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Australian Army History Unit

16 July 2014

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# AUSTRALIAN ARMY JOURNAL



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No. 2

Aug-Sep

1948



# AUSTRALIAN ARMY JOURNAL

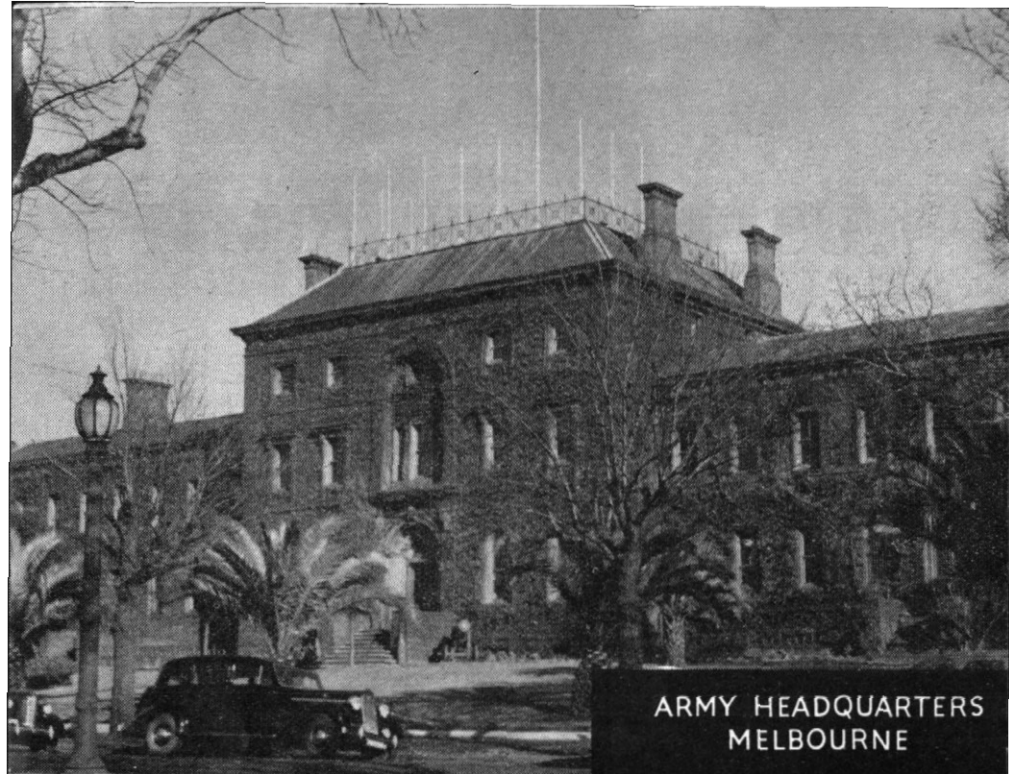
*A Periodical Review of Military Literature*

Number 2

Aug-Sep, 1948

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ARMY HEADQUARTERS  
MELBOURNE

# AUSTRALIAN ARMY JOURNAL

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Contributions, which should be addressed to the Director of Military Training, Army Headquarters, Melbourne, are invited from all ranks of the Army, Cadet Corps, and Reserve of Officers.



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# PSYCHOLOGICAL WARFARE ..... AND THE SOLDIER

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Written for the Australian Army Journal by  
the Directorate of Military Training, AHQ

**DURING** the American Civil War a Confederate general wrote to his opponent protesting in firm but courteous terms against the latter's "unsoldierly conduct" in causing printed invitations to surrender to be distributed in the Confederate lines. The Federal commander replied in equally courteous tones, pointing out that, after all, he was only trying to induce rebel soldiers to return to their proper allegiance.

Before dismissing this engaging correspondence as a quaint relic of the past, we might well pause to enquire if our own knowledge of psychological warfare is any better than that of the Confederate general. Is it not a fact that most soldiers think of this aspect of war as the task of a few specialists whose work is only remotely related to their own duties? How many soldiers realize that psychological operations are an integral part of modern war and international relations?

The great danger of ignorance lies in the curious sense of security which, illogically, we feel belongs to us alone.

Unless we appreciate the competency, ingenuity and ruthlessness of the exponents of psychological warfare we are all too prone to imagine that we, as

a people and as individuals, are immune to all forms of propaganda. And, unless we know something of the methods employed by the propagandist, we can neither effectively support nor resist the psychological offensive, nor can we properly understand what is happening in the world today.

## Early Developments

The use of propaganda to further political and military aims is as old as history itself. The insidious weapons of rumour, persuasion and blatant intimidation were employed long before the dawn of the Christian era. The Greeks used them to the limit of their meagre resources, while "Divide and Conquer" became a cornerstone of Roman policy. Napoleon climbed to power in the guise of the champion of the suppressed people of Europe, the apostle of revolutionary reform. And Napoleon, even when his Grand Army stood poised for the invasion of England, had his admirers in the British Parliament.

Improvements in the means of waging psychological warfare marched parallel with the improvements in the more visible weapons of war. Nevertheless, it remained for Leon Trotsky, collaborator of Lenin and organizer of the

Bolshevik military victory in the Russian civil war of 1917-20, to relate in precise terms his "Strategy of Disintegration" to the more orthodox military methods of gaining political ends.

Trotsky visualized war as a continuous process which would cease only when all the people of the world had been incorporated in the Communist stateless society. In this struggle the armed forces had two functions, viz :—

To support psychological warfare operations by the ever present threat of physical violence;

To confirm, if necessary, after a short, sharp struggle, the victory already won by psychological attack.

In the Trotsky concept peace simply could not exist until the Communist victory was complete throughout the world. Until that conclusion was reached psychological warfare would not cease for an instant. Any armed clashes which occurred during the struggle would simply be superimposed on the psychological assault. Trotsky saw these armed conflicts as victory marches for the Red Army, against opponents already weakened to the point of disintegration by the operations of his psychological experts.

Concurrently with the development of these theories, means for their practical application were piling up all over the world. Thousands of radio transmitters and millions of listening sets, improved facilities for travel and intercommunication, centralized press agencies, talking pictures, improved printing methods and an ever increasing supply of paper.

Along with the means, skill in their use had also developed. The growth of advertising produced men who could predict mass reaction with some accuracy, men who applied scientific analysis to the preparation of their message and the choice of methods for transmitting it.

The German Nazi Party adapted Trotsky's theory to their internal struggle for political power. As soon as this goal was reached they applied it to the conversion of the German people to the Nazi ideology. Next, they applied it to the attainment of their ultimate aim—German world rule.

### The Pre-Belligerent Phase

In the pre-belligerent phase of their psychological war the Germans sought to weaken and destroy opposition to their aims by a wide variety of means, some simple and direct, others tortuous and subtle. The basic idea behind all these efforts was:—

- (a) To intimidate the immediate victim by violence and threats;
- (b) To placate, weaken, divide and bemuse more remote victims.

For the performance of these tasks the Reich Ministry for Propaganda and Popular Enlightenment recruited a large and highly qualified professional staff. For these people nothing was too big or too small. They spread their net in all quarters of the globe, and at all levels of society. The activities of each agency were nicely calculated to work on the predilections, the hopes, the fears and the ambitions of the individuals and groups it was designed to influence.

In the case of the immediate victim these activities took the form of political and economic agitation. In the long range plan, however, more subtle methods were adopted. There the immediate aim was to create the impression that the Nazis were peaceful, ordinary folk attending strictly to their own affairs. The rumpus going on at odd places near Germany was nothing to be alarmed about, and was not going to worry anyone. The long range aim was to convert indifference to admiration, and, wherever possible, active support for the Nazi system.

In nearly all cases the Nazis sought to transmit their propaganda through individuals not directly connected with

the Party or even with Germany. In fact, the more remote the connection the better. Many innocent people fell into the trap, and became disseminators of Nazi propaganda. Through the unwitting agency of folk with a genuine love of Wagnerian music, and students of German art, literature and science, many people were made to feel about Germany exactly what the Nazis wished them to feel. Cultural relations clubs, pen friends and photograph exchanges all helped to spread the gospel. Well written magazine articles and excellent documentary films helped to show the marvellous job that Germany was making of her economic and social problems.

In every country there are people who feel that society has not recognized their true worth. Every group contains its greedily ambitious member. People like this lent a ready ear to Nazi blandishments, and came to see society being moulded nearer to their heart's desire by the wizards of Berlin.

These schemes worked. They worked to a greater or lesser degree of success in every country touched by the Nazi net. They worked so well in Austria and Czechoslovakia that those two countries were incorporated in the German Reich without a shot being fired. They paved the way for the German victory marches in Norway, Denmark and Holland. They destroyed the morale of France, and they helped to keep America out of the war for two years. Even Great Britain had its Fascist Union, and friends of the Nazi leaders could be found in influential quarters. Right here in Australia there were German well wishers, wittingly and unwittingly, openly and covertly, supporting the Nazi cause.

Why do these things happen in a sturdy democratic country? They happen because a democratic community is naturally a tolerant community. The average democrat is concerned chiefly with minding his own business, and assumes, somewhat naively perhaps, that other folk are doing the same thing.

He is accustomed to political cranks, economic cranks and cranks without any particular classification. Very often he is a bit of a crank himself. That is to say, he has a hobby or an interest on which he considers himself to be an authority, and about which he is willing to talk to anyone who will listen. He good naturedly accords the same privilege to others. When he visits his neighbour to borrow a lawnmower, or some other implement of Sunday toil he is prepared to listen to his friend's views on anything under the sun. In the days before the war he saw no harm in listening politely to a mild defence of German actions. In the process of mowing the lawn before dinner he forgot all about Germany. But later on, if the subject came up in casual conversation, he was not unlikely to repeat his neighbour's opinion, possibly from no other motive than a desire to contribute to the discussion. If he had the reputation or the air of a knowledgeable fellow he probably made another convert who was at least ready to say, "It is no business of ours anyway".

Or take the case of a camera fan who began to exchange photographs with an unknown amateur or camera club in Germany. In his enthusiasm for his hobby he slipped by easy, imperceptible stages from an admiration of German camera technique to an admiration for Germany and the Germans. How was he to know that the pictures and letters that came to him from the other side of the world were prepared by professional experts.

And so it went on in all countries and at all levels, intangible, insidious, creating indifference and tolerance, and even active opposition to the few voices raised in protest at the course of events.

### The Belligerent Phase

If the outbreak of hostilities closes some avenues of propaganda it opens up new ones, and removes certain restrictions from some of the methods

previously employed. Thus, the distribution of literature and the exchange of correspondence comes to an end, or can only be carried on surreptitiously and at great risk, while cultural groups and other good-will associations are smothered by defensive measures and public opinion. On the other hand, all restrictions come off the radio; you can say what you like about the other fellow.

As well as attacking each other's morale, the belligerents now intensify their efforts to attract neutrals to their cause, or at least keep them neutral. All the old avenues are open in this sphere, and, in addition, great play can be made with suitably doctored news of military operations.

### The German Radio War

The Nazis started the war with a radio propaganda organization in being. All they had to do was to adapt their techniques to the new conditions. In doing this they showed considerable skill, although their failure to properly appreciate the psychology of other peoples, notably the British, led them into some amusing blunders.

The following paragraphs give a resumé of the more successful German methods in the radio war:—

*Official Communiques* — So long as the Germans held the initiative in field warfare, they held first priority with radio listeners in friendly and neutral countries. Whilst the Nazis held the initiative these communiques seldom departed from the truth, although they naturally played up favourable situations in detail while glossing over unfavourable ones.

In the early stages lack of co-ordination led the propagandists into promising military successes which did not materialize, and thus gave the British radio an opening for an effective counter-stroke. The Germans thereupon effected a close liaison between the soldier and the propagandist, so that the radio people would discuss and

predict only those things which the army was reasonably sure of accomplishing. There we see the exponents of psychological and orthodox warfare acting as a closely knit unit.

As a result of this close liaison between the soldier and the propagandist, the Nazi radio won some good points. For example, during the brief Norwegian campaign the German radio broadcast news of mythical British successes. As a result of this build up of hopes, the effect on morale in Britain, and on our friends in neutral countries, was all the greater when the crash came.

*Planted News* — Throughout the war Nazi agents "planted" suitable news in German controlled newspapers and radio stations in neutral countries. The German press and radio then quoted this news to other neutrals as representative of informed opinion in the country in which it had been published. Sometimes prominent people in those countries who had fallen under the Nazi spell linked their names with these news items.

*Bogus Radio Stations* — Some of these stations purported to have nothing to do with Germany, and broadcast defeatist news with a superficial anti-German note.

*Ghost Programmes* — These pretended to emanate from Allied stations. They were transmitted on the proper wavelength when the Allied stations were closed down.

As a variant they jammed out the Allied station with overwhelming power to give an "Interruption to Programme" broadcast of important news, cleverly falsified of course.

### Leaflet Raids

Both sides began dropping leaflets and other literature on each other as soon as the outbreak of hostilities removed the impediment of this method of reaching the enemy people. In the early stages the efforts of each belligerent resulted in a fiasco which

strengthened rather than weakened morale. The Germans had been well drilled in what to expect, and when millions of our leaflets dropped on them in the full tide of their military victories they were taken as a sign of British weakness. The lesson again is that strategic propaganda must be very closely co-ordinated with military events.

### The British Effort

From the outset the British realized that the inhabitants of the countries over-run by the German armies could still render valuable assistance to the Allied cause, provided they did not sink into a state of lethargic acceptance of defeat. The problem of maintaining morale in the occupied countries, and eventually organizing physical resistance, demanded the establishment of means of more or less regular intercommunication. On the one hand the people of the occupied territory had to be kept informed of the real state of affairs in the outside world. On the other hand it was necessary for the allies to know what was going on inside the occupied country, to distinguish between secret collaborators and the people really engaged in underground resistance activities.

Despite efficient German counter measures, the British effort, co-ordinated by their Political Warfare Executive, attained a high level of effectiveness. By means of secret radios, printing presses and other means, the people of the occupied countries were kept informed of the progress of events, and their morale sustained throughout the darkest days of the war. Liaison was maintained with the resistance movements, and their activities were closely co-ordinated with military operations.

Profiting from the lessons of World War I, the British conducted their psychological operations in neutral countries very skilfully. Throughout the war they followed a policy of truth. They made no promises of early

victories; neither did they understate the appalling difficulties of the way ahead. They acknowledged the desperate seriousness of their situation. Nevertheless they succeeded in creating an impression of indestructibility. Amidst the welter of fear and shattered faith the British alone seemed to be sure, so very sure, of themselves. This policy of truth and restraint, illuminated at intervals by the magnificent defiance of Churchill's speeches, proved a most effective counter to the Nazi effort. Because they did not minimise failure they were able, in due course, to make effective use of any military victories that came their way.

In the Pacific the native peoples over-run by the Japanese could not be expected to offer much active opposition to the enemy. However, an Australian inter-service organization succeeded in bringing about a lot of useful passive resistance. This organization maintained the faith of the natives in the Allied cause, and from them obtained much useful information about enemy movements. By persuading the natives to take to the hills they deprived the Japanese of a large proportion of the local labour on which they depended. On the other hand they were nearly always able to call in the natives to provide labour for Allied operations.

### Tactical Activities

In the tactical sense, psychological warfare means the propaganda aimed directly at the opposing field forces. Some of it is intended to lower morale and consequently fighting efficiency; some is aimed at inducing troops to surrender singly or in groups. The first object requires a long range plan; the second may be attained by direct methods applied at any point where the situation is favourable. For any degree of success both must be closely related to the general military situation, and to the particular situation in the area in which the propaganda is applied. Both should be co-ordinated with the overall strategic propaganda plan.



In the long range tactical propaganda field the Germans staged a very good radio effort. Generally, the Germans used their tactical radio to put on programmes for Allied troops in selected areas. These programmes came on the air at regular times, and were really first class entertainment. But into them the Nazis managed to introduce, very indirectly, a note calculated to induce in the listener a longing for home and a feeling of hopelessness about his present situation. These programmes might have been more dangerous if the German Army had been able to support them with military successes in the areas at which they were directed.

Both sides used leaflets and bogus newspapers extensively. Some of these were calculated to create in the soldier's mind doubt and anxiety about the welfare of his family at home. Others were straight out invitations to surrender, and promised safety and good treatment to the person who surrendered with the leaflet in his possession.

All belligerents attempted to win over prisoners of war, if only to obtain information. The Russians and Germans made great efforts to induce prisoners to join one of the "free corps" they maintained.

Were these efforts really worth while, or were they just so much waste of time? Exact figures are not available for the European theatre, but it can be said with certainty that very considerable success was obtained by the Allies towards the end of the war. In the South West Pacific Area statistics indicate that approximately 20 per cent of Japanese surrenders were the direct result of tactical propaganda. Taking into account the toughness of the Japanese soldier, that figure must be regarded as significant.

For obvious reasons it would be unwise to give details of enemy successes against allied troops. But they did have some success, and there were many doubtful cases. There was, for instance, the case of an Australian

soldier in Tobruk, whose comrades swore vehemently had openly cleared out to the enemy. If their allegations were true, Nemesis soon caught up with the culprit for, shortly after his release from Germany, he fell down the hold of a ship and broke his neck. This unhappy event scotched any investigation that might have been made.

Information about the number of our foes we induced to join our cause after capture is not available for publication. However, we were not unsuccessful. Our own prisoners of war put up a magnificent record of firmness in the face of adversity and great temptation. Nevertheless, there are some cases of known or suspected weakness. The Germans had a small "British Free Corps", the members of which were appropriately dealt with after the war. The Russians induced a considerable number of German prisoners to join them, including at least two generals.

### The Post-Belligerent Phase

When the German Army was overrunning Europe its advancing formations brought along with them organized psychological warfare units to complete the military victory by converting the conquered peoples to the Nazi ideology. They had some success, as the numerous post war collaborationist trials testify.

The British and Americans, in the belief that government should spring from the conquered and liberated peoples, made no effective arrangements of a similar nature. But the Russians did. And they did it very thoroughly too. In some of the countries overrun by their armies they were able to instal their Communist nominees in power straight away. Thus, in Poland the Russian sponsored Lublin Committee assumed power despite the existence of a constitutional Polish Government temporarily located in London. In Yugoslavia the Communist Tito displaced and executed the unfortunate Mikhailovitch. In countries where the constitutional elements were too strong to permit immediate seizure of power

they introduced teams of Russian trained Communists, many of whom had been recruited from prisoners of war. In Germany trained apostles of Communism went into action almost on the heels of the forward units.

### Post War Developments

As the firing died down the forces of psychological warfare came into full operation. All the old tricks of the Nazis were brought into play, and more besides. World events since the close of hostilities indicate that the present effort shows more evidence of long range planning, more skill and more ruthlessness than the Nazis ever displayed. One after another the countries of Eastern Europe have fallen victims to the psychological assault.

Present day activities follow the pattern set by the Nazis. For the immediate victim the line is intense agitation, intimidation and violence. For the more remote victims the policy is, on the one hand, persuasion and conversion, and on the other, undercover agitation and disruption. For the time being Australia is more concerned with long range activities. Against these activities it is the duty of every Australian soldier to protect his own morale, the morale of his unit and the morale of the Army as a whole.

Earlier in the discussion it was said that the great danger to be feared in long range psychological warfare lies in democratic toleration, the feeling of personal security and the desire to avoid arguments. We are all too prone to imagine that propaganda is confined to the activities of a few agitators, and to be misled by the poor showing of certain candidates at elections. Actually these open operations are, perhaps, the least dangerous of all. The real work of conversion is being accomplished by hidden, indirect means, by odd remarks, chance conversations, literature—the real purpose of which is cleverly concealed, study groups, documentary films. There is, literally, practically no limit to the means employed.

The Report of the Royal Commission which investigated subversive activities in Canada, brings to light some startling facts about the methods employed by a foreign power. One of the most striking is the disclosure that only a very few of the Canadians involved were, in the first instance at any rate, connected with a political party. They were nearly all well educated people. Some had achieved eminence in their professions. Even those who were actually engaged in espionage had been regarded as persons of responsibility and integrity. The care, ingenuity and forethought exercised in their "conditioning" by imperceptible stages reads like a chapter from a highly imaginative novel.

These things happened, only very recently, in a sturdy British community. It is sheer, fatuous vanity to suppose that they could not happen here. Defence against them demands eternal vigilance by every Australian soldier.

The first line of defence in the present stage of psychological warfare is not on the political platform, in the press, or on the radio. It is in the home, amongst one's friends and acquaintances. It lies in combating the chance remark, the odd twist to a conversation that seems to support the good intentions of our potential enemies. There is no need to be rude, but we should at least be firm. And, since it is not sufficient simply to deny our enemies' undoubted accomplishments in many fields, we must always be ready to contrast them with our own infinitely better ones.

It is always dangerous to underrate one's adversaries. How strong they are in the military sphere we do not know for certain. But their many recent successes have demonstrated all too clearly their capacity and strength in the realm of psychological warfare. Unless each individual makes it his personal business to combat these elements in his own sphere of activity, subversive influences will spread in this country as they have in so many others.

# Railways in Relation to Defence



Colonel J. G. N. Wilton, DSO

**ARMY** Training Memoranda 53 and 54 contained two very interesting articles on Railways in Relation to Defence by Lieutenant-Colonel D. O. Muller. In these articles it is stated that to enable the railways to fulfil their function in maintaining the defence potential of the country there are three main requirements, viz:—

- (a) The construction of certain new lines both for strategic and developmental purposes;
- (b) Standardization of gauges, rolling stock and equipment;
- (c) Modernization of equipment and practices.

Before accepting these requirements as being essential to maintain the defence potential we should remember that transportation is only one of many components which make up a balanced defence potential. Our total resources are limited and the allocation to railways should not be made without due regard to the requirements of other measures

essential to defence, otherwise the defence potential would become unbalanced.

It is therefore necessary to examine carefully the tasks which the railways might perform in war in order to assess their correct relationship to defence. These would vary greatly according to the strategical situation. If Australia was likely to be invaded then railways would be a vital factor in our plans for operations on the mainland as these would require the strategic movement, both interstate and intrastate, of troops and war materials. This is the situation envisaged by Lieutenant-Colonel Muller in the arguments in his articles "when he refers to strategic lines and "pack" trains, etc. Should this unfavourable situation occur there is no doubt that the fulfilment of the requirements stated by Lieutenant-Colonel Muller would be of great importance to defence.

On the other hand if Australia is not likely to be invaded the railways will not be required for the *strategic*

movement of troops and war material. The troops required for local defence against sea and air raids would be those raised locally. Troops for overseas service would, in most cases, be trained in the State in which raised and embarked for overseas from a port in the same State. War material produced in each State would also in most cases be exported from a port in the same State. It will be seen therefore, that, in this situation, the interstate movement of troops and war material would not be a large commitment and the disadvantage caused by the breaks of gauge would be acceptable from a military point of view.

Which of these two situations should we plan for? Our soundest strategy would be such as to ensure the defeat of an enemy before he establishes himself in a position from which he would be capable of attempting an invasion of Australia.

Under this strategic concept the war effort would be directed so as to achieve the following objects:—

- (a) Provision of armed forces.
- (b) Production of war material and supplies of all types to meet our own requirements and also to assist the UK and our likely allies.
- (c) Maintenance of a sound civil economy, which is essential to support the direct war effort.

Our defence potential should therefore be built up in peace with those objects in view and when war comes the aggregate national manpower and material resources should be allocated so as to produce the most effective and balanced war effort to implement a strategical plan for the defence of Australia.

From the above considerations it is evident that the standardization of railway gauges and equipment and construction of strategic railway lines cannot be accepted as being required primarily for defence purposes unless they are essential for the implementation of strategic plans for defence. Until we can see more clearly into the future it would be unsound to claim that this will be the case.

Resources available for allocation for defence, consistent with the requirements of a sound civil economy and the development of the nation should be applied to meet positive defence requirements such as the armed forces and the munitions, aircraft, naval shipbuilding and other industries required to equip and maintain them. Without these essentials the desired railway system would be of no defence value.

If, however, it can be shown that for economic and developmental reasons there is a sound case for standardization of railway gauges and equipment and construction of new lines, the case can be made even stronger by introducing the possible strategic requirement as a subsidiary reason.

There is undoubtedly a strong case for standardization of railways for economic and developmental reasons but consideration of these is beyond the scope of this article, except to state that, to build up her defence potential, Australia also needs, for example, an increased population, and additional power, fuel and water resources.

The requirements for these purposes should be considered when assessing the allocation of resources to railways in the nation's economy and developmental plans.

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# FIGHTING IN FORESTS

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Condensed from an article in the Infantry Bulletin  
United Kingdom

*Many Australian officers are conversant with the difficulties of conducting operations in the mountainous jungle terrain of New Guinea, but few have any experience of fighting in the forest areas of other countries. It is felt, therefore, that the following account of operations in the Reichswald Forest will be of general interest.—DMT.*

## Introduction

The following notes are produced as a result of conversations with Commanders and Staff Officers within 158 Infantry Brigade, of 53 (W.) Infantry Division. This Brigade fought its way almost entirely through the Reichswald Forest from the north-west to the south-east corners.

The Reichswald Forest is mainly coniferous with an inner belt of deciduous growth. Large patches have been cut clear with little or no attempt at replanting. These areas are covered with low scrub. Visibility varies from a few yards to two to three hundred in the cleared areas. Being a State forest it is intersected systematically in rectangles by numerous tracks and rides. These, being cut straight, gave visibility in many cases up to several hundred yards. Map reading was complicated by the fact that many tracks shown did not exist or were overgrown, new ones had been developed, and many of the clearings had been extended or new ones cut.

## Tactics

Experience gained by this Brigade in the Ardennes, followed by special training prior to this Reichswald Forest operation, proved the absolute essential of a Battalion advancing on a single axis, in other words, one company up. To attempt a wider front in forest fighting leads not only to loss of control by the Battalion Commander but probably to the actual loss, maybe for several hours, of sub-units and of vehicles. In forest fighting it is probably more necessary for a Battalion Commander to have a firm control of his sub-units than in any other type of operation. Wireless, within the Battalion, cannot be relied upon in this sort of country. Cable or runners must use existing tracks. If frequent laterals do not exist, a Battalion Commander, if he has deployed on two axes, must stay back at some track junction until another lateral has been cleared. If he does this he tends to become out of touch with his battle. By fighting on one axis only one main cable has to be laid, runners can quickly function without fear of being lost, the Battalion Commander can himself be right forward and he has his sub-unit under his hand.

Flank protection to the main axis is a difficult problem. When fighting through a forest to reach definite objectives, as opposed to clearing, certain risks must be accepted. If a Battalion Commander feels uneasy about a flank, the best method to deal with it has proved to be to detail one company to provide a



series of flank picquets on the North-West Frontier principles. These are seldom more than one hundred yards from the main axis.

Operating on the one axis, bounds given to the leading company are strictly limited and are usually at most some four to five hundred yards. Leap-frogging the next company through is then adopted. In this way the Battalion Commander retains a tight hold on his fighting sub-units.

Leading companies usually move two platoons up, one on each side of the axis. These platoons are deployed on a very narrow front, probably not exceeding fifty to sixty yards, the whole again being restricted in order to make certain of control.

There is a definite danger from enemy striking at the tail of a Battalion on one axis if this tail becomes too long. In an advance to seize definite objectives, as was the case in the Reichswald Forest, enemy will certainly be left unmopped-up on either flank. He will take every opportunity to attack the tail of a unit or attack the unit from the flank or rear when its objective has been seized. Every effort must be made therefore to prevent the Battalion straggling out along the axis, all-round watch must be maintained throughout, and all-round defence once the objective is reached must be stressed to an even greater degree than normally. The endeavour should be to have as tight a formation as possible when moving and a solid, compact defensive layout when halted.

It is essential to keep the enemy on the move, and contact once gained must not be lost. If he has a chance to stabilize himself he will be all the more difficult to dig out. As, in forest fighting, artillery support can seldom be used, this becomes all the more important. To effect this a Battalion Commander must be well forward in order to leap-frog his companies without delay. Risks must be taken in this respect even to the extent of pushing through the next company before the first is finally consolidated.

### Weapons

All sections were made up to two Stens for this operation. They proved invaluable.

The 3-in. mortar was largely man-carried on account of the indifferent tracks. During the advance the artillery could give little or no support so that the mortar, especially for smoke, proved its value many times.

The enemy opposition encountered usually consisted of some forty to fifty Infantry supported by one or more SP guns sited to shoot down the tracks. The Hun showed a definite respect for the PIAT. A hit on an SP gun usually damaged it, but, even if it did not it seldom stayed in that position to receive a second shot. The PIATs in one battalion anyway, are fought in pairs or threes. One shoots and the second observes the strike and if necessary sends in the second round. This saves any time lag whilst the first weapon is being reloaded. The carriage of ammunition presents a definite problem on a long advance such as during this operation. Twelve bombs per company was found to be all that could be taken. PIATs were also effectively used as mortars in some instances.

The Hun still will not face a determined man with the bayonet. On one occasion an SP gun supported by a company of Infantry was holding up the advance across a clearing in the Forest. The enemy were some two hundred yards away, maybe a little more. After all ordinary methods to shift him had failed, the company commander concerned led his whole company in a bayonet charge across the open ground. The enemy did not wait for it to arrive and a PIAT finished off the SP gun. There were five casualties only to our own troops.

One Battalion improvised a further rifle platoon which was placed under the Carrier Platoon Commander, the whole acting as a very useful two-platoon fire company. (The carriers themselves being used in the operation as "F" echelon

transport vehicles.) This improvisation was possible as the Battalion was well up to strength with reinforcements. NCOs and men were withdrawn from Rifle Companies to form it, and the necessary weapons were found from the WASP Section of the Carrier Platoon.

Artillery could seldom support the advance owing to lack of observation and danger to our own troops. Only when the situation stabilized on any particular objective was support possible, and it then proved invaluable for holding or breaking up enemy counter-attacks.

The Infantry were supported by tanks throughout. The difficulty of manoeuvre in face of SP guns sited to fire down the tracks, and the presence of some mines, inevitably cause casualties to tanks. But, particularly in view of the lack of possible artillery support, the presence of tanks is considered of great value. The morale effect on our own Infantry cannot be over estimated and for this reason tank casualties should be accepted. Communications between tank and Infantry still remains a problem. In this operation the No. 38 Set did not work. A system of Vercy light signals requires considerable preparation and tying up so that it is ensured that tank crews are on the look out for them. Any such system, however, makes changes of plan difficult to improvise rapidly. No. 26 Yellow smoke generators were used extensively in this operation to stop tank fire when necessary. In one Battalion all men in all sections carried one of these generators.

Searchlights proved of real value in this Forest fighting. In spite of the fact that lights were not in direct support of this Brigade, there was no unreasonable delay in passing demands. Messages were acted on usually in approximately half an hour.

#### Map Reading, Direction Finding and Message Writing

It was anticipated that map reading would be a difficult problem and probably

complicated by certain inevitable recent changes in the Forest due to fresh areas being cut, new tracks made to these areas, etc. To simplify this matter certain precautions were insisted upon before the operation started.

- (i) Brigade HQ issued a trace of the forest on a wide distribution, embodying a very large number of code names. For instance, every single forward track was given a name and every single lateral track a number. All clearings shown in the map and any other features on the map were also named.
- (ii) Battalions advanced on compass bearings, whether by night or day, and they maintained regular navigating parties throughout including pace checkers and the use of white tape knotted every 100 yards.

On account of the above precautions all movement worked smoothly and direction was accurately maintained. Message writing proved extremely simple and the inevitable delays produced by the use of MAPLAY and SLIDEX were almost entirely eliminated. Any variations between ground and map were quickly spotted, and there were many.

#### Communications

This presents probably the greatest difficulty to overcome both on the brigade and battalion levels, and to a very large extent controls tactics particularly within the battalion. This Brigade found it essential, in order adequately to control its battalions, to establish its HQ not more than 2,000 yards behind the leading battalions. At this range the wireless sets worked well. Battalions found the No. 18 set unsatisfactory in this type of country and regarded them as a pleasant bonus if they worked, but did not rely on them in their Signal plans.

# Reserve of Officers Training

Written for the Australian Army Journal by  
the Directorate of Military Training, AHQ

## Introduction

Prior to the last war practically no training was given to our reserve officers. Early in 1946 a limited training scheme was introduced with the primary object of maintaining the efficiency and interest of these officers pending the re-introduction of Citizen Military Force training.

This object having been achieved, a new and comprehensive scheme for reserve officer training has been approved, and will be implemented as soon as the necessary details have been finalized.

## Object of the Scheme

The object of the new scheme is to ensure that as many as possible of our reserve officers are kept up-to-date and trained in peace so that they will be available for the majority of the regimental and staff appointments which have to be filled on mobilization.

## Outline of the Scheme

The new scheme covers both regimental and staff postings and may be outlined briefly as follows:—

*Regimental Postings.*—Each CMF Unit will be authorized to select and train 30 per cent additional officers in the correct proportion of ranks as shown in the peace establishments. These additional officers will be authorized to attend and receive pay and allowances for 14 days camp and eight days home training a year.

*Staff Postings.*—Reserve officers will be selected and trained for as many as

possible of the appointments which, although not filled in peace, will be required on all the major headquarters on mobilization. Reserve officers selected for these appointments will be grouped according to the type of training required, and will receive CMF rates of pay and allowances for all training carried out up to a maximum of 14 days a year.

It will be appreciated that some reserve officers whose civil employment closely approximates their mobilization postings will not need the full 14 days training. These officers will be authorized to receive pay for a lesser number of days.

Wherever possible reserve officers will be allotted to fill a definite mobilization appointment.

Normally the training will be carried out as Home Training, but attendance at camps and schools, and tactical, administrative, etc., exercises will be approved where necessary.

## Training for Officers not Absorbed by the New Scheme

It is appreciated that the new scheme will not absorb all the available Reserve officers. Every effort will be made to provide some limited form of training for those officers, who, through insufficiency of vacancies or their inability to give the necessary time, are unable to participate to the extent outlined in the foregoing paragraphs.

This article is not an authority for beginning the scheme, as details have yet to be finalized and instructions issued.

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## ***An Army in Pursuit***

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# **EL ALAMEIN TO TRIPOLI**

Lieutenant Colonel Hugh M. Exton, Field Artillery Instructor  
Command and General Staff College, US Army

### **Introduction**

The best way to emphasize the principles or techniques employed in any tactical operation is by historical illustration. History is replete with examples of pursuits. Some were successful and some were not, and the results were usually due to the proper or improper application of the basic principles. These basic principles have not changed through the years. Only their application has changed with new developments in weapons and equipment which have produced such manoeuvres as amphibious or vertical envelopments, flanking naval gunfire, tremendous air bombardments, and very rapid movement of armoured forces.

One of the finest historical examples illustrating the principles of the pursuit is the advance of the British Eighth Army in 1942-43 from El Alamein to Tripoli.

By late June 1942, German Field Marshal Rommel's *Afrika Korps* had forced the withdrawal of the British Eighth Army to a position in the vicinity of El Alamein bounded on the south by the Qattara Depression and on the north by the Mediterranean Sea (see Map 1). The situation became generally

stabilized, with both armies being depleted and exhausted. During the month of August, the opposing forces prepared defensive positions and made strenuous efforts to build up strength in personnel, material and supplies. It was also at this time that General Sir Harold R. L. G. Alexander assumed command of the Middle East, and Lieutenant General Bernard L. Montgomery assumed command of the Eighth Army. These two commanders believed in offence rather than defence and immediately initiated plans for an attack which would completely end the Axis threat in Africa. It soon became apparent that Rommel could not build up strength as rapidly as could the British, and that if this unbalance continued for any length of time, he would have to withdraw or risk destruction. Hence his only alternative was to launch an offensive before the difference in the respective strengths became too great. The British, therefore, deliberately adopted a strategic defensive.

On 30 August, Rommel launched the anticipated attack. It came at the southern sector of the line where the British, after much analysis, had decided it would come. By using armoured units in mass and in defensive roles, avoiding anti-tank ambushes, the heavy

*From the Military Review, USA,  
April 1948.*

artillery and air bombardments of the enemy forces, the British forced the Axis troops to fight on ground of British choosing and they were repulsed with considerable losses. Thus, the last threat to Egypt was ended. The battle resulted in further increasing the British relative superiority in troops and material.

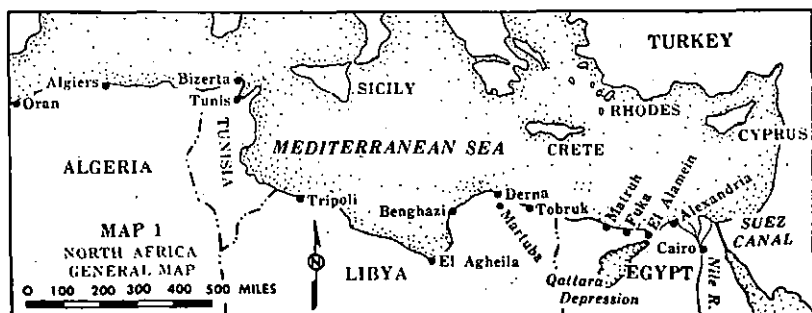
After this battle, the British continued the preparations for the coming offensive. Vitrally needed Sherman tanks were arriving from America. New six-pounder anti-tank guns were received and placed in the hands of the seasoned desert troops. The X Armoured Corps, consisting of the 1st and 10th Armoured Divisions, was assembled in rear areas and conducted extensive training exercises to make it ready to perform the role of the exploiting force. Throughout his army, General Montgomery emphasized three basic fundamentals: leadership, equipment, and training. The enthusiasm and anticipation of the Eighth Army increased hourly.

By mid-October it was obvious that the British offensive was imminent. The period of full moon was approaching. The British could now show a force of 177,000 men, 1,000 tanks, 900 artillery pieces, 1,500 anti-tank guns, and an air force capable of attacking with 700 bombers at one time, against an Axis strength of 93,000 men, 500 tanks, and 1,400 artillery and anti-tank pieces, and 700 planes dispersed in Africa, Sicily, Greece and Crete.

The Eighth Army was now ready to attack, and plans were completed not only for the attack, but also for a vigorous exploitation and pursuit to drive Rommel out of Africa.

General Montgomery tentatively chose the night of 23-24 October for the commencement of the attack. On 18 October, the Royal Air Force, which had been attacking the coastal road in the Axis rear and the port facilities as far back as Tobruk and Benghazi, suddenly intensified its efforts and directed them more on the enemy forward area. The air offensive concentrated on three objectives: (1) to force enemy aircraft to assume a defensive role; (2) to destroy supply and communication facilities; and (3) to break the morale of the Axis troops by keeping them awake and continuously harassed for three days. The attack was delayed until the RAF could give positive assurance that it held complete domination of the air. On 23 October this assurance was given and the attack was launched.

The battle line was as shown on Map 2. The British plan called for a penetration in the north sector by the XXX Corps with a secondary attack on the remainder of the position. The XXX Corps was to breach the enemy defences, after which the X Armoured Corps was to pass through the gap and commence the exploitation and pursuit.





### What is Pursuit?

Webster's Collegiate Dictionary defines "pursue" as "to follow with a view to overtake; chase"; and "pursuit" as the "act of pursuing". Technical Manual 20-205, *Dictionary of the United States Army Terms*, defines "pursuit" as "following a retreating enemy force and keeping it engaged for the purpose of destroying its combat power". Neither of these definitions is complete nor entirely clear. The latter definition implies a straight pushing back of an enemy force along its line of communications. This will not necessarily destroy an enemy's combat power. Field Manual 100-5, *Operations*, states that "the object of the pursuit is the annihilation of the hostile forces". It further states that "direct pressure against the retreating forces must be combined with an enveloping or encircling manoeuvre to place troops across the enemy's line of retreat". Thus, a more descriptive definition appears to be "following and cutting off a retreating enemy force in order to destroy it".

Now that a definition for the pursuit has been established, the next problem which arises is the determination of the principles of the pursuit. What are the factors applicable to the conduct of the

pursuit? These factors fall into four general categories as follows:—

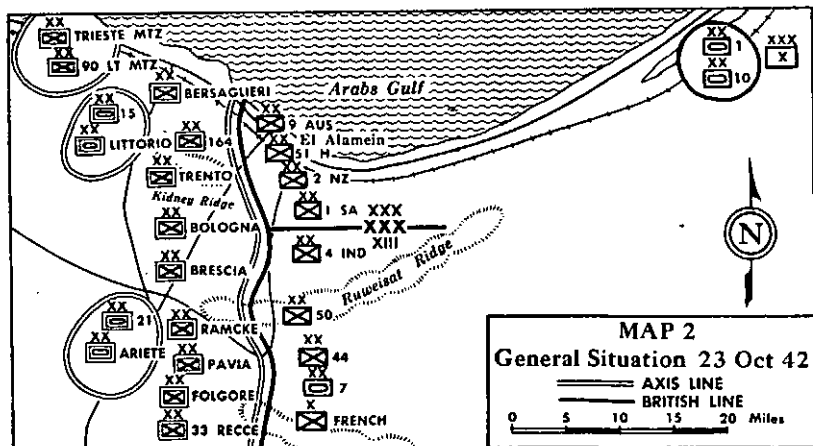
- (1) The conditions necessary prior to launching a pursuit.
- (2) The time to launch a pursuit.
- (3) The technique of the pursuit.
- (4) The conditions necessary in the conduct of the pursuit.

### Conditions Necessary Prior to Launching a Pursuit

The conditions which should be present prior to launching a pursuit are the following:—

- (1) Superiority of force, material and supply.
- (2) Air superiority.
- (3) A breakthrough or disintegration of the enemy defences.
- (4) Favourable weather.
- (5) Favourable terrain.

We have already noted how the British Eighth Army achieved superiority over the Axis forces, in men, material and supply. We have also seen how General Montgomery launched the attack at El Alamein only after he had received assurance from the RAF that air superiority had been attained. Thus is demonstrated compliance with the first and second conditions which



we have listed. Now let us examine the other three conditions as they were present in the British preparations for the pursuit of Rommel's forces.

The breakthrough was achieved on 2 November, 1942, and soon thereafter the exploiting force started passing through the gap. This force consisted of the X Armoured Corps followed by the 7th Armoured Division and the New Zealand Infantry Division (motorized) (see Map 3).

It has already been mentioned that the British attack was launched during the full moon period in order to take advantage of the light for night attacks. Equally important was the weather, as rain could have ruined the entire operation by reducing the mobility of the pursuing forces, slowing the follow-up of supplies, and hindering the vital air operations. Actually heavy rains set in on 6 November and continued for several days. The effect of this rain on both the retreating and pursuing forces along the coastal road was the same, but it completely immobilized the vehicles of the British encircling forces on the desert to the south. Similarly it seriously impaired the British air operations. Fuel and supplies failed to reach the forward units. It has been said that these rains saved the Axis forces from annihilation at that time, enabling them to escape to the west. This may indeed have been the case. The conditions of favourable weather is thus emphatically illustrated.

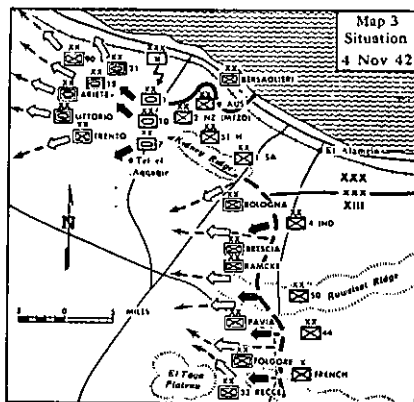
In selecting the location for his breakthrough General Montgomery was influenced more by the enemy dispositions than by terrain. As far as terrain was concerned, he could have chosen several places in the line between the sea on the north and the Qattara Depression on the south, as manoeuvre beyond the few ridges in the enemy defensive position was comparatively unhampered by terrain. Of course, it is obvious that terrain prevented an encircling manoeuvre to the south and dictated that the attack be a penetration. However, many times the selection of

the area of a breakthrough will be considerably influenced by the terrain in the rear of the enemy defences. This terrain should be such that the use of mobile forces, particularly armour, will be favoured. The exploiting forces must not be canalized or delayed by terrain features either at the time of commitment or later in the pursuit.

### The Time to Launch a Pursuit

Field Manual 100-5 states that "the pursuit is launched when the enemy is no longer able to maintain his position and endeavours to escape by retreat". Exactly when this phase of a battle is reached is often very difficult to determine, but there are certain indications which will enable the commander of the attacking forces to make his decision to launch the pursuit. Some of these indications are an increasing number of prisoners, the abandonment of material, abandoned dead, diminution of artillery fire, the cessation of counter-measures and reports of enemy withdrawal. Some military men condense these various indications down to one—when the soldier in the front line is able to stand up and move forward, the time has come to launch the pursuit.

It has been previously mentioned that the gap in the enemy position at El Alamein was made on 2 November. However, it was not yet clear, at this



time, that the enemy intended to abandon his positions, and that anything more than an exploitation of the breach was indicated. The necessary indications appeared on 3 November. A report by Lieutenant General Freyberg, the commander of the New Zealand Division dramatically illustrates these indications. "On going around the front, I saw a great change. Everything seemed to point to a general enemy withdrawal. Divisional cavalry found the enemy were moving back from the north of the salient . . . Many dug-in tanks had been destroyed and there was a considerable amount of equipment and many German dead in No Man's Land. In the early afternoon of 3 November, I saw the Army and Corps Commanders and said that there would be no more fighting. So certain was I that I drafted a cable to the New Zealand Government giving them early news of the battles we had fought". Also on 3 November, the Desert Air Force reported heavy traffic moving westward on the coast road. In view of the fact that the breakthrough had been made, and that the enemy was hastily withdrawing, General Montgomery made his decision to send his pursuing forces to drive westward to cut off the Axis retreat.

### **The Technique of the Pursuit**

Upon effecting the breakthrough of the enemy El Alamein defences, and upon receiving the reports of the hasty withdrawal of the Axis troops, General Montgomery ordered his pursuing force of the X Armoured Corps, the 7th Armoured Division and the motorized New Zealand Division to move rapidly to cut off the Axis retreat. He assigned the pursuing force the following missions:—

- (1) Cut off the retreating enemy.
- (2) Get astride the Axis supply route and disarrange its supply services.
- (3) Seize Axis airfields for subsequent use by the Royal Air Force.

### **(4) Effect the disintegration of the entire Axis forces.**

As initial objectives to accomplish these missions, part of the pursuing force was directed to cut the coast road at Fuka while the remainder was to advance across the desert to cut the road at Matruh. As previously mentioned, the heavy rains of 6-8 November prevented the accomplishment of cutting off the Axis forces at this time. After reaching Matruh, the pursuing force was directed to seize the Martuba airfields for use by the RAF and subsequently to cut off the enemy at Benghazi. In advancing on this latter objective, part of the spearhead troops used the coastal road and part cut across the desert directly on Benghazi. In these operations, the separate units were released from close centralized control and advanced as rapidly as they could at their own rates and on their own selected axis of advance. Thus we see the use of deep objectives, wide fronts, decentralized control and a continuous impetus to accomplish the mission of cutting off and destroying the enemy.

When the pursuit was launched, the XIII Corps was directed to send mobile columns to race westwards along the entire corps front to round up the demoralized Italian divisions which had been left by the Germans with little water or transportation. The XXX Corps followed the advance of the pursuing force. As the X Corps advanced rapidly westward to cut off the main enemy force, many small Axis units were left isolated by themselves. These troops were rounded up by the two following corps.

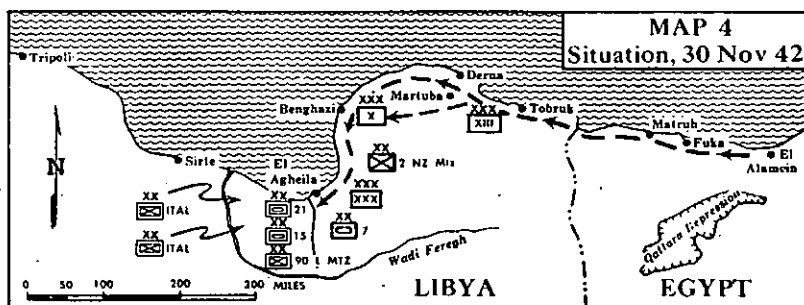
The Royal Air Force operated at maximum intensity, attacking enemy supply installations, air-fields, lines of communications and continually harassing the long columns of the retreating Axis combat forces. The purpose of these attacks was to disrupt the Axis retreat and to maintain air superiority. Also, the RAF provided air cover for the armoured spearheads of the Eighth

Army. Air-fields were moved forward as rapidly as possible in order to provide maximum support. It was for this reason that the pursuing force was given the mission of seizing air-fields. In addition, the Royal Navy operated along the coast on the flank of the retreating Axis forces, firing into their columns and on their supply installations.

Toward the end of November, the Axis forces had reached El Agheila (see Map 4). This area provided a very strong defensive position, bounded on the north by the sea and on the south by the Wadi Feregh, an extremely difficult obstacle to traverse. It had long been regarded as the position controlling the gateway to Cyrenaica. There, Rommel turned and commenced

troops could get behind them. The New Zealand Division made remarkable progress in its envelopment and did cut off the Axis rear guard. However, this rear guard split up into small units and was able to escape during the night. Although this manoeuvre failed to trap the Axis forces, it did turn the enemy out of his position. This operation effectively illustrates the maintaining of the momentum of the pursuit by the expeditious use of aggressive encircling manoeuvres in conjunction with direct pressure.

From the foregoing description of the pursuit by the Eighth Army from El Alamein to El Agheila, we can extract several principles, the proper application of which form the technique of the



to organize a defensive position. General Montgomery realized that he could not afford a battle in which the Eighth Army would suffer serious casualties, as this would sap his strength for continuing the pursuit. However, he also realized that here was an opportunity to capture or destroy the main Axis force. Thus, he planned a bold manoeuvre to accomplish this. A direct pressure force would attack along the coast while the New Zealand Division made a forced march across the desert around the supposedly impassable obstacle of the Wadi Feregh and came in on the Axis rear. Rommel, however, decided not to stand and fight, and withdrew the greater part of his force before the encircling British

pursuit. These are:—

- (1) Missions designed to destroy the enemy main force and prevent the reorganizing of his defences.
- (2) Decentralized control.
- (3) Objectives deep in enemy's rear.
- (4) Continued impetus of the pursuit night and day.
- (5) Operations on a broad front.
- (6) The by-passing of small centres of resistance and concentration on the destruction of the main enemy forces.
- (7) The use of every available means to press the pursuit.

### Conditions Necessary in the Conduct of the Pursuit

A pursuit is conducted with whatever means are available. However, there are certain conditions which are necessary to the successful accomplishment of a pursuit. These include the following:—

- (1) The use of forces as mobile as, and preferably more mobile than, those of the enemy.
- (2) Speed of advance.
- (3) Aggressiveness.
- (4) Adequate supply.

Whenever available, armoured units should form the nucleus of the pursuing forces. They possess the required mobility and fire power for effectively cutting off a retreating enemy. However, these armoured units should be closely supported by mobile infantry units for consolidating the gains made and protecting the armour from enemy anti-tank weapons. It has already been noted that General Montgomery, in planning his attack at El Alamein, foresaw the need for a mobile exploiting force. Thus he formed the X Armoured Corps. When the pursuit started, the motorized New Zealand Infantry Division was attached to the X Corps in order to provide the necessary close support. Throughout the entire pursuit from El Alamein to Tripoli, speed was the keynote. The only delays were caused by weather, lack of supplies, or periodic regrouping of units.

It must be realized that armoured forces and motorized units will not always be available, nor will the situation always be such that vehicles can be employed. Jungle and mountainous terrain may well prevent the use of vehicles. In such cases, the pursuit is conducted with foot troops. However, the use of speed is still of prime importance and the foot units must maintain relentless rates of advance. The successful culmination of a pursuit may be a large step toward eventual victory. Therefore, all troops

must be pushed forward to the limit of their endurance.

During the first week in January 1943, the leading elements of the British Eighth Army had advanced to within 200 miles of Tripoli, its next objective, when a storm wrecked the port of Benghazi, the Army's principal supply port. The only available port now was Tobruk, 250 miles farther to the east. There was not sufficient supply vehicles to supply the Eighth Army from Tobruk. Hence, at first glance it would appear that the only solution was for the Eighth Army to turn back in order to insure its supply. However, that would have ended the pursuit and given Rommel a chance to rehabilitate his forces, receive reinforcements, and re-establish the German position in Africa. General Montgomery estimated that it would take him ten days to reach Tripoli, the possession of which would assure his supply. He also estimated that, because of the demoralized state of the enemy, he could press the pursuit with only part of his army. He, therefore, "grounded" the other part, turned the vehicles over for supply purposes, and commenced to build up ten days' supplies. On 15 January, the attack was launched with a coastal thrust directly under the command of General Montgomery and a cross-desert outflanking operation by the 7th Armoured Division and the New Zealand Division under the XXX Corps Commander. Early on 23 January, eight days later, the leading elements of the Eighth Army entered Tripoli. General Montgomery's estimate of ten days was not far off.

This operation demonstrates the great importance of supply. With circumstances slightly different, the loss of the port of Benghazi might well have meant the end of the pursuit and might have led to a resumption of the "back-and-forth" campaigns of the preceding two years. The factor which overcame this lack of supply in this situation was General Montgomery's aggressiveness. In a sense, it was a gamble, but it was a considered gamble,



and no pursuit can be successful without taking a few chances in order that the pursuing force is always the aggressor. Of further interest is the fact that this operation illustrates several factors already discussed. These are the use of an encircling manoeuvre in conjunction with a direct pressure force, an advance on a broad front, decentralized control and speed.

### Conclusion

Now that we have reviewed the four general categories of factors applicable to the pursuit as classically demonstrated in the Eighth Army's advance to Tripoli, let us condense them into what can be termed the principles of the pursuit. In determining these principles,

it is well to look again at our definitions of pursuit. The principles should be those which most effectively contribute to the *following*, *cutting off*, and *destroying* the enemy. With this in mind, the following emerge as the principles of the pursuit:—

- (1) Aggressiveness.
- (2) Speed by use of mobile forces, broad fronts and decentralized control.
- (3) Continual concentration on the destruction of the main enemy force.
- (4) Relentless maintenance of forward momentum night and day, using all available means.

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### Andre Maurois on Leadership

Andre Maurois, the eminent French writer and philosopher, served for six years on full time duty with the French national services before the first World War, and with the French Army throughout that conflict. In his autobiography, "Call No Man Happy", he gives some sound advice on leadership as applied to Frenchmen.

Maurois would appear to be an assured success with the Australian soldier if he practised what he wrote. Of his fellow countrymen he said—

"They were always ready to sacrifice their lives provided someone took the trouble to tell them why. A Frenchman has to understand. During manoeuvres I had been able to do with my men what I liked because I had treated them as intelligent, free, human beings. The Frenchman asks nothing better than to work if the task seems to him worth while; if he gets the feeling that he's wasting time he becomes embittered. In short, a Frenchman has a need of justice; promises must be kept and offences must be judged fairly. Such were the lessons I learnt in the army."

## THE LOYAL TOAST

GREAT institutions of long standing seldom divest themselves completely of their early forms and ceremonies. Of those that survive the process of evolution some are but symbols of functions or practices long since dead, while some remain of practical value in present day affairs. Some of the Army's existing customs are survivals of long ago, and their historical background is little understood by the present generation of soldiers. The purpose of this article is to list some of our military customs, and to explain their origin and significance in the hope that they will be of use to those on whom falls the duty of instructing the uninitiated.

### The Loyal Toast

The ceremony of drinking the Sovereign's health in officers' and sergeants' messes perpetuates a custom which has its roots in the dim past when the early Greeks and Romans poured out their libations to the gods and drank to them. Wassailing, a "health drinking", flourished among the Saxons, the king being toasted with "Be of good health, Lord King".

Drinking the sovereign's health at mess does not appear to have become an accepted British Army custom until about the middle of the eighteenth century. In those days a pledge of loyalty in wine was a pledge from which no gentleman could honourably withdraw. It seems to be generally agreed that after the Jacobite rising of 1745, when the loyalty of many regiments was at least doubtful, the authorities directed that officers should pledge their loyalty to the King by drinking his health at dinner. To

refuse, of course, was to declare one's rebellious intentions, whilst compliance was tantamount to an oath of personal loyalty. It is said that officers with Jacobite sympathies overcame the difficulty by passing their glasses over the finger bowls as an indication that they drank to "the King over the water", the pretender to the throne being at that time an exile in France.

Apparently some regiments, whose loyalty was considered to be beyond question, were excepted from the order. In proud remembrance of the honour thus conferred these regiments never drink the sovereign's health at mess.

In the Navy the sovereign's health is honoured sitting down. This custom has its origin in an accident that befell the Prince of Wales when dining aboard one of the old cramped, wooden warships. When the loyal toast was announced the Prince, who was very tall, leapt smartly to his feet, and nearly brained himself on the low ceiling. The King, doubtless out of consideration for other tall sailors, forthwith ordered the Navy to drink his health sitting down.

### Military Ranks

The nomenclature of military ranks has always been puzzling. Why, for instance, should a Lieutenant-General be senior to a Major-General; whereas a Lieutenant is junior to a Major. The riddle is solved if we go back to the sixteenth century. In 1557 a British Army was on service in France, and its records show that the officers by rank were:—

Captain-General—The Commander-in-Chief.

Lieutenant-General—The Second-in-Command or assistant to the C-in-C. (The word lieutenant means assistant.)

High Marischall—A sort of Quarter-master-General.

Sergeant-Major-General—The Chief Staff Officer.

Colonel—Commander of a Regiment.

Lieutenant-Colonel—Assistant to the Colonel.

Sergeant-Major—A sort of adjutant.

Captain—Commander of a company.

Lieutenant—Assistant to the Captain.

Ensign—The officer who carried the standard.

Leave out the "Captain" from "Captain-General" and the "Sergeant" from "Sergeant-Major-General" and "Sergeant-Major" and we have our modern ranks exactly. The Sergeant-Major was originally a commissioned officer; the word "Sergeant" was dropped and he became "Major". Later, when it was desired to distinguish the senior sergeant the word "Major" was added, and he became "Sergeant-Major".

Until Napoleonic times Major-General appears to have remained an appointment rather than a rank in some continental armies. Thus Marshal Berthier was Napoleon's Chief-of-Staff during the Moscow campaign with the title of "Major-General of the Army".

The British Marshalate traces its origin to the French "Mayors of the Palace" of the seventh century. Henry I of England (1100-1135) created Gilbert de Clare, Earl of Pembroke, "Marshal of the Kingdom", which appears to be the earliest appointment of this type. Richard II (1154-1189) appointed the Duke of Norfolk, "Lord Marshal of the Army", and successive sovereigns made similar appointments until the seventeenth

century when Captain-General became the highest military rank. Even the great Duke of Marlborough was not a British Field-Marshal, although he held the rank of First Field-Marshal-General in the Dutch Army.

The first British Field-Marshal was the Earl of Orkney, who was appointed on 12 January, 1736. Since that time there has been an establishment for the rank.

### Military Bands

The military band seems to have originated in the days when the feudal Barons went to war in considerable comfort. They took the field with the full retinue of their retainers, including the minstrels, to help pass the time away when not engaged in battle. During the Crusades they copied from the Saracens the practice of grouping the minstrels around the standard, and having them play their hardest while the fight was on. The standard was, of course, the rallying point, but was liable to become obscured in the dust of battle. However, so long as the troops could hear the music they knew that all was well. Performers on wind instruments must have had a hard time in a prolonged conflict.

Although the drum is probably the most ancient instrument of martial music, its use in modern times may be traced to the *Landnechts*, who achieved military fame in South Germany in the sixteenth century. The *Landnechts* were very proud of their drums, and the variety of rolls which they played on them. The drum beat with which our present marches start is exactly the same as that used by the *Landnechts*, i.e., a roll on the first two beats of the bar, a single note on the third and silence on the fourth.

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# A HISTORY OF RADAR

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Written for the Australian Army Journal by  
the Directorate of Royal Artillery, AHQ

## Introduction

The previous articles of this series have outlined the principles of radar and its application to gunnery problems in the Army.

This, the last article, will briefly describe the beginning of radar and tell of the important jobs done by radar during the recent war. The story will not be told in strict chronological order—rather, the stages of development in each particular application will be discussed.

## Early Discoveries

In 1886 Heindrich Hertz, who had discovered radio waves earlier, showed that these radio waves were reflected by solid objects. In 1904 a German engineer was granted a patent on a proposed method of using this property in an obstacle detector and navigational aid for ships.

The principle of pulse ranging, which is employed in modern radar, was first used in 1925 to measure the distance to the ionosphere, the radio-reflecting layer near the top of the earth's atmosphere. The technique consisted of transmitting a series of very short pulses of radio energy, and measuring the time required for a given pulse to travel from the earth to the reflecting layer and return.

The idea of using this pulse transmission for the detection of aircraft and vessels was conceived by more than

one person, and work commenced independently in several countries. Practical problems such as increased power, shorter pulses and directional aerial systems had to be solved.

## British Radar Development

The British Air Ministry set up a committee for the Scientific Survey of Air Defence in 1934-35. The chairman was Sir Henry Tizard, and one of the suggestions his committee received was a carefully worked out plan for the detection of aircraft by a pulse-ranging method. This was submitted by a scientist, now Sir Robert Watson-Watt.

The plan envisaged a coastal chain of "radio-location" stations, facing out over the English Channel whence it was anticipated a threat of aerial attack would eventuate. The first experimental system was set up in April 1935 on a small island off the east coast. The system proved a success, and in 1936 work commenced toward installing the British Home Chain of early warning stations. The Thames Estuary was given first priority. By March, 1938, a chain of five stations, about 25 miles apart, had been completed and was operating under RAF control. These first stations were the nucleus of the great chain which eventually circled Great Britain.

With the Home Chain being installed, effort was directed to equipments suitable for mounting in aircraft. Two types were envisaged; one to detect surface

vessels, and the other to detect aircraft from night fighters.

The first equipment was developed first and was known as ASV—Air to Surface Vessels. An experimental system was successfully demonstrated during Home Fleet manoeuvres in September 1938.

The other equipment was called AI—Aircraft Interception. The experimental model was in operation by June 1939, and was demonstrated to Fighter Command in August of that year. The Air Ministry asked for 30 equipments to be installed in aircraft in 30 days. This requirement was met, and four equipments had been fitted by the day war was declared.

This emphasis on airborne radar equipments produced a requirement for smaller and lighter components. In particular, the aerial system had to be small, and still be effective in forming narrow beams, at high power. The earlier equipments operated on a radio-wave length of 1.5 metres, and an efficient aerial system at this wavelength was a bulky unit.

With the co-operation of British industry, the University of Birmingham developed the cavity magnetron, a generator of high-power microwaves—radio waves of wavelengths less than about 10 centimetres. (Magnetron is the general name given to a vacuum tube which must operate in a magnetic field. It consists of a number of cavities formed in the metal body of the tube.)

The magnetron, with other developments, led to an enormous widening in the applications of "radio-location" which took place in 1940.

In this year, Britain and America combined the efforts of their research laboratories, and mutual disclosures of accomplishments were made. One thing which Britain received in return for the magnetron was the term "radar" (coined by the US Navy) although it was not officially adopted in Britain till 1943, when the older term "radio-location" was dropped.

## Radar and Air Defence

In August 1940, when the Luftwaffe began the air assault on Great Britain, radar received its first great test.

The story of how the RAF, despite a critical shortage of fighter planes and pilots, was able to counter each raid is well known. The defensive radar chain, begun four years before, removed the necessity for constant fighter patrols. In fact not only did it give better warning than fighter patrols could ever hope to provide, but at the same time it also enabled the RAF to use its numerically inferior forces economically and with the maximum effect.

When the German air force abandoned day raids for night attacks a heavier burden still was placed by the defenders on radar. During daylight it was sufficient for the fighters to be directed to within the general vicinity of the incoming bomber stream. At night however, the target had either to be illuminated by searchlights or the fighter directed close enough for the pilot to see the silhouettes of the enemy planes against the night sky. The means used to bring the fighter pilot within visual distance of the enemy was a new technique called GCI (ground controlled interception) which was employed in conjunction with AI.

The GCI equipment was a special set which showed the air situation on a PPI tube. The fighter controller watching this PPI, gave detailed course instructions (vectors) to the fighters under his control. The object was to bring the fighter into a position from where the AI set in the plane could pick up the target, the best position being one to three miles behind the target, just below, and on the same course. When the AI operator in the fighter picked up the target on the screen he directed the pilot until the enemy plane could be seen. The pilot then completed the attack.

This technique of night interception demanded a high degree of efficiency,

ability and teamwork on the part of the controller and both members of the fighter crew. In spite of this however it was highly successful and as many as six kills in one night for a controller and his fighters were quite common.

One other device was necessary for radar to work efficiently in the air defence system. This was known as IFF (Identification Friend or Foe) which as its name implies enabled the echoes on a radar screen to be distinguished as friendly or hostile. Without IFF, control during the day would have been much more difficult and the GCI—AI system would have been unworkable at night.

A number of improvements to radar used in the air defence system gave increased accuracy and efficiency, but the system of air warning and control of interception remained basically the same throughout the war.

There were two weaknesses in the early radar air warning sets which the Germans failed to exploit. One was the great aerial array which marked each radar site as an unmistakable target. The other was the inability to give adequate warning on low flying planes. If the Luftwaffe had made determined attacks on the radar sites or if they had made low approaches, the result of the Battle for Britain may have been different. Later when shorter wavelength equipments were developed these two disadvantages were removed and the warning system became so efficient that, until the advent of the V2 rocket, no enemy plane could approach without being detected.

### **Radar Against the U-Boat**

More than in any other phase of the European war, the war against the U-boat was a technical conflict with new devices and techniques being developed on each side to counter those made by the other. Although radar was only one of the many devices engaged in the battle it played a vital role against the submarine.

As has already been seen, ASV radar was being designed before the war started. This early equipment for the detection of submarines or other vessels on the surface was first used at the beginning of 1941 and was immediately effective.

Very soon it became apparent to the Germans that attacks on U-boats were too frequent to be the result of purely visual sightings. They suspected radar and in the spring of 1942 they captured an ASV equipment. As a counter they installed a receiver in the U-boats, which could pick up the ASV signals. In this way the U-boats for a time were able to submerge before the approaching aircraft could attack.

The Allies soon realized the reason for the falling off of radar sightings and were fortunate that they had the answer already developed. The magnetron enabled the ASV radar to be used on the microwave band. This of course could not be picked up by the receiver in the U-boat and the Allies again had the upper hand by the spring of 1943.

The introduction of microwave ASV into the battle had a phenomenal result. The U-boat captains had been lulled into a great sense of security by the listening receiver and so they surfaced with every confidence. The result was that in May, June and July of 1943, nearly 100 confirmed submarine kills were made, two thirds of them by aircraft.

Now began a hunt by the Germans to find the cause of the sudden change of fortune. Modifications to the receiver were made, tests with anti infra-red paint carried out and many other counters were tried—all without result. In 1944, two scientific expeditions put to sea with civilian experts, and the most complete and up-to-date German apparatus was on board. One lasted 13 days, the other only nine.

It was not until near the end of 1944 that the Germans produced the answer. This was the air tube called Schnorkel which enabled a U-boat to breathe and

run its Diesels while still remaining submerged.

What the answer to this would have been is not known as the war finished before the effect of it had been felt and there was no need for any counter to be put into operation.

Besides ASV, another type of radar also played a major role in the U-boat battle. This was ship-borne radar. While under water sound gear could detect submerged U-boats, radar could detect any submarine which surfaced at night or in foggy weather near the convoy.

Search radar also played its part by enabling the escort commander to keep a 24 hour watch on the convoy. An escort was quickly despatched to guard a straggler until it could be brought back into line. By this means the U-boats were deprived of one of their easiest targets.

In the last year of the war, the U-boats were being sunk at the rate of nearly one a day. That the war in Europe was won as early as it was is due largely to the failure of the U-boats to stop supplies reaching Great Britain. That they failed can be attributed in large part to radar.

### The Strategic Air Offensive

Bombing by purely visual means was not a true strategical weapon because strong defences forced a large proportion of the attacks to be made at night, and also poor weather conditions very often prevented this type of attack. To overcome these disadvantages some means had to be found to enable bombing to be effective no matter what the weather conditions.

In the Battle of Britain the Germans used a method very similar to the normal peace-time navigational aids. Later they also developed marker flare and bomber leader techniques, but these were never fully tried before the RAF put an end to Nazi raids.

When the RAF started its strategic air offensive it was decided that night bombing would be economical and effective provided every aircraft had good aids to navigation and each formation was led by a Pathfinder aircraft fitted with special target location apparatus. Radar was used once again to provide the means.

As a navigational aid, a new system working on the radar principle was installed in all Bomber Command aircraft. This could be relied upon to get the main force in the vicinity of the target.

For target location one method used was a refinement of the pulse navigational system which guided the leaders on to the target and indicated the moment of bomb release. These leaders dropped flares by which the main force was able to bomb the target. This system was used to devastate the Ruhr in 1942 and was very accurate. However, as it depended on a beam from Britain its range was limited and could not be relied upon beyond the Ruhr.

To bomb Berlin and other targets well into Germany an adaption of microwave ASV was found to provide the solution. The discrimination of this radar enabled the operator to pick up shore lines, mountains, rivers, cities and lakes. This equipment known as BTO (for bombing through overcast), was used for both navigation and target location during 1942-43. Its accuracy, however, was found to be less than required, and a similar equipment on a much shorter wave length was developed and put into operation for the first time in November 1943.

Although this new BTO equipment proved to be reasonably accurate, visual bombing was still the better method. A technique therefore was worked out whereby the BTO was used to bring the plane to the target but the method of bombing was decided at the latest possible moment—the bombsight following radar data in case the target became visible.

Radar played another part in the strategic air offensive. This was assisting in the control of escort fighters. In long range bombing operations relays of long range fighters had to be used to escort the bombers. Since these fighters carried a pilot only, navigation over long distances was a major problem.

The type of radar used in this role was a ground radar originally intended for air warning. The escorts were followed on the screen and a controller directed them from their base to the bomber formation and back again. The range of these sets was limited to approximately 200 miles, but even so the burden on the fighter pilots was halved if they had to go further than the range of the set. If a fighter became lost, provided the pilot was able to fly into range of the set, the controller was able to guide the plane to its base.

### Radar in Naval Warfare

The use of radar in the war against U-boats and convoy control has already been mentioned. These however are only two of the many roles in which radar was used in naval warfare.

Soon after radar was first developed it became apparent that the ways in which it could be employed by the Navy were numerous. Air warning, surface cover, gunnery control and fighter direction were some of the many roles in which the Navy, like the Army and Air Force, could use this new device.

There was one factor, however, which seriously limited the radar which could be used on a ship in the first years of the last war. This factor was the size and weight of the aerial system. In a ship any additional structure placed above the centre of gravity must be counter-balanced by a weight below this point. The counter-balance required depends on a number of factors but it is sufficient to say a radar aerial which must be placed as high as possible, needs to be balanced by approximately ten times its weight at the keel of the ship. Needless to say, before the introduction

of magnetrons enabled microwaves and so smaller aeriels to be used, shipborne radar had of necessity to be limited to the absolute minimum because of the large aerial arrays required. Search radar was given priority and most ships only had this type of equipment throughout the years 1940 and 1941 when the Royal Navy was trying to keep the Mediterranean life-line open.

With the introduction of microwave technique, however, shipborne radar could be employed in the numerous roles previously denied it. All ships, even the small corvettes, carried a number of sets each used for a different purpose. Air and sea-search and gunnery control equipments were common to most ships, but some equipments were peculiar to certain types of ships. For instance on an aircraft carrier, fighter direction and aircraft control were two important functions carried out. The ways in which radar was used in naval warfare are too numerous to mention here; many of them being still bound in secrecy. It is sufficient to say, however, that their lead in radar technique gave the Allied Navies an advantage which the Axis powers were not able to offset in any way, and which hastened the end of the war as well as making naval and combined operations less costly.

### Post War Radar

Towards the end of the war, when the story of radar was first made public there was a great deal of uninformed speculation about its employment in peace. There are, however, many peaceful applications for radar, some of which had already been developed and put into use before the war ended.

One of the more important ones is Loran (for long range navigation), which makes air and sea navigation continuous and almost fool proof. This device consists of a series of ground stations spaced at intervals over any required area. These stations transmit on a wave length not very different from those used for long range radio



communications so that reception is unaffected by the curvature of the earth. A ship or aircraft, from the signals received, can find its position as accurately as by celestial fixes.

It is hoped to improve and expand this system so that ships and aircraft can obtain fixes anywhere at any time no matter what the weather conditions.

Other ways in which radar can be used will be obvious from what already has been said. Some of these are traffic control at airfields and harbours; tracking of rain clouds to give an accurate forecast of meteorological conditions over a given area; radar altimeters for aircraft and ship-borne radar for pilotage in darkness and fog.

As time goes on and research brings forward new techniques, radar will be applied in more ways than it is at present possible.

Great as the benefits of the direct application of radar have been, however, by far the biggest influence radar has

had since the war is indirect. Many of the components used in radar equipment are identical with those of radio and television sets, hearing aids and other electronic devices, and the tremendous improvement of these components during the war has given the whole electronic field a new horizon. The great strides which television has made in the last few years can be attributed almost solely to influence of radar.

As it has been with television, so it will be with other electronic devices such as radio communications, and it is to be expected that new applications will be found which will cover a wide variety of fields.

The effects that radar has had on the civilized world have been enormous, and yet only 13 years have passed since the first set was built. What the future will bring forth is a matter for conjecture, but there is no doubt that the techniques developed during the war will have profound and far-reaching effects on our daily lives.

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**"The true leader will dominate the events that surround him; once he lets events get the better of him he ceases to be of value as a leader".**

*— Field Marshal Montgomery.*

# DEVELOPMENT OF "B" VEHICLES

Captain G. E. Johnson  
Directorate of Mechanization, AHQ

VERY little progress was made in the period between World War I and World War II to mechanize the transport of the Australian Armed Services, and the horse still played a major part at the outbreak of the second World War. At September, 1939, the Army had only 363 vehicles, mainly commercial type cars, utility trucks, and 30 cwt. and 3-ton lorries, and very little knowledge had been built up of the use of mechanized transport for military operations.

In addition to the vehicles needed for the equipment of units in Australia, the AIF required 9,000 vehicles. There were three sources of supply to meet these requirements:—

- (i) Stocks of new vehicles held in Australia.
- (ii) Impressionment of second-hand vehicles.
- (iii) Importation from overseas.

All three sources were tapped, and by September, 1940, 40,000 vehicles, including approximately 10,000 from new stocks, 2,000 second-hand vehicles and 5,000 impressed motor cycles were obtained.

The majority of these were commercial pattern vehicles driving on one axle only, and it was not until early 1942 that the Canadian War Department models began to arrive in Australia. These were known as WD Trucks 4 x 4, being designed and manufactured in Canada for improved cross-country performance and to withstand the rough usage of service conditions.

## Development in Australia

In 1937 the Army commenced designing bodies for special vehicles for certain Arms of the Service. These bodies were produced in relatively small numbers and were fitted to commercial type chassis. It soon became apparent from user experience that the commercial type vehicle was not ideal for military operations, especially where good cross-country performance was called for.

In 1942 the Army commenced design of bodies for the WD chassis then arriving in the country. In all, 98% of the bodies for WD vehicles were designed and built in Australia, this policy being governed by the fact that a chassis occupies only one sixth of the shipping space required for a complete

vehicle. Throughout the 1939-45 war, 238 different body types were accepted and introduced into the Service. Many more designs were produced but for various reasons were not accepted for general use.

By 1942 American military type vehicles began to arrive in Australia; these were basically the now familiar Jeep and the 2½-ton 6 x 6 truck. Both of these vehicles proved invaluable for tropical areas and cross-country operations, the 2½-ton truck having distinct advantages over the equivalent WD type due mainly to its 6-wheeled drive.

Australia will continue to use stocks of WD and American type vehicles similar to those used during the last war, but these will probably be replaced later by new types, depending on availability and finance.

Some developmental and experimental work will continue in this country, but Australia must rely, for the time being at least, mainly on development undertaken overseas.

### Future Trends

The future trends in the design of "B" vehicles are influenced by experience gained in the 1939-45 war. Basic requirements are:—

- (a) Maximum tractive effort to be distributed over as many wheels as possible.

- (b) Even distribution of load on all wheels
- (c) Low unit ground pressure
- (d) Adequate ground clearance
- (e) Low centre of gravity.

*Chassis.*—A reduction in the number of basic types of chassis can be expected. Owing to the success of the 6 x 6 vehicle, the present trend is for medium and heavy vehicles to be of this type. The lighter vehicles such as cars and utilities will be of the 4 x 4 type. Some extremely large vehicles and trailer combinations up to the limit of bridging capacities can be expected.

*Body Design.*—Vehicle bodies will consist of a limited number of basic designs. These will be capable of adaptation into special types by the attachment of kits and special fittings.

*Engines.*—Engines will be of a very few basic types with interchangeable component parts, built in varying horsepower ranges from approximately 85 HP for a Staff Car up to 350 HP, being a considerable increase of power over the engines at present used.

*Standardization.*—A major problem of the recent war was the colossal quantity of spare parts required for the repair and maintenance of the wide variety of vehicle makes and types in use. Every reduction in the number of different chassis, engine and body types will result in a corresponding increase in overall efficiency and economy.



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## THE INDIAN SUB-CONTINENT

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Written for the Australian Army Journal by  
the Directorate of Military Intelligence, AHQ

THE Indian sub-continent, which for the past 150 years, has been a British possession, is now divided into two independent Dominions, namely — India and Pakistan.

Pakistan, the Moslem-majority Dominion, occupies two areas in the sub-continent, one in the West comprising Sind, Baluchistan, the North-west Frontier Province and Western Punjab, while in the East the Dominion controls part of Bengal and Assam.

Within the borders of both Dominions are a number of Princely States. Although these States were, by treaty or usage, autonomous as regards their domestic affairs, they accepted the control of the Crown and its handling of their foreign affairs. With the advent of the new Dominions they were left to decide their own future.

### Geography

The Indian sub-continent, separated from the remainder of Asia by the great Himalaya Range, is a vast triangle projecting southwards into the Indian Ocean. It has a total land area of 1,537,286 square miles. The countries

bordering the northern frontiers are Persia, Afghanistan, Sinkiang, Tibet, Nepal, Bhutan and Burma.

Only the southern half of the sub-continent lies in the tropics, but because of the sheltering wall of mountains in the north, most of the country is tropical in character. This and many other climatic disadvantages are traceable in part to the presence of the sheltering mountain wall which is 1,500 miles long, 150 miles wide and averages 20,000 feet in height.

### Population

The population of the sub-continent numbers 339 millions, of whom only 12 per cent are literate in any language. With the exception of approximately 15 millions who are domiciled in the few remaining independent Princely States, the remainder of the total population is divided into two groups. 100 million live in Pakistan and those Princely States that have acceded to her, and the remaining 274 million are in the Union of India and those Princely States that have acceded to that Dominion.

The chief concentration of the population lies in the valley of the

Ganges (United Provinces and Bengal) and in the drainage system of the Upper Indus (the Punjab). The tip of the peninsula (Madras) is also heavily populated, as are the plains which border the east and west coasts. There are 562 Princely States on the sub-continent, with a total of 93 million subjects. The population of each State varies from a few hundred to a million or more, the largest being Hyderabad with a population of over sixteen millions. Muslims, who number 94 millions, are mainly concentrated in the north-west. Hindus, who number 255 millions, occupy the remainder of India, although a sprinkling of Muslims can be found in most parts of the country.

There are more than 100 languages spoken on the Indian sub-continent, the main one being Hindustani (which includes Urdu and Hindi). This language is used by 100 millions and Urdu is the official language of both Armies. English is spoken by a considerable number of the population, the reason for this being that English is taught in the lower schools, and in most parts of the country is the medium of instruction in high schools and colleges. Other significant languages, used generally on a regional basis, are Bengali, Marathi, Tamil, Telugu, Gujarati, Punjabi, Sinhi, Kanarese, Malayam, Oriya and Pushtu.

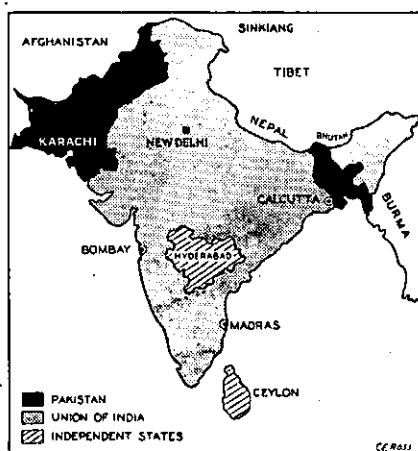
Religion is the basis of life in India. Hinduism, which practices the caste system, is followed by all Hindus. 'Islam' is the Moslem faith of Pakistan. There are numerous other religions and sects, including Sikhism, Parsis, Christianity and Buddhism.

### Resources

The Indian sub-continent is primarily agricultural, but in the last 50 years large and important developments have been made in industry, due primarily to the use of British capital. The extent of this development can be gauged by the fact that during the recent war India produced practically all of its army material requirements in addition to

supplying certain types of equipment to other members of the British Empire. The country possesses important deposits of coal and iron, while the chief auxiliary minerals are mica, manganese and bauxite. Large deposits of monaxite, used in atomic research, are contained in the beach sands of Travancore. The sub-continent is the world's largest producer of sugar cane, jute, shellac, hides and skins, and the second largest producer of cotton, tea and rice. Wheat, barley, maize, ground nuts, vegetable oil seed and tobacco are crops grown in large quantities. The petroleum production is not large but the oil is of good quality and strategically well situated. The Indian sub-continent has more head of livestock than any other country in the world—over 300 million—and of this number 170 million are cattle. It is estimated that half of India's bovine population are surplus and uneconomical because to the Hindu a cow is sacred and must not be killed.

Pakistan's already precarious economic position is aggravated by the great distance which separates the two parts of the Dominion. In normal times transport between East and West Pakistan must prove a costly business. Should difference of opinion occur between Pakistan and India the overland route would be closed, and the long sea



journey around the Indian sub-continent might well prove beyond the means of Pakistan in face of Indian opposition.

Whether or not Pakistan will overcome her economic difficulties is a crucial problem which the world will watch with interest, and may well be a profound influence in the future state of peace on the sub-continent.

### History

The history of the Indian sub-continent is a story of incessant invasion and the rise and fall of great kingdoms. The original inhabitants, the Dravidians, could not withstand the onslaught of their invaders. The Aryans in 1500 BC, Alexander the Great in 327 BC and the Moslem hordes from the 8th century to 1707, all contributed their share to the bewildering mixture of peoples, cults, languages and religions which exist there today.

The British were the last foreigners to control the sub-continent and the Charter of the East India Company was granted by Queen Elizabeth in 1600. This company in 1833 became the authority responsible to the British Parliament for the administration of the Indian sub-continent. The Indian Mutiny of 1857 led to the eventual transfer of power to the Crown in 1877. Although the British were the last foreigners to control the sub-continent, both France and Portugal were represented in the early struggle for power. Remaining French possessions consist of four small states, Yanam, Pondicherry and Karikal on the east coast and Mahe on the west, totalling 170 square miles. The Portuguese have Goa, Daman and Diu Island on the west coast totalling 1,100 square miles.

From 1861 the Indian element in the Administration increased, and in 1880 the National Congress Party was formed. The long felt Moslem fear of Hindu domination resulted in the formation of the All India Moslem League in 1906. The British Government in 1917 stated its aim to be a responsible Indian

Government as an integral part of the Empire. The Government of India Act of 1935 provided for the creation of an All-India Federation consisting of the eleven British Indian Provinces. Provision was also made for the admittance of any of the Princely States who were prepared to voluntarily enter the Federation.

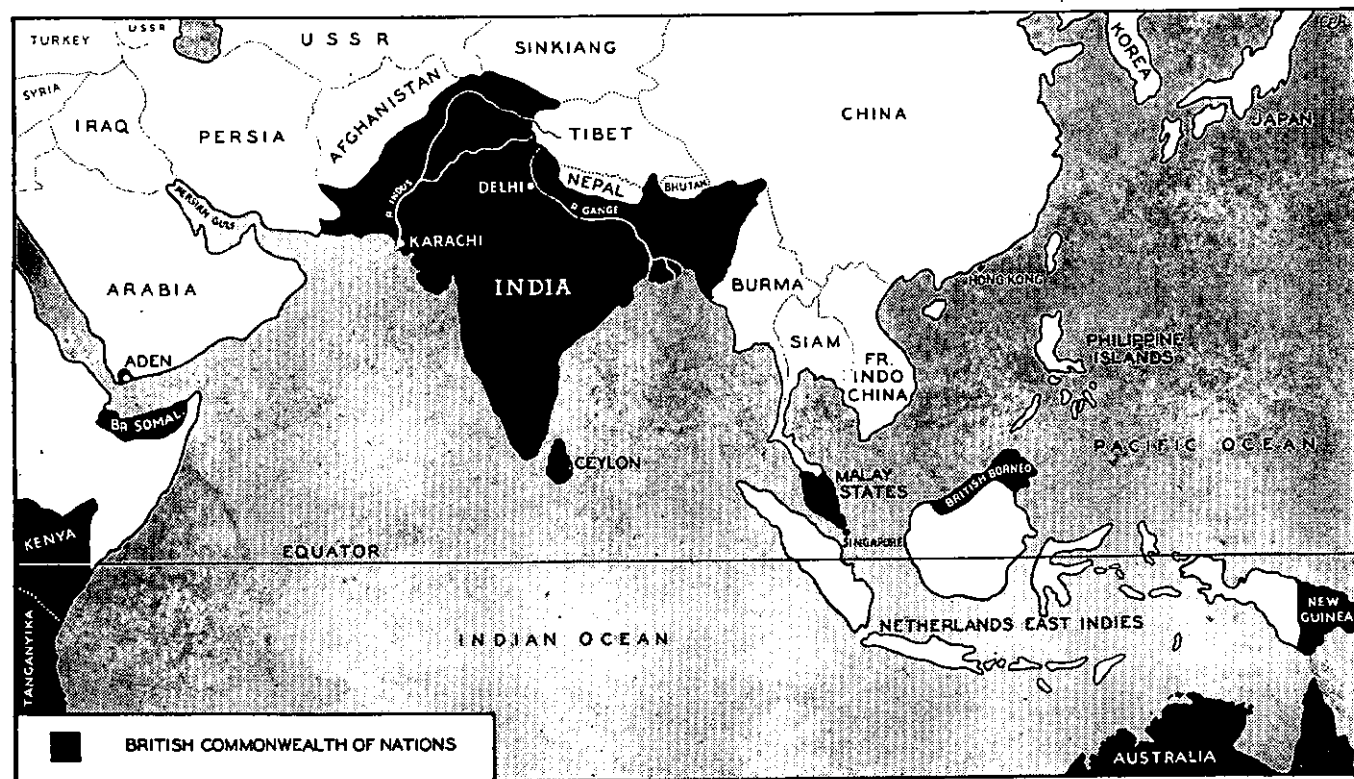
In 1939 India declared war automatically on the side of Britain, but the political parties contested this move, and it was not until Japan entered the struggle that differences were shelved until the common enemy was defeated.

In 1942, after the breakdown of Sir Stafford Cripps's negotiations with the political parties, serious rioting broke out, with the subsequent arrest of many of the political leaders. The Hindus claimed a United India, the Moslems demanded Pakistan, and the Princely States preferred their own independence.

When the war ended, Congress demanded a British withdrawal from the Indian sub-continent. In February, 1947, Britain's decision to "Quit India" by June, 1948, was announced, and in June, 1947, Britain's final plan advocating a division of the sub-continent into two new Dominions was made public.

The plan became law on 19 July, 1947, and came into effect on 15 August of the same year.

After the Moslem-majority State of Pakistan and the Hindu-majority State of India had been established, serious rioting broke out in the Punjab, following its division between the two Dominions. The Punjab riots with their estimated death toll of 1,000,000 caused the largest mass migration in modern history. Hundreds of thousands of Moslems trekked westward into Pakistan, while a similar number of Hindus and Sikhs moved into India. Although the wave of rioting died out in December of last year, considerable friction still exists throughout the area. Most of the Princely States followed Britain's advice



to strengthen their relationship with either of the two Dominions, but the major exceptions were Hyderabad and Kashmir, both of which indicated their desire to remain independent. Hyderabad with a Moslem ruler and predominantly Hindu population is situated well within India, while Kashmir, bordering both India and Pakistan has a Hindu ruler and a predominantly Moslem population. When the Maharajah of Kashmir acceded his State to India late in 1947, a rebel government, known as the Azad Kashmir Government was established with the declared aim of deposing the Maharajah and acceding the State to Pakistan.

In the meantime a number of tribesmen had crossed the borders from Pakistan and formed up with the Azad forces. Indian Army troops were subsequently moved into Kashmir to take action against the rebels and a minor war developed between the opposing forces.

The Kashmir problem was presented by India to the United Nations in December, 1947. In April of this year the UN Security Council approved of a resolution to send a Commission to Kashmir with the object of endeavouring to solve the problem by mediation.

In Hyderabad, the Moslem ruler acceded his State to Pakistan, but India refused to recognize the accession. Numerous talks have been held between India and Hyderabad on the subject but these have always ended in a deadlock. India is exerting considerable pressure upon Hyderabad, hoping that this Princely State will be forced to reverse its decision and accede to India.

### Political

It should be appreciated that of the Indian sub-continent's 389 millions only a very small percentage have, hitherto, had either political interests or the right to vote. In 1942 Congress claimed that its membership was  $4\frac{1}{2}$  millions while the Moslem League claimed one million. Although the membership of political parties has increased since 1942, the

percentage of population who are politically conscious remains minute. Britain has for some time endeavoured to transfer its power in the government to Indians, and to a degree, this was effected some years ago. Such officials were, however, appointed by the Viceroy and not by franchise and consequently did not have the confidence of the people.

The basic problem in the transition of the Indian sub-continent to independence is its communal problem. Nowhere do religious, ethnic and social divisions have greater significance and these affect the political divisions, influence military organization and touch almost every phase of life. The political impasse which has existed is due to the two main groups of the mixed population being unable to reconcile their differences.

Politics are based on religion, and of the major political parties the National Congress Party is the most powerful, and, although it claims to be a national party, it is Hindu in character and leadership. The All India Moslem League is a purely Moslem party and rules Pakistan.

The aim of Congress is a United India administered by a Central Government, whereas the Moslem League, afraid of Hindu domination, has realized its policy in the formation of a separate state of "Pakistan" ("Land of the Pure").

Lord Mountbatten relinquished his post as Viceroy of India on 15 August, 1947, and became Governor-General of India at the invitation of the Indian Government headed by Pandit Nehru as Prime Minister. Dr Jinnah became Governor-General and President of Pakistan with Ali Khan as Prime Minister. Karachi was chosen as the Capital of Pakistan, and New Delhi became capital of India. The two governments set up their own Constituent Assemblies and the British began to leave; the last troops departing from Bombay on 28 February, 1948.

On 22 June, 1948, Lord Mountbatten relinquished his post as Governor-



General of India, and Sir Chakravarty Rajagopalachari became the first Indian Governor-General.

Following Mahatma Ghandi's assassination on 30 January, India has been carrying out a purge on all organizations preaching or practising Communal violence, militant Communist bodies being included in this category.

### Strategic Significance

The Indian sub-continent is on the flank of British communications across the Indian Ocean. It is also of particular importance to Australia as, for the first time, this country would have an open left flank if Pakistan or India, or both, should come under the influence of powers unfriendly to the British Commonwealth of Nations. If Sinkiang should become an autonomous State, India's importance would be further increased, particularly in view of Sinkiang's possible future affiliations with the USSR. Also the sub-continent could form a most important base for operations in the Near, Middle and Far East. Its situation is particularly important owing to its proximity to the

vital area of oil sources in the Persian Gulf.

### Ties to Other Nations

Both Pakistan and India have religious ties with those Central Asian, Middle and Far Eastern countries where Moslems form part of the population. Numbers of Hindus have migrated to South Africa, Burma and Malaya and these naturally look toward India as their motherland.

Both Dominions owe great developments in economic, industrial and educational fields, in their armies and general living standards, to their two century old contact with Britain.

Pakistan and India are both becoming increasingly aware of their economic, strategic and numerical importance in world affairs. It is difficult to predict the manner in which either will develop their future ties once they settle down, but it is hoped that both Dominions will further strengthen their ties with the British Commonwealth. The probability that India in particular, will further develop her ties with the Far East can not however be overlooked.

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**It is well, when you are judging a man, to remember that he is judging you with the same godlike and superior impartiality.**

— *Arnold Bennett.*

# *Fresh Food on Active Service*

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Brigadier P. S. McGrath, CBE  
Director of Supplies and Transport, AHQ

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FOOD is one of the most important weapons of war. This fact is now recognized by all the major nations, and since World War II intensive research has been proceeding in Great Britain, USA and Australia to repair the weaknesses disclosed during active operations. At an Army Food Conference held in Chicago in April of last year, General Eisenhower in his introductory address, stated that he wished to be remembered as the American Chief of Staff who did something to improve the Army's food supply.

During World War I as long as a sufficiency of food was available, authorities were satisfied. Very little thought was given to variety and, as refrigerated foods were practically unknown, all supplies were necessarily canned. Bread was replaced by biscuits, meat and vegetables were in a composite tin pack, and such items as bacon, margarine, jam and cheese comprised the ration. Fresh commodities were seldom sent beyond base areas and even in the latter were mainly confined to the inevitable "stew" which eventually became very unpopular, not because of its quality, but because of its monotony.

Actually the standard of feeding of an Army should bear a close relationship to the civilian standard at the outbreak of hostilities, but for World War I this was not so. The main reasons for this were that men were drafted to camps with either antiquated cooking equipment, or none at all, and expediency had to be resorted to in the utilization of whatever could be obtained haphazardly.

Very few people had any practical experience in the maintenance of masses of men and primitive methods became standard. For movement the 'iron ration' of 'bully beef and biscuits' was resorted to. In active operations the tin opener, or a substitute — often the bayonet — was essential.

The experience of World War I, combined with the advances in dietary made in the civilian sphere during the intervening period, marked a different approach to World War II. The standard ration scale of World War I used by all British and Dominion troops engaged was replaced by the United Kingdom and each Dominion having their own scale for their own contingents. Each scale was typical of the country using it, and bore the food characteristics of the country of origin. For example, the AIF scale provided a much higher issue of fresh meat and vegetables than

the UK scale. However, this was counter balanced by a higher proportion of tinned bacon, fish and vegetables in the UK scale.

Between wars great progress was made in the production of tinned meats and vegetables and dehydrated foods. Also, especially in the United States, refrigerated fresh foods were developing.

In the maintenance of any overseas force, the availability of shipping refrigerated space for food consignments is all important, and is the greatest limiting factor to the amount of fresh food that can be included in the ration scale. To offset this, reduction in bulk is essential. It will be realised that quarters of beef, carcasses of mutton, and raw green and fresh vegetables can occupy a lot of valuable space, especially when the edible portions are not more than 75 per cent of the bulk.

Fortunately for the 2nd AIF certain progress had been made in Australia in 1939 in the development of boneless beef, telescoped mutton and dehydrated vegetables. The adoption of these methods and their further development by the Supplies and Transport Services enabled a regular flow of fresh foods to the Middle East in packs which not only conserved shipping space but also were practically 100 per cent edible. Actually the above Service can claim the credit for the rapid development of the boneless beef pack and its successful initiation into the Australian export field.

It will be realized that a necessary concomitant to the successful handling of frozen fresh foods is adequate refrigeration along the chain from producer to consumer. All links must be equally strong, for this produce is easily destroyed and exposure to normal temperatures for comparatively short periods can result in wholesale loss. It must always be backed by a tinned reserve to provide for such a contingency.

In the early days of the New Guinea campaign the absence of refrigeration in that area and the limited amount of space available in ships allocated to the task

placed a severe limitation on the amount of fresh food that could be sent there. As the campaign progressed these handicaps were surmounted, and eventually fresh food became the basis of the normal ration scale.

The US Army has always been food conscious and the advent of their forces in New Guinea gave a much needed impetus to the issue of fresh foods to the Australian troops. With adequate, fast moving transportation and mobile refrigeration at their disposal, they were able, on occasions to forestall the AMF, although in the early stages they relied solely on Australian products. But for a long time the limiting factors of shipping space and local refrigeration effectively prevented the issue of sufficient to cover all needs, and troops of both forces in the forward areas received only haphazard supplies of fresh rations. Eventually, however, large refrigeration installations were built in all Base Sub Areas and all units were provided with the smaller types. It is interesting to note that whilst the AMF relied on large static installations, the US Army preferred the mobile trailer type which could be concentrated as desired and moved with the troops.

Whilst tremendous progress was made in the handling and utilization of fresh foods, the end of the war found the main problem of issue of hot normal meals to troops in contact with the enemy not completely solved. It is to this difficult problem that attention is now directed and much research and study is being devoted to it, especially in the USA where civilian resources and technical knowledge and experience are being co-opted at the Food and Container Research Institute in Chicago.

Since the war the Australian Army has been very active and is fortunate in having the responsibility for the complete maintenance of the BCOF in Japan. This has permitted practical experiment in the testing of the latest advances in food handling, and in pioneering the export of Australian processed fresh foods.

One of the greatest advances is the 'quick freeze' process for fresh vegetables. No longer is it necessary to ship fresh green vegetables with the attendant waste of shipping space and, more serious still, often waste of the vegetables by deterioration. The new process enables almost every variety of vegetable to be prepared for the table, partly cooked, quick frozen, and despatched in handy cartons. With ordinary handling, care and availability of refrigeration these packs have a life up to twelve months and are easily prepared by unit cooks. Moreover, each pack contains 100 per cent edible fresh vegetables already prepared. The comprehensive value of this process is obvious and potentialities great, but again its success is entirely dependent on refrigeration. Recently a new process termed 'sublimation' has been discovered. In this the product is frozen before being dehydrated. This serves to lock its physical structure and, provided it is vacuum packed, it will keep indefinitely at normal temperatures. Most types of meat, green and root vegetables and fruit can be processed in this way. The great potential value of this discovery is that once the product is processed and packed no further refrigeration is required and it can be transported with ease.

Experimental packs of frozen whole milk have been successfully shipped and sent by air from Australia to Japan, and at present arrangements are in hand for the sending of frozen fresh fish from Australia to satisfy the requirements of BCOF. This in effect will be the pioneering of a new Australian industry by the Army.

Post war developments are also taking place in improved methods of dehydration, and dehydrated egg powder is now a very satisfactory product. New methods of vacuum and gas packaging is ensuring the maximum retention of flavour and increasing the storage life of almost all canned products.

The results obtained during World War II proved the efficacy of Field

Bakeries and that fresh bread can be made available in practically all circumstances. A new departure to cover all emergencies has been the production of tinned bread which retains all the qualities of the fresh variety and has quite a long life.

It will be recognised that, where possible, production of fresh commodities close to the area of operations is by far the most economical and efficient method. This was recognised in New Guinea where vegetable farms, orchards, poultry farms, fishing platoons, bakeries, slaughter houses, etc., were set up in Base Sub Areas and, in some instances, units were encouraged to provide such fresh produce for themselves. Interest is now manifested in the success achieved by the US Army in the production of fresh salad vegetables, by the hydroponic or nutricultural process, in places where soil culture is not possible. Although expensive and prodigal in technical manpower and materials this process proves that soil is not a vital necessity to the growing of vegetables, provided the plants can obtain nutriment by other means. Also, by the use of radio active isotopes, the first step in the synthesis of vegetable plants from simple chemical products naturally present in the atmosphere has been discovered. This alone presents a vast field for research with amazing possibilities.

The soldier can rest assured that the aim of the authorities is to provide him with the best food under all conditions. Especially it is their object to ensure normal fresh rations to the front line soldier either pre-heated or packed in an insulated container or equipped with a self heating device. The main limiting factors will always be freight space and refrigeration availability. Planning and research will be continued and commercial processes closely watched to ensure adaptability to Service requirements, and the possibilities of improving the processing of foodstuffs explored so as to ensure the retention of full flavour, palatability and nourishment.

AUSTRALIAN MILITARY FORCES

## GOLD MEDAL ESSAY

THE "AMF Gold Medal Essay Competition" is held annually with the object of encouraging the study of military subjects, stimulating thought, and providing all ranks of the Australian Army with an opportunity to express their ideas in a useful and constructive way.

The subject for the 1948-49 competition is:—

**"No armed service can have a high degree of morale unless, amongst other things, it is nourished by the good will of the community from which it is drawn.**

**Discuss this statement, indicating the positive steps which can be taken by the Australian Army to ensure that it has the support of the Australian people as a whole."**

The rules for the competition are:—

The right to compete will be limited to officers and other ranks on the Active and Reserve List of the Australian Military Forces.

The essays submitted for the prize must not exceed 10,000 words in length; they must be typewritten and submitted in quadruplicate.

The authorship of the essays must be strictly anonymous.

Each competitor must adopt a motto, and enclose with his essay a sealed envelope with his motto typewritten on the outside and his name and address inside.

The title and page of any published or unpublished work to which reference is made in any essay, or from which extracts are taken, must be quoted.

The essays will be addressed to the Secretary, Military Board, Victoria Barracks, Melbourne, S.C.1, the envelope being marked "AMF Gold Medal Essay", and must reach him not later than 30th June, 1949.

The essays will be judged by at least three referees, to be appointed by the Chief of the General Staff.

The decision of the referees will be final. They are empowered not to award a prize if, in their opinion, no essay submitted to them comes up to a sufficiently high standard of excellence.

The result of the competition will be published in Australian Army Orders, and the prize essay will be printed and circulated.

## The Future of . . .

# ~~~~~BIOLOGICAL WARFARE~~~~~

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Major G. A. Johnston, Directorate of Armament, AHQ

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THIS article is an attempt to evaluate briefly, and in non-technical language, the military possibilities and limitations of Biological Warfare, based on the study of papers published in the May 1947 issue of "The Journal of Immunology" and the December 1947 issue of the "Bulletin of the Atomic Scientists".

It is emphasized that, although this article deals with the possible offensive use of biological agents in warfare, this aspect is considered solely to enable the reader to appreciate the difficulties involved in providing effective defence against this weapon. The British Government being a signatory of the Hague Convention, has no intention of initiating the use of Biological Warfare, but must be prepared to protect itself against its use by an enemy.

In considering the subject, it will be of value to keep before us the following definition :—

"Bacterial (or biological) warfare comprises the use in war of pathogenic bacteria and other agents of infective disease, of their toxic products and of certain other organic chemical poisons of an animal or plant nature, intended to kill or incapacitate human beings or

economically useful animals or destroy or damage food crops or other plants".

Biological warfare is known to have been under investigation and development by Germany and Japan prior to the last war. The Allies also, were fully cognisant of the potentialities of this mode of warfare, and expended considerable energy and resources in fundamental research on the subject.

It has been stated that a full scale biological attack would rival the atomic bomb in its casualty effect, without the disadvantages of physical damage to property. But, since biological agents have not been used in modern warfare and published data which indicates the potential activity of the agents is scanty, we can make no precise estimate of their effectiveness. We know, however, that there is a varied and flexible group of biological weapons which could be used to destroy human life, animals or plants selectively, or merely to render them temporarily or permanently useless. Because it could produce large numbers of casualties, and because its effects would be delayed rather than instantaneous, a biological attack would have a tremendous effect on both military and civilian morale unless there were adequate defensive measures.

### Some Characteristics of Biological Warfare Agents

Chemical (or gas) and biological warfare have many characteristics in common — they are effective over a large area, their action is insidious, they have a demoralizing effect against troops inadequately protected or untrained in defensive measures, and show some degree of persistence.

All biological warfare agents, however, have an incubation period between contact and first appearance of symptoms, and they show some degree of persistence in that they may remain active in certain types of ground for short or long periods. Some infective agents have the capacity to spread from one infected person to another and continue spreading in this way over a large area, but all are unstable and subject to loss of the capacity to produce disease, particularly when handled apart from the tissues of their characteristic host. We should note, however, that in some instances the virulent effects of certain agents can be enhanced. Provided the agents can be produced under bulk conditions and suitable methods of dissemination devised, we must assume that biological weapons may be used in any future war.

### How Biological Weapons May be Used

It is unlikely that biological weapons will be suitable for use in operations where opposing troops are in close contact or where they are likely to change position rapidly, since both sides may sustain casualties from the agent used. On the other hand, where an objective is isolated and need not be occupied by the attacking force, as in the case of some island naval or air base, a biological attack obviously has great possibilities.

Similarly, biological agents could be used for the disorganization of industrial areas; against military camps, barracks and depots, livestock and crops, in order to paralyse the flow of reinforcements and supplies to the armies in the field and disorganize the civilian war effort.

### Possible Methods of Attack

At present, aircraft appear to provide the most useful means for the dissemination of biological agents, but the possibility of using contaminated bullets or shell, the incorporation of biological agents in the warheads of strategical or long-range tactical rockets, and sabotage methods cannot be discounted.

Biological agents sealed in glass ampoules, each fitted with a gas generating element to ensure the breaking of the ampoule, could be dropped from aircraft to contaminate the water supply systems of large centres of population. Liquids containing agents in suspension, mixtures of certain agents with the less toxic screening smokes, and infected dusts, could also be sprayed from aircraft over the human and animal populations and over food crops, with disastrous results to the nation's war effort and economic life. The use of suitably contaminated projectiles, while limited by tactical considerations, would cause the spread of disease through an army, and vastly increase the problem of disposal of casualties by the medical services.

The use of biological agents for sabotage purposes seems to have endless possibilities owing to the small size of containers needed. These could be incorporated in cosmetics or foodstuffs by saboteurs employed in the industries concerned, with very little risk to themselves and with widespread effects on both the civilian and military populations. Saboteurs could also operate against stored foodstuffs and textile fibres such as cereal grains, wool, cotton, etc., and contaminate growing crops and cattle, causing great damage to the nation's supply of food and clothing, apart from any effect which the lack of raw materials may have on industries directly connected with the supply of equipment to the forces in the field.

To achieve success with biological warfare agents by the methods outlined above, many problems would have to be overcome, such as the development of

suitable media for the growth and preservation of different types of agents, bulk production, and selection of agents suitable to any given task.

The indoctrination of Public Health, Veterinary and Agricultural authorities in the potentialities of Biological Warfare would do much to minimise and possibly eliminate the effects of a biological attack on a civil population.

### **The Problem of Protection**

The term "protection" is used to indicate the means employed by an army using biological warfare, to safeguard its own troops against the agent; "defence", to designate measures taken against agents used by the enemy.

Among measures of "protection" may be included the necessary safeguards in the preparation, assembly and dissemination of agents; the selection of agents to suit the purpose of the operation; the immunization of attacking troops and the use of respirators and protective clothing.

Defence against attack by an enemy is undoubtedly the most difficult problem and falls into three main phases — warning of impending attack, detection and identification of agents, and means of control. Existing means for warning and detection of air raids may be adequate, but special precautions would be needed to deal with enemy planes shot down and suspected of being loaded with biological agents. Amplification of

routine sanitary measures in a well organized community may serve to identify the nature of a biological attack and thus start the machinery for control. Likewise, the available public health services could be used for the detection and identification of more common diseases.

The problem of control of the effects of a successful biological attack calls for careful planning by Defence, Public Health, Veterinary and Agricultural authorities in peace, and close co-operation between these bodies and the public in war. Detailed measures for control cannot be considered in this article but planning would include emergency measures to be applied immediately following a successful attack, those of a permanent or semi-permanent character and long range defensive measures aimed at reducing the effectiveness of attacks.

It is well to remember that any civilized country, irrespective of its size or monetary resources could undertake the production of biological warfare agents by employing the facilities within the community for normal medical and biological research and development.

Although the treatment of this subject has necessarily been brief, it is hoped that sufficient has been said to indicate that biological warfare has great possibilities in the future, and presents a vast field for research and development in both its offensive and defensive aspects.

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**Obedience alone gives the right to command.**

— Emerson.



# WINSTON CHURCHILL ON

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## SALUTING

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Brigadier J. Field, CBE, DSO, ED  
4th Infantry Brigade

ON the 4th September 1940, Mr Winston Churchill visited and inspected units of the 2nd AIF then encamped on Salisbury Plain. While passing down the ranks of the writer's battalion, the Prime Minister keenly scrutinized the men, meanwhile asking a number of questions on the state of training, supply of unit equipment and so forth.

As is well known, Mr Churchill was first commissioned in the 4th Hussars and, during the Great War of 1914-18, at one period, he commanded the 6th Royal Scots Fusiliers. It was clear that his own regimental training, his possible association with men of the 1st AIF in France, and speculation on the qualities of the new Anzacs, inspired the final question in this interrogation: "How are they on saluting?"

The answer to this was followed by one of those inimitable comments which, like so many of the famous statesman's utterances, gets down to the roots of the matter in arresting phraseology. He said: "You know, in my young subaltern days, I was always taught that saluting was the outward and visible sign of an inward and spiritual grace".

In May 1944, when the United Kingdom was crammed with British and American troops in training for D Day, a questioner in the House of Commons asked the Prime Minister if he would consider an order that would eliminate the obligation to salute when off duty.

Mr Churchill's reply is quoted in full:—

"No Sir; a salute is an acknowledgement of the King's Commission and a courtesy to Allied Officers, and I do not consider it desirable to attempt to make the distinction suggested. If my honourable friend had an opportunity during the war of visiting Moscow he would find the smartest saluting in the world. The importance attached to these minor acts of ceremony builds up armies which are capable of facing the greatest rigours of war".

Failure to give and return salutes is not only bad soldiering, but bad manners. In the words of Army Training Memorandum 53, "Saluting is a privilege and an obligation, to be jealously guarded and punctiliously performed by all soldiers".

# STAFF WORK

Condensed from a lecture given by  
Air Marshal Sir Thomas W. Elmhirst, KBE, CB, AFC  
to the officers of GHQ, New Delhi, India

**WHAT** is *good* Staff Work? My own view is that it is "team work by competent officers" whose only purpose is to serve the front line fighting men. How does one get this team work? I put loyalty to the Chief first; without that there will be no team work and no confidence either at the HQ or at the units under them. I do not put too high a value on brilliance in Staff officers; I would much rather choose a competent, hardworking, loyal officer who is a good mixer. If a Staff Officer thinks himself too superior to talk to his confreres or juniors he will not fit into any team, and the force will suffer. A Staff Officer who visits a unit with his "nose in the air" will neither help that unit nor draw out of the unit information (or gossip) that will be of use to the Commander or Staff of his own HQ. Similarly, in a HQ, if "G" and "Q" are not on speaking terms, there will be no team work, and lower formations, who take their cue from above, will likewise be at sixes and sevens.

## On Responsibility

Delegate responsibility as much as possible. The old business saying, "If you employ a man trust him—if you don't trust him sack him" is good advice.

*From USI Journal, India, October 1947.*

My wartime Chief said, "Give your juniors full responsibility, but if there is one failure on the Operational side, the man responsible must be sacked, as that means loss of life. Allow a second chance on the Administrative side, but no more!" The success or failure of any force or staff largely depends on the leader's choice of his staff and junior Commanders.

## On "Minutes"

I never write a minute to someone in the same building if I can possibly help it. I either go and see the person or ring him up. There are cases where you have a busy Chief whose office you cannot get into, or he is away on a tour, and then there is something to be said for minute writing, but not often. I once found a Staff Officer writing a long minute to an officer of the same department and same rank in the next door office with a dividing door in between! He did not do it again.

On the writing of letters and orders. The fewer, the better. The personal visit, the personal telephone call, confirmed, if the order is complicated, by signal, will usually be better. For example, I recall that within the six months between the fall of Tobruk and its retaking, which included a long retreat, the battle of El Alamein and the advance to Benghazi, I wrote two

Administrative and Supply plans, one for the retreat and one for the advance and six official letters, and I believe that no unit in the Desert Air Force was even in doubt as to where and when it was to move and where it would find its supplies. The units knew what their function was and did not need written orders on the subject.

### On Telephoning

If an officer is not capable of acting on a telephonic order he is of no use. I once had a case in a crisis of an officer saying he must have my telephonic order in writing. I told him that all he would get in writing from me was an order for him to report to the base as being of no value in the field. If in your job it is necessary to telephone more than once to a strange department or officer, ensure that you visit him so that you both know what each other looks like at the end of the line.

### Regarding Secrecy

Not too much secrecy. I know of far too many operations and supply arrangements that were a failure because those taking part were not "in the picture". There are too many people who say "I cannot discuss this on the 'phone". Over secrecy in normal day-to-day operations handicaps everything. There is one vital secret that must be kept at all costs, and that is the shape and date of future operations. I speak with experience on this subject, as I have been a Director of Intelligence and know what an enemy can and has made use of and what matters little.

### The Right Channels

A good Staff Officer will find, know and use the "right channels". One is always wanting something; it may be more men, aeroplanes, tanks, repairs, cars, food, whisky, a cheap trip by air on leave, etc., etc. You can generally get them, and quickly, if you know the right channels. There is always someone who deals with your particular want; the thing is to find him, and not his senior

or junior (the former will be offended). I was known for some time in the field as "Channels Elmhirst" as I would get up at conferences when I heard a remark by a unit commander that he was short of something, and say "If you or your Adjutant had only used the right channel, which was so-and-so, you could have had your request met the same evening".

### Politeness

"Please's" and "thank you's" in signals or letters from senior to junior formations cost nothing and always pay in enhanced good feeling. And never be frightened of retracting an order, if necessary the same day that it was issued, if you think the order was wrong. It is only the proud and inefficient officer who thinks his prestige will be lowered, if he admits by signal or letter that he has issued a wrong order.

### On Confidence

A successful Armed Force is one where all formations and units in the force have confidence in each other, and in the Commander and staffs that run them. I would always say that it is the duty of the superior formation to gain the confidence of the lower formation or unit and not vice versa. Such confidence can best be obtained by (1) the junior staff or unit knowing that the senior Staff Officers have been selected for outstanding work in lower formations, and (2) by "visiting".

Time spent by Staff Officers on visits to units is never wasted. I have heard many Staff Officers say that they have so much in their "tray" they could not possibly get away on visits. My answer is "Rubbish!" A visit will find out what a unit really wants, or why it is a good unit or a bad one. There are many things that a unit will want but not request "in writing", for, as they think, the superior HQ are too busy, etc. A visit will also find out whether the CO or his staff are good or want changing, also what the unit thinks of the superior

staff; perhaps it is they who want changing! A staff should have sufficient transport to enable officers to visit units when they so wish. And lastly, a visit should be made to help and not to find fault. If faults are found action can come later. And visits should be "two-way". Unit Commanders or Staffs of lower formations should be encouraged to visit their senior HQ staff.

A word on the bullying Staff Officer. You will always find them and they want rooting out. They usually bully down the telephone to juniors, who cannot talk back, and they are usually too polite to their seniors! But they breed lack of confidence and the negation of team spirit.

A Staff Officer should never take his Chief's name in vain and use it as a stick to beat the lower formation or unit. "The C-in-C is terribly annoyed", etc. If the Chief is annoyed, then it is he alone who should administer the reproof in person, in writing, or on the telephone. There is nothing a CO of a lower formation dislikes more than to be "told off" by a Staff Officer of a senior formation, more especially if the "rocket" is in writing and signed by an officer of equal or (and I have seen it) lower rank!

Then there is the policy of "the open door". A Staff Officer should be approachable and encourage visits by other Staff Officers or Unit Commanders. He should if possible have his door open and get the reputation of never being too busy to welcome a visitor. And

conferences (as long as they do not happen too often) where junior commanders or Staff Officers can sit round a table and put up their suggestions to their seniors will always pay high dividends. The hospitality and drinks that go with such meetings add 20% to their value.

One of the most difficult jobs of Staff Officers is to be able to concentrate their attention on the essentials of their jobs. Often a very great number of files and papers to read arrive in their "In" tray, and a lot of it possibly is most interesting to "browse" through. But we have all only certain hours of daily work, and if we are going to keep our efficiency and health it is inadvisable to stretch these hours too much. My advice is to concentrate on the essentials, "maintenance of the objective", and be quite ready to pass a lot of stuff from the "In" tray to the "Out" tray direct as not touching the job you are established to do.

One other point on the daily work of the Staff Officer. Don't let dealing with the "In" tray be the daily sum of your work. I always say that 75% of an officer's time should be spent on current affairs, but that 25% of his time should, if possible, be spent in looking how he can improve the "set up" that he has to deal with. A newcomer to any job should have some fresh ideas that can improve a department or organization, and he should not be satisfied with himself when he vacates that job if he has not got something new and valuable incorporated into the machine he has been part of.

# The Anti-Tank Regiment

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Major G. P. Marriot, ED  
Royal Canadian Artillery

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*This article is designed purely to present the problem of the immediate future of the Anti-Tank Regiment and to promote thought and discussion on the subject. It does NOT attempt to supply all the answers, but should serve to keep readers up-to-date with current thought in the United Kingdom and the United States.*

"Speak softly—and carry a big stick!" The late Theodore Roosevelt, when President of the United States, advocated this as a national policy. The inference is, of course, that it is not necessary to be aggressive to be forceful when backed by the "big stick" in the form of power. The fact that possession of power acts as a deterrent to the other fellow, even though it may not actually have to be brought to bear on him, is a time-worn principle which is as sound now as it ever was. The classic and clear cut "big stick" today is the possession, by the Western Democracies, of the atomic bomb, presumably stocked and ready for use.

The point I wish to make is that the Anti-Tank Regiment, properly organized, handled and equipped with the acme in weapons, constitutes a definite deterrent to the use of armour by a potential or actual enemy. It is an integral and vital part of our military defences. As such

it warrants, in fact demands, a great deal of thought and planning to keep it, in whatever form is decided, as the master of the tank.

Anti-Tank Artillery, as we know it today, is a comparatively recent innovation. A start was made during World War I which rather petered out after the war. With the lightly-armoured tanks of the period, the field-piece in the anti-tank role was counted upon to cope with the problem. In the late thirties came the first decisive step to form a separate anti-tank branch of the Artillery. The weapon chosen was the 2-pounder anti-tank gun. The 2-pounder was an excellent little gun but pitifully inadequate in the face of the heavily-armoured Panzer Divisions, as was crushingly demonstrated prior to Dunkirk.

Alive at last to the paramount need of anti-tank defence, the British Army converted many Infantry Regiments to anti-tank, and new and heavier guns were developed. Each Corps was to have an Anti-Tank Regiment in addition to one per Infantry and Armoured Division. The 6-pounder made its appearance and replaced the 2-pounder. More powerful than the 2-pounder, it was still inadequate and gave way to the hard-hitting 17-pounder. The 6-pounder was given to the Infantry Battalions as their local and immediate anti-tank defence.

With the coming of the 17-pounder, we at last were getting into the position

*From the Canadian Army Journal, February, 1948.*

where the gun could master the tank. The demand for cross-country performance and a semi-armoured gun for the initial stages of the consolidation produced the self-propelled anti-tank gun. This served also as a mobile reserve to handle the counter-attack and was ideally suited for working with Armour.

The position today is one Anti-Tank Regiment per Corps and one per Infantry and Armoured Division. The Corps and Armoured Division Regiments are 100% self-propelled and the Infantry Division Regiments 50% self-propelled and 50% towed. All are equipped with the 17-pounders.

The question now arises "What should be done with the Anti-Tank Regiment?"

1. Should we continue to develop its weapons along orthodox lines or should we swing over to unorthodox types, such as recoilless weapons?
2. Should it remain under Artillery control?
3. Should it be 100% self-propelled?

**1. Should we continue to develop its weapons along orthodox lines or swing over to unorthodox types such as recoilless weapons?**

Development of more heavily-armoured Fighting Vehicles has shown that the penetrative performance of existing weapons is inadequate. Obviously the development of much more powerful anti-tank weapons must be pressed energetically. This development should aim not only at producing the answer to existing Armoured Fighting Vehicles, but also to the most heavily-armoured Fighting Vehicles which it is considered practical to build. This may call for penetration of up to 16 inches of armour plate.

The United States is concentrating on research into and development of the recoilless weapon. Being the foremost

advocates of this type of weapon, they are perhaps further advanced along these lines. Great faith is placed in the shaped charge for projectiles, which type is entirely suitable for the recoilless weapons.

The main advantage of the recoilless weapon is its light weight. Against that may be balanced its relative inaccuracy, rearward blast and limited range, plus the great weight of projectile and propellant (twice that of the normal gun).

The United Kingdom, on the other hand, feels that the future of the recoilless weapon is not sufficiently assured to warrant a change to it in the near future. Until such time as it becomes apparent that the recoilless weapon has the desired propensities, the United Kingdom will concentrate on and continue the development of heavier and more powerful guns of the orthodox type. Included in this programme are the shaped charge and sabot type of projectile.

The chief advantage of this is the fact that the principles of design and construction are already familiar and have been proven in battle to be effective. With orthodox guns there is virtually no limit to the thickness of armour which may be penetrated. The disadvantages are weight, cost, engineering and manufacturing problems in mass production, as well as maintenance.

**2. Should it remain under artillery control?**

The United States feels that the limitations of towed anti-tank guns outweigh their advantages in many situations. Also, the development of tanks with heavy armour and guns obviates the necessity of self-propelled anti-tank guns, or, as they are called in the United States, "Special Armoured Vehicles of the Tank Destroyer Type". Therefore the United States advocates that the anti-tank responsibility be

allotted to the Armoured Corps with a staff officer at Division, Corps and Army Headquarters to co-ordinate anti-tank defence. Each Division, Corps and Army would then have allotted to it a proportion of tanks in the anti-tank role.

The only time that they would come under control of the Artillery is when they are employed as field artillery, i.e., indirect fire in a fire plan. The United States doctrine is to encourage this use whenever the tanks are not carrying out their primary anti-tank role. In the matter of anti-tank guns operating in a field artillery role when not engaged in the primary anti-tank role, the United Kingdom policy is in agreement with that of the United States.

Due to the distribution of armour and the need for great mobility in a tank, the size of gun which can be mounted on it is limited. There is, therefore, a limit to the penetrative power which can be given to a practicable tank because of the limitation of size and weight of both guns and ammunition which can be put into it.

The acceptance of limited traverse in a self-propelled gun and the different distribution of armour as compared to a tank allow for a heavier orthodox gun being mounted on a mobile self-propelled carriage. Following this principle, the United Kingdom feels that the advantage lies in developing the self-propelled anti-tank gun along orthodox lines rather than relying on tanks in the anti-tank role.

The Americans had their tank destroyers as a separate arm in World War II and, as has been pointed out earlier, subsequently changed their policy by incorporating the anti-tank responsibilities of the Tank Destroyer Battalions in the Armoured Corps.

In the event of a policy involving the incorporation of the self-propelled anti-tank element in the Armoured Corps and following the United Kingdom policy of retaining the towed gun, should the

towed element go to the Infantry? It is the Infantry who need the *immediate* support of towed guns in their bridgeheads.

There were cases in World War II when the Infantry, relying on the Gunners to produce the necessary anti-tank defence, did not get their guns across and into the bridgehead. The result was no immediate anti-tank defence, and a comparatively easy success for the armoured counter-attack.

There are several arguments pro and con as to whether the anti-tank should be an arm of its own, come under Artillery control or be broken up, with the self-propelled element going to the Armoured Corps and towed guns to the Infantry. The British policy is to keep it under Artillery control.

### 3. Should it be 100% self-propelled?

The Americans, having allotted the anti-tank responsibility to the Armoured Corps, would appear to favour 100% self-propelled. The recoilless equipment again becomes the crux of the problem. With the powerful, light recoilless weapons in the hands of the Infantry Battalions, the need for towed equipments disappears.

The British, on the other hand, following the policy of orthodox development, are pretty well forced to retain the towed gun. Admittedly, this type of equipment is awkward and often difficult to man-handle. However, the weight factor greatly influences the situation. The question of crossing light bridges and rafting guns across to a bridgehead to reach a desired gun site necessitates a greatly reduced weight which can be achieved by the man-handling of a towed gun into position. There is, also, as always with mechanical equipment, the greatly increased load on AEME services which would accompany a policy of 100% self-propelled.

There are other problems connected with the future of the Anti-Tank

Regiment. Questions such as "Have we enough or too much anti-tank artillery?" "Is the actual Regimental organization as it should be?" and many others merit consideration. However, having presented the problem at least in part, I will leave it at that and hope that it will provoke some serious thought on the subject.

There has been, and still is, a race between the tank and the gun. Sometimes

one is in the lead and sometimes the other. The point to bear constantly in mind is that the Anti-Tank Arm(s) and its weapons(s) must be organized and developed to the pitch where once and for all it provides the threat against which no enemy will dare pit his armour. Until this stage has been reached, and "the big stick" is indeed big enough, great energy and sober thought must be devoted to this end.

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#### **EARLIEST AUSTRALIAN BATTLE HONOUR.**

In the June - July issue of the Australian Army Journal it was stated in the article on "Regimental Colours" that the earliest battle honour possessed by an Australian unit dates from the South African War of 1899-1902. A correspondent has pointed out that four Australian units are entitled to carry the battle honour, "Suakim, 1855", on their Colours. The units are :—

**1st Battalion (The East Sydney Regiment)**

**3rd Battalion (The Werriwa Regiment)**

**17th Battalion (The North Sydney Regiment)**

**20th Battalion (The Parramatta and Blue Mountains Regiment).**

These units were originally companies of the Sydney Rifle Corps, a volunteer organization formed in 1854. The companies contributed quotas to the contingent sent from New South Wales to the Sudan War in 1885.



# JUNIOR LEADERSHIP

Field Marshal the Viscount Montgomery of Alamein.

WE must pay great attention to the training of our junior officers and non-commissioned officers; that is where we will get a good dividend, since they will be the senior officers in the next war.

An army is a fighting weapon moulded by discipline and controlled by leaders; the essence of the army is discipline. Good morale is impossible without good leaders; both are impossible without good discipline.

Soldiers want to be able to recognize in their leader some quality which they themselves do not possess; that quality is "decision". The leader's power of decision results from his ability to remain imperturbable in the crisis. The leader's greatest asset is the ability to act normally in abnormal conditions, to continue to think rationally when his men have ceased to think, to be decisive in action when they are paralyzed with fear. There are many important qualities which a leader should possess, but they can never be a substitute for:

- (a) Decision in action; and
- (b) Calmness in crisis.

These are the two vital attributes of a leader, with which he will succeed and without which he will fail.

These two qualities exist in varying degree in every potential leader. But those men who possess them only to a limited extent can become adequate

leaders by training. Some people say that good leaders are born and cannot be made; I do not agree with this. I consider that provided a man is efficient and has in him only a limited spark of leadership, that spark can be greatly developed by training; that man can well become a competent but not outstanding leader.

Regimental spirit and tradition can be a powerful factor in making for good morale, and must be constantly encouraged. But in the crisis of battle a man will not derive encouragement from the glories of the past; he will seek aid from his leaders and comrades of the present. Most men do not fight well because their ancestors fought well at the battle of Minden two centuries ago, but because their particular platoon or unit has good leaders, is well disciplined, and has developed the feelings of comradeship and self-respect among all ranks and on all levels. It is not devotion to some ancient regimental story that steels men in the crisis; it is devotion to the comrades who are with them and the leaders who are in front of them.

Therefore, it is essential that in our training we select men who possess within them the potentialities of leadership and, secondly, we develop those potentialities. This is best accomplished by giving the leader responsibility. The mere fact of responsibility will increase the leader's powers of decision and make him confident of his ability to handle any crisis.

# The Battle of Moscow

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Translated and condensed by the United States Military  
Review from an article by General Guillaume in  
"Revue Historique de l'Armée" (France)

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THE battle of Moscow was a battle of attrition of four months duration following a campaign of more than three months during which the opposing forces had already become exhausted. It took place over a front 350 kilometers wide and 300 kilometers deep. Actually, it was a series of battles.

The two German attacks of October and November were followed in December and January by reversals. Each side in turn scored important tactical successes. Large forces on several occasions were encircled and destroyed, but at no time was there a true strategic breakthrough. In January, the snow and the cold did not permit the Soviet command to exploit its victory fully.

For two months, the Germans stubbornly attempted to carry out their encircling manoeuvre, although the armoured attacks on either side of Moscow which were to have brought the decision had been halted during the first few days. Surprise was no longer possible. The Soviet command was able to organize its defence on successive lines, and by bringing up fresh forces on 6 December was able to reverse the situation.

*From the Military Review, USA, May, 1948.*

## German Forces

For the Germans the battle ended in a tank disaster. Fifteen hundred tanks were destroyed, the majority by artillery.

Out of twenty-four armoured divisions at the disposal of the Germans in 1941, thirteen were engaged at Moscow. Of the twelve divisions of the Hoth and Hubner formations, which were charged with the encirclement on the north, seven were armoured and two motorized; only three were normal infantry divisions. South of Moscow Guderian had seven divisions at his disposal, of which four were armoured and one motorized. Of the four divisions in the attack on Kachira, three were armoured.

It would appear that the terrain in the area should be favourable to the deployment of armoured forces. But such was not the case. Regarded as a whole, the Moscow region is nothing more than an immense forest broken here and there by clearings, which are the only inhabited and cultivated spots.

The terrain is not only wooded, but it is often marshy. The first rains of autumn render travel difficult, except over the roads. This is particularly true of the area extending over 100 kilometers west and north of Moscow. Three large highways cross this zone, converging on the capital. All of them pass along the shores of lakes or the edges of marshes

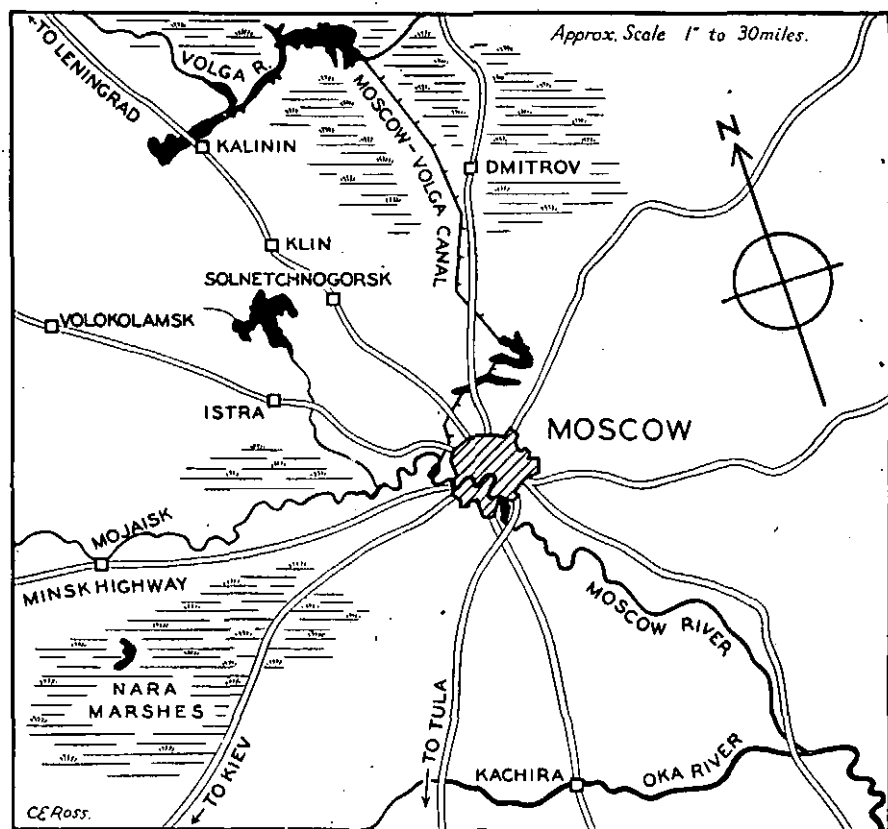
in several places. East of Mojaisk, the Minsk highway is bordered on the south by the Nara marshes (Narskie Prudi), and on the north by the meandering course of the Moscova. Lake Istra absolutely bars the thirty kilometer interval which separates Istra from Solnetchnogorsk, that is to say, the Volokolamsk highway from the Leningrad highway. North of Solnetchnogorsk this latter highway is bordered by Lake Sine (Sineskoirozero).

### Anti-Tank Defences

The passages between these lakes and marshes are only narrow corridors admirably adapted to anti-tank obstacles, camouflaged on the edge of the forest.

Except for these three large roads, the lateral east-west communications which Hoth's and Hubner's forces were obliged to follow toward Dmitrov and Yakroma, are dirt roads which are very muddy when it rains. Between Solnetchnogorsk and Moscow Lake there is no gravelled road connecting the Leningrad highway with the Moscova-Volga canal.

When after heavy losses, tanks succeeded in breaking their way through an obstacle and coming out into a clearing, they were stopped at the opposite edge of the forest by a new anti-tank ditch covered with new abatis. Back of this obstacle, anti-tank units were on the watch. These units were equipped with



weapons which had but recently come from the factory. They fired point blank, when they were certain to hit their targets. In this way the Soviet 289th Anti-Tank Artillery Regiment alone destroyed 189 tanks during the battle. It received the designation of "First Anti-Tank Artillery Regiment of the Guard." The 296th Anti-Tank Artillery Regiment destroyed twenty-two tanks alone on 24 November.

South of Moscow and beyond the Oka, forest is found only occasionally in the expanse of cultivated fields. Marshy areas are rare. This explains the rapid drive of Guderian's tanks to Kachira. In this sector it was the stubborn defence of Tula which appears to have paralyzed and disconcerted the German Command.

### German Difficulties

It seems that in engaging nine armoured divisions west and north of Moscow, the Germans did not realize the difficulties they were to encounter. They could not foresee that their advance would encounter new anti-tank weapons of surprising effectiveness, and having staked nearly everything on their armour, they did not have enough infantry north of Moscow to outflank the anti-tank obstacles through the forests. Moreover, the intervals were strongly held by large forces of Soviet infantry and cavalry, guided and supported by partisans. When tanks and trucks become involved in traffic jams on the roads, the fire of Soviet long-range artillery was disastrous.

For the first time in the war, German aviation was dominated by Soviet aviation. Soviet *Yak* fighters were at least the equal of the *Messerschmidts*. Under fighter protection, the *Stormovik* planes attacked the German columns from low altitudes, destroying more than 400 tanks from 1 to 11 November. Intense night bombardments harassed vehicle columns on the congested roads.

Canalized by the terrain toward anti-tank obstacles which were defended by excellent artillery, lacking infantry for

outflanking them, and harassed by superior aviation, the German armoured division suffered heavy losses daily. They were gradually worn down by continual encounters against increasingly powerful resistance. Each bound, however short, cost more tanks and more men.

### The "Russian Winter"

Such were the true causes of the German defeat at Moscow. But rather than recognize them the Germans resorted to fiction. They claimed that the battle had been won, not by the Red Army but by the "Russian winter." To accept this view would be to forget that the action started at the beginning of October, several weeks before the beginning of the severe cold season, and also to ignore that Hitler on 2 October exhorted his armies to win before the arrival of winter. Not until the start of the second phase of the offensive on 16 November did weather conditions render fighting more difficult. Moreover, even if the freezing weather caused great suffering among the troops, it froze the marshes and facilitated tank movement off the highways. Hitler's stubbornness was responsible for the German troops being caught in summer uniforms at temperatures of from minus 20 to 30 degrees centigrade. But when the winter battle began, was not the German cause at Moscow already definitely lost? The Soviet command, in spite of the danger which continued to hang over the capital as late as 6 December, had the situation well in hand. The battles of October and November proved that German armour was not invincible.

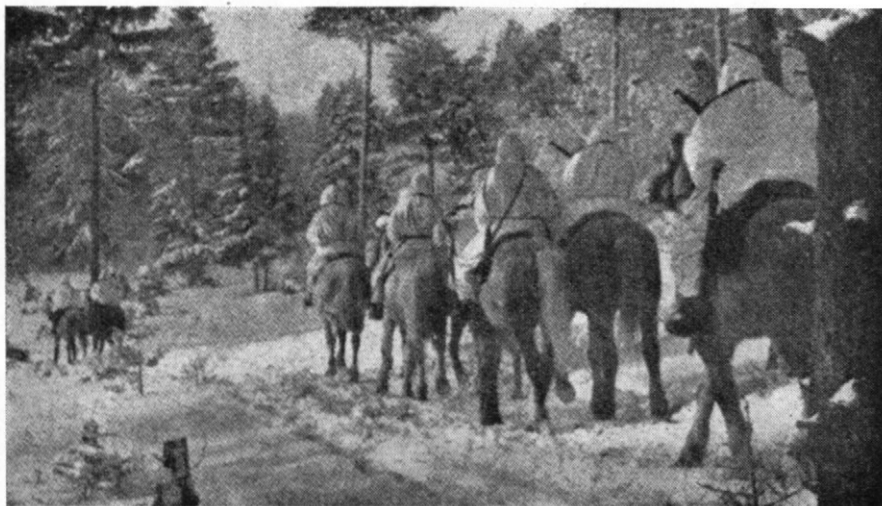
Indeed, Hitler continued to pursue his attacks in spite of the objections of his general staff, and refused to admit his defeat. His generals begged him to suspend the offensive and resume it in the spring, after communications could be re-established, the Soviet railway lines brought back to normal, and the units again filled out. He replied by a new order for attack.

When the Moscow defeat resulted, he punished the commanders for not having been able to carry out his plans. Brauchitsch was relieved on 23 December in the midst of battle. Von Bock was replaced by von Kluge, who in turn was replaced by Heinrich at the head of the Fourth Army. Guderian, after a stormy interview with Hitler at the latter's headquarters in East Prussia, was replaced by Schmidt.

One thousand five hundred tanks were destroyed at Moscow, but the losses in

Although bled white, the German army was again able to assume the initiative in 1942, after the resupply and regrouping of its forces. But it was never again able to operate on several different fronts simultaneously, a fact which greatly facilitated the Soviet reaction.

Moreover, as the German forces drove deeper into Russia, their lines of communication were strained. Operating in hostile country, their liaison between front and rear was threatened. Partisan



Russian Cavalry Patrol

men were more severe. This was true because the losses affected the armoured battle corps, which included many of the best German youth. The conquerors of Poland and France went down at Moscow. The tanks could be replaced, but not the crews.

From the strategic viewpoint, the defeat of von Bock's forces by General Jukov completed the picture of German deceptions on the Soviet front. It marked the complete collapse of the "Barbarossa" plan.

action, prepared in peacetime, began to be felt, and this caused no small amount of worry to the German command.

### Soviet Situation

On the Soviet side, the Red army came through the test stronger than ever, in spite of severe losses. The early terror of German tanks suddenly disappeared. With its anti-tank artillery and *Stormoviks*, the Red army now felt able to destroy the armour which nothing previously had been able to stop.

The annihilation of the German units encircled in the Moscow forests completed the work of inspiring in the Soviet infantry and cavalry a feeling of superiority which the reverses of the summer of 1942 were unable to destroy and which were still intact at the battle of Stalingrad.

The Red army, forgetting the disasters of the first months of war, regained confidence in its leaders and its weapons. It regained confidence in itself. During the four months of hand to hand fighting at Moscow, the Red soldiers gave proof of endurance, tenacity and sacrifice.

### **The Myth of Invincibility**

The myth of invincibility of the German army was exploded by the victory of the Red army at Moscow. It was destroyed in the eyes of the German troops and the entire German people, who now lost their blind faith in the *Fuhrer's* lucky star. This myth was also destroyed among the Red soldiers and the peoples of the Soviet union, and

gave courage to the Allies and the subjugated peoples of Europe.

These were the consequences of the German defeat, from the military and political points of view. In World War II, the victory of the Red army at Moscow in December 1941 is no less important than was the victory won in September 1914 on the Marne by the French Army in World War I. Both mark a decisive turning point in the wars of conquest begun in Germany.

The battle of Moscow marked the beginning, on a world-wide scale, of the war of attrition. The era of Hitler's sensational exploits was ending. The German effort, strained to its limit at the beginning, was not able to continue indefinitely against the combined forces of the free world.

In 1942, the Red army underwent new tests over which it triumphed. But the defence of Stalingrad can not make us forget Moscow. At Moscow Hitler suffered his first defeat. It was there that his dream of conquest crumbled before the resistance of the Soviet army.

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**"Training can be fascinating, or it can be deadly dull and soul destroying. Too often the latter is the case, owing either to lack of imagination or to mental inertia"**

— *Field Marshal Montgomery.*

# MAGNETIC SCRAP COLLECTION

Written for the Australian Army Journal by  
the Directorate of Mechanization, AHQ

THE accumulation of scrap metals such as nails, tying wire, hoop-iron, etc., on roadways, loading platforms and aisles within Ordnance Depots, presents a constant problem of counter-action against punctures on pneumatic tyred equipment. In one depot, a survey of this problem indicated that in one week a total of 30 tyres had to be repaired. The consequent loss of man-hours in Depots and Workshops demands counter-action of some kind.

At first sight it would appear that the problem could readily be overcome by sweeping, if the necessary manpower was available. This method again raises the problem of the effect of dust both inside and outside the Depots, with the consequent damage to machine parts and other general stores. In addition, sweeping cannot be guaranteed to remove metals which may be lightly embedded in the mud on the surrounding roadways.

Since the advent of pneumatic tyres many attempts have been made to solve this problem, but only partial success has been achieved.

In industry, the trend has been toward some form of magnetic device which will incorporate the use of either electro-magnets or permanent magnets. Both these types are limited in their ability to effect 100 per cent pick-up. There is also the disadvantage of weight and operating power.

As the strength of a magnetic flux is inversely proportional to the square of the distance between the pole faces and the metal to be attracted, it is apparent that the magnets must travel very close to the surface to be cleared. Consequently, these devices are limited in use to more or less perfect road surfaces.

Again, the speed at which the magnet passes over the object to be attracted is of great importance. Speeds must be kept to a minimum, thus adversely affecting the time-factor in the operation.

These are some of the problems which have to be overcome before a 100 per cent efficient Magnetic Scrap Collector can be obtained. It was with these points in mind that experiments were carried out with a revolving brush device which would make actual contact with the scraps and, by means of a magnetic field, deposit them in a receptacle without the formation of dust, and which could also deal with some of the metal slivers embedded in mud. It was found, however, that this device had many inherent defects among which was the excessive weight together with its detrimental effect on the steering of the prime mover, and the fouling of the brush with the surplus extraneous matter.

Although these faults have made themselves apparent it is proposed, at a later date, to investigate the revolving brush more fully in an effort to arrive at a successful device of this nature.

Experiments are now being centred around the use of a permanent magnet made from a new kind of aluminium and nickel alloy for which is claimed not only an intensely high flux for a given pole area, but an extremely long life as well. It is expected that this type of magnet will assist greatly towards the solving of the problem, as, being comparatively light in weight, the design of suitable attachments is simplified. In addition, the other mechanical problems usually associated with the use of heavier type permanent magnets in relation to

load distribution and steering of a vehicle, are almost completely obviated.

As a basic vehicle for these experiments it is proposed to use the Truck,  $\frac{1}{2}$  ton (Jeep) mainly because of its manoeuvrability and because its dimensions are such that it can be operated on roadways, loading platforms, and aisles in and around the Depots. It is envisaged that the permanent magnet device will be supported on a fixed frame mounted in front of this vehicle, and it is along these lines that design work is proceeding.

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**Captain James Cook, sailing out of the east from the following of a star in 1770, brought to the vague new shore of his discovery a national watchword, Endeavour, the name of his lone and valiant little ship.**

**Australia must never forget this tradition.**

*— Ernestine Hill.*



# What is Morale ?

Condensed from a Radio Broadcast by  
General Sir William Slim, GBE, KCB, DSO, MC

WHEN in 1945 the 14th Army was making its dash for Rangoon, we hadn't enough transport aircraft to keep the troops supplied with full rations, and at the same time give them all the ammunition they needed. So the rations went short. Then, just when we were strung out in the advance, a Japanese division appeared on the rear flank of one of our columns and put in a counter-attack. For a bit the situation was tricky. At the time I was visiting a battery, the guns were firing all out. I stood watching one gunner stripped to the waist, his lean bronzed back glistening with sweat as he slammed shells into the breech of a 25-pounder. There was a momentary pause in the firing, and I said to him—"I'm sorry you've got to do all this on half rations." He looked at me with a grin under his battered bush hat and answered, "Never you mind about that, sir; put us on quarter rations, but give us the ammunition and we'll get you into Rangoon."

That gunner knew that getting the army into Rangoon wasn't going to make things any easier for him. He knew, as well as I did, that Rangoon would be only a stage on the way to Singapore, and the whole grim business over again. He wouldn't get any less hardship and danger, yet he was willing, indeed eager, to go on. That was morale.

The other day I was walking past a row of dismal little houses, tight jammed in a back street of one of our industrial cities. The sort of houses which if it hadn't been for the war and its aftermath would have been condemned and pulled down years ago. I was invited into one of them. It seemed to me to have everything wrong with it that a

house could have. It was ill-lighted, lacked the most elementary amenities, was in the most depressing surroundings, yet inside it was clean and tidy and somehow cheerful. The mother of the family lived there, an elderly woman, clean and tidy in herself but obviously tired, smiled as I looked around and said, "No, it isn't much of a house, but until we can get a better one we'll do the best we can with what we've got." And she had—she'd made a real home out of what might have been a hovel. That was morale, too. And I think my gunner in the jungle would have touched his old bush hat to that tired housewife and to thousands like her and said, "I give it to you, Ma, you're a better and tougher soldier than I am."

Morale isn't only a matter of the fighting services. True, an army without morale is nothing but a collection of unhappy fighting men, but a nation without morale is just a collection of quarreling, discontented sects and parties with no unity and with no real aim. Morale is the most important thing in any organization.

When I first got command of the 14th Army, I sat down quietly by myself to think out this business of morale, and my thoughts ran something like this. Morale is the intangible spirit of any body of men or women. Like courage, it's a state of mind, a mixture of emotion and reason. High morale means that every individual in a group will work or fight, and if needed, will give his last half-ounce of effort in its service. Now for a man—especially an intelligent man—or woman for that matter—to feel and act like that, his morale must have certain foundations, certain things on which

it is solidly and firmly based. These foundations are, I think, first spiritual, then mental, and lastly material. I put them in that order because that, I believe, is the order of their importance. Spiritual first because no other foundation of conduct will stand firm under real strain. I use the word spiritual, not necessarily in the meaning of religious belief, though religion is, and always has been, one of the greatest foundations of morale, but in the sense of faith in a cause. A man must believe that what his organization is working for is worthy of all the labor and sacrifice that he may be called upon to give, that it has a great and vitally necessary object—a noble object, if you like. Next he must feel intensely that he is part, even if only a small part, of that organization, and that what he is and what he does really count in it.

So much for the broad spiritual foundations of morale. What are the mental ones? First I think, the intelligent man must be convinced that the object of the organization is really obtainable. Difficult perhaps, but not impossible. Second, he must feel that he belongs to an efficient show, one in which his efforts and perhaps his life are not likely to be wasted. As the third mental foundation he should, whenever possible, know why he's asked to do certain things.

That brings me to the material foundations. I put these last because you can have good morale, in fact the highest type of morale, amidst the worst material conditions. But any leader would be very unwise to expect it, and he certainly wouldn't get it unless his men knew he was doing everything he possibly could to improve those conditions. That, in fact, is the material foundation of morale. Not that conditions are perfect, or even good, but that the need for improvements is recognized and they are being made at the best rate they can be.

It is deliberately on these foundations, spiritual, mental and material, that we began to build up morale. I think they were sound and that we succeeded.

Anyway, the Japs thought so. Now I know very well that lots of things can be done in the Army that can't be done in civil life. But after all, my gunner in his green battle dress is now in dungarees in some factory, field, mine, shop or office somewhere in Britain. He's still the same chap, and he'll still respond to the same appeals if they can be shown to apply equally to the job he is doing now . . .

But it's not enough to have a worthy object. We've got to convince everyone in the party that it is a worthy object. For what might seem obvious to me, sitting in Army headquarters surrounded by maps, reports, returns, might not be so self-evident to the orderly at my door, who hadn't seen his wife for four years, or to a wet hungry soldier up there in the jungle who was being shot at. It may not be so plain to a lot of people now. We found that the best way to convince men that what they were doing was worth while was to tell them. The spoken word, delivered in person, is the greatest instrument. An occasional talk by the man who holds the responsibility for the show counts a lot. It doesn't need an orator; any man who holds control over others should be able to do it. He needs only two qualifications. First he must be clear in his mind about what he wants to put over, and second, he must believe in himself.

Such talks shouldn't be just high expositions of lofty aims, you've got to come down out of the clouds and talk about the things that occupy men's minds—pay, housing, working conditions, prospects—but, at the end, whatever the audience, give a final word on a higher plane, on the spiritual foundations. People will always respond, sometimes a shade disconcertingly. Once when I'd talked to a battalion about a coming offensive, a little Cockney sergeant jumped up and said, "When the day comes, sir, we'll all be behind you."

I felt compelled in honesty to reply, "Don't you believe it, sergeant, when the day comes you'll be quite a long way in front of me."