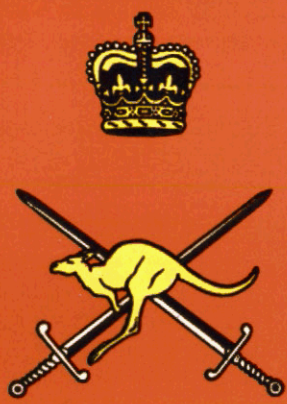


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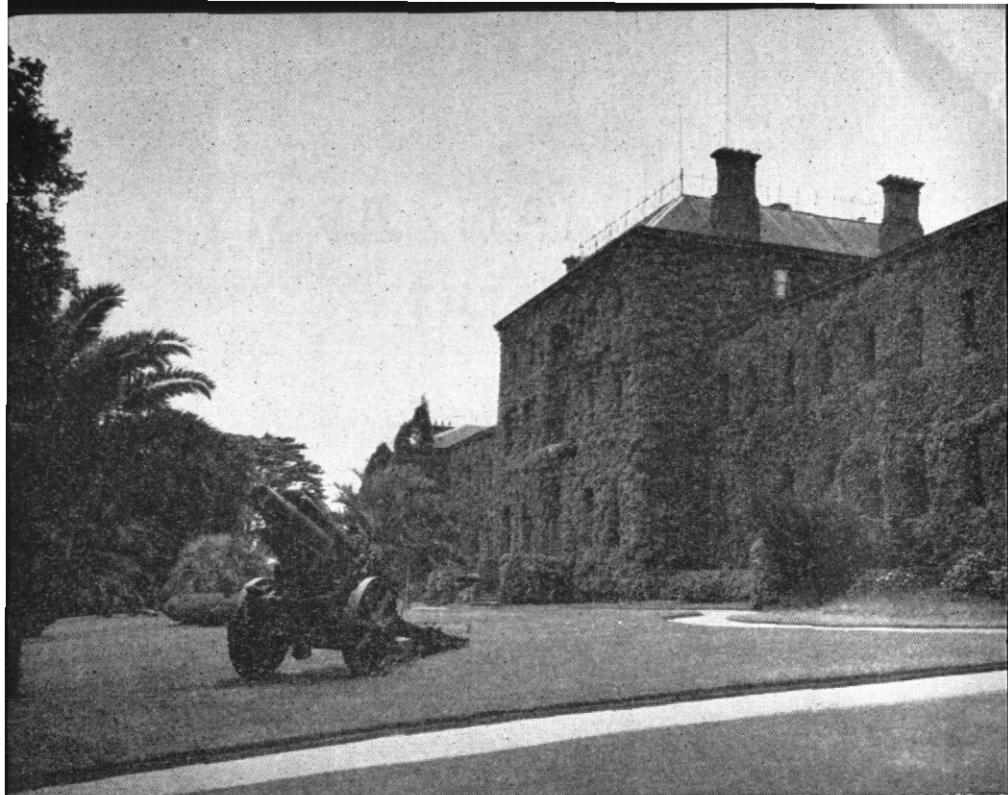
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VICTORIA BARRACKS, MELBOURNE

AUSTRALIAN ARMY JOURNAL

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Defeating Tanks in the Jungle

MAJOR P. D. YOUNGE
Royal Australian Engineers

WHEN tanks were used in the tropics during the 1941-45 War against Japan the battle was generally one sided. In Malaya, we had no tanks and hardly expected the enemy to use any. Our anti-tank weapons were inadequate and we had few anti-tank mines to base our defence on.

During the rest of the Pacific War, we were rarely faced with tanks. When we in turn deployed tanks, we achieved surprise. The Japanese were at the end of a long and difficult sea supply route with no tanks, few anti-tank guns and with anti-tank mines that were too small and too limited in numbers.

The Japanese improvised with anti-aircraft guns as anti-tank guns and with shells and depth-charges as mines, without a hope of producing the numbers required for complete minefields. The mines they laid were easily detected and sometimes defective.

The lessons on defence against tanks in jungle have possibly been lost or distorted by the absence of tanks on both sides at the same time, and by the lack at all times of adequate defensive weapons on the side being attacked. The result has been a tendency to ignore the part played in defence by mines and even by our own tanks.

Means of Defence

Defence against tanks in Africa and Europe was achieved by deploying a

combination of tanks, unarmoured anti-tank weapons and obstacles. All of these can be employed in jungle.

Open tropical country and tropical savannah present similar conditions to Europe. Consideration of the employment of the various weapons will be confined to jungle alone.

Tanks

The Centurion tank fires solid armour piercing shot capable of penetrating the armour of comparable enemy tanks. The gun of the tank is a flexible weapon in that it is completely mobile and is protected by the tank armour. It would appear from these characteristics to be a weapon of the same value for defence against tanks in jungle as it is in open country.

Unarmoured Anti-tank Guns

Success of the 17-pr type weapon firing solid shot depends on the kinetic energy of the round. It is possible to penetrate any enemy tank given a large enough gun. In jungle the disadvantages are obvious — immobility and inflexibility. These disadvantages exist in open country where the weapon can be sited to cover a large area. They are greatly multiplied when movement and fields of fire are limited by trees.

The largest anti-tank weapon firing explosive filled rounds is the 120-mm BAT, weighing in the vicinity of 1 ton. Being a towed equipment it suffers the

same disadvantages of immobility and inflexibility as the 17-pr. Whilst it is a valuable weapon in open country because of its comparatively light weight, it is severely hampered in jungle because the sensitive fuze of the round will be operated by intervening trees and vines. A light tank which would be readily destroyed by solid shot in the jungle has a far higher chance of surviving the fire from a BAT.

The Rocket Launcher

This weapon, firing explosive filled rounds, is light and flexible. It is limited in range but this is of little importance in jungle. Like the BAT it has a sensitive fuze and a curved trajectory and the chances of destroying a tank except at very close quarters are poor when foliage intervenes. Like all unarmoured anti-tank weapon it can be neutralized by machine gun and artillery fire.

What has been said about the Rocket launcher in jungle also applies to the Energa Grenade. All weapons firing chemical energy projectiles would be effective on cleared jungle tracks, however they can be defeated by thin extra protection on the front of a tank. This will not reduce penetration by solid shot.

Obstacles

Obstacles whether natural or artificial are not tank killers. Their value lies in slowing up tanks or placing them at a disadvantage so that they can be destroyed by the weapons mentioned above. The jungle itself is a partial obstacle, however, it is not wholly advantageous to the defender. Natural obstacles such as rivers and cliffs, although not as easy to defend in jungle as in open country because of restricted fields of fire are, nevertheless, formidable. However, their occurrence is infrequent. Fields of fire over artificial obstacles are restricted and artificial obstacles are generally difficult to construct in jungle due to restrictions in working engineer plant and moving stores. With the exception of minefields they will not be considered further.

Minefields

The artificial obstacle which can be produced with the least effort and material is the minefield. In North Africa and in Europe mines were used in large quantities by both sides. In the Far East and South West Pacific, mines, when available to either side, were inadequate in size and numbers. The threat of tanks to the Japanese was so great in Bougainville and Borneo that they used every type of ammunition as improvised mines. That these improvised mines delayed our advance is certain. They were not more effective due to the lack of numbers resulting from the effort required to improvise mines and also to the lack of adequate anti-tank guns to effectively cover the mines laid.

Once an enemy is known to possess tanks in a theatre of war, minefields can be neglected only if it is known that it is impossible for enemy tanks to penetrate due to the terrain or vegetation. This situation will seldom occur even in the tropics. If tanks are employed, the following remarks from *Notes From Theatres of War, 1943, No 16, North Africa (Tunisia)*, are just as relevant in jungle:—

"When tanks have been ordered to assault over a mined area, heavy casualties have nearly always resulted. In a squadron attack near Peter's Corner on 24 Apr 43, six out of the squadron's seventeen tanks were lost on mines before reaching the objective, and the attack was a failure."

The mine has been worth the weight and effort wherever the tank has been used against us. As we expect to be able to use our current tanks in jungle and expect the enemy to do the same, the mine must not be forgotten again. At the same time we must be quite clear on the role of the anti-tank mine. It is not a tank destroyer. As the weight of tanks has been increased the weight of mines has been raised to the minimum that will break enemy tank tracks. Only rarely in the process has there been a

case of a tank being set on fire or destroyed internally or the crew killed. The normal result was a high proportion of immobilized tanks which were sitting shots for anti-tank weapons and usually quickly despatched.

Let us get this picture quite clear — the anti-tank minefield is a spider's web — the anti-tank weapon is the deadly spider.

The idea that a minefield is inflexible is something that must also be beaten into shape. Once it is decided to defend a feature all the preparations for defence are inflexible. To gain protection from small arms, artillery, tank and nuclear fire, it is necessary to dig and provide the diggings with substantial over-head cover. This may take a couple of days to complete. If the siting of the defence does not stop the enemy, a bad appreciation of ground has been made. The situation can only be remedied by expending a further amount of effort elsewhere. The same will apply to the minefield. On the other hand, the original minefield will help to ensure that a well chosen defence site is not lost through necessity to withdraw.

Once a protective minefield has been sited round a defensive position it is inflexible in respect of stopping tanks by-passing the position. In jungle the gun can't prevent by-passing either. When it comes to an assault on the position, however, the mine's inflexibility is its advantage. It does not have to duck it's head to avoid small arms or artillery fire as do the crew of an anti-tank weapon.

If the enemy uses mines wisely and in quantity it is embarrassing to think how they can neutralize our tanks. As a result we tend to think of all the places where, and all the reasons why, mines are not worth using. Having accepted that tanks can be used in the jungle, as described in the AHQ Interim Study Precis, Armour 2, should we dismiss the possibility of the enemy and

us using mines as a basis of anti-tank defence in the following words of that precis:—

"Mines — Any attempt at full scale mining would place great strain on any jungle supply organization and mines could be brought forward only at the expense of other items."

What is "full scale mining" when we are operating in jungle?

It is certainly not a massive collection of Barrier and Defensive minefields. Perhaps the effects of full scale mining can be achieved much more easily in rain forest. If the terrain is such that the enemy can use tanks and can replenish them it will usually be possible for us to bring in mines and other stores. When enemy tanks threaten to destroy us may not mines achieve a higher priority than some "other items".

The disadvantage of the sensitive fuze of the BAT and the Rocket Launcher has been mentioned. We may reach a situation where the solid shot of the anti-tank gun or the tank is the only real defence. Assuming that an anti-tank gun of about one ton weight could be positioned in one piece, it would surely not be difficult to deliver one ton of anti-tank mines (75 Mk 7 or 186 Mk 5 mines) by any means including portorage.

At a normal density of one mine per yard of front we can now with one ton of Mk 7 mines lay a minefield 75 yards long just wherever we want it. Will we be able to cover it all with one BAT? Most unlikely. In rain forest the field of fire of those weapons is very restricted. We have, however, a spider's web 75 yards long to trap tanks and leave them open to close range attack by our tanks and rocket launchers.

Choice of Anti-tank Defence

In deciding which is the best combination of the weapons dealt with above for anti-tank defence in jungle, two situations must be considered —

- (a) The case where both we and the enemy can move tanks, anti-tank guns and smaller weapons into position.
- (b) The case where the enemy can bring in tanks over relatively easy terrain but we are unable to because of more difficult terrain in our rear. (This may occur in an out-flanking move by our force.)

In case (a), our own tanks will be flexible and mobile and able to destroy enemy tanks with solid shot. If we were equipped with anti-tank guns firing solid shot they would be more vulnerable and inflexible than our own tanks and unlikely to be worth deploying.

Weapons of the BAT type would be inflexible, immobile, vulnerable and their effectiveness severely hampered by vegetation.

Rocket Launchers and Energa Grenades would be flexible but would be vulnerable and would only be effective at very short ranges because of vegetation. They may even then be limited in value due to thin spaced protection on the tank.

Mines would be as inflexible as the whole defensive works. If well sited they would not be vulnerable. Their task would be to immobilize enemy tanks for the benefit of other weapons and to prevent sudden disastrous penetration of our defences.

Summarising case (a) we need —

- (i) Tanks for destruction of enemy tanks at all ranges.
- (ii) Rocket Launchers and Energa Grenades for defence at short ranges and to despatch tanks immobilized on mines.
- (iii) Mines to immobilize tanks enabling them to be destroyed by short or long range weapons and to prevent sudden deep pene-

tration—the minefield sited as the framework of the anti-tank defence.

Our anti-tank defence is then based on the tank and the minefield—both immune to small arms and artillery fire, augmented when practical by the rocket launcher. In thick jungle the tank roles of mobile reserve and counter-attack may be subordinated to the anti-tank role.

In case (b), we cannot deploy tanks, anti-tank guns or BATs.

Here the weapons that can be portered in are rocket launchers, anti-tank grenades and mines. It should be clear from what has been said before that the more mines that can be portered or air dropped, the more chance this unarmoured defence has of repelling an enemy tank attack. The uncertainties of the rocket launcher must be reinforced by the protective minefield.

Mine Warfare Policy

Having confirmed the importance of anti-tank mines in the jungle, an examination will now be made of the suitability of current mine warfare policies when applied to jungle.

British mine warfare policy has been evolved as a result of operations in North Africa and Europe. The patterns and methods used are a result of bitter experience of the dangers of haphazard and unco-ordinated laying, combined with a practical solution to the problem of adequate depth combined with effective density.

A high degree of standardization of policy has been achieved between the UK, the USA and Canada with only minor and unimportant variations.

The British authority on laying mines is Field Engineering and Mine Warfare Pamphlet No 5, "Laying, Recording and Marking of Minefields". The introduction to Part I contains the following statement:— "to achieve surprise and

inflict maximum casualties upon the enemy, the technique employed in the use of mines is almost certain to change during the course of operations, and may even vary between different theatres of war".

Assumptions

The following assumptions will apply in this investigation:—

- (a) Primary and Secondary jungle are the only vegetation types which need be considered. Tropical savannah and open tropical country present full scope for employment of Protective, Defensive, Barrier and Nuisance Minefields.
- (b) Our own and enemy tanks can be expected to be capable of penetrating the various types of vegetation and to perform a useful role in support of infantry attacks.
- (c) In the event of war in the Far East, Australia can expect to be fighting alongside the UK or the USA or both. Consequently the standardization achieved by these two countries must be accepted by Australia unless alternative policies to suit tropical conditions are agreed to by all.
- (d) The use of anti-personnel minefields against infantry attack does not come within the scope of this paper. The use of anti-personnel mines in mixed clusters to protect anti-tank mines is normal. They may be omitted under certain circumstances.
- (e) Minefields in open country with a density of one mine per yard of front may have a depth of 400 yards or more to hinder enemy silent breaching during the hours of darkness. In the rain forest the view by the defender of the minefield is obscured twenty-four hours a day by the dense vegetation. The enemy can breach at his leisure and little advantage can be gained from great depth.

Minefield Types

The various types of minefield used in open country will be examined to determine their value in jungle.

Nuisance Minefields

These minefields are best sited on roads and tracks. It is not normally possible to cover nuisance minefields by observation or fire. As movement through jungle is normally canalized along roads or tracks there is excellent scope for nuisance minefields.

Barrier Minefields

Barrier Minefields are laid to block enemy attack formations in selected areas, especially to the flanks, and to deflect his approach into selected battle areas. It would seldom be possible to site a barrier minefield in continuous jungle and cover it by observed fire. Under these circumstances anti-lifting devices and anti-personnel mines would have little value. Thus it would generally be uneconomical to employ available mines for barrier minefields except astride tracks where accurate artillery fire could be delivered.

Defensive Minefields

Defensive minefields are laid in open warfare to defeat penetration between positions occupied by units of company, battalion or brigade size. A normal requirement is to cover the minefields with machine gun, mortar, anti-tank and artillery fire. Cover by fire would seldom be possible in jungle except perhaps for minefields between companies. Mines fitted with anti-lifting devices could be pulled with comparative immunity and little loss of surprise. Anti-personnel mines could be dealt with at leisure in the cover of the jungle. For these reasons, defensive minefields are likely to be an uneconomical use of mines in jungle.

Protective Minefields

A protective minefield is one employed to assist a unit in its local close-in protection. This type of minefield

immobilizes tanks and also slows down an enemy attack in its final stage through delay and disorganization caused by these casualties. This gives the defender a better opportunity of defeating the attack by close range anti-tank fire. Protective minefields will obviously be essential to defence in jungle. In open country the protective minefield can be sited out to a distance which can be covered by small arms and anti-tank fire—say 600 yards. In jungle it will seldom be possible to cover a depth of more than 20 yards in secondary growth or 100 yards in primary growth even with weapons firing solid shot. Small arms fire against mine lifting teams is similarly hampered.

Minefield Summary

Where defences are located in continuous primary or secondary jungle the difficulty of covering minefields by observed small arms or artillery fire will limit effective minefields to protective and nuisance types with occasional short length of barrier minefield on tracks. If on the other hand defences are located in rain forest which is surrounded by more open country, all types of minefields may be used in the defence.

Infantry - Armour Attack

Consider now an enemy attack in jungle using infantry supported by tanks. In jungle, tanks are able to move to within sight distance (say 20 yards secondary jungle, 100 yards primary jungle) of defensive positions before there is any appreciable danger of being hit by anti-tank guns or other tanks. Rocket launcher effective ranges may be much lower. The effect of mines outside sight distance is minimized if they can be lifted with immunity. In addition an enemy tank losing a track on a mine remains recoverable if it cannot be subsequently destroyed by anti-tank fire.

Once tanks in jungle are open to observed anti-tank fire they are themselves in a position to do damage to the defenders. If in the short distance, from the time they come into view, they cannot

be immobilized they may over-run a defensive position smothering anti-tank fire with machine guns.

It appears that in the distance between the foremost pit and the sight distance to tanks there should be the greatest density of mines possible. Using the minimum depth of standard minefield pattern, 38 yards depth is required to obtain a density of one mine per yard of front. Allowing for a space of 15 yards between the nearest anti-tank mine and foremost weapon pit brings the distance to the outer edge to 53 yards.

Taking an average sight distance of 40 yards with a minefield of density one mine per yard of front, and remembering that any one anti-tank weapon may cover only a narrow frontage due to trees and vines, it would be necessary to site the majority of anti-tank weapons in the foremost pits to ensure that tanks immobilized on the outer mines are destroyed. Until the immobilized tank is "brewed up" by our anti-tank weapons it is capable of using its full armament against the foremost pits. After destroying the foliage by fire its effective range will be increased. The lanes of fire cut by the tank may not reveal it to an anti-tank weapon's position. If the tank is exposed this may only be above turret ring level and, due to slope and thickness of armour, not a good target.

Anti-tank ammunition fired by rocket launchers or recoilless anti-tank guns will be ineffective if exploded on intervening foliage. At the same time the fire of all the tank's armament will penetrate foliage without loss of potency.

This argument leads to the following proposition:—

The best use of available mines will result if they are sited so that they cannot be lifted with immunity and they can immobilize tanks at close range to the defenders where rocket launchers have the greatest chance of success. This calls for a dense minefield of small depth, say 25 yards. This arrangement cannot be achieved with the standard pattern.

Jungle Minefield Patterns

There are numerous patterns to which minefields could be laid in jungle to give greater density and less depth than the standard pattern. The need for safety in laying and recovery must be uppermost in the design, particularly if mixed anti-tank and anti-personnel minefields are to be laid.

In primary jungle a continuous minefield may be suitable, and a jungle standard pattern is required to give greater density and less depth combined with safety in laying and lifting.

In secondary jungle with thick undergrowth the defenders will clear lanes of fire for small arms weapons. These may also be utilized as anti-tank fire lanes. Under these circumstances it may be more economical and easier to lay mines along the fire lane. In addition, enemy attempting to lift mines will come under small arms fire.

Mines in fire lanes could be laid scattered. On the other hand, for All Arms laying, a safe and simple fire lane pattern could be used for mining tracks in jungle.

Scattered mine laying is restricted in open warfare generally to infantry assault pioneers and engineers. In jungle it will be necessary to relieve the strain on the resources of the pioneers and engineers by ensuring that the majority of fighting arms are fully trained in scattered laying.

When patterned laying is attempted in jungle the placing of some mines will be hindered by vegetation. It would be preferable to maintain the standard pattern and to eliminate the mines which would coincide with trees or roots. By this means recording will be much simpler and recovery safer.

Any of the above changes in patterns or procedures for jungle warfare will cut across the UK, USA and Canadian standardization. It is essential that an early agreement be obtained between all interested countries for modification to mine warfare policy in the jungle.

Conclusions

If the enemy uses tanks in the jungle our anti-tank defence must be based on minefields covered by weapons firing solid shot, the most valuable of which would be our own tank guns. In thick jungle, mobile reserve and counter-attack roles for tanks diminish in importance.

Mines must be given a high priority in defence stores. The effectiveness of rocket launchers and anti-tank grenades will be very much less than in open country, but will be the only suitable weapons in terrain closed to our own tanks. The 120-mm BAT is not recommended for use in close jungle except on tracks and when access is easy.

The types of minefields which will be effective in jungle are Nuisance, Protective and occasionally, in the vicinity of tracks, Barrier.

Standard patterns are unsuitable for protective minefields in any jungle with visibility under about 80 yards. Special jungle standard patterns of less depth are necessary.

Training of All Arms for scattered mine laying will be required. The restrictions imposed by the standardization agreement must be modified for jungle.

Any variations in patterns or procedures from existing British Mine Warfare Policy, must be agreed to by all nations likely to fight as allies in jungle. This agreement must be achieved at an early date to ensure safety and adequate training.



Thoughts on the Build-up of the German Army

GENERAL LEO FRHR GEYR VON SCHWEPPEBURG
German Army (Retired)

Translated by G. M. Carrington, BA, Army Headquarters

I

"**A**H, les Allemands, bon soldats, bon soldats", (Oh, the Germans, they're good soldiers, yes indeed), Marshal Foch once said to Lloyd George, as the latter told the Author.

Stalin had similar sentiments when he said to his generals in the Kremlin in 1941: "Beware of the German generals, they're no school boys".⁽¹⁾

But now the question arises, what value, rising Phoenix like out of its ashes, have the new German soldier and his leaders today. An army does not inherit necessarily, complete with "Written Warranty", the fighting spirit of its forerunners. Both technical and martial aspects of its fighting spirit have to be re-created anew in each generation.

In the past 150 years the Prusso-German Army had to be created afresh three times following the most complete disintegration. Of all these the last, the creation of the Bundeswehr was, both psychologically and technically, the most difficult.

The re-creation of the Prussian Army after Jena was based partly on Scharnhorst's revolutionary ideas and partly on his immensely powerful personality. In the practical execution of his plans he could draw on a good selection of the Prussian officer corps. The same applied to Seeckt's rebuilding of the Reichwehr following Versailles, though in contrast to Scharnhorst, Seeckt had remained bound by tradition in his ideas.

The creators of the Bundeswehr were handicapped even before they started by several features of postwar Germany. A large proportion of the nation was, following the defeat, the so-called re-education and also due to a strong materialistic influence, either indifferent or actively hostile to the idea of military defence. This was especially true of the youth which would be the most affected section of the community. The political opposition played around with

1. From documents captured by the Author's Armoured Corps, Kiev 1941.

old resentments and political daydreams. They had learned nothing and forgotten less.

Great care was exercised by the German government before and AFTER the decision to re-arm had been taken, to ensure that the new German Army and its leaders would play only the most subsidiary role in the life of the state. The fear of the "Black Man", of the strong soldier, was very much apparent.

The participation of the older generation of soldiers was not even considered in the rebuilding of the army, although they possessed the largest store of experience in field command and especially in peace-time training. The West German Government was in a relatively advantageous position in regards to German re-armament. If it had considered the situation logically and with expert assistance it would have realized that it was in a position to demand. The situation was then such that, without a sizable German contribution, Western Europe would have been indefensible against the onslaught of the eastern avalanche of armour, especially as it would at least initially be covered by a tactical superior air cover. The allied powers could not afford this in view of their global strategy. Because of these facts the West German Government was advised by a technically and internationally known German expert (The author himself — Editor) to make two demands. These were to be —

- (a) To raise only as many divisions as Britain was prepared to guarantee to maintain in Europe, and
- (b) That the new German Army was to be equipped to the same standard and with the same equipment as the US Army.

Both these demands, suggested in approximately 1952, were ignored.

II

The rebuilding programme was begun under the direction of a Minister who

was inexperienced in military matters and politically subservient to the Government, and under the influence in technical matters of a group of General Staff officers who had little or no real command experience in the field, or, more important still, sufficient knowledge of practical training under conditions of peace. To support our contention that this was serious, we should like to quote the considered opinion of a highly successful British soldier, General Auchinleck, who stated that a good peace-time officer is more valuable and more difficult to obtain than a good battlefield officer.

Both the fire eaters of the battlefield and the soldiers experienced in human leadership were called later, but, since the spiritual foundation had already been laid, too late.

Of special significance, as an indication of the current "international stock market" value of the German contribution to European defence, was the question of the term of service. This question was hotly debated and fought over in even the highest governmental circles, and was, temporarily at any rate, settled at one year. This was of course far less than the Eastern powers, rich in human resources, could afford. The two opposing problems under debate were on the one hand the purely military considerations, and, on the other hand the absolute necessity to avoid any possibility that the economic programme could be jeopardized through lack of new blood, or that industry could suffer through lack of skilled labour. But this solution could only work if all efforts were to be concentrated on producing a *field* soldier, creating the right facilities for that only, and dumping overboard the old traditions and customs that are redundant in this Atomic Age and that have remained stuck like burrs. These traditions and customs consisted of endless parade ground drill, of the garrison-bound mentality, and of the idea of barrack square teaching as preparation for battle as well as of the now antiquated idea that the infantry was the "Queen of the Battlefield". The

infantry had long ago been dethroned by the tank, the plane, the rocket, and finally the atom. But the numerical superiority of "learned" Infantryists in relation to advocates of armour in the army branch of the Department of Defence was the deciding factor. Although the Defence ministry had to withdraw a planned syllabus for the formal training of the soldier, the training syllabus still contained despite the short service period, a three monthly *infantry* training programme for all arms. Even though the pattern of atomic war is still hazy, this infantry training for all arms had absolutely no connection with atomic warfare.

III

The initial build up was, despite the revolution in warfare caused by atomics, completely conventional. But finally concern was expressed not only from our allies, so that the German government finally felt it advisable to introduce a stronger hand to help and guide the rearmament programme. Such help could not be expected from the military side, and could anyway be introduced only from the political side. The industrial manager Theo Blank relinquished the position of Defence Minister to the Bavarian Franz Josef Strauss. This robust man and experienced politician received the highest possible qualifications from Mikoyan, when the latter called him the most dangerous man in Germany. It is not usually the duty of the defence Minister of the most threatened country, ie, Germany, to try and win the pleasure of a probable enemy. From the German point of view, it is already today evident that Franz Josef Strauss had made the rearmament programme more realistic by slowing it down. One can have differing opinions about details of his rearmament programme, for instance about the late date at which effective air defence will become available. The programme may have become more circumscribed, but it also became more realistic and, most important, behind the programme stands a will that is strong and certain of its

goal. Strauss is more than just a political yes-man. On the other hand, much he has been unable to alter, or considers that the time is not yet ripe.

One of the almost insoluble problems facing us is the quite insufficient area available for field training. Even before the Second World War this lack of training area was one of the major headaches in France, Britain, Belgium, Holland as well as Germany, and with the development of new techniques it has increased. This lack of space is most apparent in the lack of training the young German Army has had in the basic group training and, most important, in the co-operation of the various arms both by day and by night. In this respect the German Army has been and has remained, a people without room.

Another problem is the remarkable way in which weapons and equipment are ordered. These seemed to have been ordered on a basis other than a purely qualitative one.

The Defence Minister has a remarkably clear mind and a good instinct for solving modern military problems. But his weakness lies understandably in his lack of practical military experience and of practical judgement of military equipment. As an example of the latter we can mention the M 48 tank, which with its 4000 odd parts is complicated to make and maintain, and that has been adjudged by first class foreign experts to have been technically surpassed since 1954.

IV

In questions of training, practical experience is essential both for politicians and soldiers. Military leadership should be free especially from any partisanship on behalf of any one arm. Prior to World War II the personnel of the German General Staff was predominantly artillery minded. The present General Staff has a predominance of the infantry mentality. The spiritually and technically most progressive ground weapon of the

Second World War, the armoured weapon, should have had far more influence, both in numbers as well as in the planning of the training programme, especially as there are only a few of its old practitioners left. In this respect the situation is quite different in Russia today.

In one thing the Defence Minister is in error. He not long ago expressed publicly, that of the old traditions only the best has been retained. Unfortunately he has allowed too much of what is only second rate to survive. In this category belongs especially the old fashioned infantry rifle range type of training, especially as superior training in the use of weapons under field conditions can often be most decisive in battle.

The US Army has lately reorientated its approach to training towards battle realism through the use of Trainfire system, and thus, seemingly, created a new and revolutionary approach. This system though is as similar as two eggs to one used by the German armour as early as 1944 (The author was responsible for this innovation being adopted — Editor). But war experiences are soon forgotten in the comfortable chairs of the government officer. What ought to go also, and as soon as possible, into the historical archives is, inter alia, the separate education of the officer replacements for the various services.

The British Army had, due to its world wide and varied obligations, long ago developed to the highest pitch its system of training of new officer material. It left these ideals, when Britain withdrew from India, behind. The Indian Forces choose, building upon their inheritance, the highly novel and modern idea of training for 2 years all officer cadets of all services together, using an Academy of Defence Science system, before the future officer commenced training in his own service or arm.

V

The first phase of the build-up of the German Bundeswehr can now be regarded as completed. The second phase extends,

following the sound idea of the Minister of Defence of producing quality before quantity, until 1961. By this time a larger part of the German Air Force should be also battleworthy.

A reorganization of the Bundeswehr is to take place in 1959. From what is known at the moment of the plans, this reorganization is a definite step forward. But in some respects it could have gone even further. From an armoured point of view the standardization of the well accepted principle of the battle group is a welcome move, although not representing and fundamental innovation. This development towards the greater independence of the lower fighting units, the brigades, has been dictated by the exigencies of atomic warfare.

We are going to discuss here only the advantages and disadvantages of the new system as they relate to command, organization in general and to the technical equipment.

In what has been said up to date on the subject of command, there is no indication as to whether and how the chain of command is to be shortened. In practice this would mean that either the corps or the division would become redundant.

The speed lent to orders given on the spot in the course of the battle by radio communications was one of the major reasons for the success of German armour in the early and successful years of the war. Using proper radio communications the corps or division, whichever one is retained, can then successfully juggle with 6-7 balls, ie, brigades.

One of the major reasons and advantages in favour of shortening this chain of command is that the idea of tank formations engaging in fencing duels will finally be erased from armoured text books. This is especially important, as the Soviet armoured doctrine does not allow, and rightly so, for anything but an aggressive spirit in its armoured tactics.

The reputable German press says also, that the new brigade formations will allow more leadership from the front. Armour experts regard this as utter nonsense, because this "leadership from the front" was the dogma of armour already in the Second World War. Of the seven commanding generals of a Panzer Corps (The author's own—Editor) four died on the battlefield. No more need be said.

Next let us look at the organization. The proposed establishment of the division of one armoured brigade to two mounted infantry brigades would have been better if it were the other way round. Mounted infantry is as a rule roadbound, and so cannot follow the tanks across country. This sort of handicap is an anachronism in the age of the atom, of strong tactical air forces and of night fighting. If the high cost of obtaining tracked vehicles is the governing factor, then the balance will be paid in the diminished changes of success, and, which is far worse, with the blood of the troops. On the other hand the idea of making the brigades self-sufficient for periods up to five days by adding a QM Battalion is an excellent one.

But within the proposed organization, and due to it, the following shortcomings are becoming evident. The brigades have no organic air reconnaissance and communications means. Being dependent for these on the division means that intelligence will be so much the slower in coming forward. It was always wrong, and is even more so today, to retain central control in this regard. Considering that the brigade has now become an independent unit, this is a very serious, though understandable error.

One scout company per brigade is definitely not sufficient. At least the Armoured Brigade should have a stronger scout unit, and definitely more than one Pioneer company, especially as the Armoured Pioneers are often the "Black Husars" (Famous Prussian mounted troops, used as shock troops—Editor) used on the sharp end of any armoured breakthrough.

As far as technical equipment goes we are going to limit ourselves to certain details, although a lot could be said. A new tank of about 35 tons, with diesel propulsion and the thereby increased range, is absolutely essential. Similarly the mounted infantry should be in armoured carriers and not on trucks.

There remain two further points of a more general nature to be considered. Half of all the at present available armour is to be part of the Mounted Infantry Brigades, and this allocation is logical. But this leaves the German Army without a really effective armoured force. This concept is especially questionable when considered against the Soviet concept of having large and powerful armoured groups for deep penetration. Even if nobody would dream of attacking the Eastern Block, the retention of the offensive as a means of defence still remains a valid and vital principle.

Finally, we should also mention an organic NATO requirement, namely, that immediately an alarm is given, there must be available a force ready for battle. An organization designed for yearly recruit intakes up to four times a year creates an animal that is neither a training force nor a battle-ready force, and this situation grossly overloads the available cadre of leaders. It is essential to separate training from the standing force by creating separate training centres. The old German conservatism towards really thorough going reforms is here strongly evident.

VI

But despite all the mentioned weaknesses and growing pains the future development of the new German Army should be, on present indications, favourable. This prediction is based on a number of clearly evident and pleasing facts.

The Defence Minister responsible has definitely a strong will, and is not afraid to take measures which may be unpopular, like for instance the necessary preparation for equipping the Bundeswehr with atomic weapons.

Co-operation and mutual instruction of the various NATO Staffs and a favourable attitude of the German officers towards their opposites in other countries have been most successfully developed. This is especially true, and highly pleasing, in the relationship between Germany and France.

The influence of war experienced senior officers and commanders of schools on the development and growth of the new army has grown.

The moral qualities and the enthusiasm of the junior officers are highly

encouraging. These give one the hope that the biggest need, namely of good junior leaders, may be lessened, although not quite satisfied in the foreseeable future.

Last but not least a surprise. This came from the German youth, whose previous "... you Jack, I'm all right" attitude had not led one to expect the gratifying results obtained by the called up conscripted men. They promise, judging by their performance during the last manoeuvres, to honourably fill the place allotted to Germany in the defence of the West.

ROYAL NAVY'S NEW GUIDED WEAPON

THE name of "Seacat" has been given to a new ship-to-air guided weapon now being developed for the Royal Navy, and described as "an ingenious weapon with a novel type of guidance equipment".

A Joint Admiralty and Ministry of Supply announcement said that the new close range weapon will replace the Navy's 40-mm anti-aircraft gun.

The makers stated that "Seacat" is a small and highly manoeuvrable weapon powered by a solid fuel motor and designed to be instantly ready to attack. Development of a land-based version of the weapon, to be known as the "Tigercat", is being investigated.

— *UK Information Service*

IMPROVED READING

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ACCORDING to the last edition of the *Year Book of the Commonwealth of Australia*, about 186,000 tons of wood pulp was converted to paper in Australia, the bulk of which will pass through a printing press. The finished product will be read in the form of newspapers, books, journals or jam-tin labels. While much of this vast flood of printed material is dedicated to the murder of time, there will be an imposing volume of instructive matter positively valuable to the engineer, the chemist, the soldier, the scientist or the farmer who wishes to keep pace with the advance of knowledge in his particular field. Instructive literature will not only engage his interest as a specialist but as a citizen enjoying the decent living of democracy for, if he is to retain his identity as a free individual, he must read widely to evaluate the economic, social and political issues hammering upon his mind through eye and ear by a multiplicity of media: issues which may seriously threaten the democratic ideal. Knowledge is endless: life is brief.

Professor F. J. Schonell states: 'Few people could challenge the statement that reading is the most important subject in the curriculum of the elementary school; success in this subject conditions, to a large extent, progress in most other subjects and, as recent studies show, influences the whole attitude of the pupil towards school life'. But learning to read also influences the future habits of the reader. The fact that university students need to be taught to read is startling. That most of us are reading

cripples has recently received a good deal of publicity in the popular press for the simple reason that, in Australia, the idea is rather novel. In Melbourne, at any rate, commercial interests have not been slow to cash in on it. Reading clinics have been set up and business executives and students are being urged to attend courses in their professional interests. They are doing so, and some spectacular claims have been made in respect of their improvement.

Consequent upon the reading improvement programme carried out at the USAF Air University Command, the RAAF inaugurated the Staff College Reading Clinic in June 1956. On 24th November, 1958, the Army commenced a Reading Improvement Pilot Course at AHQ, based initially upon the technique developed at Point Cook. Realising that there is often a good deal of loose thinking and exaggerated press publicity about innovations generally, this course was an experiment, the aim of which was to assess the objective realities of the claims made for this technique, by testing the efficiency of the apparatus and methods used in reading improvement training. It was soon felt that, in order to make the course more meaningful, greater emphasis should be placed on comprehension so, instead of giving a test every fourth period, it was decided to administer a test each period. Moreover, it was considered by DMT, who initiated the course, that efficient reading for comprehension must not fall below a standard of eighty per cent. In effect, the trend was away from comprehension as a function of reading speed to reading

speed as a function of comprehension: pursuit of this deviation has led to further variation of the earlier technique.

Course No 1 showed a percentage increase in reading rate of fifty-five per cent, Course No 2 one hundred and fifty-six per cent. To correct undue weighting for a low initial rate, averages were expressed as an index for each group; the mean of the final five tests is taken to represent the degree of improvement and, since the starting attainment is assessed as the mean of an easy and a difficult test, this tends to give a more conservative estimate of improvement than would be the case if only the last two tests, similar to the first two, were used to obtain the improvement figure. Course No 3 is now proceeding; however, two students have completed the course with three hundred and twenty and two hundred and sixty per cent improvement respectively. Another student who has almost completed the course has read his last three tests at an average speed of 1,150 words a minute. All comprehension tests measure equally reading for detail, criticism and reflection.

It is not proposed, in this article, to discuss technique at any length, for an unduly condensed exposition might give rise to assumptions incompatible with the facts; nevertheless, some reference to the apparatus and its limitations may not be amiss. A reading rate controller holds a book under a moving shutter which covers a line of print at a time. Set at specific rates of speed, it forces the reader to his capacity, increases concentration; and by cutting off the lines read, prevents regression.

A tachistoscope speeds up the reader's ability to see and comprehend words flashed on a screen. It is derived from a 35-mm slide or film strip projector fitted with a shutter allowing images to be thrown on a screen at controlled speeds. Practice with this machine increases effective eye-span by sharpening peripheral vision. Each machine is a useful aid but, like the electronic brain, you cannot get more out of it than you put

into it. Man's perennial hope of getting without giving is dashed again: the machines will not increase his vocabulary; they will not teach him the methods by which writer's develop their themes; they will not enable him to read paragraphs for ideas rather than words; they will not practise for him between periods. All these things and others are required of the student. And it must never be forgotten that speed itself is a variable.

Talking of variables, the whole field of reading improvement is an almost undifferentiated expanse of variables: the facts are empirically determined. To carry out a scientifically controlled experiment, the theorist would need to have access to large groups in a similar IQ band; use all methods singly and together; employ teachers with, at least, similar personality profiles; and have a lot of time and statisticians at his disposal. The obstacles to carrying out such a project are not insurmountable but they are formidable.

Meanwhile, there are varying interpretations as to what mental and physical events actually take place in the process of becoming a fast reader. Though the proponents of at least three schools of thought on this subject may differ as to the best method, so long as they get valid results, theory can be deferred: it is not unusual for pure and applied science to develop asynchronously.

Finally, the student who has successfully completed his reading improvement course is a reader who is versatile; who knows when and how to adjust his speed to the nature of the material; who clearly understands the purpose for which he is reading.

That army officers are exposed to an enormous mass of reading material, waxing rather than waning with the ascent of the professional ladder, is well recognized, at least within the Service; therefore, in view of the reading improvement effected by the above project, it is intended to continue the courses.

WEAPONS AND TACTICS

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THERE is a continual interplay between the weapons with which armies are equipped and the tactics used to deploy those weapons with success in battle. This truism has been the subject of comment by nearly every military writer who has ever put pen to paper. Every student of military history sees this evolution in which each new weapon engenders a change in tactics—either forethought or adopted on the battlefield in the face of disaster.

The exploitation of the tactical possibilities of a new weapon has many times been shown to give results out of all proportion to the effort employed. And just as surely, other developments have subsequently taken place to counter the effect of the new weapon. One of the most spectacular demonstrations of this dominance of a new tactical conception of a relatively new weapon, followed by the levelling up process, was given in World War II. In the Battle of France, the speed over the ground at which a battle could be pressed by armoured and motorized troops, supported by aircraft, led to the defeat of the colossal French Army and the withdrawal of the BEF from the Continent. Then came the levelling up: in tactics and weapons, the use of anti-tank measures of all sorts to slow down the armour, of fighters to defeat the Stuka and, as executed in both North

Africa and Russia, the drawing out of an armoured force's supply lines to the point where its mobility could no longer be sustained.

Every military system is at present engaged in a deep study of the tactical employment of atomic weapons and every tactician, practical or arm-chair, is prepared to offer opinions on the employment of these weapons and the organizational and equipment changes needed either for their successful use or for successful defence against them. There can be no doubt that the crown of Queen of the Battlefield, unexpectedly found resting on the machine-gun's brow in 1915, grasped at by the tank in 1917 and finally secured by that weapon in 1940 has now passed to the tactical atomic warhead.

But there will be many fields of battle upon which the Queen will not appear: which weapon will be her Knight-Champion? And once a tactical atomic weapon has been used, what will be done to exploit the situation thus created?

The statement is truly made that a mobile force of all arms must be used, this force being rendered mobile in the face of conventional weapons by its built-in armoured protection and its ability to move fast over the widest possible types of terrain. To this end,

each army is concerning itself with gun-tank and armoured personnel-carrying capabilities.

It has already been shown in practice that anti-tank weapons of sufficient capabilities, skilfully handled, can nullify even the most aggressively handled armour: at some stage, a tank thrust can be halted by the deployment of a weapon system which, by some means, gains an edge of superiority over the tank. Practically, however, at the close of the World War II, some tanks had almost emerged which were superior to ground weapons of the light projectile type which could then be deployed for their defeat. These tanks are now in service and their defeat is a matter of grave concern, none of the unguided missiles which can be used against them being good enough to gain that edge of superiority and retain it.

Besides the nuclear weapon, the means available to defeat the tank include very high velocity armour piercing shot, shaped charge warhead projectiles, squash head projectiles, large calibre high explosive shell, anti-tank mines, anti-tank grenades of various high explosive or incendiary types, napalm aerial bombs and other novel weapons.

Whilst an exhaustive treatment of the advantages and disadvantages of each of the above weapon types is beyond my intention here, the chief limitation of each of these, at present in the hands of troops, may be summarized as follows. Armour piercing shot demands a high velocity gun of reasonable calibre and extreme accuracy: this combination, when mounted in a tank, results in a vehicle of upper limit weight and lower limit mobility. Its tactical use in a ground weapon — an anti-tank gun — is prohibitively expensive in casualties. Until recent years, the shaped charge projectile was limited to comparatively short range use since, being unrotated, its aerodynamic performance introduced vagaries in accuracy which could not readily be overcome. To be effective, a hit must be obtained on the armoured

shell of a tank, thus enabling penetration, and the area presented by tanks for this attack is quite small: these weapons are no match for the tank gun. Squash head projectiles are larger than either of the previous types and, like the HE shell of equivalent performance, require a gun of a calibre and accuracy not practicable for tank mounting. Anti-tank mines, now needed to be very large for effect, are expensive logistically to provide and tactically to lay in sufficient numbers to obtain overwhelming results. Anti-tank grenades can only be used when the action has really been closed and, therefore, are the last means of offensive defence. Air-borne anti-tank weapons demand at least local air superiority for their use — this can never be guaranteed.

On the battlefield, combinations of most of the above means have been tried, allied with the use of ground obstacles to reduce armour's mobility and force it to present a target. As evidenced chiefly by universal adherence to the high-velocity medium tank gun, the most satisfactory means of defeating a tank is to fire an individual weapon against it, to either gain entry to it and destroy its crew or internal mechanism or to hit it so hard on the outside that its weapons and means of propulsion are put out of action. And, because of the speed of tank operations and the guaranteed retaliation in case of failure, such a weapon must have the highest probability of hitting its target.

Several such weapons are now in production or development. Some of these may depend upon a homing device for their accuracy, whilst others depend upon a human operator guiding the missile along his line of sight to the target, the response of the weapon to human or in-built control ensuring the high degree of hit probability. MALKARA, developed in Australia to meet this requirement, appears to be one of the most successful of these weapons types to be shortly available. Many of those who have seen demonstrations of this weapon will assert that this is the

type of thing which will see the tank off the battlefield as surely as the original firearms saw the demise of the armoured knight. Others will not go as far as that, but most will agree, and we may well see this in war, that a MALKARA-type weapon, integrated in a system of all other current anti-tank measures, provides that edge of superiority needed to dominate the tank and thus to give defence ascendancy.

Assuming it is not a long step from MALKARA to the evolution of a complete weapons system which gives defence ascendancy over the tank, integrated with a system of small arms and artillery fire ascendant over infantry in the 1915-17 tradition, we have the defensive measure of those currently conceived mobile forces of all arms which are needed to exploit the openings created on an atomic battlefield or which could otherwise dominate a conventional battlefield. It would appear that, once again, fire will overcome movement and any approach to the enemy defence zone will be so fraught with casualties that operations will bog down again to position warfare.

This century has, I believe, taught mankind that position warfare in which victory is sought by attrition of the enemy — a sort of warfare which must be fed by *levee en masse* — could become race suicide when fought by nuclear armies. Yet, wars are not won by defence ascendancy but by offensive action, actual or threatened.

By some means, a relapse into position warfare must be prevented. This can only be done by the adoption of tactics which may demand new weapons again — or of a strategy — which precludes the mobile task forces operating on the battlefield from being immobilized beside their tanks by MALKARA or pinned down in their fox holes by small arms and artillery fire.

Now, how this can be done is the real question. What are the tactical means at hand for use with the armoury of conventional weapons? Some are simple

things: for example, observed artillery fire upon MALKARA sites and aiming posts to destroy them or smoke to blind them. These are easy if one has the reconnaissance capacity to find such targets with great speed (for we must assume them to have high mobility if they are to reappear on the field after atomic attack). This reconnaissance must have many strings to its bow — the air, infiltrating ground parties and field intelligence, all feeding information gained to a counter-weapons system by the fastest and most accurate means. Other tactical means are more involved — air strikes against weapon sites or vehicles, conventional artillery barrages (which will be difficult to concentrate on any part of a nuclear field of battle), changes in the organization of tactical units to improve fighting capacities and control; these are but examples.

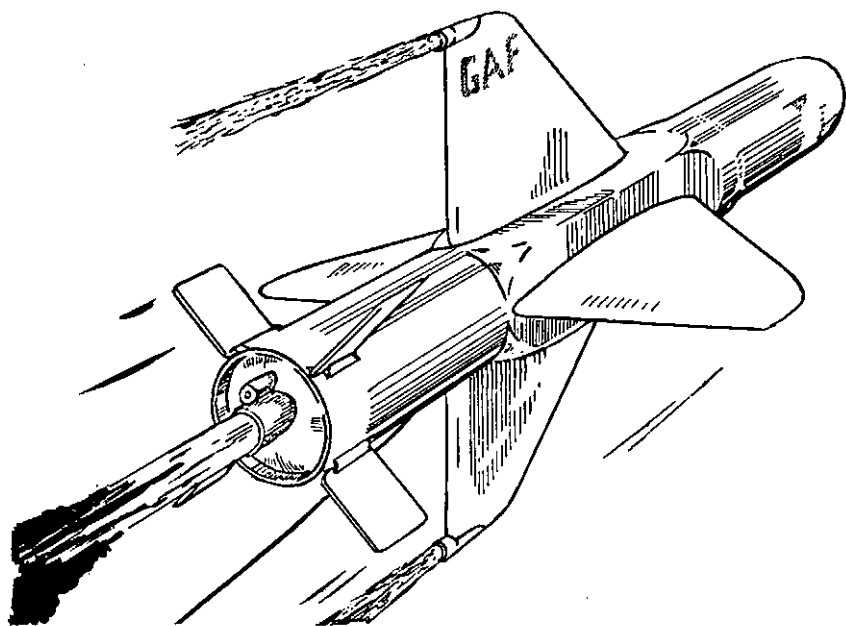
It is possible that a new weapon will be a crucial item. We have seen the tank grow from a light machine of a few tons in 1939 to a 50-ton complex monster. A light, small tank with extreme mobility, reasonable armour and sustained performance is now indicated. Such a vehicle would substitute speed for thickness of armour, and elusiveness and small size for a capacity to swop punches with enemy tanks, whilst retaining fire-power against troops and soft-skinned vehicles. Its development should not be a retracing of steps to any previous light tank, but be from a new look at the problem.

How may a strategy be developed which will provide a path for a thrust at the enemy heartland? This involves the most extensive military-geographical-logistical study of the situation currently, as it obtains at the outbreak of war, as it changes during the progress of operations and as it is likely to change as either side achieves portion of their war aims. Everywhere, higher commanders will be seeking strategical solutions to the problems confronting them on their fronts. So often has it been shown that it is a far cry from beating at the enemy's frontier posts to

beating successfully upon his capital's gates that one cannot hope to cover this subject in any fitting way in such an article as this.

The weapon which, giving in its several operational limitations, is the answer to the medium gun tank, is almost with us. It behoves us to think,

not only of its employment, but of the reactions its employment will have in the tactical field and to plan to gain full advantages both of the weapon itself and the reactions of tactics to it; only thus will be found a means of restoring the tactical commander's mobility, permitting him to fill his battlefield role.



The Nature of the Threat

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THE Army's future plans and concepts are in great measure determined by the threat of Communist aggression which faces the United States and its allies. A full appreciation of the nature of this threat must include not only the armed forces of our potential enemies but also the strategic concepts of the Sino-Soviet Bloc and the ideological atmosphere in which these concepts operate and on which, to a degree, they are based. To put these factors in logical sequence, one should begin with the Communist ideology, which explains much of the aggressive, expansionistic policies of the Sino-Soviet Bloc.

Ideology

This ideology is not a new one. It has been with us since the middle of the last century when Marx and Engels jointly produced the basic statement of socialist doctrine, *The Communist Manifesto*. This relatively brief document contains the core of the ideas which these men later amplified in much longer works.

In essence, Marxism may be divided into four inter-related branches: a general philosophy of all phenomena; a critique of capitalism; a theory of human history; and a vague forecast of the future development of human society into its ultimate perfection. At the risk of some oversimplification, this doctrine can be summed up by saying that it advocates the abolition of private ownership of the means of production, on the theory that there would then be no exploitation of workers by employers.

The practical example of such a system as provided by the Soviet Union shows that the abolition of the institution of private ownership results, in effect, in sole ownership of the economic resources of a state by the group which controls the government of that state. While this concentration of economic authority enhances the power of the government, it deprives the individual of a basic right, that of accumulating some degree of wealth and security by diligence and free enterprise. We could add that the centralization of all economic power in the hands of a relatively small group of political leaders enables those leaders to wield this dictatorial power as they will to the detriment of other nations — and therein lies one of the main points of our story.

The theories of Marx and Engels were translated into action in Russia by Lenin. This man contributed to the doctrine the theory that the inevitable changes in world socio-economic structures foreseen by Marx and Engels should be hastened by a political party of dedicated revolutionaries willing to accept a rigid party discipline. He was the sparkplug behind the splitting away of the Bolshevik faction from the Russian Social-Democratic Party. His theories and policies have been included in what is now called the doctrine of Marxism-Leninism.

It is this militant fanaticism of Lenin, coupled with the material power of the Soviet state, which makes the Communist ideology of today the very real threat to the free world that it is. Party members, in the spirit of what is euphemistically called "democratic

centralism", subjugate all else to the good of the system, overlooking abuses and mistakes in the blind conviction that they are building a better world. The leaders of the Sino-Soviet Bloc find justification for their ruthlessly aggressive policies in the Marxist belief that the triumph of world Communism is inevitable and in the Leninist teaching that this triumph must be accomplished by the revolutionary activities of a militant Communist Party.

But the Soviet Union by no means limits itself to propagating Communism by political subversion alone. The recent brutal suppression of the Hungarian revolution has again demonstrated that the Soviets are willing to go to the extreme of military force when persuasion and coercion fail. Nor are they so inflexible that they seek to jump in one great leap to the immediate destruction of capitalism. Instead, the whole history of Soviet Communism indicates an extraordinary flexibility in the short-range tactics they will employ to achieve the long-range strategic goals of their ideology.

Strategic Concepts

Soviet strategic concepts can be described in terms of time, geographic area, and military means. The very flexibility of their short-range tactics as well as the indefinite time frame basic to their ideology leads us to believe that in terms of time, Soviet strategy is geared to a long period. The blockade of Berlin, the war in Korea, the era of "peace and light" after the Geneva conference and the subsequent abandonment of all of these and many other apparently short-range moves in the international chess game indicate strategic concepts which are not geared to a rigid timetable.

What does this indicate concerning the purely military aspects of Soviet strategy? We believe that it means a military strategy of flexible opportunism. Rather than the calculated all-out blow at a pre-selected time, it seems likely that the

Sino-Soviet Bloc will seek to expand by political subversion whenever and wherever possible as a preferred means.

When the time seems ripe for more open aggression, as it possibly did at the time of Korea and the Viet Minh campaign against the French in Indo-China, they will not hesitate to employ loyal satellite forces against the free world. In time, they may feel free to commit Soviet forces thinly disguised as "volunteers" as the Soviet leaders threatened to do in the Middle East or even, eventually, undisguised Sino-Soviet Bloc forces in naked, deliberate seizure of vital strategic areas.

To say that the Communist leaders are flexible and prefer to seek gradual expansion by such measured means as the circumstances of the moment will permit is not to say that we can neglect the possibility of a deliberate all-out blow at some point in time. This possibility has been with us since the Soviets added the hydrogen bomb to their arsenal. Our national security policy must insure that the Soviets are deterred from any such suicidal move, as in fact it is wisely designed to do.

At the same time it should be recognized that other forms of Communist aggression are more in keeping with their basic philosophy, and pose an equally dangerous threat over the long term. These forms will vary with time and circumstances as well as with the world area toward which they are directed.

What geographic areas are of primary concern to the Communists? It seems apparent that Communism seeks to expand, and is best able to expand, gradually outward from its nucleus—much as a cancerous growth spreads in the human body. In this way the strong core can nourish the offshoots and the homeland can add military weight to its followers, just as Communist China and the Soviet Union lent backbone to the North Korean drive to the south.

Furthermore, the balance of world power between the United States and the USSR lies on the periphery of the Eurasian continent, geographically vulnerable to just such Communist expansion. The industry and skilled population resources of Europe, the oil of the Middle East, and the raw materials of Africa and South-East Asia — all are accessible via land bridges from the USSR. Moreover, these areas include the bulk of the world's population to which the Soviets seek to spread the philosophy of Marxism-Leninism.

It would seem most logical for these objective areas to be uppermost in the minds of Soviet strategic planners, not only because they offer resources needed by the Communist heartland, but because the denial of these resources to the United States would cause an American withdrawal into a hemispheric isolationism.

If the Soviets were able to acquire Western Europe, the USSR would then control, for example, about 55 per cent of the world's production of finished steel, as opposed to the 24 per cent which the Sino-Soviet Bloc now produces. They would also have available about 45 per cent of the world's electric power production as opposed to their present 19 per cent.

If instead of attempting direct acquisition of Western Europe, the Soviets were to secure the Middle East, with its 75 per cent of the world's proven oil reserves, it is possible that Western Europe would become a victim of Soviet economic pressures. Consequently, we believe that Soviet military-strategic concepts centre around the Eurasian-African continents and that it is into these areas that the Sino-Soviet Bloc will seek to expand.

Strategic concepts should also be considered in terms of means. In military strategy, these means are armed forces. The structure and strengths of armed forces are inevitably governed by the strategic concepts of the state

which supports them. Conversely, these forces frequently provide physical evidence of the concepts from which they spring. For example, Great Britain's strategic concept has for years been one of maintaining the unity of the industrial home islands with raw materials producing areas and markets overseas. Consequently, naval strength has predominated in her armed forces structure. The fate of Russia, on the other hand, has long been tied to the land.

Russia, and now the Soviet Union, lies in the centre of Eurasia. Most of her major wars have been fought with the neighbouring states of Germany, Turkey, and the European empire of Napoleon. The Soviet peoples have vivid recollections of the German invasion of World War II and are constantly reminded of it by their leaders' propaganda. Consequently they have long maintained, and continue to maintain, large ground forces capable of either offensive or defensive action on the predominantly land frontiers which separate the USSR from its neighbours.

Possibly an equally valid reason, from the Soviet leaders' point of view, for maintaining large and effective ground forces is the necessity of maintaining the Communist regime in power. This was apparent during the Hungarian revolution when these forces brutally but effectively stamped out the spark of freedom before it could break out in other parts of the satellite empire. Poland is held in check from further freedom today by the threat of massive Soviet forces on both her eastern and western borders. The East Germans are ruled, in effect, by the 22 Soviet divisions stationed within their borders.

The power of the armed man on the ground to impose his will on the territory which he physically occupies is the ultimate instrument of Communist power, perhaps even within the Soviet Union itself.

However, Soviet military concepts (and these are synonymous with Sino-Soviet

Bloc concepts) do not ignore nuclear weapons or air and naval power. While the Russians rejected strategic bombing as an instrument of military power during World War II, they have since made clear that they are rapidly developing a long-range nuclear delivery capability. We know that they have in production aircraft similar to our own latest types.

At present there are more than 20,000 planes in the Air Forces of the Soviet Army, most of them modern jet fighters. Soviet leaders have shown a keen interest in guided missiles and are rapidly developing this most advanced weapons delivery system. The Soviets already operate the largest submarine fleet in the world — some 500 undersea craft. In addition, the Soviet Navy has 25 modern cruisers and 130 modern destroyers.

Soviet military doctrine is based on well co-ordinated employment of all forces under a single commander. Should the Soviets decide on war in some form as an instrument of policy, it seems apparent that the means employed would be well-integrated forces of all arms and services employed with due consideration as to time and place.

Sino-Soviet Bloc Capabilities

While the Communist ideology and concepts are more or less common to all members of the Bloc their military capabilities should be treated separately, with each of the component states of the Bloc considered in turn. Experience has shown, particularly in Korea, that we may be faced with one or several members acting in concert. The USSR can always elect either a role of limited participation or remain as a threat in the background to influence the scope and intensity of conflict.

Soviet Union

Soviet ground forces number about 2½ million men, organized into 100 rifle divisions, 75 armoured-type divisions, and supporting units. These divisions are

not all at full strength; indeed some of them within the USSR are probably cadre type units which can be brought to full strength rapidly upon mobilization. Of the total of 175 divisions, the majority are stationed in the Soviet Union, mostly in border regions. There are 22 divisions in East Germany, and much smaller numbers in Poland, Rumania and Hungary. These ground forces are supported by effective tactical aviation under the direct control of the ground commander.

Soviet ground forces have been almost completely re-equipped since World War II. They have a complete new family of small arms, new artillery, new trucks, new medium tanks, amphibious vehicles, and helicopters. (See "New Soviet Weapons", *Australian Army Journal* No 108).

Some 28,000 new T-54 medium tanks have been produced for the Soviet Army ground forces, of which large numbers have been delivered to Soviet forces in East Germany.

In addition to these strong active forces, the Soviet Union has an ample pool of well-trained manpower for mobilization. Their system of universal military training turns out about 700,000 fully trained reservists every year, all of whom remain on the reserve rolls until age 50 and are subject to immediate recall when needed. The Soviet mobilization system is believed to be very effective, capable of bringing all units to full strength rapidly and forming many new ones as well. Ample equipment is kept on hand and in depots for mobilization purposes.

European Satellites

These satellite forces are estimated to number about 1½ million men. In the main they are equipped with older Soviet material but many newer items of equipment such as 57-mm light anti-aircraft guns and T-54 tanks are beginning to make their appearance. In these countries also universal military training is the rule.

As a result of the developments in Poland and Hungary, the loyalty of many of these forces to the Bloc is certainly open to question. However, we must remember that the leadership of these forces is now more than ever subject to the closest political scrutiny and we must presume the presence of loyal and influential cadres. Furthermore, national hatreds are often stronger than political beliefs and must be reckoned with. Even under the most unfavourable of circumstances, from the Soviet point of view, the USSR has the military force to maintain order in Eastern Europe without materially affecting its capabilities for attack on the West.

Communist China

The Chinese Army of 150 divisions plus supporting units has been re-organized and modernized since 1952. This has included standardization of weapons with resulting simplification and increased efficiency in supply. More service and support units have been organized; the military school system has been vastly expanded.

Communist China certainly poses the most serious threat of all the Bloc states other than the USSR. In addition to the sheer weight of its forces, Communist China has territorial objectives of its own which must be reckoned with quite apart from loyalties to Moscow. Mao Tse Tung has been outspoken in his threats to take over Taiwan and liquidate the Chinese Nationalists. His support of the North Koreans helps to keep that area a tinderbox. Communist China furnished material support to Ho Chi Minh in Indo-China and would probably support renewed aggression into South-East Asia should the circumstances seem opportune.

Research and Development

Modern war, just like modern civilization, is becoming ever more complex. The scientific and technical progress of the Sino-Soviet Bloc thus becomes a vital factor in assessing the

Communist threat, and must be considered along with strategy and military forces. Since the USSR undoubtedly leads the Sino-Soviet Bloc in research and development, we can limit ourselves in this consideration to the Soviet Union.

One of the most significant characteristics of Soviet education is the emphasis placed on mathematics and other scientific subjects in the first ten years of Soviet schooling. The curriculum prescribed for all primary and secondary school students includes algebra, geometry and trigonometry as well as five years of physics and four of chemistry. It should be noted that in many of our states the minimum requirement for graduation from high school includes only one year of mathematics and one year of some other science.

Soviet scientific-technical manpower is growing both in quantity and quality. One reason for this growth is that a scientist's salary is several times that of an ordinary worker. In addition he receives incentive benefits such as automobiles and other luxuries completely inaccessible to the average worker. In addition, the Soviets allocate large sums as prizes to encourage individuals to excel in science and technology, and to stimulate original ideas which will materially assist the Soviets in achieving their goal.

The Soviet Union has inherited a scientific history which is rich with achievements in the basic sciences. Russian scientists have made significant contributions in such important fields as mathematics, chemistry, electromagnetics, and psychology. Stalin, in 1931, sounded the keynote of all scientific and technical endeavour — "technology decides all." Science is now one of the main bulwarks of Soviet power.

Since the early 1930s an impressive scientific-technological machine has emerged. Despite the crippling effects of World War II, and the unevenness which has resulted from rapidity of growth,

the USSR has developed from a technologically inferior nation to a nation whose educational research and development structures are geared for two basic activities: first, massive support of top priority research and development programmes; and second, long-range planning in science and engineering with the goal of ultimate technological supremacy.

Although closely shielded from public view, the Soviet achievements in high priority research and development fields are quite impressive. Of equal significance is the evident Soviet determination to initiate early mass production of the products of their research and development programmes.

The Soviet Union has made important progress in such fields as nuclear energy, electronics, guided missiles, and aircraft. The Soviets have an ambitious atomic weapons testing programme evidenced by public announcements of Soviet test explosions. Although starting considerably behind the West in electronics know-how, the Soviets have recently begun to display originality in electronics design and technique. Soviet aircraft displayed on numerous occasions, and the Soviet announcements concerning their guided missile capabilities, emphasize their determination to push forward in these vital fields.

In the field of conventional weapons the Soviets have a tradition of weapons that are distinguished by their simplicity, ruggedness, ease of maintenance and mass production.

Although the Soviets have neglected much of their economy to stress weaponry and heavy industry, the consequent limitations on consumer goods production are accepted by the Soviet people. Thus, we foresee that the Soviet Union will continue to push forward in selected critical research areas with grim determination for many years to come.

Spectrum of War

What conclusions can be drawn then, as to the ability of the Sino-Soviet Bloc

to engage in various types and forms of warfare? First, we believe that the Soviet Union, alone among Soviet Bloc states, is continuing to improve its capability to fight the all-out nuclear battle which lies at one extreme of the modern spectrum of war. Their detonation of a multi-megaton nuclear weapon in November 1955 ended the Western monopoly of the ability to devastate the heartland of an enemy in one quick blow. Second, the Soviet Bloc also has the capability of fighting wars of lesser magnitude, including limited wars of varying scope and intensity.

These lesser wars would pose a threat to the United States equally dangerous, if not as immediately devastating, as the outbreak of unrestricted nuclear warfare. Such wars might occur in Asia if Communist China elected to implement its threats to seize Taiwan, if the North Koreans were induced to renew aggression against the Republic of Korea, or if North Vietnam with or without Communist Chinese backing, made further moves toward the south.

Probably the most likely area at present for limited wars of this nature is the Middle East, where local antagonisms have produced an explosive situation ripe for exploitation by the Soviets. This manipulation is now being accomplished through diplomacy and material support but could extend to the employment of Sino-Soviet Bloc "volunteers".

In other areas of the world there is local friction resulting from a variety of causes which could conceivably result in armed conflict of less than all-out magnitude. These danger areas offer fertile fields for Communist exploitation.

We believe that the Sino-Soviet Bloc, following a policy of military opportunism, has sufficiently flexible military capabilities to intervene in such situations in a variety of ways, ranging through the spectrum of war from armed revolution to the extreme of all-out nuclear warfare.

Strategic Review

The Formation and Development of Communes in Communist China

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LIVING things do not grow at random; the plants and animals of the earth are organized into definite communities, and when human beings settle in a place, they become a part of the community. Usually they do not come alone, for with them come dogs, cats, poultry, fleas, bedbugs, cereals, and other familiars of the human community. In the ensuing struggle the newcomers generally break up the old communities, and substitute new ones. But old or new, there are laws of community life just as binding as the laws of breathing or eating. If these laws are kept, men remain long and prosper in the land of their fathers. If the laws are violated, we have ghost towns, abandoned farms, and decayed empires.

The individuals of a human group, large or small, establish homes, produce, gather, and store food, and establish a code of living. In doing these things they collaborate with their fellows. We say that each of these communities has its own type of culture. It is by modifying his activities or his culture, that man has been able to live in all parts of the globe, subsist on a wide variety of foods, and in general make adjustments that exceed the range possible to any other living animal.

Cities are social organisms that have grown out of men's desire for living together. Their locations are the product of geographic relationships, and their size, shape, and structure, their appearance and function are to an important degree conditioned by factors of the local and regional environment. Ruralism was the universal way of life in primitive society, because the activities

by which early man supported himself required close contact with nature and a large area of land per person. Despite the isolating tendency of ruralism, human beings seem to be almost instinctively gregarious, and out of this deep seated propensity has grown the city and town and their urban mode of living.

Urbanism has indeed, become so powerful an influence in human life, that in most languages of the world, the very term which we use to express larger social loyalties is citizenship or some cognate — a word referring to a city.

Clearly enough, the activities of men that fit them for community life are learned, are the result of training, and can be communicated by means of speech, or described and preserved in written records. These activities, or this culture can be changed by invention or exchange with other groups and so adjusted to changing needs and conditions.

Culture as we have used the word, is the means whereby men govern their relationships to each other and to the natural world in which they live. Ordinarily a man is good or bad according to how harmoniously he fits into the culture of his group. A good desert dweller will not waste water; but a good Australian will use water lavishly rather than go unwashed. But the matter is not so simple. Cultures too may be good or bad. A good culture promotes harmony and collaboration among the people who share it. A good culture also promotes harmony with the laws of nature and so ensures its own permanence.

So it is that, while we consider a man good if he fits into the culture of his group, history has always considered him better and greater, if he finds the means to improve that culture and so make it more harmonious and permanent. To secure such an improvement is of course, the unending task of the leaders of mankind. It is a baffling and intricate task too, especially at this time when invention and rapid communication are producing so much change.

The Chinese Community Organization

The Chinese community organization, at one time composed of family units, is undergoing a gigantic convulsion. Mao Tse Tung has announced spectacular plans for an internal revolution which will bring Red China to the brink of complete communism within six years. Highlights of Mao's plan are —

- (a) The "liberation" of all women with household chores.
- (b) The adaption of agricultural labour to industrial production.
- (c) The organization of the labour force on military lines to achieve rapid mobilization in case of war.

Mao's plan is, in essence, an attempt to hurdle the most painful period of Soviet development when Stalin squeezed the peasant class dry to provide means for rapid industrialization. Mao intends to turn the Chinese peasantry into an industrial labour force without urbanizing it, as both the West and Russia had to do during their industrial revolution. It will be similar or akin to the cottage industry system that preceded the Industrial Revolution.

China's plunge into the Commune System is of a kind and on a scale such as neither Stalin nor any other Russian ever contemplated in their wildest dreams. Indeed, the Russians under Stalin abandoned the Commune System as early as 1933 as being completely impracticable.

Mao, however, is aiming at "the transformation of man". He holds the doctrine of creating multipurpose masses.

It is but a short step from the almost total regimentation and organization in which human as well as animal breeding is strictly controlled by party guardians. There is as yet no knowing in the long run, whether this fabulous concept will be accepted or will work. But the indications are that the Chinese can take it for some years. On the whole the people appear to be intoxicated with the new ideas pumped into them. There is said to be every prospect of the emergence of the largest and most highly disciplined community in the world, with a greater degree of adaptability than it has ever had before.

The commune extends far beyond agriculture and its ancillary occupations. It will control military, industrial, commercial and cultural activities, and is intended to become the basic unit of local administration.

Says the Party Magazine, *Red Flag* —

"In the communes, industry (the worker), agriculture (the peasant), exchange (the trader), culture and education (the student), and national defence (the soldier), merge into one harmonious whole".

The Communes would embrace all the people and property within an area approximating that of a county or township — running in typical size from 10,000 people up to several times that figure. They would replace the entire present system of government in rural areas. They would thus be roughly the equivalent of a division or army corps and be organized in much the same fashion.

Although the commune's officers would not have precisely military rank in peace-time, there would be a chain of command and "militarization" of civilian life on a broad scale.

The communes would embrace all types of activity within their area — economic, cultural, educational and military.

These communes are primarily devices to put China's entire rural population to work for capital construction on a

grandiose scale. In communes organized to date, Chinese are being drafted to build small steel and iron factories, to engage in re-afforestation, to build dams and other irrigation systems, and other types of economic enterprises. The idea apparently is that, by the use of military methods and forced labour, Communist China can effectively put to use its main national resource—hordes of human beings, massed manpower—to push the nation forward on the path of modernization and building up of economic-military power.

The History of the Establishment of Communes

When the Communists took over China in 1949, each village was assigned and administrative head who was responsible in turn to county and provincial administrators. Most farmers belonged to one of the 740,000 agricultural co-operatives established throughout the nation. The first communes were set up in Honan Province in April 1958, merely as a controlled experiment. During the summer the Communists swept most of the country's peasants from state run co-operatives into the new organizations. Village chiefs have disappeared. The 740,000 co-operatives have been reduced to 26,000 communes in which the communists claim to have enrolled 99% of the nation's peasants. Some communes have 300,000 members. Each unit is run by a communist dominated council which sets wages and working conditions.

Today virtually all rural China lives under the commune system. The next step on Mao's plan was to be the complete regimentation of the city dwellers, already begun experimentally in Mukden (Manchuria), Peking and Shanghai. But recently it was announced that the Party Central Committee had decided to call a temporary halt in the plans for big city communes because of the "bourgeois ideology" still prevalent in the cities—in other words, because of the opposition of the prospective members.

The Impact of the Communes

When he joins a commune, the individual loses everything he owns. If he has tools, he must "sell" them to the commune (but without getting paid). His garden plot and livestock are also taken over. His wife has to give up her cooking pots and household furnishings. Everything goes except the clothes the people are wearing. All further clothing is issued by the government. The family generally moves out of its house and into segregated barracks. Children and old folks live separately. So do husband and wife. The basic social unit, therefore, is not the family, but an all male or all female platoon of 20. Under the impact of communes, rural life as China has known it for 4000 years has disappeared almost overnight.

Now China's peasant discovered he was no longer simply a farmer. When the crops were in he could not putter around the house, as he once did, or mend a pigsty, or merely rest. Instead he was yanked out of the barracks before dawn and marched off to build roads, tear down other people's villages, construct more barracks, or melt cooking utensils down into pig iron so that the New China might have the 11,000,000 tons of steel that had been set as the goal for 1958.

He needed a pass to leave the area he lived in. When he started out for work in the morning—after reveille, gymnastics and a mess hall breakfast—he marched off in formation, under flags. India's Prime Minister, Nehru, recently described China as one big army camp, explaining, "They go to work at a certain time, they come back to lunch at a certain time, all together, the whole village, the whole commune". And not only the men. Women, children, and the aged live in barracks too. In the cities, workers live in barracks next to their factories. There is military training for all.

In a People's Commune, the members eat, sleep, produce, think, act, even procreate, not as individuals but as an integrated social unit.

First Achievements under the Commune System

As a result of the industrialization (carried out by the Russian method of 5 Year Plans, and later the introduction of the People's Communes) the country has begun to be more urbanized. Towns have expanded into cities, villages have turned into towns, and many parts of the country have the appearance of a boom era. Because the town population is growing in size, its share of the membership of the Communist Party, which its members have always desired to see larger, is now increasing.

China's "Great Leap Forward" slogan for its 1958 economic program is producing solid achievements. The last six months have seen China launch her first 8700 ton cargo ship, produce prototypes of five motor cars and 27 lorries, and the flying of her own small aeroplane, the An-Two, on internal routes.

China's big orders for foreign raw materials and equipment, which contrast with the parsimony of her expenditure on imports during the first five year plan, indicate a rapidly expanding economy. Britain's trade with China increased by *more than half*, as a result of the growing demand for machine tools and steel products.

In the agricultural field Chinese planners, claiming that the country's peasants have defeated floods and drought, looked forward to a record food harvest. Irrigation projects last winter kept 100 million peasants building the dykes and canals which now cover half the land under cultivation in China.

The wholesale compulsory drafting of city workers into the countryside, and severe restrictions imposed on the movement of peasants, have swelled the labour force on the farms by perhaps several millions. The Chinese newspapers report that millions of women are being liberated from housework to lend their menfolk a hand in the fields. Last year, for the first time in history, China's food crops passed the 200 million ton mark.

From a political control aspect, the Party now has an even tighter control than ever before.

Disturbances and Internal Unrest Within the Communes

Today, if the communes could really promise utopian conditions, persuasion might be all that the peasants need to convince them that this way of life is better than what they knew before. But since the essential purpose of the *communes is to squeeze out every drop of capital and labour for the most ambitious industrialization program ever before attempted in the history of the world*, the communes of necessity cannot be made utopian. They are, in fact, military compounds, where men have only two days free each month, and women have four days free, and where long hours in field and factory are accompanied by periods of military training and political indoctrination.

There are valid grounds for believing that China this year may be obliged to resort to armed force in the communes, and to divert the people's attention from the local excesses by an external offensive. In Washington and Taipei (Formosa), where the hope that the communists have bitten off more than they can chew is always apt to colour opinions, there has been for some time a belief that China may be on the brink of an internal explosion. The most careful and sustained examination of the official Chinese publications does not support this view. The Tibetan revolt is too isolated from China, and the *communes too well controlled by armed "red and active" cadres.*

Even the most persuasive cadres are unlikely to be able to convince all peasants that this is a desirable way of life. And the Party obviously has concluded that in the interests of industrialization force will have to be used where persuasion fails.

In Kwangtung there are at present fears of an uprising. Fishermen from this coastal province have been fleeing to

the British Crown Colony of Hong Kong by the hundreds, all bringing reports of widespread unrest and discontent within the recently established communes. Refugees are also pouring in to the Portuguese Colony of Macao, and it was from this city that the Lapp Island uprising was reported and observed. Peasants from Fukien Province have even tried to sabotage the communes. One member was executed for putting poison in 40 buckets of cooked rice. Reports of disturbances, counter-revolutionary movements, and executions on a large scale have been received from places as far away as the remote province of Tshinghai. Even the Peking Daily mentioned that in Honan Province the communes were short of clothes, footwear, and bedding. Crime has had a sharp increase, particularly in the province of Shanshi, since the introduction of communes. It would appear that everywhere in China where the communes have been established, discontent, unrest, disturbances, and mass executions are natural everyday occurrences.

Foreign Opinions of the Communes

Without exception, the Western World has regarded the establishment of communes with nothing less than horrified revulsion. It is a system both foreign to the laws of nature and foreign to the laws of man.

Even China's senior communist partner, Russia, has viewed the formation of communes with grave concern. During a recent interview by American Senator Humphrey, Krushchev was reluctant to talk about them. When asked what he thought of the communes, he stated:—

"They are old fashioned. They are reactionary. We tried them right after the revolution. *It just doesn't work.* That system is not nearly as good as the state farms and the collective farms. You know that they are based on the principle 'From each according to his abilities, to each according to his needs'. You know that that won't work. You can't get production without incentive."

Conclusion

The political union of a people implies per se the use of force or power. In all political organizations power is either usurped by a few, or else granted by the many to those who control the state. Without power to organize and direct the nation and to administer its laws, there could be nothing but chaos and anarchy. It should be, in fact must be, recognized that some sort of power, exercised by someone or some group, is essential in all political actions, and that power can derive from love and loyalty towards the leaders, as well as from fear of them.



Some Problems of Industrial Mobilization

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Reserve of Officers

THE term "Mobilization" can have a limited meaning, ie, to become organized and make ready for war, but in applying it to industry I want to use it in a wider sense to cover the build-up to maximum effort. I propose mentioning a few of the problems that arose during the last war as regards the supply of munitions, with the object of bringing out some of the factors that can effect the speedy mobilization of industry. For anyone interested in this subject I would recommend that they read "Science and Industry in War" by Professor D. P. Mellor, which is a recent issue of the Australian Official War History Series. This book covers a wide range of subjects and brings in the principal events, together with the tasks and problems involved. I propose quoting a number of extracts from this book as it is authoritative and gives an overall view in relation to some of the points I want to make.

One of the major problems experienced both in the United Kingdom and in Australia during the last war was the delay in getting into mass production for the manufacture of various types of equipment for the Services. This was stressed in a speech by the United Kingdom Minister of Production (Sir Oliver Lyttelton) to the Institution of Production Engineers in 1943, who said —

"In the future it may be of greater importance to have a few of the latest weapons very quickly than to have a

bulk of the same weapons a few months later. I would ask whether in certain cases some half-way course cannot be followed; can we by taking this middle course produce a high output by not such elaborate tooling, and without falling into the other danger of using skilled labour to too high a degree. I feel, therefore, that it is perhaps your next and greatest contribution to war production, to devote your efforts to reducing the number of weeks or months which must intervene between the decision to make a new product and the time when that product first comes off the production line".

The effect of a long time span between decision and action will be obvious, but another important point that may be overlooked with mass production, is the loss of flexibility, or adaptability to change, which increases directly as the time span for development, where the tooling is elaborate or specialized machines are to be used.

Someone once said "Nothing in this world is as permanent as change", and the Services are no exception in wanting changes, which as we know are dictated by performance, or changing conditions and, therefore, must be capable of easy introduction. Quoting again from Sir Oliver Lyttelton's speech, he said —

"I want to impress upon you that changes in type and design, which appear infuriating to the production engineer, are in the main due to the need for improvement in quality and

flexibility through the dynamic changes which war brings rather than to incompetence and hesitance in the central direction of the war".

In order to show the effect of major changes on production, I shall trace the history of a gun project that was undertaken in South Australia during the last war.

In 1940 the Government Ordnance Factory at Maribyrnong was in the course of preparing to make some 2-pr anti-tank guns on a limited volume basis. Then came Dunkirk, as a result of which the BEF brought back only 322 of the 2,794 guns shipped to France. This changed the whole outlook in Australia as regards the demand and supply of many guns, and in June 1940 South Australian industry was given the job to mass produce the 2-pr gun, with an initial order for 1,047 guns, which was soon increased to 1,459.

Not one of the firms concerned had any previous experience in making guns, but within 10 months the first 2-pr was proofed at Port Wakefield in April 1941. Two months after this event, however, and before the 2-pr gun was in full production, there were enquiries on changing over to producing the 6-pr anti-tank gun, resulting in an order being placed in August 1941 for 973 6-prs. It was stressed at the time that the 6-pr was wanted urgently and if necessary to be introduced at the expense of losing production on the 2-pr.

The first Australian 6-pr was proofed in July 1942 (11 months after the order had been received) which was considered to be a splendid effort but it was about this time, ie, in June and July of 1942, that the British Army experienced setbacks in the Libyan Battles of Knightsbridge and Mersa Matruh. This led to the debate and "no confidence" motion in the House of Commons, when reference was made to the 6-pr which was then in mass production in England and had arrived in the Middle East but had not been in full use. It was obvious that the whole question of anti-tank

gun design was under close review. In August, ie, one month after the proof test of the first Australian 6-pr gun, came advice of a possible extension of 16 inches to the barrel which was confirmed in November 1942. This delayed the production build-up, as it involved major changes to a lot of the machine tools (many of which had to be lengthened) required complete new forgings from the steel mills, and came at a time when there were other changes being introduced on the gun and its mounting.

It was not until April 1943 that the first of the new long barrel 6-pr guns was produced, but by this time the new 17-pr anti-tank gun was already in production in England and the 6-pr project began to close off as the Australian 17-pr was being produced in Victoria.

The story of the anti-tank guns was an unusual one because it was influenced by the early loss of guns, and the subsequent speed at which armament for tanks and the design of anti-tank guns developed on both sides.

As a contrast to the story on anti-tank guns, quite a number of which were used in service, I would like to briefly touch on a different kind of project—the 18-inch aerial torpedo—which presented some extremely difficult problems as regards manufacturing and can rightly be regarded as an achievement for Australian industry. The decision to make this torpedo was made in December 1941 by the War Cabinet (on the advice of the British Admiralty) the first of which was ranged at Pittwater, NSW, in February 1944 but Professor Mellor records—

"It is perhaps something of an anticlimax to have to record that Australian made torpedoes were never used in action. Even before the torpedo had come off the assembly line, the tide of battle in the Pacific had turned so far in our favour that the orders from the Admiralty and the RAAF were drastically reduced".

In selecting two major projects in which events of the war moved faster than development for production, I have done so purposely to emphasize some of the points I made earlier when quoting Sir Oliver Lyttelton. I would like to make it clear, however, that it is not my intention to belittle in any way the effort that was made in Australia and I do not want to convey the impression that this was typical of the whole Munitions Programme.

In order to show you that the problem also existed in Great Britain, I would like to quote from a White Paper published in England after the war which took into account some of the secret reports made to Mr Churchill during the war on delays and waste in tank and gun production —

"Delays and waste held up British tank and gun production for periods as long as 12 months in the vital war years of 1941 - 43. A certain measure of blame must be attached to three main agencies — The War Office, Supply Ministry and the manufacturers. Measured in terms of production for current battle requirements, the British manufacturing effort fell far short of realizing expectations in 1944. It involved what appear to be wasteful use of national resources."

The report added that if the potential value of the 6-pr gun had been appreciated when it was first designed, 12 months could have been saved in production.

Professor Mellor comments in his book on the problem in Australia with equipment delivered at the wrong time as follows:—

"All too often by the time the materials for a project had been ordered, and the administrative organization set up, the manufacturing capacity assembled and the technological difficulties overcome, the need for it had passed. War does not adapt itself to the industrial pace of a small and relatively in-experienced nation.

I make no excuse for discussing quite fully projects which, although they did not contribute to Allied Military strength, often made a real contribution to Australia's strength as an industrial nation.

"Similar seemingly wasted effort took place in a number of scientific investigations . . . War is inherently wasteful. The course and needs of war are governed by the action of two opposing sides and it is only in relation to one of these that any kind of detailed forecast of military requirements can be made. Even these forecasts can be completely upset by some quite unexpected move of the enemy . . . Much of a soldier's time is spent in preparation for events that never happen."

The important thing is to accept the inevitability of changing programmes and get industry started early, but to do this means an early appreciation of the need for placing 'educational orders', which create the essential organization and initiate the mobilization of such important items as gauges, machine tools, cutting tools, raw materials, etc. This line of approach was advocated some time before the outbreak of World War II by far-sighted individuals who saw the importance of these aspects, but it met with limited support. As Professor Mellor points out — "In mass production there is an inevitable delay in beginning manufacture owing to the necessity for 'tooling up'. For example, it took about six months to prepare for the mass production of a shell, 12 months for a rifle or machine gun, and for an anti-aircraft gun something like 2 years. This time lag, inherent in the mass production technique, was not always fully appreciated by members of the Services, other than those responsible for provision of equipment".

I have already mentioned the mobilization of tools, gauges, etc, but there is also the question of mobilizing all our factories, including the smaller ones, many of which lack the necessary

technical services to meet the requirements of a munition programme. The way in which this was organized during the last war was by appointing a number of firms as major co-ordinating contractors working under State Boards of Management, whose job, in relation to the smaller firms, can be summarized as follows:—

1. To organize and control the supply of raw material and the movement of finished parts.
2. To design and secure all production gauges necessary for accurate interchangeability.
3. To afford assistance in obtaining requirements of cutting tools, operating supplies, etc.
4. To provide technical service facilities.
5. To control and issue overall schedules.

This spread the work of managing all the detailed functions and made the greatest use of technical groups and specialized shops.

The early placing of the 'educational orders', which I mentioned, also provides the opportunity for training industry to meet Service requirements and standards. This is an important factor, which is not often realized or taken rather lightly, as was found in the early stages of the last war. Quoting again from "Science and Industry in War"—

"Although industry was acquainted with the principles of mass production and some branches had had experience in the manufacture of components to precise measurements, most of them had to learn that the tolerances and tests for war materials were much more exacting than they had been accustomed to. It fell to the inspection services to teach industry something of the standards required."

The Inspection Branch is dependent on the information issued by the Design Section and if there is poor liaison between each group in regard to design

queries, it can be an important factor in delaying a project. With all the complexities in modern munitions, it is possible for the supervisory function of the manufacturer and the design function of the Service Department to become widely spread in a number of different organizations and departments and co-relation thus becomes more and more complicated. Consequently, the time between decision and action extends with the result that unity in realization is difficult. Mobilization of industry must be paralleled by the establishment of adequate and competent design and inspection groups, with close liaison with industry, and any tendency to use unqualified people can have a disastrous effect on the length of time required to produce equipment.

In mentioning the Services Design Group, there is not only the matter of a close relationship in order to handle drawing queries and design changes, but also for them to help the manufacturer as regards making designs that have been considered from the point of view of productability. As an example of the difference in thought given to productability, I would mention the 2-pr and 6-pr guns again. Although the 6-pr was bigger and heavier, it was much simpler in design and the barrel took only 60 man hours to produce, whereas the 2-pr barrel took 143 man hours. The same kind of comparison applied to the breech rings for the two guns and can be explained by the fact that the 2-pr was of pre-war design.

We have come a long way since 1939 as regards the services developing their own Design Sections, and there is now an increasing awareness of the importance of designing with an eye on the manufacturer's problems.

In looking ahead as to what may be the requirements if ever there was another war, it is obvious that the problem will be quite different and made much more difficult because of the technological advances made in various fields. It may well be a problem of first mobilizing

the technical staff to deal with the production of specialized equipment, and again time would be the big factor.

Finally, I would like to restate some of the points I have already made by incorporating them in a statement of objective — namely, that mobilization of industry requires the early organization of suitable factory potential with the ability to produce some munition supplies, or experimental types of equipment, quickly, leading to a stage of readiness for the development in the shortest time practicable the necessary tooling to enable the use of semi-skilled labour for mass production of proven equipment, and to

be able to adjust these facilities quickly to imperative changes. It would need to be recognized with these objectives, that decisions connected with the various stages may have to be made with incomplete data, with a certain amount of courage and with the knowledge that further changes may have to be made.

I hope that these objectives do not sound too impossible, and perhaps Sir Winston Churchill's warning is an apt conclusion —

“There is only one thing certain about War, that is that it is full of disappointments and also full of mistakes.”

COMPETITION FOR AUTHORS

The Board of Review has awarded first place and the prize of £5 for the best original article published in the May issue to “Some Thoughts on the Local Counter-Attack” by Major H. P. Boland, 17/18 Infantry Battalion.

BOOK REVIEWS

SOUTH-WEST PACIFIC AREA — FIRST YEAR — KOKODA TO WAU, by Dudley McCarthy. *Australia in the War of 1939 - 1945, Series 1, Army, Vol V.* (Australian War Memorial, Canberra ACT)

THE author, Dudley McCarthy, is not only a writer of distinction, as this volume is ample proof, but is also a soldier who knows well the things of which he writes.

The volume describes the fighting on land in the South-West Pacific from mid 1942 to March 1943. It vividly and in detail describes the bitter fighting during the critical operations in the Owen Stanley mountains, at Milne Bay and round Buna, Gona and Sanananda. It tells how Australian troops stemmed the advance of the hitherto victorious Japanese. The advance was stemmed, however, only after many heavy and grievous blows had been suffered by the Australians.

Also described in detail are the guerilla operations round Lae and Salamaua, the defeat at Wau of the last Japanese offensive against Australian troops and the final phase of the Independent Companies operating in Timor.

Woven through the story is an account of discussions and sometimes sharp differences between the Allied generals conducting operations over this period.

In his Preface the author makes it clear that his story is primarily that of

the Infantryman. For the most part it is the story of small groups of men, infinitesimally small against the mountains in which they fought, who killed one another in stealthy and isolated encounter beside the tracks which were life to all of them; of warfare in which men first conquered the country and then allied themselves with it and then killed or died in the midst of a great loneliness.

The story commences in March 1942 when the southward march of the invader was well under way. It describes conditions affecting the military situation in Australia at that time. One division lost in Malaya, three others overseas and no comparable formations in Australia fit to take the field.

It tells a sorry story of the lack of foresight in not having trained formations available to meet what was to be the most serious threat that Australia had yet to face. It describes the sometimes extraordinary and hard to believe efforts to pull the military machine into gear, culminating in the appointment of a Commander-in-Chief Home Forces, a Commander-in-Chief without even the convenience of a headquarters from which to exercise command. However, direction of effort began to emerge upon the appointment of General Blamey as Command-in-Chief AMF.

The author describes the raising and committal to action of Kanga Force which was destined to be the only force for a considerably time actually opposing the Japanese in New Guinea. He describes the great difficulties confronting

this force, difficulties that were in no way alleviated by the somewhat fanciful directive given to its Commander.

Via the muddled situation then apparent at Moresby, the story leads on to Kokoda. It describes in detail the bitter fighting that was to continue for so long and to end in final but costly victory. During this period the story is told of brave men, and of men not so resolute. It tells how highly trained and experienced formations met defeat, it also tells of poorly trained and inexperienced formations being required to meet the Japanese who were able to defeat their more experienced comrades. All credit is given to these formations, but in the main, their story is a sorry one.

A brighter picture is painted of the fighting at Milne Bay, where side by side experienced and inexperienced formations were to inflict the first defeat to be suffered by the Japanese during their southwards march.

Back again to the Trail and onwards to Buna and Gona, the entry of the Americans into the fighting on land in New Guinea. When reading of the vicissitudes of the Americans it is only necessary to refer back several pages to find a similarity between their units and some Australian units — a similarity showing a lack of achievement.

As the story unfolds the author cleverly weaves into his narrative a description of events occurring far from New Guinea, events, however, which were to have a vital effect on the outcome of the fighting in New Guinea. He tells of the Battle of the Coral Sea, the Battle of Midway and the American fighting on Guadalcanal. These events were to exercise profound effect on the Japanese plans for their New Guinea campaign, leading beyond any doubt to their eventual defeat in that area.

The final battles on the coast are vividly described. In the light of later events it is perhaps easy to wonder why

it was necessary for some of these battles to be fought to their final bloody conclusion. The author rightly suggests that the reader should bear in mind the necessity at that time for a victory to be clearly established by force of arms rather than niceties of tactics.

The fighting round Wau and forward of Wau is described in detail. It can be seen during this period that lessons learnt during the earlier fighting are being well applied. The author leaves the force at Wau with the situation well in hand and the force poised for its eventual final successes in that area.

Recording, as it does, the history of the military achievements of that most critical year in Australia's memory, this volume should find a place in every Australian household. It is indeed a dramatic story.

To the professional, the close study of this volume is a clear necessity. Everything described in the volume did in fact happen. It is necessary that the professional studies closely those things that were bad. It is his business to see that those bad things do not occur again.

— Major K. B. Thomas

THE STEEL COCOON, by **Bentz Plagemann**. (Secker and Warburg, London, and 317 Collins St, Melbourne) 239 pages, 18/9.

This is the story of a newly-commissioned American destroyer, USS Ajax, in the early days of America's entry into World War II. The crew is a blend of experienced regular Navy personnel and recruits on their first sea-going duty. The author sets out to show the reactions of the recruits to their unaccustomed environment and to the influence of the patient, competent leadership exerted by the experienced hands.

Mr Plagemann succeeds very well in creating the atmosphere that exists in any service unit in similar circumstances.

The importance of a leavening of experienced men at all levels, particularly in the non-commissioned ranks, is clearly brought out. Anyone who has served under similar conditions in any service will recognize some of the characters, both amongst the recruits and amongst the steady, reliable NCOs unobtrusively playing a vital role in licking the team into fighting shape.

In delineating his characters, Mr Plagemann over-emphasizes the element of sex. He seems to have swelled whole all the works of Freud and his disciples. The thing appears to have got on his mind, and he apparently imagines that all men are similarly affected. If he is drawing upon personal experience, all I can say is that my own experience of men at war, which is much longer than Mr Plagemann lays claim to, has produced a rather different impression of human motivation and reaction to war-time service conditions. The warriors of my acquaintance were strong men, but they were not all positively dripping with sex, not all the time anyway. Most of them had some other ideas some of the time.

Another bad trait in Mr Plagemann's writing is his excessive use of obscenity. We all know well enough that many men seem to be constitutionally unable to converse in any other way, but Mr Plagemann might well have left something to our imagination. The writer who finds it necessary to employ large and frequent doses of printed obscenities to get his effects is by no means a master of his craft. One feels that Mr Plagemann could have done better work because his book contains some very fine passages indeed.

Despite its defects, however, this book does present a clear picture of the sort of situation in which many leaders might well find themselves in the early days of a war. Its perusal will have been well worth while if the reader notes the lessons and resolves to give to the men

committed to his care better moral leadership than that given by the officers of the mythical USS Ajax.

— E. G. K

1000 MEN AT WAR, by Malcolm Uren. (William Heinmann Ltd, 317 Collins St, Melbourne and 113 Bathurst St, Sydney).

Regimental histories are usually rather tedious affairs of real interest only to members and ex-members of the unit. This history of the 2/16th Battalion in World War II is a brilliant exception, a book which could be read with enjoyment and profit by anyone with even a passing interest in the Australian soldier.

Mr Uren is never dull, not even when describing the unexciting process of forming the battalion from the parties of raw recruits arriving at the assembly area from various districts in Western Australia. Indeed, before the narrative takes us that far, the story of the hilarious railway journey of the goldfields recruits raises nostalgic memories of our mis-spent youth.

The regular army component of the original 2/16th consisted of the second-in-command, the adjutant and the quartermaster. The other officers were drawn from numerous CMF units. On this team, many members had not even met each other before their arrival at the assembly area, there descended a sudden influx of men from all walks of life and most of them without any previous acquaintance with the army. These men represented a fairly typical cross-section of Australian life — farmers, clerks, tradesmen, bank managers, miners, timber getters, unskilled labourers, etc. Some were rather old and some were rather young, on the whole they were older and more set in their ways than the National Servicemen of today. Many of them had never worked for a boss in their lives, many more had tolerated one just as long as he suited them.

This is exactly the situation in which many a young regular officer might

suddenly find himself — faced with the task of assisting to form a disciplined unit from this mass of unmilitary material. Not improbably he will have had little or no experience of this type of recruit, more particularly when the cross-section suddenly arrives en masse. But if he has read and absorbed the lessons of this book he will not be without some knowledge of the problems and how to solve them.

As the various parties of recruits arrive personalities emerge and the battalion begins to take shape, the raw material is moulded into a disciplined, aggressive, fighting unit. Writing with a lively wit and fine descriptive powers, Mr Uren follows the fortunes of the 2/16th to the Middle East and through the Syrian campaign, back to New Guinea and across the Kokoda Trail to Gona where the battalion finished with just 50 men still on their feet, to the Ramu Valley and Shaggy Ridge, and then to the final battle at Balikpapan. The narrative is illustrated with excellent sketch maps and some good photographs including groups of the survivors of each of the original companies still with the battalion at the end of the road.

Mr Uren does not concern himself with strategy. He simply tells the story of a fine fighting battalion, he shows us World War II as seen by the fighting infantrymen, its pathos and its humour, its light and shade, its courage and high endeavour. His story is as lively as life in that battalion undoubtedly was, and might well be taken as a model by those still faced with the task of producing their unit histories. It should certainly be in the library of everyone who seeks understanding of the Australian citizen soldier at war.

— E.G.K.

ALLIED INTELLIGENCE BUREAU.
By Colonel Allison Ind. 305 Pages.
David McKay Co, Inc, New York.

Review by Lieutenant-Colonel Joseph F. Dunn, Artillery, in the MILITARY REVIEW, Command and General Staff College, Fort Leavenworth, Kansas, USA.

The book contains a splendid description of the functioning of a high-level intelligence office during the war with Japan. For the reader interested in viewing General MacArthur's Pacific campaigns from the perspective of a theatre level intelligence staff agency, it is an extremely interesting document.

The campaigns of the Solomons, New Guinea, New Britain, and the Philippines serve as the report's background. The agency mission was to "obtain and report information of the enemy in the South-West Pacific Area and where practical weaken the enemy by sabotage and destruction of morale." The author, who was the deputy director of the agency, makes it a living, vital, compelling tale. It is liberally laced with many examples of rugged courage displayed by the numerous operators deployed throughout the contested islands.

The Coast Watchers of the Solomon Islands as well as the Commandos of Singapore harbour are skilfully linked to a compelling requirement of Supreme Headquarters — contributing to its own security by procuring enemy intelligence.

Here is a unique G2 view of SWPA activities by an officer who actually experienced the operations.

— E.G.K.

CAN WE LIMIT NUCLEAR WAR

R. N. ROSECRANCE

Reprinted from the March 1959 issue of the *Military Review*, Command and General Staff College, Fort Leavenworth, Kansas, USA.

IT may have been true that the strategy of "massive retaliation" was to the special advantage of the United States relative to the Soviet Union when it was announced in January 1954. If we could reach into the very heart of Russia while still preserving our basic strategic capacity against Soviet attack, all-out war would be more dangerous for the Russians than for us, and the threat to wage all-out war would become a weapon in our favour. But if this were true in 1954, it is no longer. Now we do not possess a decisive advantage in the field of unlimited weapons and delivery systems; if we can destroy the Soviet Union, she can very probably also destroy us.

The recognition that "massive retaliation" has now become a double-edged sword has occasioned a new "great debate". The question is whether we should place greater emphasis upon limited war strategies than we are at present doing. The major argument in favour of greater preparation for limited wars is that if we do not develop

our limited capabilities, an aggressive power could confront us with an almost impossible choice. If we have no shield except the absolute weapon, we may have difficulty responding to a limited aggression with a strategy other than all-out war or all-out surrender.

At each stage of the enemy's advance we will ask ourselves whether the territory absorbed is worth the risk of total war; in each case we may postpone a decision, waiting for a less ambiguous challenge. If, on the other hand, we mount the ability to resist with limited means, we may possibly avoid the choice between Armageddon and surrender; we have a chance to counter the limited aggression of the enemy by the limited retaliation of a defensive coalition.

The advocates of limited war have a cogent argument. Without prejudice to the manifest need to strengthen and protect our capacity to wage all-out war, we must recognize that total reliance upon weapons of mass destruction may ill serve our purposes. But even with the inclusion of "limited war" in our strategic doctrines, there is the additional problem of the type of limited war strategy to be included. Some proponents stress the need for a diversified military establishment permitting three separate strategies: limited conventional war, limited nuclear war, and all-out war. Others argue that we should place primary reliance upon limited and unlimited nuclear war, meeting even conventional attacks with tactical nuclear weapons. Despite the currency of this second opinion, there are good reasons for a

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re-examination of the strategy of conventional war. Limited nuclear war may have more serious disadvantages than it was at first thought.

Limited Nuclear War

There are many strong supporters for a current thesis that future wars will be nuclear wars, either all-out or limited, and that the war which starts out with the limited use of nuclears is easier to keep limited. The case they make is strong and not without appeal and the arguments in favour of a limited nuclear strategy are numerous and impressive. Here is how they reason.

Perhaps the most basic contention of those who support such a strategy is that it provides an alternative between conventional war and all-out war which takes the best from each strategic situation. On one count, limited nuclear war holds a greater threat for possible aggressors than a merely conventional strategy. The merit of "massive retaliation" was its frightening potency; if all-out war would follow upon the slightest aggressive venture, the aggressor would reflect long before making an advance. Conversely, if limited nuclear war provides a greater "deterrent" than conventional war, it still does not inhibit action. Nations, it is held, will not hesitate to wage limited nuclear war when limited challenges arise. In this fashion it steers a mid-course between opposing evils: it poses a greater threat than conventional war, and a greater incentive to action than all-out war.

A second argument advanced by those who favour "limited" nuclear war is that in all probability it can be limited. The tactics of a limited nuclear war in the future will be such as to minimize destruction. Airfields probably will not be attacked; cities, unless near the centres of troop concentration, will not need to be destroyed. The object of war will be the destruction of opposed armed units; for this purpose absolute command of the air will neither be possible nor necessary. With the advent of missiles and vertical take-off aircraft, it is

contended, it will be as economical to destroy the enemy's aerial strength in the air as on the ground. In addition, there will be little need to use large numbers of tactical nuclear weapons upon ground troops. Units will be highly mobile, dispersed and self-sufficient; the enemy will try to avoid concentrating his forces and thereby presenting a target for massive firepower. Such bombs as are dropped will be aimed at small troop concentrations.

The case for ready limitation of nuclear war does not rest only on its limited destructiveness. It is maintained that limited nuclear war can be as easily confined as conventional war. While it is theoretically possible for the aggressor to raise the nuclear ante by responding with 150 kiloton bombs to the defender's 100 kiloton weapons, he may hesitate to let the conflict broaden in scope and destruction. Each nation retains the power to retaliate with unlimited weapons and each time the nuclear stake is increased the likelihood of a thermo-nuclear response also is enhanced. In such a war, therefore, it will be in the interest of the relative winner to refrain from pressing his luck too far; the gains won in limited war could be quickly cancelled with a broadening of the conflict. The proponents of limited nuclear war also argue that the relative loser will hesitate to accept all-out war because his forces would be more subject to weapons of great destructiveness than those of his adversary.

Another argument advanced in behalf of limited nuclear war is that it may even be easier to limit than conventional war. If a war begins with strictly conventional weapons, both parties may raise it one step without calling forth all-out retaliation. But the very fact that conventional war is not just a step away from all-out war introduces an element of uncertainty which could lead directly to it. If armies are engaged in conventional war, and one adversary suddenly chooses limited nuclear weapons, his opponent may be uncertain whether the war is now to be

fought as another form of limited war or as all-out war. To protect himself he may have to assume the worst.

The fact that there exists a clear cut-off point between conventional and nuclear war may turn into a double-edged sword: the existence of two families of weapons may serve to limit the war as long as the limitation holds. Once breached, however, it may set off a vicious spiral, difficult to control.¹

The advantage of limited nuclear war, it is held, is that it is always closer to unlimited conflict than conventional war. Because the choice is not between two different forms of limited war but between limited war and all-out war, both parties will redouble their efforts to avoid an expansion of the conflict.

It is also maintained that a strategy of limited nuclear war is peculiarly suited to our own capabilities and unsuited to those of probable adversaries. Our Defence Establishment is planned on the assumption that nuclear weapons will be used; to adopt a different strategy would give the advantage to our enemies. We have a broader technology and more adaptable way of life than our probable enemies, and limited nuclear war places a premium on these qualities. It requires competence not only in weapons systems, but in those technical fields which permit the development of highly mobile forces capable of subsisting for long periods without direct communication with supply centres. Thus the capacity to wage limited nuclear war depends upon a diversified industrial plant. Our likely antagonists, the Soviet Union and China, are deficient in these respects. The Russians have shown that by concentrating upon one production item their technology can produce excellent results. It is questionable, however, if they can maintain the diversified industrial effort on which limited nuclear war would depend.

1. Henry A. Kissinger, *Nuclear Weapons and Foreign Policy*, Harper & Brothers, New York, p. 193.

It is not in technical and industrial competence alone that the Soviets are deficient. Limited nuclear war will require a flexible strategy, leaving a great deal of leeway to commanders in the field. As their operations in World War II demonstrate, the Russians have never been able to master such a strategy. Their attacks were co-ordinated from headquarters far behind the lines. Commanders at the front had little or no role in planning operations or in changing plans to meet military exigencies in the field. On both grounds, it is maintained, we should have an advantage over the Russians. It is not surprising that they have persistently reiterated two themes: limited nuclear war is impossible and the atomic bomb should be "banned".

Finally, the proponents of limited nuclear war contend that it is impractical to develop forces possessing both conventional and nuclear capabilities. Dual purpose forces will find it exceedingly difficult to switch from conventional to limited nuclear war on the opponent's initiative. During the conventional phase of their military activity these forces will be highly vulnerable to nuclear attacks because of their approximation to a continuous line formation.

The side which cedes the first nuclear blow to its opponent compounds the traditional disadvantage of the defensive war. The side which has the initiative, on the other hand, can disperse its formations before resorting to nuclear weapons. It will, therefore, be much less vulnerable to retaliation by its opponent.²

The conclusion reached is that emphasis upon a limited nuclear strategy will best serve our interests.

Analysis

It is impossible, with our present state of knowledge, to give a thoroughgoing refutation of the views, of the proponents

2. *Ibid.*, p. 182.

of limited nuclear war. We do not yet know enough about various limited war doctrines to be sure that one is preferable to another. We cannot be certain which is most capable of limitation; we are not positive which will rebound most to our own interests and to the detriment of those of our probable antagonists. There seems reason to believe, however, that the claims of limited nuclear war have been overstated and that a re-examination of conventional war is appropriate and needed.

The arguments for limited war are persuasive, but they are not wholly consistent. Two of the most basic contentions in favour of a limited nuclear strategy are that nuclear war can be more easily limited than conventional war and that nuclear war poses a greater military threat to aggressors than conventional war. It would seem difficult, however, to support the two contentions simultaneously. As the exponents of limited nuclear war use the terms, the greatest military threat is posed by thermonuclear war; and the military threat of either strategy would seem to vary directly with its tendency to bring on all-out war. If a nuclear strategy involves a more formidable military danger, it is by virtue of the fact that it is more likely to develop into a thermonuclear holocaust. If it is less likely to lead to an all-out war than a conventional struggle, conventional war must carry the greater threat.

This line of reasoning would lead to the conclusion that we must either place primary emphasis upon the need to limit conflicts or upon the need to pose a maximum military threat. If this argument were to be accepted, we should have to admit that "deterrence" and "limitation" cannot co-exist. There is, however, no need to equate "deterrence" or "maximum threat" with the threat of all-out war. A state will be "deterred" from attacking a neighbour if it is certain that it could not win the ensuing war, or, if it could win, that it could not do so at an acceptable cost. This could even suggest that there may be circum-

stances in which a state would be deterred from beginning a limited war and yet find thermonuclear war to its advantage.

Factors

More interesting is the contention that limited nuclear war is more likely to remain limited than conventional war. This argument depends upon an analysis of the factors which affect limitation and the respective strategies to be employed. For present purposes these may be classified into five groups.

First, a war of major destruction will be must less likely to remain limited than one in which slight destruction is inflicted. The reason for this is that as a conflict deepens in ferocity, as its toll in human and material terms rises, there will be a growing readiness on both sides to launch the absolute weapon. The more destructive the conflict, the less disadvantageous does all-out war become.

Second, whether war can be limited or not depends upon the type of targets involved. If the targets include great cities and important airfields, the enemy will be more willing to launch all-out war. Much of the present hesitancy to wage unlimited war reflects the attitude of great urban populations which fear the hydrogen bomb. If the course of war brings mass destruction to large urban areas, these populations will be more ready to accept all-out war against the enemy. If important airfields are brought under fire, there will be a more willing acceptance of the risks of thermonuclear war. Attacks on airfields may be viewed as attacks on strategic airpower or as attempts to gain control of the air; neither could be accepted without great threat to retaliatory capacity.

Third, the ability to limit war relates to the extent of the area involved and its geographical location. A war engulfing a large area would be more likely to lead to unlimited conflict than one in a straitly limited area. Also, for example, a war

in West-Central Europe undoubtedly would be much harder to contain than one on the border of Pakistan.

Fourth, a war which brought the forces of the major antagonists, the US and the Soviet Union, into direct conflict with each other would be harder to limit than one which involved the use of satellite armies against the Western Powers.

Fifth, the limitation of war depends upon the respective resolves of the protagonists. If both are eager to keep out of an all-out war, such a war may be prevented. On the other hand, if one or both of the combatants is more or less indifferent to the choice between limited and unlimited war, the latter will be the more likely to occur. It should be noted that the respective attitudes toward limitation will vary with the course and conduct of the war.

Comparison

How do limited conventional and limited nuclear war compare against these criteria? On the first count, it seems that limited nuclear war will be far more destructive than its proponents have thought. Recent exercises indicate that the toll in human life exacted by a limited nuclear war would be very substantial. According to some sources, hypothetical "hits" on field units have involved casualties up to 40 per cent for the unit involved; entire battalions were knocked out of action. The use of tactical nuclear weapons against army formations meant that fully organized battalions had to move in to replace disabled units. Although figures were not given indicating impact on local populations, it must be assumed that the "scores or hundreds" of nuclear explosives employed would have taken a sizable toll among non-combatants. In fact, it is reasonable to speculate that relatively large numbers of nuclear weapons will be used within a short space of time in a future limited nuclear conflict. Ground formations evidently have proved a more inviting and vulnerable target than had been assumed previously.

It seems probable, on the other hand, that limited conventional war will not be so destructive. For the immediate future tactics of limited conventional war will be similar to those of limited nuclear war, given the important difference occasioned by less potent firepower. In the years to come the tactics of both types of war would seem to envisage highly mobile units possessing potent firepower and an increasing trend away from the fixed line formation. The object of both strategies apparently would be to force the enemy to concentrate a force large enough to be susceptible to attack by conventional or nuclear firepower, or alternatively, to require him to disperse his forces so completely as to lose control of territory. In either case the destructiveness of war would be circumscribed by the less potent firepower of conventional weapons.

On the second count, limited nuclear war would seem to be little better than a conventional strategy. Neither strategic conception would aim at the destruction of great cities and strategic airfields. Absolute, as differentiated from local command of the air, could be attained only by risking all-out war, and mass attacks on great urban centres could serve to make all-out war acceptable to the enemy population. It would seem, however, that if such targets are involved in the battle area, a conventional strategy would afford a better safeguard against all-out war than tactical nuclear weapons. Use of conventional weapons against such targets might possibly pass muster as enhanced limited war; use of nuclear weapons, on the other hand, would introduce a sliding scale of weaponry, the end point of which would be thermo-nuclear war.

Third, limited nuclear war has no apparent advantage over conventional war. The greater mobility of both conventional and nuclear forces in the future suggests a wider battle area. There is, however, no reason to believe that the conventional will be any larger than the nuclear battlefield.

On the fourth count, it may well develop that conventional war would be safer than limited nuclear war. A conventional war could be fought between Russian satellites and the West, but use of nuclear weapons against a Communist state would make Russian involvement very likely.

Finally, it is far from clear that the combatants in nuclear war will try harder to avoid all-out war than those involved with conventional means. Indeed, the arguments of the advocates of limited nuclear war on this point smack rather of "brinkmanship". These theorists contend that the nations fighting a limited nuclear war will be more resolute against an expansion of the conflict than nations involved in conventional war. In other words, the closer nations are to the brink of Armageddon, the harder they will try to avoid going over it; the safest place, it is almost suggested, is the very edge of the chasm. But it is difficult to believe that states involved in conventional strife will be less aware of the dangers of unlimited conflict than those fighting a limited nuclear war. The fact that they chose conventional instead of all-out war would seem to be ample proof of their desire to avoid a broadening of the conflict. Nor is it clear that if a conventional war were suddenly transformed into a limited nuclear war, the ensuing uncertainty would make for an all-out struggle.

Nations prepared to wage limited conventional war will have a thorough understanding of the different limited war strategies that may be employed. Certainly, they will need the doctrine and the capability to wage both conventional and nuclear war. Given this understanding (and even an exclusive limited nuclear war strategy could not be adopted without it) there seems little reason to suppose that a shifting of strategic gears need lead to breakdown. It may be true that nations engaged in a limited nuclear struggle will be more careful to avoid all-out war than will nations engaged conventionally to avoid limited nuclear war; a broadening in the first case may

be less acceptable than a widened conflict in the second. It would not follow, however, that conventional contestants will be less resolute against all-out war than limited nuclear contestants. Assuming equal resolve of the antagonists to start with, the conflict which will go over the edge first is the one which is nearer to it.

Additional Considerations

There are other than purely military reasons for choosing among various limited war strategies. Future even more than past wars will be fought to attain political objectives. The avoidance of all-out war and the "all-out victory" associated with it indicates that exclusively military objectives may no longer be all-determining. Limited aggressions have been undertaken not merely to gain territory, but to stabilize coalitions and to weaken opposing groups. Limited resistance to aggression has been undertaken not merely to restore the military *status quo* ante, but also to gain adherents and to strengthen an alliance system. Russian intervention in Hungary not only posed a threat to the further development of national communism in Eastern Europe, it also tested the resolve of the Atlantic Alliance. The Taiwan crisis seems to indicate a very sophisticated awareness on the part both of the Chinese Communists and ourselves of the type of military measures which allies and uncommitted states will accept.

Considering the political character of war, it may well be that limited nuclear war is not a universally applicable strategy. In the Taiwan situation thus far, nuclears have played no part. In various other hypothetical situations, moreover, it is questionable that tactical nuclear weapons would provide a satisfactory means of repelling aggression. Suppose that the Sino-Burmese boundary controversy were renewed and large areas of North Burma occupied by the Communists. Limited nuclear war might be feasible militarily, but it would impose an enormous strain upon our

political acceptability in Asia. If a powerful military revolt occurred in East Germany and West Germany were drawn in, would we be ready to wage limited nuclear war in support of the insurgents? Entirely aside from the military problems involved, it is well to remember that if we are to be regarded as a kind of policemen to guard against Communist burglary, we will have to use weapons which are congenial to those who are being robbed or our services will never be requested.

There is a special reason for local opposition to the use of nuclear weapons in the event of limited aggression. For the local inhabitants, the choice of weapons affects not only military but civilian populations; while only our soldiers would be involved, the host country would risk total devastation of its human and material resources. The desire to avoid weapons of great potency must be greater in the latter case. It is not surprising, for example, that another "great debate" raged last spring in West Germany over nuclear weapons. While Dr Adenauer and the *Bundestag* majority favoured equipping German forces with tactical nuclear arms and approved *Nike* sites, the German people opposed missile bases and nuclear defence.

A recent poll indicated that 73 per cent of those questioned opposed establishment of ballistic missile sites and the arming of the *Bundeswehr* with nuclear weapons; previous surveys have shown that a strong majority are against use of nuclear weapons in Germany's defence unless the Russians initiate their employment. Since the result of limited war will depend in part upon the organized support of the host population, it will be well to make sure that the strategy we use does not inhibit local co-operation and aid.

The final issue is one of practicality; "Is limited nuclear war more to our advantage relative to the Russians than limited conventional war?" The traditional view of American and Soviet capabilities in the limited war field

has given the edge to the Soviets in conventional weapons and to ourselves in tactical nuclear devices. The immense superiority of the 150 or more Soviet divisions, abetted by the 80 satellite divisions, it is held, can never be countered without the employment of nuclear arms. We have a preponderant advantage in the tactical nuclear field, it is argued, and we should use this advantage to neutralize the Soviet reservoir of ground troops.

If this assessment was a reasonable presentation of the case based on the knowledge available to us in 1957, it is considerably muddled by more recent developments. It seems now that limited nuclear war is not an infallible antidote to ground troops. The evidence seems to suggest that the potency of tactical nuclears is so great that the advantage may fall to the side which has the greatest number of replacement battalions. If this is true, the assumed American advantage in the tactical nuclear field may have been wiped away. Perhaps a reconsideration of the Korean strategy which permitted us to neutralize armies two to four times our number by greater conventional firepower is in point.

Objectives

Our aim should be to develop a strategy in which our inferiority in numbers can be compensated for by superior firepower. The appropriate strategy from the American point of view would be one in which firepower is used to neutralize but not to obliterate; in this instance the result will depend on firepower more than ground forces. It is difficult at this juncture to identify a strategy which will conform perfectly with this requirement, but it is doubtful that limited nuclear war is an entirely satisfactory answer.

There are other reasons for believing that our vaunted edge in tactical nuclear weapons is more or less ephemeral. The Russians have been making strides in the limited nuclear field and the military review in Moscow in November 1957

demonstrated a not inconsiderable capability. Further, the suspension of nuclear tests after a series of exercises with small nuclear devices probably indicates that the Soviets are further along in the limited nuclear realm than we believed.

Of course, it does not follow that if we do not have an advantage in tactical nuclear war we must necessarily have an edge in conventional war. Yet it may be that we are not at quite so large a disadvantage as is often portrayed. Because of the limited firepower of conventional weapons, there may be no such thing as "conventional plenty" corresponding to "nuclear plenty". In a limited conventional war no nation may be sure that it has more than the quantity of munitions needed before the conflict begins. If this is true, the outcome of the conflict probably will be affected by an immense productive effort on both sides. In terms of sheer productive capacity, we are superior to the Soviets, and it would seem that this could at least partly counteract the Soviet preponderance in ground forces. Nor would it necessarily follow that limited nuclear war would place a special premium upon American initiative and resourcefulness while the Soviet's rigid centralization would make it vulnerable. It may be that initiative and independent action will be disadvantageous in a limited nuclear war, despite the claims of its proponents. The major problems seem not to be how to give greater initiative and decision to commanders in the field, but how to control operations of the war from a central headquarters. Commentators have suggested that a limited nuclear war would lead to such disorganization and chaos that it could not be controlled at all. There is need for greater development of communications networks and greater co-ordination of the tactics of individual units in such a war. In this effort we are not likely to have an advantage over the Russians.

Finally, it is necessary to ask whether it is possible to adopt a strategy of limited conventional war and still be

prepared for limited nuclear war, should it occur. Advocates of limited nuclear war stress that although forces capable of waging either limited nuclear or conventional war can be developed, the strategies of the two types of war are so different that the shift from one to the other would be impossible to effect without great loss to the defensive forces. This is primarily because they conceive of conventional war in terms of World War II, and nuclear war in terms of dispersed formations and great mobility. It would seem, however, that tactical innovations in both types of war will proceed along parallel lines. Moreover, it is suggested that when tactical nuclear weapons are introduced, they can exact an impressive toll even against forces which are prepared for them. If nuclears put the defence at a disadvantage, it is a disadvantage to which the offence is not immune. It is possible that the defence can recoup the initiative by powerful nuclear strikes on the enemy's ground forces together with the commitment of new ground forces.

The balance of informed opinion seems to lie in favour of dual purpose forces; they are currently being maintained in NATO and the pentomic division is capable of fighting either with or without nuclear warheads. Current NATO doctrine is to employ limited conventional war where "brush fire" aggressions occur; yet preparation is being made to wage a limited nuclear war against a more formidable but still limited military attack.

Conclusion

Two conceptions of limited war have been reviewed widely. One conception emphasizes the employment of limited nuclear war in all, or almost all, limited conflicts. The other stresses the development of balanced capabilities for limited conventional, limited nuclear, and all-out war. This conception reflects a prevailing uncertainty about tactics of limited war; we do not know for certain which strategy is most likely to remain limited, and we cannot be absolutely sure that tactical

nuclear war is to our advantage relative to the Soviet Union. Because of this uncertainty, it is better to be ready to be ready to fight different kinds of limited war than to put all our strategic eggs in one basket. Our present knowledge seems to indicate in particular that total reliance upon tactical nuclear weapons as a limited war strategy may not wholly serve our interests.

Of course, the second strategic conception is the more expensive, it is more costly to prepare for three kinds of war than for two. But if estimates are correct, limited conventional war may not require much more manpower than limited nuclear war; in either case it would seem that a military establishment of 2,500,000 men is insufficient for the purposes at hand. If we are to be prepared to wage various types of limited wars, we must be ready to spend considerably more than we are now spending on defence. Some have said that the attempt to prepare for the small war would induce national bankruptcy and give the Russians the advantage. Actually, in terms of sheer military spending, we have the advantage. If we

are forced to compete to develop a balanced military capability, Russia will go "bankrupt" before we do. And in a limited war of attrition we again would have the advantage; for in a war of attrition, the outcome would depend upon the respective productive resources of the contending nations.

The inclusion of a strategy of limited conventional war among our military doctrines will not solve all problems. However, it will permit us to consider requests for military support more seriously than in the recent past, even if it will not always allow us to act. Conventional capability did not spell the difference between intervention and abstention in the Hungarian revolt, nor would it necessarily enable us to respond to an appeal by East German insurgents. Yet it is true that the more obviously our strategy is keyed to limited conventional war, the greater the number of potential conflicts in which it may be used. If "massive retaliation" paralyzes the will, conventional war liberates it. It is, moreover, a form of war which is at present acceptable in almost all countries as a means of resistance to aggression.
