had a moment of special amazement when, at last moment to withdraw and offer battle on the small scale, the British squadron The admiral, as Dr. Freeman puts it, was of "that not unfamiliar type that has to be persuaded to do what he knows he ought to do and probably intended all the while to do." Washington applied the persuasion a visit to the flagship, and the outcome was the supreme triumph of his dealings with foreign allies. De Grasse consented to give his un

St. Clair, bravely versus complacent.
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