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*Capt M. J. ...*  
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16 July 2014

**AUSTRALIAN**

*Seymour - Victoria.*

0120000890

**ARMY**

**JOURNAL**



**NO. 76**  
**SEPTEMBER**  
**1955**

*Notified in AAOs for 30th September, 1955.*

MILITARY BOARD

Army Headquarters,  
Melbourne

1/9/55

Issued by Command of the Military Board

*AW Knight*

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*Distribution:*

The Journal is issued through RAAOC Stationery  
Depots on the scale of One per Officer, Officer  
of Cadets, and Cadet Under Officer.

# AUSTRALIAN ARMY JOURNAL

*A Periodical Review of Military Literature*

Number 76

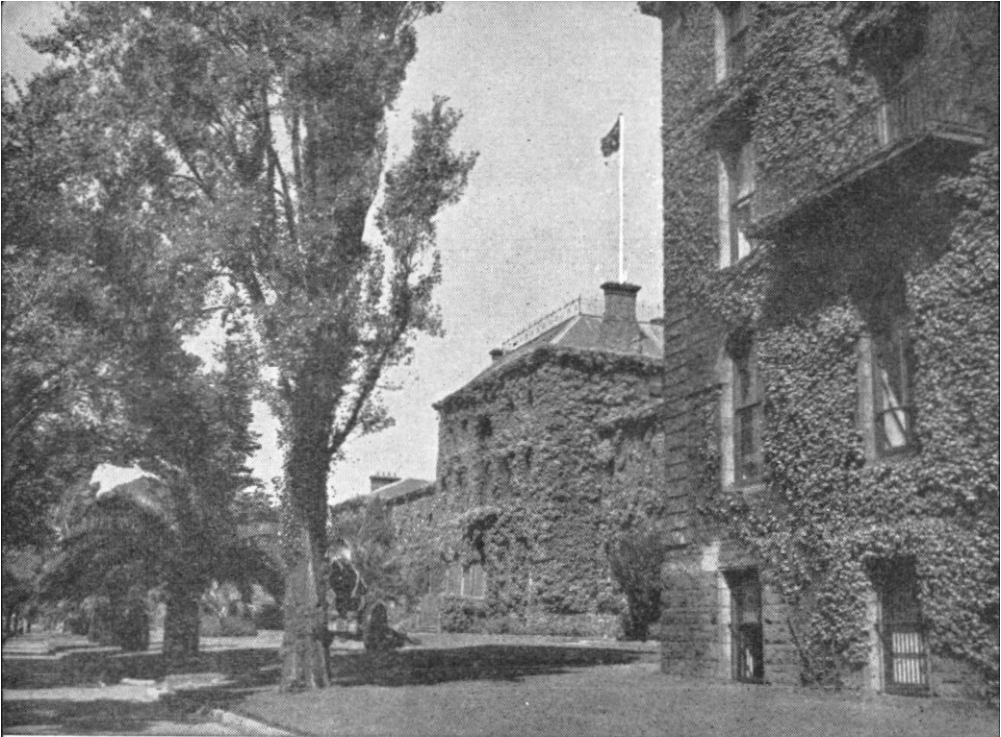
September, 1955

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VICTORIA BARRACKS, MELBOURNE

# AUSTRALIAN ARMY JOURNAL

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# Some More Thoughts on Tactics and "A" Weapons

Lieutenant-Colonel H. L. Sabin,  
Royal Australian Infantry

**A**TOMIC weapons are now available in a tactical role, and we must assume their use by land forces in a future war. Such weapons would be used in direct support of land operations against a background of thermo-nuclear strategic bombardment and possible thermo-nuclear tactical interdiction.

This has given rise to a general enunciation of the requirements of the field army to meet this new situation, *viz.*:—

- (a) It must be streamlined, mobile, hard-sitting and capable of rapid concentration and dispersion.
- (b) It must be led by aggressive commanders, who can operate under a broad directive, using their own initiative as opportunities occur.

A great deal of thinking is going on at present which is aimed at producing a tactical doctrine for use by the battle commander. New or-

ganizations are being tested, new techniques developed and so on. So far little by way of firm or detailed policy has emerged. Such is unlikely until a great deal more knowledge is gained by trial and test. Nevertheless it is possible to look at the new situation, and by simple appreciation expand on the general enunciation outlined above.

The aim of this study therefore is to produce further thoughts for consideration in the field of tactics and atomics.

## Evolution of "A" Tactics

The evolution of a firm and complete tactical doctrine involving "A" weapons must necessarily be slow as opportunities for practice (it is hoped) will not occur. In addition, there is the security aspect, which slows down the wide distribution of relevant information. It will be recalled that the introduction of gunpowder was probably as revolutionary in its day as "A" weapons

are today. In the early days there was ample opportunity for trial and comparatively no security problem. Notwithstanding, tactics, as a result of gunpowder, did not change quickly. The evolution of "gunpowder tactics" was only speeded up in recent years by the introduction of long range weapons, the armoured fighting vehicle and use of air power.

One way to study this problem is to assess the effects of the weapon and relate these to the present methods of application of the Principles of War. This should produce some general conclusions, which can in turn be applied to specific tactical considerations. It is not considered practicable at this stage to attempt to examine in detail the various phases of war.

#### The Effects of the Weapons

It is not proposed to deal with these in any detail, as they have been fully covered with a good tactical backdrop in previous articles in this journal.

It is most important to remember the two main effects, viz.:-

- (a) The initial explosion with heat, blast and radiation, followed by
- (b) The radioactive contamination which may persist for some time.

It is also important to appreciate the comparative logistic ease with which this great volume of fire support may be delivered.

Having established the effects of "A" weapons clearly in our minds, we can now examine briefly the Principles of War, and see what changes in the *method of application* will be necessary as a result of "A" weapons.

#### The Principles of War

##### Selection and Maintenance of the Aim

The aim will still have to be selected and maintained, but may go several stages further than that based on conventional weapons. That is to say, commanders at all levels can now increase the width and depth of their respective tactical horizons, as this new weapon will increase the number of tactical possibilities in any operation. More speedy and deeper penetration will be possible, and objectives accordingly selected which in normal circumstances would be considered for a later phase. As will also be shown, "A" weapons will confer a distinct advantage on the defender or during withdrawal, because of the great ease with which this tremendous weight of fire power can be put down.

##### Maintenance of Morale

The application of this principle now becomes even more important. New and severe strains will be present under "A" conditions as the speed and violence of atomic fire power will be shattering. Despite this, the immediate rallying of men following "A" attack is vital, and therefore an extremely high standard of junior leadership is necessary. In the past morale has been helped a great deal by providing amenities and services. If the army of the future is to be streamlined, there will be drastic cuts in our "tail," and many of these amenities and services will surely disappear. Morale, therefore, will have to come from:-

- (a) The maintenance of a very high standard of knowledge, training and efficiency, par-

ticularly regarding protection from "A" explosions.

- (b) Superb physical fitness, confidence in oneself and one's leaders.
- (c) Efficient means of casualty evacuation and post-explosion reorganization.

The necessity for high morale is vital.

### Concentration

The application of this principle promises greater rewards but has added dangers. The great danger, of course, is to present an atomic target for any length of time. If we can utilize the tremendous concentrated fire power of the "A" weapon and then exploit it to the full, without at any stage exposing ourselves to serious atomic counter-attack, then rewards must be plenty. The method of application of this principle (as it applies to the physical massing of troops and equipment) has got to be speeded up a great deal, otherwise we shall seriously violate security.

The security of a force tactically concentrated is not enhanced very much, even though the force is under cover of darkness or fog. Some protection will be given to such a force during our own "A" fire support and for a short time thereafter, but this is not very great. When committed and in contact the force should be relatively safe from atomic counter-attack, but this cannot be assured, as a sufficiently ruthless enemy would accept casualties to his own troops.

The successful application of this principle in its physical sense will depend therefore on speed.

### Surprise

Greater opportunities will exist for achieving both local and general tactical surprise by using "A" weapons. The comparative ease with which "A" fire can be produced means that a tremendous volume of fire can be put down at short notice and sustained without any tell-tale pre-bombardment logistic activity.

Local surprise will on most occasions be achieved in and around the target area(s), but against troops of high morale this will not last for long.

To achieve general surprise, more than the explosion will be required. This will occur in the case where atomic fire power is used to support an operation of reasonable size. Several atomic strikes on selected targets, coupled with extremely rapid and vigorous follow-up action into these vital areas, will result in general tactical surprise, which may well produce large dividends. Imagine an Arnhem-type operation supported by atomic fire power and the point should be clearer.

### Offensive Action

The application of this principle is still as necessary as hitherto, for without it no battle can be won. Large-scale offensive action has, to date, been planned at the highest possible level, and this master plan passed down in fairly detailed form. The early phases of such an offensive have been planned in great detail, requiring large build-ups of troops, ammunition, equipment, etc.

This may not be the case in a future war using "A" weapons. It will then be necessary for field commanders and battle-group com-

manders to work within a broad directive laid down at top level. The speed with which an offensive may be mounted will probably be a more important factor than the size of the offensive. Atomic weapons can provide fire power quickly and in great volume, therefore hard and telling blows can be delivered if a fleeting opportunity occurs, providing our organization and techniques are equal to this task.

The real application of this principle therefore will tend to be decentralized, and its effectiveness will depend on the vigour and speed of its application by a group of subordinate commanders rather than by the commander-in-chief. The successful exploitation of any opportunity created at this lower level will be the responsibility of the higher commander by regrouping and thus maintaining the momentum of the offensive action already begun.

### Security

How can we achieve reasonable tactical security when up against "A" weapons? Our base, our L of C, any concentrations of troops and equipment, will be vulnerable. We shall not be able to guarantee firmness on the front, the flanks or rear by troop dispositions if "A" weapons a-plenty are available to use against them. This is indeed a gloomy picture, but it is as well to deal with such a situation to see how this principle can be most effectively applied.

You will all remember the "narrow" and "broad" front policies advocated during the Allied operations in North-West Europe. The narrow front depended for success on a deep full-blooded thrust into

enemy territory, backed by the whole administrative resources of the Allied armies, whereas the broad front envisaged lining up on the Rhine and, after the necessary administrative backing was available, launching the assault. It is obvious in which of these courses the principle of security was *directly* applied, viz., the broad front. The narrow front policy did not neglect this principle, but depended on the application of other principles to create the necessary degree of security. These were surprise, offensive action, morale, administration and flexibility.

These same principles will have to be applied in a future war if the proper degree of security is to be maintained. We must be aggressively-minded, swift and decisive in our actions, and always be able to exploit an opportunity. Camouflage and concealment will help with security, but proper security will not be achieved by passive measures.

Good intelligence, reconnaissance and observation, efficient staffs, simple techniques, will all be important factors in the application of this principle.

### Flexibility

It is pretty clear by now that if the other principles are to be applied by the methods suggested this principle is the keystone to them all. To give full effect to its application, organizations, procedures, communications, technique of control and command must be capable of meeting any situation with utmost speed.

In addition to having the capacity to exploit one tactical situation after



another, the ability to recover and quickly reorganize after sustaining a heavy atomic blow is also of great importance. This will entail the rapid employment of large medical and engineer resources, the quick re-establishment of supply channels and/or dumps, and so on. Lack of prompt attention to this aspect may well have a serious and damaging effect, both material and moral, on the battle.

Better means of observation, more speedy reconnaissance and good communications are essential for future commanders if they are to keep pace with the tempo of the battle. This calls for further development of infra red as a means of night observation, and possibly new equipments, such as airborne television, for reconnaissance and battle observations.

We must strive towards greater flexibility as never before. This will not be achieved by good organization, weapons, physical mobility, if the mind cannot keep abreast and ahead of the situation. This applies at every level of command.

#### **Economy of Force**

This simply means "do not be wasteful" and NOT "use a little." There will be a great tendency to violate this principle if atomic weapons are plentiful, as it will be a great temptation to engage targets of non-atomic size and value.

The reasonably large area which now can be temporarily neutralized or controlled by "A" weapons must give rise to careful consideration before committing troops to the ground as in defence. Likewise the tactical value of an obstacle must be more carefully assessed if we are "not to be wasteful."

The provision of screens and garisons to protect vital areas all have to be assessed somewhat differently, and a nice balance struck between security and flexibility.

#### **Administration**

Some do not accept this as a principle but a factor. However, it is a vital consideration in planning tactical effort. The introduction of "A" weapons into the tactical picture must surely produce tremendous administrative problems. Is the conventional Advanced Base still practicable, with its docks, marshalling yards, installations, etc.? Can we in fact use a port as a means of unloading our stores? Can we maintain a L of C involving railways and roads? All these problems are receiving active attention, and space does not permit their full discussion in this paper. It is sufficient to say that it will be necessary for all units, groups or formations to operate quite independently of an administrative link for a limited period in a future war. Their capacity to do this must be increased to the maximum without impairing in any way their efficiency. In addition, their re-supply must be rapid and flexible.

The atomic weapon has, however, produced a great logistic advantage. Compare the effort required to shift 200,000 tons of HE-type ammunition with that to move 10 x 20 kilo-ton "nominal" missiles. Even though this comparison is based on theory, as regards explosive effort, the point of saving in logistic effort must surely be clear.

The means of ensuring continuous administration in the shadow of atomic attack will depend on our

ability to avoid presenting targets in our rear areas. There is no indication that we can properly defend these areas; therefore no worthwhile targets should remain for other than the shortest possible time. Movement of stores, etc., must be done quickly and in large forward bounds, e.g., from ship or BMA to divisional area. Vertical lift aircraft are the only means we have of doing this. If ports are to be avoided, ship-to-shore unloading on a large scale will be necessary.

Some of the salient points which emerge from this look at the Principles of War are:—

- (a) Morale is of greater importance than ever.
- (b) Security cannot be assured by troop dispositions, and rear areas are now particularly vulnerable.
- (c) Flexibility at all levels, among all units and in all situations is of paramount importance. This applies equally to the administrative and operational functions.
- (d) Much greater responsibility must be accepted by commanders at the lower level, who must be capable of assessing the situation and acting on their own initiative.
- (e) The temptation to use a "A" weapon on any target must be resisted.
- (f) Organization, equipment and techniques must be reviewed to meet these new demands.

Let us now look at the general tactical picture, and see what useful conclusions we can draw from our study:

### **Movement**

In all areas, the capacity for reasonably quick cross-country movement for considerable distance will be required, either by air, ground-vehicle or on foot. This applies to troops, equipment and supplies, and is necessary by night as well as day. The atomic weapon will not be more useful directly against moving columns than the conventional, but can make a route impassable for a longer period.

### **Fire Support**

A greater volume of concentrated fire power with infinitely more speed and less effort is now possible. In defence and the withdrawal "A" weapons can provide a telling amount of fire support with little logistic effort, which could well restore situations hitherto declared lost. In the attack, atomic support must surely achieve local surprise, as no built-up will now be necessary before such fire is brought down.

### **Deployment**

Atomic targets must not be presented unless the risk of their destruction can be accepted. Dispersion, concealment and camouflage, plus protective field works, are vital aspects of tactical requirements. Deployment in relation to ground and obstacles requires new consideration, due to the large areas which may be neutralized.

### **Ground**

Ground is still a dominating factor, but there will be new considerations in the selection of areas of occupation. Reasonably large areas can now be neutralized for a definite period. The routes leading to

areas considered vital may well be more important to hold physically than the areas themselves. Such routes or axes will require consideration as "A" targets.

### Obstacles

The protective value of obstacles and the problem of negotiating them must be re-examined in the light of "A" weapons. Natural obstacles such as rivers and defiles will still afford good protection, but concentrations which occur in their defence or to force a passage would present good "A" targets. Obstacles must be crossed on a broader front than before, and the pause for re-organisation kept to a minimum. "A" weapons can create formidable

obstacles if used in a demolition role, e.g., centres of communication and defiles could be made impassable by the debris.

### Timings

Precision and speed in both tactical manoeuvre and administration assume even greater importance. The ability to *get moving*, and move with the utmost speed from the smallest to a fairly large group will be vital. In addition to this, accuracy as regards timing remains tremendously important. There is little doubt that, within reason, accuracy and speed will be much more vital than the size of a force in future tactical operations in the atomic theatre.

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At the same time, we must never lose sight of the elemental fact that, in the last analysis, victory in war depends on human beings. In this field, at least, there is a point beyond which the machine cannot be substituted for the soldier. It can increase his capabilities, it can magnify his effectiveness, but it cannot take his place. We must not fall into the error—potentially a fatal one—of thinking that in war we could replace manpower with machine power to the degree that we have done so in other fields of endeavour. There is no easy road to success in combat. The only way to win victory is to fight for it.

—General Charles L. Bolte, U.S. Army.

# "A" and the Regular

Lieutenant-Colonel I. B. Ferguson, DSO, MC,  
Royal Australian Infantry

**I**N these days of atomic and thermo nuclear development, it is fashionable to talk about chain reaction. However, not even the most alert young officer is likely to visualize its relationship to "A" matters.

The "A" problem in regimental life can be likened to chain reaction in that you, as a platoon commander, by one ill-considered or stupid decision in relation to your troops, can cause the raising of a file which grows in dimension as it passes through higher headquarters, and, in many cases, may produce an administrative overburden on the desk of the Minister for the Army for final arbitration.

The pure "A" problems of war are very largely overshadowed during peacetime by the needs of individuals, and it is in this sphere, as both platoon commander and local adjutant-general, that you must be firm and just in the handling of your troops.

On the regimental level, then, man-management is the "A" problem which is generally caused by your lack of knowledge or thoughtfulness, and which restricts the training for war of personnel employed in "A" duties.

There are numerous ways in which you can reduce the "A" overburden, many of them unconnected with "A," but all ending up there when things go wrong. Some examples of these are:—

## Transfers

When a soldier makes application for a transfer he does so with a purpose, possibly for betterment, dissatisfaction, domestic problems, pure spite or just for a change of outlook. No matter the reason, he should be interviewed and helped where necessary, and in so doing you may solve his problem before it arises.

## Leave

Why arbitrarily deny a man leave when there are other disciplinary measures you can adopt? This practice leads to AWL.

## Married Quarters

Familiarize yourself with the conditions under which a soldier may apply for married quarters, and be prepared to discuss them with your troops, not with the object of promising every man a quarter, but rather to ensure that they are aware of the conditions.

### Discipline

When administering discipline ensure that you are not dealing with just the "front man," and also that you do not single out one man to be the butt of such discipline because of his weaker character. Discipline properly administered makes for a happy unit.

### Higher Duties Allowance

Where a just and concrete case exists, your course is to assist the soldier, but do not attempt to gain popularity by a promise the keeping of which is beyond your control. This will breed discontent.

### Canteen

There is not a soldier born who will not have some complaint against his canteen, be it in the operation, goods supplied, amount of beer sold, prices or conditions, and you can clear the air for him on many of these points.

### Dress

By accepting a slovenly standard of dress you are lowering the discipline of your unit, which will breed a familiarity you will find difficult to eradicate when the need arises.

### Sport

In this sphere you can and should gain the confidence of your troops, not by your standard of play but

by your participation. You will find it a key which opens many doors.

The list just given is by no means comprehensive, and could have included education, welfare, barrack quarters, medical and hygiene, all of which, when added to those already enumerated, indicate the extent of the field you must cover to produce a happy and well-knit platoon.

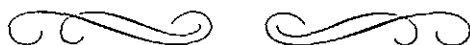
The Army, by virtue of its role, has a tighter bond between officer and man than can be found in other Services, and as a platoon commander you have intimate contact with every man under your command. Why not use it to your advantage and that of the Service as a whole?

If "A" Branch can and does know the military history of every man in the Army, it is little enough to ask you, the platoon commander, to keep a personal history sheet for each man in your platoon. If you use it and keep it amended, you will find that the personal contact it brings you with your troops will automatically solve many minor problems before they arise.

Above all, always remember your dual role of adjutant general and platoon commander, and give a balanced and sane answer to your troops' problems. They deserve it, and you will reduce the "A" problems throughout the Service.

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# Medical Effects of Radiological Warfare



Major J. G. Sloman, B Sc, MB, BS, and Captain C. W. Baird, B Sc, MB, BS,  
Royal Australian Army Medical Corps

## 1. Introduction

### PART I

#### Causation of Atomic Injuries

## 2. Injuries due to the BLAST

## 3. Injuries due to the LIGHT FLASH

## 4. Injuries due to the HEAT FLASH

## 5. RADIATION injuries

### (a) Types of radiation:

(i) Particulate.

(ii) Non-particulate.

### (b) The production of radiation injuries:

(i) Immediate.

(ii) Delayed.

### (c) Types of injury.

## 6. References

"Without an equal growth of Mercy, Pity, Peace and Love,  
Science herself may destroy all that makes human life  
majestic and tolerable."

—Sir Winston Churchill.

### I — Introduction

On August 6, 1945, soon after 8 a.m., an American Superfortress bomber released an atomic bomb over the centre of the Japanese city of Hiroshima. More than four square miles of the city were destroyed. The city centre was dominated by a number of reinforced concrete buildings owned by banks, department stores, and other com-

mercial enterprises, while outside the centre lay a densely packed zone of small wooden workshops and lightly constructed wooden dwellings. The destruction was due partly to blast and partly to fire, which took firm hold of the city about an hour after the attack and burned unchecked for days.<sup>1</sup>

1. Medical Aspects of Atomic Warfare, 1948. War Office Official Publication, London.

And so the first atomic bomb was used in war. Earlier in 1945 the prototype weapon was detonated at Los Alamos, New Mexico, and since that time some fifty atomic explosions have taken place in various parts of the world. However, there is very little unclassified information about any except the first five:

- (a) Los Alamos. The bomb was exploded on a tower 100 feet high (ground burst).
- (b) Japan. Two bombs were exploded, both at 2000 feet (air burst).
- (c) Bikini. Two bombs were exploded, one an air burst, the other at a great depth in a tropical lagoon (under water burst).

Now, about 10 years and forty bombs later, we still have to rely on the knowledge gleaned from these five explosions to plan for the future. Because our information comes mainly from such antiquated sources these two articles on the medical aspects of the Atomic

weapon will to some extent be obsolete. However, the principles are unchanged. Doubtless the efficiency of atomic weapons has greatly increased since 1945, and the estimates of the destructive power of the hydrogen bomb in particular are too well known to need recapitulation. However, it is doubtful whether the most powerful weapons would be used in any new war. Smaller, though locally more highly destructive, atomic weapons have recently been developed, such as guided missiles and projectiles that can be fired from an 11-inch gun.

It is necessary for clear thinking to have definite beliefs, but it is equally important for us to change them if necessary. These articles are therefore designed to bring before all officers the current beliefs on the medical aspects of Radiological warfare.

Part I of this paper will deal with the causation of atomic injuries and Part II will cover the management of these cases in time of war.

### Part I

#### The Causation of Atomic Injuries

The injuries sustained by the human body following an atomic explosion are due to the sudden release of a great quantity of energy. This energy is released in two main forms:

1. *Mechanical energy*, causing direct damage to the body by blast and falling debris.
2. *Radiant energy*, the thermal radiations causing burns and the ionizing radiations being responsible for the radiation effects on various structures in the body.

Radiation sickness can be caused by instantaneous rays from the ball of fire or from lingering radio activity following the explosion.

Injuries may therefore be classified as follows:

- Blast injuries.*
- Injuries due to light flash.*
- Injuries due to heat flash.*
- Radiation injury.*

Of course, many casualties will receive a combination of these injuries. Let us take the example of an unprotected soldier who is less than 800 yards from ground zero. He

A DEADLY TRIPLE THREAT —  
RAYS — HEAT — FALLING OBJECTS

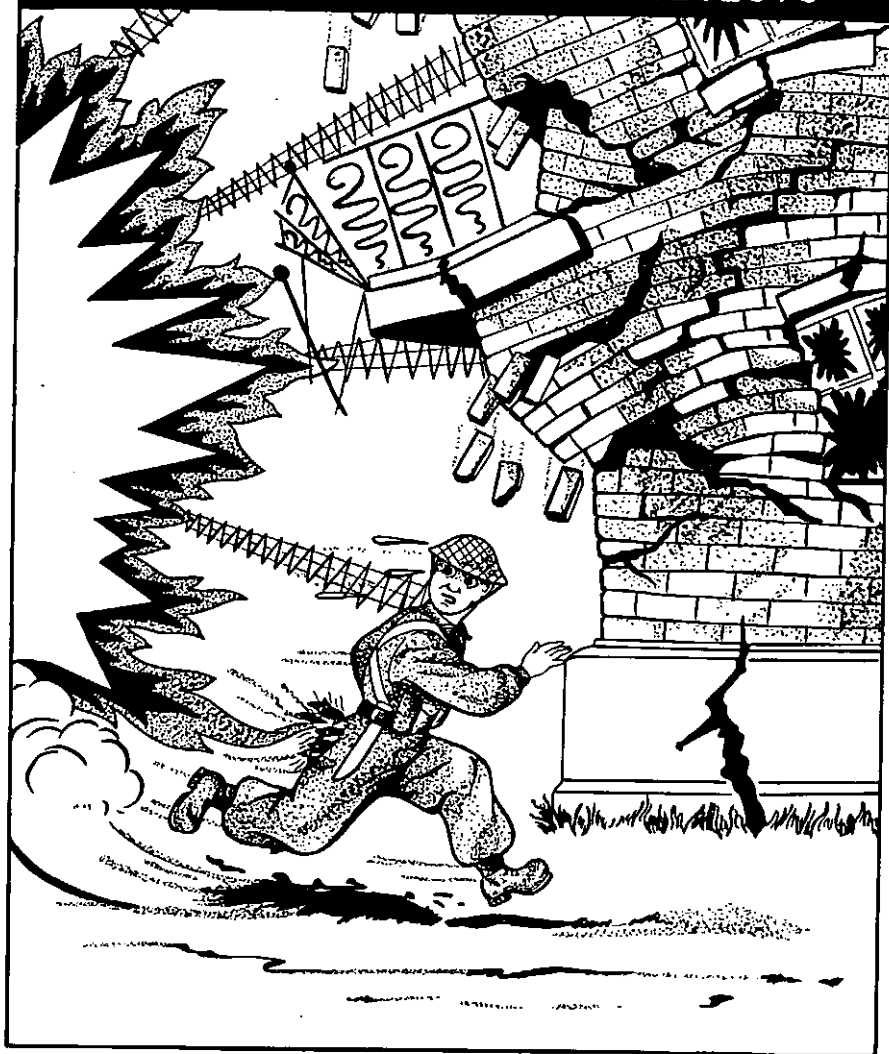


Fig. 1.



may be killed by flying timber, be burned to death or be killed by radiation. Since each of these injuries would be fatal, then which came first makes no difference.

#### 2—Injuries Due to the Blast

An enormous pressure wave spreads radially from the explosion centre, causing direct injury by blast and indirect injury by hurling masonry and debris through the air. The original positive pressure wave is followed by a negative pressure wave much greater than in an explosion due to TNT—debris is hurled violently TOWARDS the explosion centre, so that a soldier who escapes injury during the original blast may well become a casualty a few seconds later during the second phase. This second phase has been termed the "fire storm," for the winds set up contribute to the spread of secondary fires.

The direct blast is well tolerated by the human body, which can withstand pressures greater than that required to knock down the strongest buildings. Ruptured eardrums are the largest single injury occurring as a result of direct blast, and they occur infrequently. Almost universal damage will occur indirectly from flying debris. In neither case do the injuries differ in essence from those seen after a TNT explosion.

#### 3—Injuries Due to the Light Flash

The light flash is many times as brilliant as the tropical sun, but lasts for only a fraction of a second. It is not surprising, therefore, that temporary blindness is caused when unprotected eyes are exposed to it. This temporary blindness lasts for about 5 minutes in daylight and up to 1 hour at night. Ex-

perience from the Japanese explosions has shown that recovery is complete, and no case of permanent blindness has been recorded from this cause.

#### 4—Injuries Due to the Heat Flash

The heat flash accompanies the light flash and lasts for a few seconds. However, the highest intensity of heat is only present for a fraction of a second, and therefore causes only comparatively superficial burns. The amount of heat absorbed is governed amongst other things by the colour of the object. The darker the object the greater the heat absorption and the more intense the effect. For example, at Hiroshima, where a casualty had been wearing a light dress with a darker pattern, the part of the skin behind the dark pattern was burned, while that behind the light material was spared (see Fig. 2).



Fig. 2.

Whole thickness burns in exposed skin occurred up to 1000 yards from ground zero in the Japanese incidents, and together with the burns from secondary fires they accounted for about half the casualties.

It must be noted that only those casualties who are able to move themselves or can be speedily evacuated will escape the spread of these secondary fires. This is one reason given for the fact that among the Hiroshima survivors seen two months after the bombing only 4.5% had fractures.

The general line of prevention against burns is therefore clear. Light-coloured protective clothes must cover as much of the body as possible. Loose-fitting garments are better than tight-fitting clothing because of the air-insulation effect. Thus loose trousers are better than tight stockings. Wool is preferred to cotton, which may ignite, and nylon, which melts.

### 5 — Radiation Injury

This is the type of injury that principally concerns us in this discussion. We are all continually exposed to *background radiation*, which originates from the cosmic radiation of the sun and the radioactive materials in the soil and water. These radiations are of low intensity, and rarely is a dose of 20r exceeded in a lifetime.

Exposure to radiation now occurs commonly from artificial sources. When we have our chest X-rayed, invisible X-rays are sent through the body. Radioactive isotopes are used in many biological experiments to follow the fate of various elements in the body. Radium and its derivatives are used freely in the

treatment of cancer, a localised area of the body being exposed to a powerful radiation.

These radiations cannot be detected by any of the senses. For example, when an X-ray of a hand is taken, nothing can be felt, but millions of rays have penetrated the hand and are used to record a shadow on a radio sensitive film. Since the effects are not immediately apparent, special precautions must be taken to protect against these rays when their presence is known or suspected.

At this stage it may be helpful to recapitulate the types of nuclear radiation which are emitted as a result of an atomic explosion.

They are:

#### (i) Particulate:

- (a) Alpha radiations — Helium nuclei.
- (b) Beta radiations—electrons.
- (c) Neutrons—particles of the weight of Helium.

#### (ii) Non-particulate:

- (a) Gamma radiations — electro-magnetic radiations.

### The Alpha Rays

These positively charged particles of matter travel at a very high speed, but have relatively low penetration. They are absorbed in less than 10 centimetres of air, and can be stopped by a thick sheet of paper, clothing or skin. As a result, there is no danger from this type of radiation as a *direct* effect of the explosion. However, as a secondary effect of the explosion radioactive material may be deposited on the skin as a result of the "fall-out" or

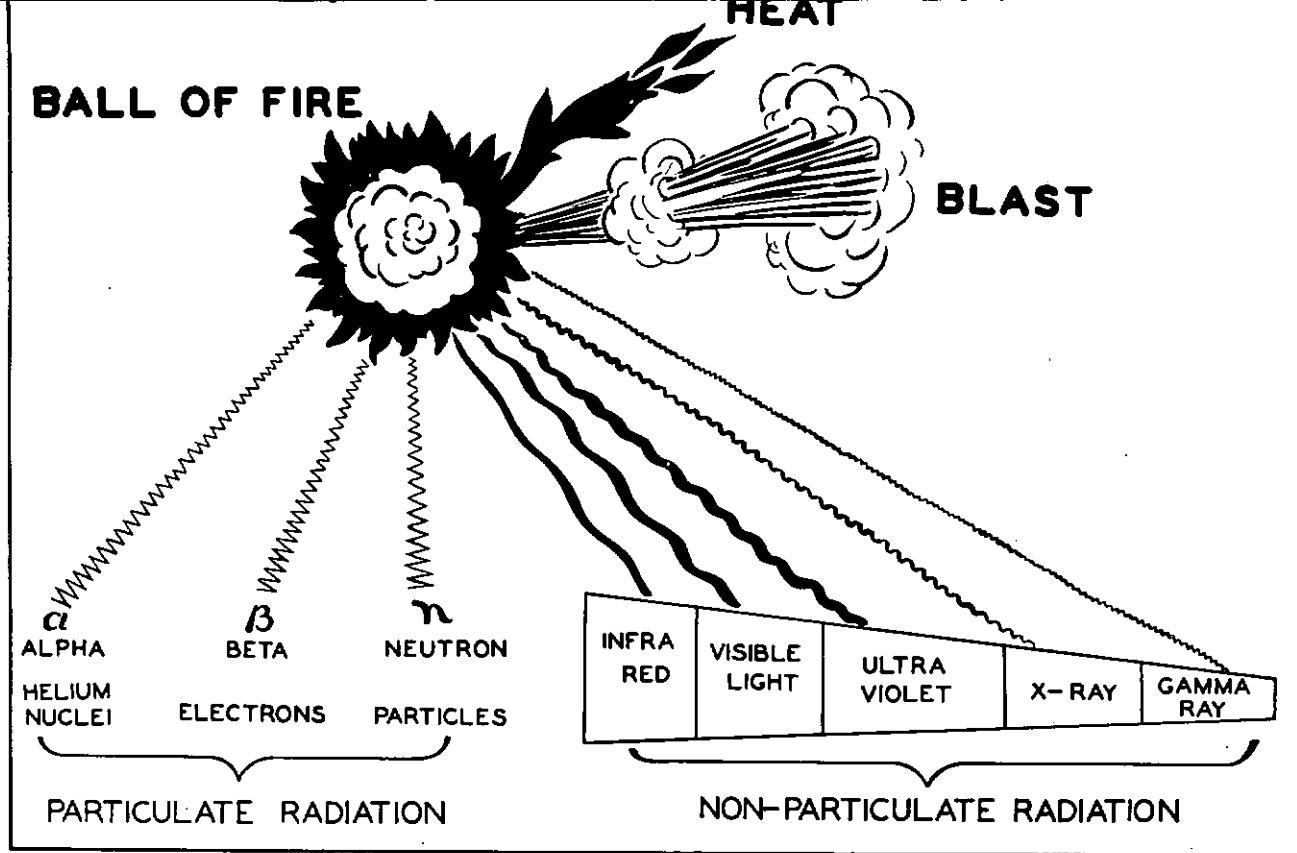


Fig. 3. Types of Energy Released by an Atomic Explosion.

# TYPES OF RADIATION

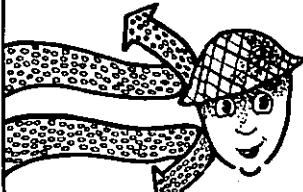
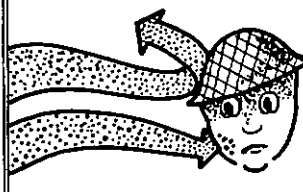
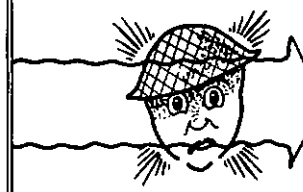
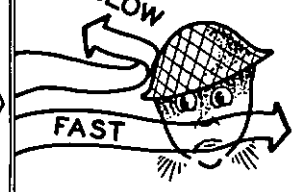
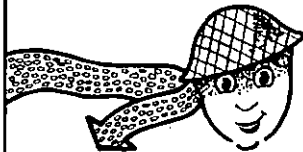
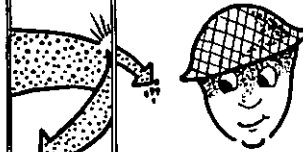
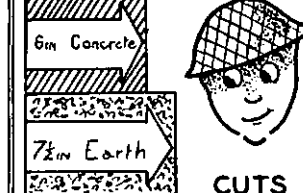
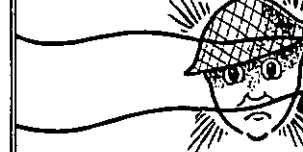
ALPHA	BETA	GAMMA	NEUTRON
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<p style="text-align: center;"><math>\alpha</math></p>  <p style="text-align: center;">PAPER, CLOTHING, SKIN WILL STOP THEM</p>	<p style="text-align: center;"><math>\beta</math></p>  <p style="text-align: center;">A METAL SHEET WILL STOP THEM</p>	<p style="text-align: center;"><math>\gamma</math></p>  <p style="text-align: center;">CUTS RADIATION IN HALF</p>	<p style="text-align: center;"><math>n</math></p>  <p style="text-align: center;">ALL GO THROUGH AT LESS THAN 800 YDS.</p>

Fig. 4.

from the "base surge" in an underwater explosion, and the alpha particles may then cause serious skin burns.

### The Beta Rays

These are negatively charged particles of matter (electrons), more penetrating in effect than the alpha rays, but still readily absorbed. They are only dangerous to the body when deposited on the skin and as a secondary effect of the explosion.

### The Gamma Rays

The gamma rays are true electromagnetic radiations, and have tremendous penetrating power. High energy gamma rays can pass through concrete in the same manner as radio waves penetrate the walls of a building to operate a radio receiver. The gamma rays are weakened by passing through concrete and other solid materials. Penetration depends on the thickness of the shielding. The gamma radiations travel in straight lines from the centre of an atomic explosion, falling off in intensity in their course. Their range in air extends to several miles. Fatalities did occur in Japan from gamma radiations up to a distance of one mile. At distances greater than one mile the hazard rapidly decreases. The danger from direct radiation emitted from the explosion centre is over within a few seconds.

### The Neutrons

Like the alpha and beta radiations, neutrons are particles of matter travelling through the air. Their damage is only considerable up to half a mile from the centre of the explosion. So that anyone exposed within this range would receive

such a high dose of gamma radiation as to prove fatal in any case. However, there are conditions when a person protected from gamma radiation may receive a fatal dose of neutrons. This is due to the fact that light substances are more efficient in slowing down neutrons with consequent absorption, while with gamma radiations the heavier the material the greater the protection.

### The Production of Radiation Injuries

Radiation injuries arise due to the whole body receiving a dose of radiation which interferes with the normal function of the cells of the body. When the whole body is radiated the relative sensitivity of the different body cells determine the character of the response. If the radiation is overwhelming, damage will occur to virtually all cells without regard to their individual sensitivities, and death will occur in a matter of hours, possibly days. Usually the dose is not immediately lethal, and there is an opportunity for the varied sensitivities of different body cells to become apparent as radiation sickness develops over days or weeks.

We will now see how these radiation injuries can arise associated with an atomic explosion.

#### (i) Immediate Radiation

Firstly, exposure may occur with the instantaneous burst of radiation emitted from the explosion centre. The only hazard here is from gamma radiations and perhaps neutrons, the gamma ray hazard being much more important. Fatal gamma ray exposure can occur at greater than one mile from ground zero, while the range of danger from

neutrons would be half this distance.

### (ii) Delayed Radiation

(a) The first way that delayed exposure can occur is through "fall-out." After an explosion radioactive particles ascend to the stratosphere, where they remain until dispersed. They may be carried a long distance in clouds, and eventually fall as radioactive dust or rain.

In March, 1954, a hydrogen bomb was exploded by the American authorities at Bikini Atoll. As a result of that explosion, "fall-out" occurred over a wide area. A Japanese fishing boat, the *Fukuryu Maru*, was 14 miles outside the restricted area about 70 miles east north east of the site of explosion in the direction of the wind, and it was heavily exposed to radioactive material from the "fall-out." A gripping account of this form of exposure to radiation was given by one of the fishermen involved in the mishap. The following account appeared in the American magazine "Life":—

"We saw flashes of light as bright as the sun rising to the sky. . . . The glow lasted several minutes and then faded, leaving a dull red like a piece of iron cooling in the air." After two or three hours Captain Tsu Tsui noticed fine white dust or ash falling. He said that some fell "into my eye and it began to burn. Then ash got into my nostrils." The ash was like talc. "Shortly after, I entered the engine room for my bath after the ash fell, I felt warmer than usual, almost as if I was glowing." The wireless operator described how that night "we were unable to eat our supper. We tried drinking some sake (rice wine), to improve our appetites, but

our appetites were not improved and the sake did not make us drunk."

Other members of the crew began to complain of headaches and nausea and then began to itch. "The itch became almost unbearable, and began breaking out with huge irregular blisters. They were terribly painful." The subsequent history of these men is not well known. However, one is known to have died following blood transfusions in Japan.

In contrast with the short-lived primary radiation, radioactivity due to "fall-out" will persist for some time where the material has fallen. This constitutes a grave risk of contamination of food and water, and also in the "fall-out" period radioactive dust may be deposited on unprotected skin, causing severe burning and constitutional upset.

After a low air-burst, radioactive material may be drawn into the ground, which may remain radioactive for some time.

(b) The second method of production of delayed radiation injuries is by the "base-surge" which follows an underwater burst. The minute droplets of water in the base-surge contain radioactive materials, and may travel a considerable distance in clouds before falling as *radioactive rain*.

(c) Finally, radiation injuries may be produced as a secondary result of the *neutron emission* from the primary explosion. The neutrons bombarding various materials may produce artificial radioactivity in such items as food, water and drugs or actually within the human body itself. This results in the affected materials or cells emitting alpha, beta or gamma radiations. In

addition, the great penetrating power of the neutron renders ordinary reinforced concrete buildings, such as shelters, almost useless as protection against these particles.

### Types of Radiation Injury

We have now seen how the various nuclear radiations can produce injury to the living body; it is therefore opportune to briefly consider the types of radiation injury which could result from an atomic explosion. Injuries can occur from (1) external and (2) internal radiation.

#### (1) Injuries from External Radiation

The injuries may be local or general. Local injuries may be produced in every way similar to radiation burns produced by radium or X-rays. Serious superficial burns may result if the radiation is of sufficient intensity. General external radiation injury occurs when the whole body is subjected to penetrating radiations. The body's reaction depends on the dose of radiation. In mild cases the clinical picture is identical with that observed in radiation sickness, which is sometimes seen when a cancer is treated with radiation. There is nausea with mild vomiting and diarrhoea. The more severe forms are characterised by severe prostration due to loss of body fluid from severe diarrhoea and vomiting, often accompanied by high fever and depression of the blood forming tissues. If the casualty survives the first few days, he may develop ulcers in the mouth, generalised blood poisoning, and bleeding may occur from the lining of his alimentary canal. These general radiation effects may, of course, be seen in association with localised skin burns, but where a large area

has been exposed to a sufficiently high dose to produce burns, it is very probable that death will have occurred before the full severity of the skin burn has become apparent.

In illustration, the following facts are noted from the case history of a 26-year-old physicist, who was fatally injured as a result of a temporarily uncontrolled nuclear reaction at the Los Alamos Laboratory. The radiation received was identical with that which occurs in an atomic explosion. Fortunately the reaction was stopped before the blast and heat flash had developed. The physicist had been touching the fissionable material when the reaction took place. It was calculated that his right hand received a dose of 20,000 to 30,000 r. The body dose was of the order of 500 r.

It was reported that after the accident the patient vomited repeatedly for three days. Then from the third to the sixth day he felt reasonably well. However, from the sixth day on he became gradually worse, the nausea, vomiting and diarrhoea returned, and on the tenth day ulcers began to form in his mouth. Death of tissue and severe infection affected the areas burnt on his hands and abdomen. Despite all treatment, death occurred on the twenty-fourth day.

#### (2) Injury from Radioactivity Within the Body

Radioactive particles may enter the body via the alimentary canal due to the ingestion of contaminated food or water, they may enter the lungs by contamination of the air, or they may enter through damaged skin. This contamination is a secondary effect of the explosion due to the "fall-out" of radioactive material from clouds or from the

base-surge. Direct burns may occur in the delicate lining of the lungs and the alimentary canal by inspired or ingested radioactive particles. Fortunately with reasonable precautions this hazard is not great. However, some radioactive material with a comparatively long half life, if absorbed into the body, can lodge in the bone and blood forming organs, causing serious or even fatal effects from its prolonged action on the tissues. The spleen and liver are particularly vulnerable to this type of damage. Cases of malignant tumours of bone due to the consumption of radioactive materials have been recorded.

The types of radiation injury can now be summarised.

#### External Radiation

(a) Immediate radiation from the explosion centre—effect due to gamma radiations and possibly neutrons.

(i) Burns to the skin and lining of the alimentary tract; lesser damage occurs to all other cells of the body, depending on their particular sensitivity to irradiation.

(ii) Generalised constitutional effects.

(iii) Induced radioactivity in some body cells due to neutron bombardment.

(b) Delayed Radiation — Radioactive fall-out.

(i) Skin burns occur due to alpha, beta and gamma radiations from the radioactive material of the fall-out.

(ii) Generalised constitutional effects, particularly on the blood forming organs, can occur, but are generally of a minor nature.

#### Internal Radiation

(a) Instantaneous radiation—Nil.

(b) Delayed Radiation.

(i) Burns can occur to the intestinal tract due to ingestion and to the lining of the lungs due to inhalation.

(ii) Generalised effects usually mild.

(iii) Late effects can occur due to deposition of radioactive material in the bones and other tissues of the body.



Local radiation to the hand, causing burns 15 days after exposure.



Cracking of the lips and ulcers on the tongue 12 days after a fatal dose of 500r (a lethal dose).

#### Radiation and the Body Cell

All the types of nuclear radiation outlined earlier are capable of producing injuries to the cells of the body. The injuries produced are all very similar, notwithstanding the difference in nature of the radiations producing them and the different cells affected. How does this



come about? Why are the biological effects of bombardment with alpha or beta particles similar to the effect of gamma radiation, which is an electro-magnetic vibration passing through the atmosphere?

There are many theories on how the rays do the damage, but the facts are few. What matters to us is that the damage is done and that we must be prepared to detect and treat it.

The common factor in the mode of absorption of all these radiations is that in the process of being absorbed they cause a change in the electric equilibrium of the body cells. As a result of this action, the biological change is produced. If the change of equilibrium, or ionisation as it is called, exceeds a certain critical value the cells will die. Cells of different tissues succumb at different values. Actively reproducing cells, such as those of the reproductive organs, the blood forming tissues and the skin are most sensitive.

#### Effect on Reproduction

It is beyond doubt that some damage is done to hereditary material

by radiations. Transient sterility is produced in the male, but permanent sterility is NOT to be expected, because the sterilising dose is so close to the lethal dose in the male and considerably more in the female. A whole body dose, sufficient to cause permanent sterility, will invariably lead to death before such sterility can be manifest.

The casualties recovering from the Japanese incidents have now produced perfectly normal offspring—demonstrating no residual defect. There is some evidence that long-term genetic effects may be produced. However, this is an aspect that must be investigated carefully in the years to come.

The psychological aspect of this reproductive consideration is of the utmost importance. If a soldier fears that he may be rendered sterile by exposure to radiation his morale will suffer. Men must therefore be told the truth, and assured that any effect that does occur is of a temporary nature only, and that recovery will be rapid and complete.

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# EXAMINATION TECHNIQUE

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**SENIOR** officers have no need to read this. They do not have to pass examinations or worry about them, and in any case what is this examination technique—never heard of it! Junior officers cannot afford not to read this. They have to pass examinations. Examination technique is just a modern term for the old, old business of getting the maximum number of marks out of any examiner.

The writer has yet to speak to a person who agrees that written examinations are a true and fair test of knowledge and ability. On the other hand, all agree that some system of testing and grading of officers according to their professional knowledge and ability and qualification for promotion, in the junior ranks, is desirable. Until a better system which is practicable is devised, written examinations covering a range of subjects will be with us. If you have to sit for examinations, then understand this subject well, because in an average paper you can pick up or throw away about 50 marks. Many officers seem just to pass and others miss by a small margin, so an understanding of examination technique can easily make all the difference.

## The Examiner

First of all, it is essential to know something of the examiner's point of view. DMT is responsible for written examinations, and his staff select, well in advance, suitable officers with the necessary qualifications to be examiners in particular subjects. The "lucky" officer receives a short directive indicating the length of the paper and the scope it is to cover. The examiner then studies all the aspects involved, and in particular checks on the availability of precis, etc., to candidates. He will also check on past papers and examiners' reports. Finally he decides on the items for inclusion in the paper, and spends some time framing questions so that his requirement is as clear as possible and the questions give a good coverage of the particular subject. He then ensures that candidates are allowed adequate time to answer the total number of questions. He should also take into account the time a candidate needs to read the paper through and understand it, and finally to check through his written answers. He then prepares draft answers to each question, indicating what he ex-

pects for a complete answer to each and submits them to DMT. Here they are again thoroughly checked before they are accepted. Often it is necessary to make changes, usually to simplify the paper.

At this stage the "lucky" examiner is over his first hurdle. In due course he will probably be President of the Correction Board for the paper, and the hard work begins. In many cases it represents at least a week of exacting work. He must be scrupulously fair, and frequent cross checks are necessary to ensure that a fair and even standard of marking is maintained. He has to account for every single book or piece of paper, and each is identified by a number only. He never sees a list of candidates and numbers, and similarly his own identity is not revealed. In many cases a member of the board marks only one or two questions, and does not see a single complete paper. So it goes on until the happy stage is reached where the adding machine is used to double, and frequently triple, check the individual totals. Borderline papers are then rechecked to ensure fair marking, and all the papers are returned to DMT. In due course results are published.

### The Aim of the Candidate

Now let us look at the problem from the candidate's point of view. Just what is the candidate's aim? To pass the examination? In the long run yes, but his aim is really to score as many marks as possible for every question he answers. Put another way—you do not know the examiner and he does not know you, but he is in a position to award marks for written answers. Therefore, do all you can to allow him

to award you the maximum for all you can write. Make no bones about it—go for marks every time, with the goal of getting a total well over the pass mark, and then you will never have to sit for that cursed paper again.

### Pre-Examination Study

From here on "do's" and "don'ts" might appear rather often, for which the writer makes no apology. However, it might be well to remember that they are only suggestions, but they are based largely on a close study over some years of hundreds of written papers.

First of all, do you know how to study? Do you know how to get the best value for the work you do? Each person is different in this respect. Many make the fatal mistake of spending long hours reading precis after precis in the hope that a little of what the eye sees will stick somewhere. Usually it doesn't. It is suggested you read in a very critical fashion on the assumption (if you like) that a fool wrote the stuff and you can phrase it all much better yourself. It is no good trying to remember the written word; reason out what is conveyed to you in each section you read and express it, mentally, in your own style. Take brief notes, because that helps you to concentrate, and the notes help later as a quick refresher.

Study the syllabus and the full scope of the subjects on which you are to be examined, and be sure you cover them all. Remember to concentrate more on the aspects you like least or know less about. Having completed your study, it is a good idea to work with a brother

officer on the basis of snap question and answer.

It is as well to remember that a superficial knowledge won't stand up to the requirements of a three-hour written examination, and you might only fool yourself. It is not a question of how good you are or how good you think you are; it is a question of expressing knowledge in the form of answers to convince an unknown examiner.

As a check on your study you must read previous examination papers and examiners' reports—they are published for this purpose. They give a good line on what to expect, and they provide questions and answers you can use to test your knowledge.

#### Confidence

Next comes the examination room with the scene of a lot of rather gloomy officers with worried looks waiting to take their places. All too often that picture is true, and it is so pathetic and unnecessary. A good night's sleep and a sensible breakfast help, but worry does not help at all. "Butterflies" in the tummy are very easily overcome, and they indicate that you have a good sense of responsibility and that you are keyed up for the test.

Here let me be a little more personal. I get "butterflies" every time I have to address an audience on any subject. I welcome it as a sign that I am ready to give of my best. In a matter of seconds I reason that I know the subject, I have a duty to explain or put it over well, and before I realise it the "butterflies" have gone and the business in hand is under way. In fact, the "butterflies" give way to confidence, which

was there all the time, and only wanted a little encouragement!

The following advice has been tried by many candidates, and it works. Admit it to yourself, you are worried and nervous, and maybe you have "butterflies" too. The idea is to turn it all into good healthy anger and annoyance, which allows your confidence to return. Start with the Army in general if you like, the person who invented examinations next, and in particular concentrate on the fiend who set the paper and caused you all this bother. Really vent your spite on him. Now take stock of yourself, a mature, sensible man, but worried or afraid—afraid of what? How silly it all is. Laugh at yourself for being such a fool, and look about you and pity those less fortunate than you who do look worried and nervous.

This sounds childish, perhaps, but it works and it allows confidence to return. Confidence helps a great deal in an examination, and if it will help you get more marks than the more confidence you have the better. In other words, only a fool undertakes a test with a self-imposed mental handicap.

Some fortunate people don't seem to worry at all, and accept an examination as a challenge, or simply as another job to do—all part of the day's work. They are indeed lucky and are probably a small minority.

#### The Examination — General

As you know, examiners do their best to express themselves clearly and ask direct questions. Don't be smart and look for traps. There are no traps in the paper; be sure of that. Instead, concentrate on under-

standing every word in every sentence, as they are all intended to convey something to you. Be quite certain you know clearly what the examiner wants from you, and give him only what he is asking for. Don't try to remember just how it was expressed in some precis. Give your own opinion based on what you have studied.

Be sure you don't fight a problem. It is likely that you have studied specific questions and have prepared answers to them. You find that the question asked is not quite the same as the one you prepared. Conform to what the examiner wants without question or argument.

Some candidates fail because of lack of knowledge, but often a failure is due to some combination of the following:—

- (a) Misreading or misunderstanding questions. This happens more often than people think, possibly because a candidate gets carried away—indulges in wishful thinking or does not concentrate enough on the wording of the question.
- (b) Careless answers. This means lack of care and thought in presenting your knowledge.
- (c) Poor layout or presentation of work and poor staff duties.
- (d) Bad writing, which makes the examiner's task almost impossible.
- (e) Bad spelling and punctuation, which does nothing to help you get marks from any examiner.

Remember that while you might be a very smart officer and ideas and reasons may be as clear as crystal in your mind, you still have to write

them on paper so that they are perfectly clear to the examiner.

### Answering Questions

When the examination paper is placed in front of you don't snatch it up and read furiously. Remember the story of the old bull—take it quietly, relax, light a cigarette and slowly read it from start to finish.

Read the heading part carefully, check the number of marks for questions and how many of the total you must do. In particular, watch for compulsory questions, that is usually a section which offers no choice.

Choose the questions you are going to answer and mark them, now reconsider them and number them in the order you propose to answer them, but start with the easiest first. It doesn't matter what order you answer questions, just label them clearly in your book.

Now check the time, and allowing a clear margin of about fifteen minutes at the end of the paper, make out a timetable against the questions in the order you are doing them. This serves as a check so you will answer the full number in the time. Don't worry if you fall a little behind at the beginning, as you will probably save a little later and warm up as you get into it. In any case, you have the reserve at the end for check reading.

About now you should be ready to answer the first question. Read it again, and tackle it slowly and methodically. It is wise always to use the left-hand side for rough notes, so jot down the headings and your line of thought to help you. Nothing you write or draw on the

left-hand side as rough notes can ever score against you. On the other hand, a smart examiner frequently looks at it to get an idea of the line you are taking, and it assists him to follow your trend of thought or argument. So indirectly the rough notes often help you more than you realise.

Watch your writing and punctuation and take plenty of room. Don't cramp your work or use small diagrams. There is no shortage of paper, as you well know. As a rule short sentences are better than long ones, and use the most simple words to say what you mean. It is better to avoid long or colloquial expres-

sions. In other words, do all you can to make the examiner's task easy—and easy to give you the marks you want.

It is a good idea to re-read sections of your work or pages as you write. This is a check against careless errors and a check to ensure continuity of your answer. This does not waste time and is well worth the effort. When you complete the paper, use whatever time is left to re-read and improve your answers if you can do it. It might be smart to leave the examination a half an hour before it ends, but it is smarter still to sit and re-check your work.

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# COMMAND and CONTROL of ARTILLERY

Major I. A. Geddes,  
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**"To be or not to be?  
That is the question."**

**T**HIS reply is submitted with reluctance. It is believed that the subject is, in its practical application, a simple one, and that the difficulties or doubts which may exist in theory should not arise in the field. However, the theories expounded by Lieutenant-Colonel Watt have a distinct gunner bias, and do not take the requirements of the supported arms fully into consideration.

It will be noted that two of the points of comment made in relation to Lieutenant-Colonel Watt's original article have been discarded. This is so, not because the points are conceded, on the contrary, but in order to avoid a highly theoretical discussion mainly centred around terminology and the use of words.

In the succeeding paragraphs deductions and conclusions are reached after consideration of certain factors. It is not suggested, however, that other deductions and conclusions could not be reached.

## **Factor**

Lt.-Col. Watt states:

"In all cases when the direct support artillery is temporarily unavailable the commander may be certain it is being used on a higher priority task."

## **Deduction**

As there is a likelihood of their direct support batteries being temporarily unavailable, battalion commanders should NOT plan on them for DF (SOS) tasks.

If artillery support is uncertain, the tasks for mortars, MMGs and even companies should be decided upon (catering for the worst situation) without considering what fire the artillery can provide.

## **Conclusion**

The fire of the direct support battery should be regarded as a bonus only, but this seems to be unpractical and theoretical.

## **Factor**

Lt.-Col. Watt states:

"Suppose now that the division is attacked, that each battalion of the brigade is involved, and that each (direct support) battery fires on the front of its respective battalion. The brigade commander would then find that . . . the fire power of the regiment . . . was being applied in three separate places and was not available to him to use in the way he considered best. . . . Would such a situation really be acceptable to (the) brigade . . . commander?"

#### Deduction

The implication here is that the situation would not be acceptable to the brigade commander. That this commander would lift the fire from the front of one (or all) of the battalions being attacked to use it in the way he considered best.

#### Conclusion

Battalions must expect to find that when they are actually being attacked they will lose their artillery support. This doctrine is rather hard to accept.

#### Factor

Lt.-Col. Watt states:

"In a surprise attack by night the direct support batteries will normally be firing close DF in support of their affiliated battalions . . . before the CRA or divisional commander has sufficient information to be able to apply large concentrations."

#### Deduction

The implication in this statement (in its context) is that battalions will be able to fire close DF tasks for a limited time only. That once the divisional commander has sufficient information he will take away their

direct support batteries to apply fire as he wishes.

As we are told that battalions are firing close DFs in a surprise attack by night, the enemy assault may be within a few hundred yards (or much less) of the forward posts, when some of them must expect to lose their artillery support.

#### Conclusion

Certain battalions must be expendable!

#### Factor

Lt.-Col. Watt wonders if the forward troops will really want to know what artillery fire support can be relied upon under adverse conditions.

"The Infantry Division in Battle," 1950, states, *inter alia*: "Successful defence depends upon . . . (a) determination to fight it out at all costs . . . achieved by instilling into the individual soldier a feeling of superiority, and an obsession to fight to the last, *backed up with the knowledge of the support available to him . . .*"

#### Deduction

There is a difference of opinion between infantry and artillery.

#### Conclusion

As artillery is a supporting arm, it is reasonable to expect that the infantry requirement should carry more weight.

Before concluding, a War Office Memorandum on the subject is quoted which puts forward rather a different view. It states, *inter alia*:

"Everyone is trying to win the same battle, so the CRA will do all he can to ensure that his (brigade) representative gives the brigade he



is supporting the maximum support.

"The regiment which is in direct support of a brigade and actively engaged in providing fire support is regarded as being 'engaged on a priority task.' . . . It is difficult to think of a task for field artillery which could have a higher priority than being actively engaged in providing fire support for its own infantry or armour."

This appears to be much more realistic.

Finally, on a unit level, surely a commander, upon consulting his artillery advisor as to the fire support

available, cannot expect such a reply as:—

"You may rely upon the maximum possible support—within any restrictions laid down, of course. This maximum possible support is likely to be temporarily unavailable, by the way, but don't worry, if that happens you can be sure it will be used on a higher priority task."

If so, no wonder we stress the necessity for a high standard of tank-infantry co-operation!!

*This subject has been sufficiently discussed, and is now closed for the time being.—Editor.*

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## COMPETITION FOR AUTHORS

Monetary awards on a competitive basis are made to authors of original articles published in this Journal.

**Monthly Award.**—All original articles published in each issue will be reviewed by a Board appointed by the Director of Military Training. The Board will select the best article published each month. The author of the selected article will receive £5.

**Annual Award.**—When twelve monthly awards have been made, the twelve first place articles will be reviewed by the Board, and the author of the one judged to be the best will receive £40.

The award of both monthly and annual prizes will be based on the substance, originality, completeness and the overall merit and quality of the article.

# The Tank Battle of TARGUL FRUMOS

A lecture given to officers of the British Army of the Rhine by  
Lieutenant-General von Manteuffel

**T**HIS account does not deal with the battle of Jassy, but with the fighting of major tank formations at the beginning of May, 1944, the centre of which was Targul Frumos, some 45 kilometres (28 miles) to the west of Jassy.

The big Russian attack, with the object of breaking through to the Ploesti oilfields, fell entirely on the Panzer Grenadier Division Grossdeutschland, which I was at that time commanding.

## Previous History

The Division had been engaged in planned withdrawal movements since the middle of March, 1944. It had been thrown out of its positions west of Kirovograd about the 19th of March, and had formed up in the Kishinev area at the end of the month. There it received orders to thrust northwards without delay, in order to delay and halt the Russian advance, which, in this area, was threatening to break up the loose defensive front of the infantry formations, which were then only in

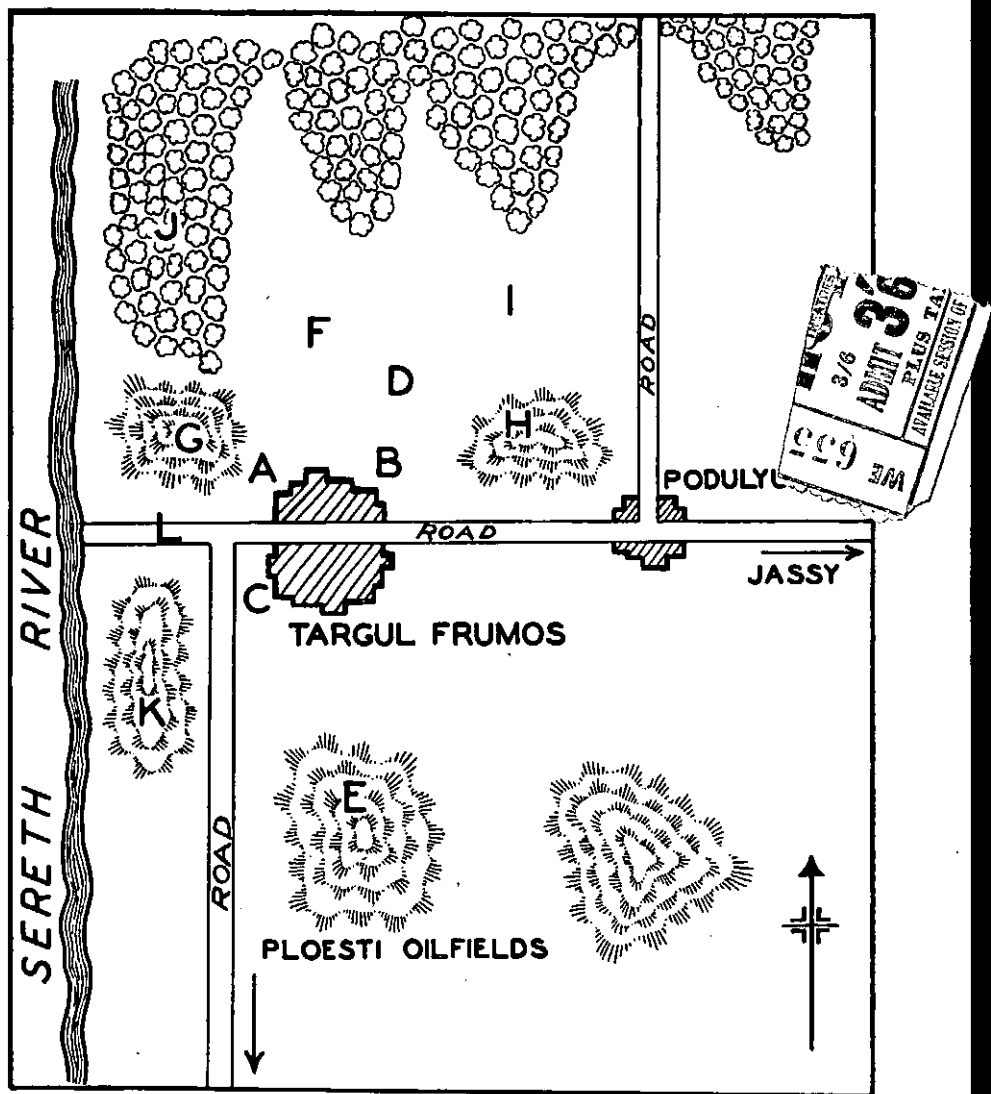
process of reorganization in this area. This intention was successful as a result of my division falling on the enemy swiftly and resolutely, in spite of extremely difficult weather and ground conditions. The snow was lying even more deeply there, and during the day there were frequently such heavy snowstorms that one could not see further than a hundred paces. The heroic behaviour of the troops, and their exemplary determination succeeded even to the extent of stopping the advance. In this way, the other divisions were given the space and time to withdraw into my division's position, and to establish themselves under the protection of our tanks.

The two infantry regiments — the Panzer Grenadier (place "A") and the Panzer Fusilier (place "B") Regiments Grossdeutschland had to carry the main burden of the fighting. They received splendid support from the tank units and the subordinate elements of the Panzer Artillery Regiment. The terrain was very hilly there, and favoured the divi-

sion in fighting, the division being extremely well equipped with automatic weapons of all kinds.

It was intended to employ the division exclusively for defensive purposes on both sides of Targul Frumos, with the heights north of

Podulyukh (Point "H") as the eastern boundary. As I saw it, the possession of Targul Frumos shut off this gateway to the south, since from Targul Frumos one controlled the only practicable road to the east of the Sereth (point "L"). On the



right of the division were employed first the 24th Panzer Division and then the 46th Infantry Division. I again relinquished command of the IV Army Corps, which I was also commanding. The Divisional battle headquarters (place "C") was in the town of Targul Frumos, at the western exit. From there I could overlook and supervise the employment of the Division, both orally and visually, and had in addition a good network of roads and of rapid communication with my commanders. The place had been badly destroyed in the fighting, and it was, therefore, probably not supposed that I would be there. I was, therefore, seldom disturbed by gunfire while working, eating or playing bridge.

During April, what I had foreseen when taking Targul Frumos became more and more apparent from air photographs, and from wireless interception and scout reconnaissance, namely, that the Russians would have to come this way if they wished to thrust forward to Ploesti. I therefore asked for a postponement of my visit to the Fuehrer's HQ, where Adolf Hitler had summoned me in the middle of April, because I regarded the attack as imminent, and did not wish to leave my troops. My request was granted, and I was able to occupy myself intensively with defensive preparations.

During those weeks, the division *clawed itself* firmly into the ground—in the most literal sense of the words. All the troops vied with one another in preparing a suitable reception for the enemy. To the request from the Fuehrer's HQ that the division should be used in another place, and should therefore be withdrawn, I replied that, in view

of the imminent big Russian offensive, the division should be left in its positions, since I considered its presence here indispensable until the attack was beaten off, in view of its thorough knowledge of the terrain, the number of the weapons, its morale, and in view of its preparations for defence against this attack. This request was granted. This represented roughly the position as at about the 25th to 28th April, 1944.

Now follows a few details concerning the terrain, fighting value and organisation of the force.

#### Terrain

North of the east-west line, Podulyukh-Targul Frumos-Sereth (Road "L") was everywhere practicable and passable for tanks with long fields of fire. The fact that the enemy was occupying the dominating heights everywhere north of this line was unfavourable, but it was at a distance of approximately 8-10 kilometres (5 or 6 miles) from our foremost covering forces, so that, as I hoped, he could only see the outline of our defensive system, and not discover its finer points. We therefore advanced our foremost covering forces to about 2500 metres (approx. 2700 yds.) north of Targul Frumos (to line "D"). South of the east-west line, rising terrain (point "K" and "E") afforded us excellent observation posts and positions for anti-aircraft and artillery. There was also a Russian field position (point "J") in front of the deep and broad wooded terrain (point "G") in which the Rumanians, who were very frightened, were digging trenches on and off. The natural vegetation in the whole sector of the division afforded us camouflage

for the infantry positions, their heavy weapons and for the assault guns.

Winter gave way to warm, sunny spring weather with clear nights, blue sky by day and good visibility. The subsoil was sandy and in general dry.

#### **The Fighting Value of the Force**

In the Rugionasa sector, in the left portion of the positional area of the Division (point "G" and "K") as far as the River Sereth a Rumanian brigade was employed in strong numbers, well equipped with automatic weapons, including anti-tank weapons of a German model, and well equipped with artillery. I had refused to mix them with my force, and took the risk—I spoke of the employment of the Rumanians thus—on myself of leaving them an independent positional sector. A Russian attack, if it fell directly on them, would still have to continue through the area round Targul Frumos. I was confident of being able to encircle it there at the latest with the elements of my division—which is exactly how it came and what happened.

The strength of the division (essential figures only) was:—

Two infantry regiments, each of three battalions, each of four companies of 100 men, in addition one battalion of heavy infantry weapons.

One assault gun battery with some 40 guns.

One engineer battalion, at full strength.

One reconnaissance battalion at two-thirds strength.

One armoured artillery regiment with four batteries, guns at full strength.

One A.A. artillery Abteilung with three batteries of 88 mm. guns and one of 37 mm. guns.

Ammunition and fuel were in good supply. Signal communications (wireless and telephones) were good. The industrious building up of a good network was carried out, although I placed more value basically on W/T communications than on line communication. This was practically all destroyed by fire on the first day of attack.

The fighting value of the Rumanians was low, and weighed nothing in the balance; they were a burden to us. The officer corps was poor. This judgment applies to all the troops employed in the Rumanian boundary position (that is, left of and behind our positions), and the cavalry division held back behind the divisional sector which I had to supply. I counted on none of these formations—and turned out to be only too right!

#### **Employment of the Force**

Both infantry regiments were in the foremost lines, escheloned in depth, with strong local reserves available to the regimental commanders. The Assault Gun Battalion (Abteilung) was divided between the two regiments and put under their command.

The Engineer Battalion and Reconnaissance Battalion (Abteilung), as well as the Panzer Regiment, were held in the Divisional Reserve.

The four batteries (Abteilungen) of the Panzer Artillery Regiment, well supplied with ammunition, were distributed over the whole Divisional sector, at the disposal of the regimental commanders, but assigned to the closest co-operation

with the infantry regiment. Heavy concentrations of fire were not only prepared, but actually ranged and were tested over and over again—inconspicuously, of course. The heavy infantry weapons, including the infantry guns, were built into the defensive fire plan.

Of the four anti-aircraft batteries of the Division—of which three batteries were equipped with 88 mm. guns—one battery was employed, and dug in, north of Targul Frumos for anti-tank defence, and the other batteries were employed in anti-aircraft defence.

The Panzer Regiment round Targul Frumos was at the disposal of the Divisional Commander. Repair services were close by, so as to be quickly at hand.

Ample supplies of ammunition of all kinds and of fuel were available, and for this reason I wish to discount the "fairy stories" that we were supposed to have been short of ammunition at this time, which have been given currency since the war. Anyone who troubled about his supplies got them.

The operating force had dug itself in, in accordance with my orders, "up to the neck," being distributed over the terrain in mixed battle groups, so that they could give each other mutual fire support. The entire system of positions was reconnoitred by the regimental commanders, was reported to me and then fixed so as to ensure uniform co-operation within the Division. Supplies of food were good. The welfare of the men in every respect was the first consideration, and was attended to.

I gave my attention to reconnoitering with foresight the employ-

ment of the Panzer Regiment. Many possibilities were discussed with the excellent body of officers, mostly together with the commanders of the other arms of the service, and settled on as soon as the plan was approved by me. This work went so far that the individual Panzer companies could be told their route and the area of their possible positions, so that the most junior commanders could make themselves familiar with the terrain, as for them knowledge of the terrain forms the basis of their fighting—more so than tactical considerations. These they should leave to the battalion commanders.

#### The Plan of the Battle

My plan of battle was roughly as follows: As I could count with a probability bordering on certainty that the enemy would attack with strong armoured forces in co-operation with strong artillery, the latter supported by good possibilities of observation, the attack should be driven off by means of the *employment of the massed Panzer regiment in mobile fighting*. I left in my statements no doubt at all that *one* Regiment of the Division would have to defend itself against the enemy alone, that is, without the support of the Panzer regiment, since our own tanks could not be everywhere at once. Reconnaissance of various kinds would be the principle at the point where it was to be expected that the enemy would attack with strong armoured forces. These were then to be attacked by our tanks and destroyed, in order that our tanks could then turn to the sector of another regiment if the employment of the Division was still necessary there. I,

therefore, reserved the employment of the Panzer Regiment for myself, and later took the regiment through all the phases of the attack. Indeed, up to the morning of the day of the attack, I had no idea where the point of main effort of the Russian attack would lie. I thought that it would probably lie in the left divisional sector, because the Russians might well hope to stampe the Rumanians there, and so be able to roll up my division by exploiting the partial success.

The purposeful and careful strengthening of the infantry's pockets of resistance, well-thought-out fire plans for all arms (that is, of the heavy infantry weapons; of the anti-tank weapons, including the elements of the assault gun battalion, under command of the infantry regiments; of the artillery and of the elements of the anti-aircraft artillery operating in a ground role in anti-tank defence), which had to be arranged according to type of weapons, calibre and ammunition. Assistance from neighbours had also to be arranged at the boundaries, just as if heavy and medium concentrations of fire were being prepared. The basic data for this purpose were obtained unobtrusively by firing.

The divisional battle headquarters was ideal. It lay, as has been previously described, just south of Targul Frumos on an eminence (move HQ back to "E"), with observation post set up there, from which one could supervise the entire sector of the fighting with ear and eye.

After full account is taken of the most careful preparations for defence against the attack, it was the

fighting spirit of the force which was decisive. That turned the defence into what it became: a giant failure for the Russians! There is no doubt that in any case the infantry had to carry the main burden of the fighting. The superior headquarters had no reserves at all.

There was very close contact with the flying formations of the air force. Its support was promised, but it was, as always, largely dependent upon the weather.

#### The Course of the Battle

In April the Russians kept quiet opposite the Division. They fired little with their artillery, and were obviously saving ammunition. Reconnaissance of their artillery discovered numerous new positions. As was their custom, the infantry in position stayed where they were, i.e., committed, until the beginning of their attack; the prisoners brought in claimed to know nothing of preparations for attack. They could not, however, deceive me as to the imminent attack. This I expected to be on the 30th of April or 1st of May. It was sunny weather, clear blue sky, dry ground, very good visibility. At about 0400 hrs. it was light enough for rifle fire.

On the day before the attack, the 1st of May, it was still quiet on the front as before. After the air reconnaissance had reported at mid-day strong concentrations in the enemy's rear positional area, I gave orders for a bomber operation on the evening of the 1st, which was carried out. It could be deduced from numerous fires and explosions that the attack was successful. The prisoners taken the following day confirmed this.

On the 2nd of May, 1944, at about 0400 hours, the day was brought in by lively artillery fire, which fell in the main on the forward positions only, and did not reach the hinterland. Our camouflage must have been good, for losses in men and material were very slight. Although the fire was mainly harassing fire, it was, as is frequent with the Russians, delivered doggedly. Looking back, I believe that this fire was intended to make the positions of our infantry and their heavy weapons ripe for the tank breakthrough.

About an hour after the beginning of the artillery fire the attack of the Russian tanks started, and some 30 minutes later tank fire struck Targul Frumos. I saw from my battle headquarters the Russian tanks rolling up to the town. Our own infantry had allowed them to roll past—partly in order to leave the prize to the anti-aircraft battery of 88 mm., dug in at the northern exit of Targul Frumos. Most of the attacking tanks, of which there were about 25, were shot up in flames, the remainder of about 10 broke into the concentration area of our Panzer Regiment, and were there destroyed. I very soon got the impression that the main attack would come from the area northwest of Targul Frumos on to the town, and therefore ordered the Panzer Regiment to move behind the west of Targul Frumos in rear of the left sector of the Panzer Grenadier Regiment (place "G"). On this knoll a troop of assault guns, beautifully camouflaged, was dug in. As I drove up, about two companies of Russian tanks, numbering about 30, were just attacking the knoll at high speed. There,

too, the infantry operating in front had allowed them to pass. The crews of the assault guns let the tanks approach within a distance of about 30 metres, and shot up all the attacking tanks in flames. Most of them exploded into fragments. I showed them later to experts, in order to prove to them the outstanding effectiveness of our anti-tank shells. We had not one dud! Another Russian company drove in "goose march"—that is, in line one behind the other, past where the Rumanians, as expected, were dislodged, but this tank company was discovered in good time by a company of our own tanks and annihilated. My first impression was confirmed by about 0800 hours. *Wave followed wave of tanks, which we shot up from favourable, previously reconnoitred firing positions and pursued.* As I was speaking to the commander of the Panzer Regiment in his command car (inter-communication), we heard tank fire of the heaviest calibre from a great distance go past between our cars. We soon ascertained that it was being delivered by heavy tanks from a distance of some 3000 metres (3250 yards), which were firing from a stationary position there. At first we thought a company of our own Tiger tanks had lost its way, because we had not previously met heavy tanks of this kind on the Russian side. One company of Tiger tanks (Mark VI) was ordered to come up, and these began to fire on the other tanks. One could see clearly the shells hitting these tanks, but they ricocheted off the armour plating. The commander of the Tiger Battalion, who was present, ordered the tanks to attack, and drove up within approximately 2000



to 1800 metres (2175-1950 yards) of the enemy tanks, and opened fire on them. Thereupon, four of the tanks burst into flames, while three tanks, as far as I could see, immediately left the position at high speed. I gave orders to one company of Mark IV tanks, which was near me, to pursue and shoot up these tanks, starting from east of Rugionasa. The swift and manoeuvrable little tanks had the good fortune to come up under cover to within approximately 1000 metres (1100 yds.) from these Russian tanks, and to engage them from the rear. The enemy tanks stopped moving, and firing—they were, as we later found out, burnt out. I have made many reports on Stalin tanks. Advantages: Heavy guns, heavy armour, low chassis (some 51 cm. (20 inches) smaller than our Mark V tanks). Disadvantages: Slow, not manoeuvrable enough. The crews were, in my opinion, not yet sufficiently familiar with the tanks.

By about 1100 hours the Panzer Regiment had shot up 250 tanks in the defence area of the Panzer Grenadier Regiment. I noticed a hesitation in the enemy attack. Many tanks could still be seen, but they were firing at long range without attacking themselves. We had at first no interest in thrusting so deep into the enemy's position with our tanks in an attempt to wipe them out; we hoped to engage them on the following day, or at another place.

Meanwhile, since about 1000 hours, alarming reports were coming in from the Panzer Fusilier Regiment (right divisional sector). Some 34 Russian tanks had even penetrated into the village of Podu-

lak, in which the battle headquarters of the Regiment was located. In the course of close fighting, in which the regimental commander personally participated, 24 were shot up. The Panzer Fusilier Regiment had indeed been broken through at several points, but held firm. This Regiment, like the Panzer Grenadier Regiment, had succeeded in separating the enemy from their tanks and holding them up. The Russian infantry had now to fight alone. I had promised my friend Colonel Niemack, the commander of the Panzer Fusilier Regiment, to link the Panzer Regiment up with him at 1200 hours. The situation was extremely critical there, and full of danger. After 1100 hours, a strong attack by Russian armoured forces went in again against this Regimental sector. I therefore ordered the tanks in the sector west of Targul Frumos, where every preparation had been made by the commander of the Panzer Regiment, in a foreseeing and exemplary manner, to provide the regiment as quickly as possible with ammunition and fuel again. In the left sector, in the area of the Panzer Grenadier Regiment, a mixed battalion of Mark V and Mark VI tanks, under command of the commander of the Tigers, had been left behind there. I myself drove forward to the Panzer Fusilier Regiment with a company of Mark IV tanks, reconnoitred the situation and the terrain, and put the Panzer Regiment (which was following me) into the attack straight from the march. It actually appeared on the battlefield five minutes before 1200 hours, the time at which I had promised the commander of the courageously persevering Panzer Fusilier Regiment.

The Panzer Regiment immediately shot up some 30 Russian tanks, which were driving round in the rear area of the infantry regiment. By nightfall, the situation was completely restored by the intervention of the Panzer Regiment.

In both sectors, a half-battalion each of tanks Mark Vs and VIs were brought into position before day broke, that is during the latter part of the night, so that they could make their tank fire effective in front of our own infantry when there was sufficient light for firing. The enemy's extraordinary tank losses, in conjunction with the fact that the Russian infantry had not reached their first objectives at any point, allowed me to hope on the evening of the 2nd of May that the worst was over. I was proved right. The Russians did indeed attack again on the 3rd and 4th of May, but in spite of their having fairly strong tank support, their attacks were broken up in front of or in our positions.

On the 2nd May, our own bomber forces operated several times, among them the Rudel squadron as anti-tank fighters. They gave effective support and shot up a considerable number of tanks. With bombs and aircraft guns they engaged most effectively the artillery and infantry positions and concentrations on the rear area.

Our losses still did not amount to more than 10 tanks or guns, though a considerably larger number were more or less damaged. The Panzer Regiment, however, did not suffer a loss of fighting strength, thanks to the outstanding organisation of the supply and tank repair service, and remained, as so often

before, the faithful helper of the plucky infantry.

The success was great. The break-through in the direction of Ploesti had been held up, the enemy's losses in men and tanks were so considerable that it could be seen that he had lost the desire to attack here again as long as the Panzer Grenadier Division Grossdeutschland was in position. I estimated his losses in annihilated tanks at about 350 and about 200 damaged A.F.V.6.

### Lessons

In my estimation, the success was due to:—

- (1) The correct judgment of the situation in general.
- (2) The careful, reliable and *detailed* preparation for defence, which ensured the closest co-operation of all arms within the Division, in which each arm could be fully deployed in accordance with its technical and tactical characteristics.
- (3) The fire-readiness and fire-technique of all the anti-tank weapons and of the artillery.
- (4) The operational readiness and determination and the courage of the infantry, artillery, assault gun and anti-aircraft artillery, and the offensive spirit of the tank crews.
- (5) The exemplary morale of all officers, NCOs and ORs, knowing that each could rely absolutely on the other.
- (6) The correct appreciation of the battle situation in its various phases, and the appreciation of the terrain by the Divisional command.

# SOLDIER MANAGEMENT

## from the Viewpoint of the Company Officer

Lieutenant-General Bruce C. Clarke,  
United States Army

FROM the company officer's viewpoint, soldier management and leadership go hand in hand. The purpose of this talk is to assist the young officer and the senior non-commissioned officer in his everyday problems of handling and managing soldiers.

There were fair, good and outstanding units of all echelons in the past war. Primarily this variation in units was in direct ratio to the qualities of leadership displayed by the unit officers.

Leadership which produces success in battle can easily be adapted to other activities and produce equal or greater success.

### What Men Expect from Their Leaders

Men have a right to expect from their leaders:

- (1) Honest, just and fair treatment.
- (2) Consideration due them as mature soldiers.

- (3) Personal interest taken in them as individuals.

- (4) Loyalty.

- (5) Shielding from harassment from "higher up."

- (6) The best in leadership.

- (7) That their needs be anticipated and provided for.

- (8) All the comforts and privileges practicable.

- (9) To be kept oriented and told the "reason why."

- (10) A well-thought-out programme of training, work and recreation.

- (11) Clear-cut and positive decisions and orders which are not constantly changing.

- (12) Demands on them commensurate with their capabilities—not too small or too great.

- (13) That their good work be recognized—and publicized where appropriate.

To the military leader, men are tools. He is successful to the ex-

tent that he can get the men to work for him. Ordinarily, and on their own initiative, people run on only 35% capacity. The success of a leader is measured by the extent to which he can "tap" the other 65%.

It is the men below who make or break an officer. Sometimes, but not often enough, those above recognize what the ones below do for them in this respect. Regardless of the recognition, the officer should not lose sight of the basic truth.

#### Some Pointers on Leadership

Some people are natural-born leaders. Others, possessing the ordinary attributes, can be fine leaders through the observance of certain procedures. Some of these are:

(a) Almost every man wants to do what is expected of him. When he does not do so, it usually is because he has not been properly instructed. This is the only tenable attitude an officer or NCO can take toward his subordinates. He will recognize the exceptions and know what to do about them.

(b) Men admire a strict officer if he is also just.

(c) An officer who tries to be a "good fellow" loses his grip early.

(d) A new officer cannot be easy at first and then get strict. He can, however, be strict at first and then ease off as circumstances warrant.

(e) Company and platoon leaders should know every man in their organizations.

(f) Men must look to their titular leaders for rewards and punishments. The company commander, himself, must decide who shall be promoted. He can and should accept recommendations, but it must

never be thought that he rubber-stamps the first sergeant's list. The company commander personally assesses company punishment, not the first sergeant. He usually does this in the first sergeant's presence.

(g) One should be able to select competent subordinates. If the commander makes a mistake in choice, then the man should be replaced. Do not carry dead wood along for fear of admitting an error in selection. Handle your own mistakes; do not pass them along.

(h) An officer should not look for cheap popularity with his subordinates. They expect the officer to play his part according to his position. They do not begrudge him his rank, pay or prerogatives if he uses them in the interest of his subordinates and superiors.

(i) Military courtesies start between officers. Observation of these courtesies between seniors and subordinates is not belittling to either; they are evidences of alertness, pride and good manners.

(j) An officer can expect the same attention from his men that he gives them—it works both ways.

(k) The officer should give orders in a manner which indicates he expects compliance. He should be clear and positive, and should follow them up.

(l) An officer should not issue orders which he cannot enforce. Along that line, it is a wise officer who refrains from criticism of a situation until he learns the reasons therefor, and can make logical, constructive suggestions.

(m) An officer must develop initiative in his subordinates. They learn by doing. In so learning they make mistakes. Learn to under-

write the honest mistakes of your subordinates.

(n) An officer must not belittle the importance of his subordinates. He must give them responsibilities and then back them up. A good officer does not bypass subordinate commanders. He uses his NCOs and adds to their prestige by so doing.

(o) An officer should be as good as his word. He should not make promises of rewards and punishments he cannot fulfil. He should fulfil those he makes.

(p) A good officer will know the names, background, and individual characteristics of his men. He must have a genuine personal interest in them or they will not have it in him. Each individual has problems. There is no easier way of getting a grip on men than by helping them to solve the personal problems that give them great concern.

(q) Be enthusiastic and cheerful. These attitudes in a leader, as well as their opposites, are contagious.

(r) Do not be too familiar with your men. Good soldiers do not expect it. It is not necessary to call your men by their first names or nicknames, even if you sleep in the same foxhole with them. Doing so does not increase your leadership ability or your grip on your men.

(s) Morale is a natural product of good leadership. Morale is not produced by USO shows, etc. Diversions are important, however. Good morale comes from doing well a worthwhile job and receiving recognition for it.

(t) Every man experiences fear in a crisis. The leader cannot show it. He must fortify himself with a scale of values which enables him to control his emotions. The only

fear that should worry a good leader is the fear of being afraid.

(u) Do everything you can to increase the personal pride of your men. Cleanliness, neatness, and orderliness are evidences of personal pride. A proud outfit is a good outfit.

(v) When a man has punishment coming to him be sure to give it to him, but in an impersonal way and to a degree that fits the circumstances and the offence. When he pays his debt forget the incident.

(w) Listen to the suggestions of your subordinates. If they are adopted, pass on the credit to them.

(x) Be intellectually honest. An officer cannot be expected to know everything. He cannot bluff his men and retain their respect. When he does not know he should say so.

(y) Be loyal. Criticism of your superiors in front of subordinates lays you open to the same treatment. Remember, loyalty works both ways.

(z) Rank should be used to serve your subordinates. Rank is not a reward nor a licence to exercise your idiosyncrasies. Rank has one object: to enable the officer to fulfil his responsibilities.

(aa) An officer's presence when the conditions are unpleasant and when the going is tough—"sharing the situation with the men"—is all-important.

(ab) Above all, set the proper example. Men will look to the officer for their model. The higher the rank the greater the obligation to those below to set the proper example.

### Conclusion

We have heard the charge that the officer-enlisted man relationship is based upon the Prussian system

as brought to this country by Baron von Steuben. There is nothing wrong today with the following instructions written by Baron von Steuben at Valley Forge and published by the Continental Congress. It is when we get away from them that we get into difficulties.

*"Instructions for the Captain"*

"A captain cannot be too careful of the company the State has committed to his charge. He must pay the greatest attention to the health of his men, their discipline, arms, accoutrements, ammunition, clothes and necessaries.

"His first object should be to gain the love of his men by treating them with every possible kindness and humanity, inquiring into their complaints, and when well founded seeing them redressed. He should know every man of his company by name and character. He should often visit those who are sick, speak tenderly to them, see that the public

provision, whether of medicine or diet, is duly administered, and procure them besides such comforts and conveniences as are in his power. The attachment that arises from this kind of attention to the sick and wounded is almost inconceivable; it will, moreover, be the means of preserving the lives of many valuable men."

*"Instructions for the Lieutenant"*

"He should endeavour to gain the love of his men, by his attention to everything which may contribute to their health and convenience; he should often visit them at different hours; inspect into their manner of living; see that their provisions are good and well cooked, and as far as possible oblige them to take their meals at regulated hours. He should pay attention to their complaints and when well founded, endeavour to get them redressed; but discourage them from complaining on every frivolous occasion."

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# BOOK REVIEWS

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**ATOMIC WEAPONS AND ARMIES.** By Lieutenant-Colonel F. O. Miksche. (Faber and Faber Ltd., 24 Russell Square, London.)

COLONEL MIKSCHÉ, who established a world-wide reputation as a writer on modern tactics with his books "Blitzkrieg" and "Paratroops," here investigates and forecasts the effects which Atomic weapons may produce on the tactical evolution and organization of ground forces. His views on the possible form of combat in the future should be read with interest by every student of tactics.

This book, although not set out as such, falls naturally into the following subdivisions:—

1. A summary of tactics up till the end of World War II.
2. Atomic Tactics.
3. A consideration of the form that future armies should take, together with comments on the problem of the evacuation of civilians from areas of Atomic battle.

The author defines tactics as being essentially a combination of Fire and Movement. He states that new weapons produce new forms of fighting, new forms of attack and defence, and points out that the growth of fire power tends to increase the strength of defence. He makes the point that as a result of the invention of atomic weapons, fire power has increased a thousandfold, whilst the means of movement on the ground has remained unchanged, lorries and tanks being used as in the last war.

A chapter devoted to fire and movement sets out very clearly the reasons for the differences between the battles of the 1914-18 War and those of the last war, and leads on to a consideration of the Blitzkreig and Counter-Blitzkrieg. These considerations deal in some detail with the technical developments of weapons and transport and their effects on the changing aspects of fire and movement in relation to ground forces.

In "Atomic Tactics" various A-weapons (A-shells projected from A-guns, A-bombs launched from aircraft, and A-

Rockets) are examined, and a comparison is made between these and conventional weapons. The conclusions reached are that all these extremely powerful weapons belong to the category of firearms, and that they automatically have the effect of making fire superior to movement.

The author then reconstructs the campaign in Western Europe in 1940, and considers what the picture would have been had the Allies as well as the Germans had armies equipped like those of today, and had both sides used Atomic weapons. This makes interesting reading, and illustrates important features of the probable use of Atomic weapons.

Considerations of Atomic Defence, Atomic Attack, A-artillery, and Tactical Air Forces are illustrated with excellent charts, which contrast normal dispositions with what the author terms "The New Look," and the conclusion is reached that A-warfare, attack as well as defence, calls for dispersion of ground forces to a high degree, but that in addition to this provision, concentration and articulation in depth are also essential. Another conclusion is that it will always be easier for both sides to concentrate A-weapons on the battlefield than it will be either for the attacker to manoeuvre his superiority in troops, or for the defender to move up his reserves. The author considers that without large-scale movement there can be no manoeuvre, and as a result the issue will be decided primarily by air power, the fight against the A-weapons being the final objective of the Air Forces, with the ground forces, although indispensable, playing a relatively subordinate role.

The chapter on "Future Armies" quotes interesting figures on the size of present-day tactical formations both in men and machines. The author's contention is that the size and present-day organization of formations of the Western armies would tend to restrict mobility in A-warfare, and interesting suggestions for the solution of the problem are offered. He states:—

"Beyond all doubt, so long as Russia has the H-Bomb, we are obliged to stick to this dangerous weapon—and as long as Russia keeps big armies we are bound to organize our ground forces accordingly. Of course we need armies, but armies which are easily adjustable, able to fight conventional or atomic type battles, as circumstances dictate."

This book is the most comprehensive analysis of the problems of Atomic warfare which has come to our notice, and is well worth study by all service officers.