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COVER: Detail from war artist B. Fletcher's painting 'Landing at Duc Thanh, Phuoc Tuy Province, Vietnam 1967' at the Australian War Memorial.

ARMY JOURNAL

A periodical review of military literature

No. 247, DECEMBER 1969

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(Photograph: Major L. A. Thomson)

Members of 105 Field Battery with Mr Ross MM, in charge of 'Everyman's' at 5 RAR Fire Support Base in

Intelligence: A Principle of War

Adequate intelligence constitutes the fundamental basis for the calculation of risks, the formulation of plans, the development of material, the allocation of resources, and the conduct of operations.

— General Matthew B. Ridgway, USA.

Major J. Fletcher, GM
Royal Australian Infantry

Introduction

MAN'S earliest aids in the fight for survival were the stone, the club, the spear — and cunning. Today's primitive Australian aboriginal provides an excellent example. He observes man and animal-made signs; the activities of wildlife; vegetation and the weather. He learns the behaviour patterns of his game and his enemies; their strengths, their weaknesses. He knows his terrain intimately. He covers his own tracks and uses camouflage and animal imitations to hide his presence. He is ever patient, watchful and observant. From the many signs he sees he is able to find his food and water and to kill or evade his enemies.

Such skills may be called cunning, craftiness, intuition, or even instinct. Military readers however will recognize the Australian aboriginal as a master of the art of military-type intelligence. By the application of this art mankind has survived to date; he who applies it best will survive the future. This is particularly so in warfare.

This article is designed to show that intelligence should be a principle of war.

What is Intelligence?

Intelligence is the product resulting from the collection, evaluation, analysis, integration and interpretation of all available information

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Major Fletcher graduated from RMC in 1955 and served as a platoon commander with 18 NS Trg Bn (Tasmania), as IO 1 RAR and as Adjt/QM of 2 Commando Coy. In 1960 he rejoined 1 RAR in Malaya, and continued there with 2 RAR. He was Adjt 1 RTB 1962-64 followed by eighteen months in USA/UK for SAS and Commando training, where he qualified at Special Forces, Ranger and Pathfinder courses. On his return he commanded 1 SAS Sqn and was 2IC SASR when assigned to Vietnam in 1967 as SAS LO/Adviser. In this capacity he was seconded to J2 MACV as a Reconnaissance Officer. He attended Staff College in 1968 and is currently a Tactics Wing instructor at JTC. He has previously contributed to this journal.

relating to a subject or problem. This definition exactly fits that process used by the Australian aboriginal.

There are many types of intelligence: military, political, industrial, technical, commercial and so on. Military intelligence can be further divided into strategic and operational intelligence.

Strategic intelligence is required by national planners and high-level military commanders to ascertain the capabilities, vulnerabilities and probable courses of action of nations or armies for the formulation of national policy or military plans. It draws heavily on other kinds of intelligence; namely geographical, transportation, sociological, political, economic, scientific, armed forces and biographical. None of these factors stands alone. For example, scientific intelligence usually contributes much to the production of economic and armed forces intelligence. Finished strategic intelligence is the product of the integration of all these components.

Operational intelligence is required by commanders for the planning and execution of all types of military operations. Without it a commander cannot determine the best use of his firepower, the best way to deploy his forces, or the best means of maintaining his own security. This is known as *combat* intelligence in the United States Army, whereas in the Australian Army combat intelligence is that knowledge of the enemy, the weather and geographical features required by a commander in the planning and conduct of *tactical* operations. That is, it is contained within the Australian definition of operational intelligence.

Although the difference between strategic and operational intelligence is not clear cut, they do have some distinctive characteristics. Strategic intelligence takes time to produce but is usually valid for a considerable period. Operational intelligence is produced from a lesser amount of information but may lose its value very quickly. For example, the capability of a nation to produce heavy tanks will not normally change rapidly, whereas the number of those tanks at a certain place on the battlefield is an item of operational intelligence which can change hourly. It was strategic intelligence which influenced the Allied decision to land at Normandy; operational intelligence was necessary for the detailed planning and execution of this decision.

The Importance of Intelligence

It could truthfully be said that Adam and Eve lacked an adequate intelligence estimate of the enemy's intention when they were led to eat the forbidden fruit. When Noah sent forth the dove 'to see if the

waters were abated from the face of the ground'[1] he engaged in a strikingly modern form of intelligence activity — aerial reconnaissance. Good intelligence and its proper use enabled Hannibal to cross the Alps and invade ancient Italy; similarly, its planned and positive use permitted General José de San Martin and his Army of the Andes to pass the Andean mountains and defeat the Spanish in Chile. George Washington, leader of the revolting American colonists, was constantly exhorting his subordinates to spare neither expense nor effort to obtain information on the dispositions and strength of the British. 'Without this', he wrote, 'we wander in a sea of uncertainties and difficulties.'[2]

Marlborough is generally acclaimed as one of the greatest generals in history. Never defeated, his war experience was spread over thirty-eight years culminating in his string of striking victories during the War of the Spanish Succession. Few generals could better fathom their enemies' intentions and dispositions than he. An astute military biographer gives three reasons for this: 'First, because of the excellence of his secret service which in its day was unrivalled; secondly, because he either personally knew or had minutely studied his opponents, and lastly, because he had a wonderful tactical eye and never failed to see things for himself if it were possible to do so.'[3]

Lack of intelligence led to the defeat of Napoleon at Waterloo and Lee at Gettysburg. It was through the proper use of intelligence of weather and terrain that Von Rundstedt succeeded, at first, in the Battle of the Bulge. General Patton's proper use of counter-intelligence enabled him to change the direction of an entire field army and help eliminate the Bulge without disclosing to the Germans serious weaknesses in other areas. Poor intelligence led General Percival to surrender Singapore to a Japanese force one third the size of his own, believing all the time that he was vastly outnumbered. Several Australian coast-watchers in the Solomon Islands supplied virtually all the information of terrain and defences for the successful American landings at Guadacanal — the first major United States effort against Japan after the spectacular failure of intelligence to warn Pearl Harbour. During the Malayan Emergency the close co-operation between military, police and civilian intelligence agencies provided the basis for victory.

The successful conduct of the war in Vietnam relies upon intelligence more than anything else. Major General Willard Pearson,

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[1] *The Bible*, 'Genesis 8-8'
[2] *Encyclopaedia Brittanica*. 'Intelligence'
[3] J. C. F. Fuller, 'Marlborough', in *Famous British Generals*, ed. Barratt Parker, (Nicholson and Watson, London, 1950) p. 50.

General Westmoreland's chief operations officer (Assistant Chief of Staff J3) said, whilst addressing a Reconnaissance Seminar in Saigon in August 1967 'This is basically an S-2's war.'[4] (That is, an intelligence officer's war.) The Viet Cong and other communist revolutionary forces constantly demonstrate that small forces can achieve significant and economical victories by using accurate intelligence based upon painstaking reconnaissance and good information. To deny the enemy this is not enough; the only way to defeat him is to actively seek information with which to produce good intelligence for our own use. Sir Basil Liddell Hart says 'The proverb "forewarned is forearmed" applies even more strongly to guerilla and subversive wars than to regular warfare as known hitherto.'[5] Without this, possession of massive combat-power superiority is worthless; it could be likened to a blindfolded heavyweight boxer matched against a featherweight. Field Marshal Viscount Slim quotes an old sergeant-major as giving the following advice 'Hit the other fellow, *as quick as you can, and as hard as you can, where it hurts him most,* when he ain't looking'[6] — an excellent principle, providing of course, that through good intelligence you know where the enemy is, where it will hurt him most and when he will not be looking.

As important as intelligence has been and is, it will be even more important in any future nuclear conflict. The devastating effects of these weapons and the speed, range and accuracy of their delivery will make intelligence the key to success on the nuclear battlefield.

Apart from nuclear devices, modern science is producing weapons and armaments for the military, the effective use of which is often denied by the lack of intelligence. Even after World War I 'it was discovered that science was the backbone of victory; science which since 1870 had advanced like a giant in seven league boots while soldiers were forming fours and practising the goose-step.'[7] The problem of target acquisition increases with the range of the weapon or delivery system. Since the innovation of indirect artillery fire the means of locating targets has been outstripped by the means of engaging them. In spite of radar, thermal, seismic, chemical and infra-red detection devices, the gap between the two remains large. This problem is not new; it has just been accentuated by modern technology. It was recognized in the oldest military treatises in the world, where Sun Tzu says 'What enables the

[4] Author attended the Seminar.
[5] Sir Basil Liddell Hart, *Strategy: The Indirect Approach* (Faber and Faber, London, 1967) p. 377.
[6] Field Marshal Viscount Slim, *Defeat into Victory* (Cassells, London 1950) p. 551.
[7] J. F. C. Fuller, *The Reformation of War,* (Hutchinson and Coy, London, 1923) p. xiii.

wise sovereign and the good general to strike and conquer, and achieve things beyond the reach of ordinary men, is foreknowledge.'[8] Foreknowledge, target acquisition and intelligence are synonymous.

Army Doctrine and Intelligence

This importance of military intelligence was recognized in Britain even before Marlborough said in 1712 'No war can be conducted successfully without early and good intelligence.'[9] However, it was not until 1873 that the British War Office established an Intelligence Branch as part of the office of the Adjutant General of the Forces. This was done partly as a result of lessons learned during the Crimean War, where blunders and hardship were largely due to a woeful lack of intelligence; partly because of such recent innovations as newspapers, the telegraph, railways and large standing armies; and partly because the evaluation of new, complex weapons was beyond the capacity of the average diplomat. In Australia, it is of historic interest that the original Military Board of 1905 included a Chief of Intelligence, the first one being that gallant and erudite soldier, founder and leader of the First Australian Imperial Force, Sir William Bridges. This post was the genesis of our present General Staff branch.[10]

What, then, is the current Australian Army doctrine as it relates to intelligence? The following quotations are taken from *The Division in Battle, 1965* series of pamphlets, which provide the basis of training and study for all arms and services.

The first of this series lists eight factors 'which affect all types of divisional operations'. They are, in order:[11]

1. Ground.
2. Weather.
3. Intelligence.
4. Security.
5. Deception.
6. Vulnerability and Risk.
7. Electronic Warfare.
8. Surveillance and Night Vision Equipment.

A knowledge of 'ground' is dependent upon intelligence, as is accurate 'weather' forecasting. 'Electronic warfare' and 'surveillance' by day or

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[8] Samuel B. Griffith *Sun Tzu: The Art of War,* (Oxford at the Clarendon Press, London, 1963) p. 96.
[9] *The Division in Battle, 1965* (DIB) Pamphlet No. 9. Intelligence, p. 1.
[10] A. Argent, 'A Photo and a Story', (*Australian Army Journal* No. 223, December 1967) p. 25.
[11] DIB Pamphlet I, *Organization and Tactics,* Section 41, p. 87ff.

night are methods used to gather that information which produces intelligence. The three remaining, 'security', 'deception' and 'vulnerability' are all part of counter-intelligence. The eight factors affecting all types of divisional operations could, therefore, be legitimately reduced to two—intelligence and counter-intelligence. A later pamphlet states, 'Without good intelligence, political and military decisions cannot be soundly based.'[12]

These are just two examples of current doctrine dealing with operations in general. See what is said about particular types and phases of war. 'The following factors are common to all offensive operations in counter insurgency:'

- Information.
- Objective. (The Aim)
- Surprise. (Surprise)
- Mobility. } (Flexibility)
- Mobile reserves. }
- Firepower.[13] (Concentration)

The words in brackets are mine, and relate the factors listed to existing principles of war. It is significant that information, that is, the raw data from which intelligence is derived, is not only included with four existing principles, but also that it heads the list.

The vital importance of intelligence is appreciated in nuclear warfare, as shown by the following extracts. 'Information is a key factor in nuclear war, and equally essential both to defender and attacker.' 'The effective employment of nuclear firepower depends on a continuous flow of accurate target information' and, 'Because nuclear weapons permit the attack of deeper objectives, the attacker must have detailed information about a larger part of the enemy area than is usually required in non-nuclear war.'[14]

The value of psychological operations is becoming increasingly recognized; in Vietnam today they are employed to supplement normal military operations and to consolidate their gains. In discussing this the doctrine states 'The importance of this factor (intelligence) in psyops

[12] DIB Pamphlet II, *Counter Revolutionary Warfare,* Section 18, p. 45.
[13] DIB Pamphlet II, *Counter Revolutionary Warfare,* Section 38, p. 22ff.
[14] DIB Pamphlet I, *Organization and Tactics,* pp. 205, 192 and 198.

cannot be overestimated. Once propaganda has been disseminated it cannot be recalled and, should it have been founded on inaccurate intelligence, nothing can be done to avert harmful consequences.'[15]

What is a Principle of War?

Let us now broadly examine the principles of war, so as to be able to measure intelligence against their requirements, characteristics and usefulness.

Napoleon said 'The principles of war are those which guided the great commanders whose great deeds have been handed down to us by history.'[16] The modern conception of the principles of war may be dated from that definition. A 'principle' is defined by the *Concise Oxford Dictionary* as a 'general law or a guide to action.' Strictly speaking, many of the so called principles do not fit this academic definition; rather are they methods by which certain results are obtained. A more fitting definition for our purposes is given by Maurice as 'the methods by which, as experience has shown, lead most clearly to the achievement of the object of war'.[17] This can be stated equally truly as 'Those principles which have been handed down to us not for blind adherence, but rather to serve as a warning that in disregarding any one of them, we accept risk, of which the enemy may well take advantage.' Modern military teaching subscribes to Maurice's statement as adequately defining a principle of war.

The British Army Field Service Regulations of 1924 contained, for the first time, a summary of what the military authorities of that time held to be the principles of war. However, many great generals had previously stated their own ideas on what they should be, and various lists have been prepared, studied and practised throughout history. An analysis of Sun Tzu's work will reveal a formula remarkably similar to the present-day principles. Napoleon's maxims are also techniques or methods, most of which can be directly related to a principle.

The original seven principles in the *Field Service Regulations* were taken from Fuller's *The Reformation of War*[18] published shortly after the 'war to end wars'. They were the principles of the offensive, security, concentration, economy of force, movement, surprise and co-operation. The principle of the objective or aim was not included but was held to be an over-riding factor affecting all of these.

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[15] DIB Pamphlet II, *Counter Revolutionary Warfare*, p. 57.
[16] Maj-Gen Sir F. Maurice, *British Strategy*, (Constable, London, 1929) p. 27.
[17] Maurice, p. 28.
[18] Fuller, *The Reformation of War*, p. 28

Most nations today have their own list of preferred principles, usually about ten in number; France being the exception with but three. It is significant for this paper that the only principles common to Britain, USA, USSR, Communist China and France are those of concentration and surprise. More will be said of this later.

An examination of the official British principles since 1924 will reveal some additions, deletions and changes: alterations made as the result of experience, changing social patterns and the constantly changing techniques of modern warfare. This is right and proper. As Maurice says 'There are no fixed laws and rules to the art of war, and even its principles are fluid and require constant re-examination in the light of the changes which time brings.'[19]

The 'maintenance of morale' is a principle which was not added to the British list until after the Second World War. This emerged as a principle largely as the result of the changing nature of society and of two long, costly and bloody wars. Although always significant, it was often, in the past, a natural product of small holy or national wars, and until recently was given a fillip by opportunities of pillage, plunder and the spoils of war. Society today does not condone such things and, assisted by the press, radio, television and the post office, has more compassion for the lot of the common soldier. Also, the moral and physical strain upon soldiers has increased tremendously with the introduction of deadlier weapons. Shortly after the Boer War, Major General Sir John Gellibrand wrote 'Insufficient weight is attached to morale, though congratulatory telegrams were the order of the day'.[20] It took fifty years and two world wars for sufficient weight to be attached to morale. Mao Tsetung includes it in his list as 'the principles of the military spirit'.[21]

The principles of war are not therefore fixed — they are the product of their time: born, destroyed or resurrected by the nature of contemporary science and society. Nor can they be held or applied in isolation. Although some principles may be outweighed by others or even be discarded in some situations, all must be seriously considered as a collective whole in order to 'achieve the object of war'; each one has some bearing and influence on the remainder. The selection and maintenance of the aim, of course, is the primary and over-riding principle, having the most significant effect upon them all. Flexibility usually has a considerable influence on surprise, concentration, and economy of force. Offensive action is nearly always effected by security, co-operation and

[19] Maurice, p. 47.
[20] Quoted in *Australian Army Journal*, No. 221, October 1967, p 39.
[21] Kemin Ho, 'Mao's 10 Principles of War', *Military Review*, July, 1967.

morale. The most recent principle, administration (personnel and logistics), apart from in itself embracing morale, flexibility and economy of force, may even at times limit the selection and maintenance of the aim.

Why Have Principles of War?

Before consolidating the evidence and presenting the proof, we should understand why we have principles of war, and what useful function they perform, if any.

Concerning scientific method and the study of war, Professor P. M. S. Blackett, Nobel prize winning physicist and an eminent student of war, said 'For it is clear that the only way to attempt to estimate the future is to understand the past. The fact that rational prediction of the military future has become more difficult owing to the advent of revolutionary weapons means not that we must abandon it but that we must put more effort into it.'[22] War has been variously described as an art, a science, a sphere of social life. It is certainly a tremendous social cataclysm, 'solved in blood' as Clausewitz says, but also containing characteristics of both an art and a science. Maurice calls organization the science, and leadership the art. It would be equally true to say that the staff officer was more concerned with the science of war, and the commander with the art.

All sciences extract knowledge from the unknown by utilizing known and proven laws established by universal inference. Hence the laws of motion, causation and aerodynamics. The arts, too, have their rules, principles or guidelines — being by nature less measurable than sciences. Society is likewise regulated by both natural and man-made laws. And so war, being part science, part art and part social activity, may legitimately have its own principles. Just as an engineer applies certain principles to make a machine, so does a soldier to achieve the object of war. War, however, like cricket, is full of 'glorious uncertainty'. Maurice gives the reason for listing principles as 'not to provide formulae for use in war, since all history of war shows this to be futile, but to guide thought about war in the right direction'. He further says 'Neither is a mere knowledge of the principles of war any value. It will not help a soldier solve a problem of war more than a knowledge of the principles of painting will, without steady practice and natural aptitude, enable an artist to paint a picture.'[23]

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[22] P. M. S. Blackett, *Studies of War*, (Oliver and Boyd, Edinburgh and London, 1962) pp. 47, 48.
[23] Maurice, pp. vi and 24.

There is a problem however; whereas an artist can discard or retouch a poor painting or an engineer can redesign his model, a soldier can only gain actual experience in his profession at war, and many mistakes made in war are, like death, singularly irrevocable. Marshal Foch gave an answer: 'They (the leaders) will only acquire the capacity to give prompt and judicious decisions and sufficient confidence in themselves to take such decisions in the field if they have developed their powers of analysis and of forming correct conclusions by an objective study of past experience, that is, of history.'[24] Keogh agrees: preferring, like Foch, to think in terms of 'experience' rather than 'history'. He makes the point that the knowledge possessed by every professional person is not built up entirely from his own experience. For example, doctors and lawyers build their knowledge on the recorded cases, experiences, mistakes and experiments of others. So too does the soldier, a fact borne out by the way in which most of the great commanders of the past have supplemented their own experience by the avid study of the campaigns of their predecessors.[25]

By using the principles of war to guide thought in the right direction, and by tackling such studies with a critical, challenging approach, Keogh lists three benefits to be gained by the student of war, and they are well worth repeating: he will develop a mind rich in the experience of war; his powers of analysis will be sharpened; and lastly he will come closer to that understanding of man in combat which is essential knowledge for any leader.

Why Intelligence Should be a Principle

Before collating the factors which have emerged from the discussion above, a simple example linking intelligence with the principles of war will serve as a useful transition to the final proof of the proposition, and may in itself convince some readers that intelligence should be a principle of war.

War is basically a conflict between men; so is a boxing match, and a boxer uses the same principles as a soldier to achieve his aim; in his case, to win the match. Again, like a soldier, he is very much dependent upon intelligence. Before the match he will study his opponent; observe him train; view films of past fights and look for weaknesses. During the fight he might win with a single punch — a concentration of force —

[24] F. Foch, *Principles of War*, (Translated by Hillaire Belloc) (Chapman and Hall Ltd., London, 1920) p. 62.
[25] Colonel E. G. Keogh, 'The Study of Military History', (*Australian Army Journal*, No. 224, January, 1968) p. 4.

provided he can see his opponent and correctly gauge his reactions to preliminary feints. Or he might 'concentrate' lighter punches on a weak point — again provided he knows where the weak point is. A boxer is constantly looking for openings for offensive action and opportunities to achieve surprise. To this end he must keep alert and watchful, never taking his eyes off his opponent. He must also look sharp for his own security. Flexibility is represented by his weaving hands, balanced footwork and quick wits; economy of force by not tiring himself too quickly; co-operation by the efforts of his manager and seconds; administration by the food and rest taken before the fight; morale by the confidence gained through training and the encouragement offered by attendants and fans. Without intelligence in the military sense, that is without knowing his opponent and being able to see and anticipate him, the most skilful boxer or general in the world is doomed to defeat. This surely is a sound reason for intelligence to be a principle.

The examination of the current doctrine has shown us that intelligence is a *de facto* principle; it is grouped with existing ones as an important factor — often the most important — to be considered in all types and phases of war. Should not this *de facto* status be legalized by marriage to the official list?

It was earlier mentioned as significant that concentration and surprise were the only two principles common to the major nations. A valid deduction is that these, by such general acceptance, are two of the most important ones. Yet of all the principles in any list it is these two that depend upon intelligence more than any other — with the possible exception of the primary and over-riding principle, the selection and mantenance of the aim. Along the same line of argument the more concentration or surprise achieved, the greater the chance of success; and the degree of concentration or surprise depends largely upon the quantity and quality of the intelligence available. It is equally clear that, when on the defensive, the possibility of defeat decreases as the amount of intelligence increases. From this argument; from the example of the boxer; from history, quotations and doctrine, it is apparent that most principles of war are dependent upon intelligence. Since each principle of war also depends upon or is influenced by others, and since they all must be examined as a collective whole, there is no bar on these grounds to the inclusion of intelligence along with them as a fellow principle.

To conclude in a more logical vein for those who still lack conviction, examine the following syllogism. The premises have already been established. They are, that to achieve the object of war it is necessary to consider all the principles of war (by definition); that most

principles of war are dependent upon intelligence (a valid generalization from the discussion above). Therefore, the achievement of the object of war is dependent upon intelligence. That is, intelligence is a method by which, as experience has shown, leads most surely to the achievement of the object of war. To apply the variation of this definition, intelligence is 'a principle which has been handed down to us not for blind adherence, but rather to serve as a warning that in disregarding it, we accept risk, of which the enemy may well take advantage'. History shows, even from the few examples given, that this is indeed the case. Intelligence, therefore, meets all the requirements of a principle of war and rightly deserves to be so listed.

Conclusion

The advantages in so doing would be three-fold. First, by guiding thought and the study of military experience in this direction, it would highlight the influence of intelligence both strategically and tactically, at the same time creating an awareness of its importance today in counter revolutionary warfare and tomorrow in a possible nuclear conflict. Secondly, it would illustrate how some of the great commanders of the past had tackled this problem, and foster ideas as to how it may be solved in the future. This way, it would help convince the soldier of the need for both greater technological know-how and for more observant and inductive men. Finally, it would help to remove from intelligence that aura of mystery-cum-black-magic on the one hand and the take-it-for-granted attitude on the other, exposing it for what it really is; the active and positive search for information, which, when processed, will enable war or peace to be concluded in the most economical and life-saving way. To gain these advantages, intelligence should be a principle of war.

In the heat of battle or the fog of war even the most practical soldiers are not inclined to pause and consciously consider principles. Even so, the validity of the proposition still stands if, like Verdy-du-Vernois at the battle of Nachod they say 'To the devil with history and principles! What is the problem?'[26] For to know the problem is to know the enemy, and to know the enemy is intelligence. □

[26] Maurice, p. 25.

Logistics in a Total War Situation

Lieutenant-Colonel K. M. Batters
Royal Australian Army Ordnance Corps

Aim

THE aim of this paper is to briefly review the logistic experiences of the Australian Army since 1945 and to assess our ability to provide logistic support in a total war situation.

Background

Since the termination of hostilities of 1939-45, the Australian Army has been deployed in Japan, Korea, Malaysia, South Vietnam and Papua/New Guinea. During the period 1946-66, the prime responsibility for logistics rested with our major ally of the period, although elements of the Australian Army made a contribution. In South Vietnam today, the United States Army provides the Australian Force with POL, rations, expense stores, engineer stores, some ordnance stores, some ammunition and some amenities. This is augmented by an Australian contribution providing peculiar Australian requirements across the whole field. Almost the full range of ordnance stores is provided from Australian depots.

Political, economic and national reasons dictate that certain Australian commodities are provided to our force in preference to the US item. Ordnance, Engineer and ST items are provided for reasons of compatibility with the main Australian support area.

In the Territory of Papua/New Guinea, the force is wholly maintained from Australia. This is the only off-shore force maintained in this fashion since 1939-45.

Lieutenant-Colonel Batters first enlisted in 1940 and served with commando units in the South-West Pacific Area. After demobilization (1946) and re-enlistment (1947), he was first commissioned in April 1952. Subsequent postings included a service appointment on HQ Tasmania Command (1955), 2IC 28 Commonwealth Brigade OFP (1957), Instructor, RAAOC Centre (1960), an attachment to JIB Department of Defence (1962), an exchange appointment to the Directorate of Equipment, New Zealand Army (1964) and DADOS AFV (1967). His present appointment is ADOS Directorate of Ordnance Services AHQ.

In all of our excursions overseas since 1939-45, the landing has been unopposed, the lines of communication secure and hostile ground operations have been at a minimum. Our logistic thinking has been unavoidably coloured by these circumstances and we now have almost a generation of officers who know no other conditions. It is now time to consider whether our current logistic apparatus could withstand a total war situation.

The Current Logistic Dependency

In 1939-45 the range of items required for a field force was relatively small. In the South-West Pacific Area, (where most operations were conducted on foot) the requirements of the field formations were those which could be worn or carried. Today, we have complex weapons systems, electronic devices, test equipment, light aircraft, field radar and a multitude of other equipments, each of which require a filled repair parts pipeline for support. Accurate documentation is a prerequisite, so that the user and the repairer can identify and obtain his requirements.

Field Repair versus Field Replacement

The alternative to field repair of complex equipments is field replacement. It is doubtful that this country could ever afford the luxury of equipment replacement in the field.

One could debate the advantages of field force equipment replacement coupled with a main support area repair system and allied to a fast air replenishment system. A necessary foundation is a large pool of spare equipments. In an era of an expanding ORBAT and critical initial equipment shortages, it is doubtful that a repair pool could remain intact.

If we are committed to field repair, then it can only be effective if the required repair parts are readily available at the point of consumption. The points of consumption will be in both the combat and communication zones and in fluid circumstances. In the advance and withdrawal phases all elements (including logistic installations) will be moving.

The Basis of Initial Repair Parts Scalings

The current logistic system provides for repair parts to be held at all levels in the total organization — unit, task force, division communication zone, main support area. Some levels are provided with a repair

pool of complete equipments to provide breathing space so that exchange and repair can take place.

The initial assessment of repair parts required for the various levels is made on the basis of previous experience and engineering opinion. It will tend to be over-generous in range of items and under-generous in quantities of particular (undetermined) items. Adjustment to the range and quantity of individual items is the responsibility of the logistic support units in the field force. Unfortunately, this adjustment can only be effected on the evidence of consumption trends. This results in the placing of a demand on the main support area which will be fulfilled by routine procedures unless a degree of priority is nominated.

It is fairly well established that 12-18 months will elapse from lodgement, to the time when field scalings will accurately reflect in-theatre usage. The future logistic system must provide a faster reaction to trends coupled with a priority for movement factor to accelerate movement of urgently required items.

The Field Force Consumption Pattern

A field force consumes line items of supply. A line item can be a shirt, a ration, a gallon of petrol, a washer, a transistor, a surgical dressing or a coil of barbed wire. Consumption will be at the rate of thousands per day or decimals per year. Each item is purported to move through the pipeline at its consumption rate. We cannot view the pipeline as being full of any one item at any point in time. (It may be full of POL, but not with 1005-66-023-7006 PIN, with a consumption of 7 per annum).

To compound the situation, the pattern of operations and deployment will influence consumption and it will rise and fall in some areas with great rapidity. Changes of climate, terrain and phases of war will generate these changes. A central provision organization based in the main support area could not anticipate all these changes in consumption pattern or react to them in the required operational time frame. Our current organization provides for service representation at every command level. They are charged with the responsibility for interpreting trends and injecting this information in the form of advice to the main support area. It is normal to find that the various service representatives compete with each other for the allocation of movement priority.

Priority of Issue and Priority for Movement

The Australian logistic system provides for a movement priority to be nominated by the demanding authority; for example, a priority one

service demand automatically qualifies for movement by air. It is left to the demand originator to determine (and justify) the priority requested. There is no clear policy statement to confine priority movement to combat oriented items.

When the availability of air space forward is restricted, priority demands from the staff and services will compete for space. The relative degree of urgency cannot be determined by the movement agency if all are priority one.

The reaction of the various services in the main support area to a priority one demand will differ according to the level of efficiency of stock management, the physical location of the stores in Australia and the means of movement available to transport the stores from the ASA depot to the air terminal. The elapsed time from initiation of demand to demand satisfaction will vary widely according to these circumstances.

Consumption Patterns and Priority for Movement

Some commodities have predictable consumption patterns; others are completely unpredictable. Predictable items include rations, ammunition, POL, and consumables. Consumables include medical items, dry batteries, clothing, tyres and tubes, stationery, field hygiene supplies, defence stores and water treatment chemicals. The unpredictable items fall generally — but by no means exclusively — in the repair parts field.

The predictable consumption items can be positioned on the far shore in large quantities and here we can fairly speak of 'days of consumption', 'contact rates' etc. The unpredictable consumption items defy classification into days of consumption, particularly to the supply manager attempting to 'fill' a pipeline with an item having a monthly usage factor of .07. Certainly an ordnance field park will scale for 60 days on the fast moving requirements of a task force. This is a very small range of line items. Field workshop stores sections (or cells) carry a larger range of repair parts but these are mainly in the unpredictable field.

It becomes obvious that a more extensive knowledge of the asset situation is required for unpredictable consumption items than is necessary for predictable consumption items. If we accept this premise, then there should be a logistic classification of items as predictable or unpredictable (rather than by the present service responsibility) as an aid to management.

If we then couple this new classification to an AHQ policy in respect to priority for movement, we can ensure that the combat oriented

item receives priority in issue and movement to and within the overseas theatre.

The Examination of Consumption Patterns

The examination of consumption patterns should be first directed towards the combat oriented items of supply. Apart from the obvious commodities — ammunition, POL, rations, water — there are a multitude of items without which a field formation cannot operate efficiently. Some examples are:

Teleprinter rolls
Dry batteries
Salt tablets
Radio Antennae
Clothing
Marker balloons
Anti-malarial chemicals.

The examination should be conducted on the following basis:

- A critical review by sponsor directors of those items *essential* to the operation of the task force and division in the combat zone.
- A similar review of the items essential for the operation of units in the Comm Z.
- The application of an over-riding consumption factor based on our experience in South Vietnam.

The consumption factor (at this point) is assessed at a criteria of not less than ten issue transactions (in-theatre) per month. This will qualify the item for priority stocking, issue and movement.

The examination of consumption pattern should then be directed to all other items in the army inventory (i.e. those with a usage of less than 10 per month). This category should be further subdivided (by machine process) into those with a usage of less than 10 but more than 1 per month and those with a usage of less than one.

It will be found that these arbitrary classifications will segregate the army inventory into the following patterns:

- *Fast moving items (over 10 per month)*
  As this category includes ammunition, rations, POL, combat clothing, tyres, batteries (wet and dry), stationery, medical consumables, field hygiene items and insecticides, it follows that this segment (although relatively low in line item headings) could represent 75 per cent of the tonnage directed into the theatre of operations.

- *Slow moving items (1-10 per month)*
  This category includes end items with a wastage factor, some repair parts and items peculiar to equipments with a medium density in-theatre. It could represent 20 per cent of the tonnage directed into the theatre of operations.
- *Very slow moving items (under 1 per month)*
  This category represents the balance of the logistic requirement of the theatre of operations and probably 5 per cent of the tonnage.

The Relationship Between Consumption Pattern and Movement Media

It is logical to use the most economical form of transport for the greatest tonnage. The 'pipeline' can then be regarded as a tube filled with high consumption items moving at a predictable rate.

If the relationship between consumption and movement of high consumption items is properly maintained, all requirements should travel by sea. Air movement can then be reserved for the slow and very slow moving items. To control resupply to this premise, a correct level of theatre stocks must be established and an efficient monitoring system for items in transit must be designed.

Theatre Stock Levels

The theatre stocking level for fast moving, slow moving and very slow moving items need not be the same in days of consumption. For fast moving items, where resupply is normally by sea, the stocking level must be higher than for a slow moving item where resupply is by air. For very slow moving items, only those with excessive bulk or weight or which have been nominated as combat essential should be held in-theatre. The considerations above would need to be modified by any tactical requirement to hold reserves in-theatre.

The Transit Inventory Control Concept

It has been clearly demonstrated in South Vietnam that air supply can only be a supplement and that the major method of logistic support is by sea. It must therefore be assumed that a resourceful enemy will attempt to inflict losses on our air and sea capacity. In a total war situation, losses will also occur between the lodgement point on the far shore and the point of consumption. These losses will occur at storage areas and in transit.

Adjustments to the logistic system can be made for losses if the full and detailed extent of the losses is known. The current accounting and recording system does not provide this capability.

Under the current mechanized accounting system, a stock replenishment voucher is produced by a computer and forwarded to a mainland depot for issue action. On receipt of the stores at the overseas depot a receipt posting is punched into a paper tape which is then transmitted to the army EDP centre. On processing the tape through the computer, the quantity currently shown as 'in transit' is erased from the magnetic tape segment and transferred to the overseas depot stock record.

Some months will elapse between the preparation of the stock replenishment voucher and the confirmation that the stores have been received at the overseas depot. If transit losses occur, it is difficult to ascertain the extent of the loss.

The transit inventory control concept is designed to provide constant transit monitoring until the stores are brought to account in the overseas depot and pass to the control of the theatre commander.

The following procedure is suggested:

- An appreciation is made of the maximum possible number of transhipment points between the mainland and overseas depots.
- Assuming this figure to be 10 — at the time the stock replenishment voucher is prepared — 10 punch cards are prepared for each line item. These accompany the stock replenishment voucher to the issuing depot.
- At the point of issue and at each subsequent transhipment point one of the 10 cards is hand punched with a suitable code and passed to army EDP centre.
- On receipt of advice that a vessel or convoy has been lost, delayed or redirected, army EDP centre could print out a listing of the items concerned and pass copies to the respective AHQ supply managers. Adjustments could then be made to the pipeline flow and any necessary procurement action initiated.

In-Theatre Stock Distribution

It has already been agreed that the fast moving items represent about 75 per cent of the theatre consumption. It is further estimated that the fast moving items represent only about 1,500 line items of supply. It is suggested that it is logical to group these fast moving items in a single stores depot, without regard to current service responsibilities in

the supply field. As the fast moving range also contains almost all the combat oriented items, it permits staff control of the important items of supply through one stores depot. A decision on whether this stores depot be divided into forward and rear elements is best taken when the theatre of operations and the force deployment pattern is known.

The slow moving items (representing 20 per cent of the tonnage and about 6,000 line items) will be mainly repair parts. Except for the fast moving repair parts (tyres, tubes, batteries, fan belts, gaskets, spark plugs, resistors, transistors, seals, brake linings, track shoes etc) which are actually consumables, the great majority of slow moving repair parts lie in the unpredictable consumption area. The age and condition of equipment, the skill of operators, the terrain, the tempo of operations, the phase of war, the level of authorized theatre repair and the attitude of individual workshop commanders will all influence consumption.

A further disadvantage is the current wide dispersion of the slow moving items and the necessity that stores depots at each succeeding higher level mirror the inventories of the smaller units. An item can therefore be held at unit or field workshop level and again at the FMA and RMA. The total theatre holding may equal many years actual consumption. Again, when a slow moving item is consumed, it triggers off a chain of replenishment demands back to the main support area. This is the pipeline concept at its most inefficient.

It has been previously stated that the initial scaling of repair parts is (at best) an intelligent assessment of the possible requirement. If usage experience is accumulated over a period of 9-15 months and the unit equipment is completely replaced, the usage no longer bears any relation to the dependency.

The most economical method of handling slow moving items (in terms of value of inventory, real estate, accommodation and manpower) is a centralized holding coupled with a rapid delivery system. With a centralized inventory, the impact of total theatre trends is immediately discernible, and there is no possibility of local shortages whilst surpluses exist elsewhere. As with the fast moving items, a single stores depot covering the full range of service items is proposed.

The very slow moving items (those with a monthly usage of less than one) should not be held in-theatre unless the item cannot be transported by air or the sponsor can prove that in-theatre positioning is combat essential. Some adjustment may be required to repair and maintenance pool levels but statistics show that this would be minor. This range could

represent up to 50,000 line items and it is in this area where the greatest investment in accommodation and manpower is required.

Suggestions for a Theatre Logistic Plan

Assuming that the correct reserve levels have been established and maintained from the main support area, the force staff need concern themselves only with in-theatre distribution of assets and the prompt reporting of amended requirements to the main support area. There appears no reason to change the present system whereby reserves are placed forward under the control of the formation commanders. Indeed, the system can be managed more efficiently once it is determined what 'days of consumption' really mean when related to items other than rations, POL and ammunition.

The inventories of all storeholding elements in the division should be critically examined. The removal of the slow moving items to a central theatre holding will greatly reduce the size of unit and field inventories. The remaining range of items may be insufficient to justify the retention of the complex of unit storeholding personnel except in the unit inventory control role.

The advent of airmobile operations, with all arms groups operating away from the main base, forces the conclusion that resupply from a central divisional point is more logical than consignments despatched from individual unit Q stores. A combined divisional logistic support unit stocking only fast moving items is capable of providing 75 per cent of the division's requirements. The availability and range of sizes will be better than individual units can provide and if organic transport is provided (including air if the deployment dictates) a twice daily service can be routine procedure.

If we accept that slow moving items are not held in the divisional area, demands for these items must be transmitted to the FMA/RMA by the fastest means. A catalogue of combat essential items (held by the divisional logistic support unit) should be available to divisional units. Demands for all other items could then be transmitted direct to FMA/RMA without passing through intermediate logistic installations. A 24-hour air delivery service from the Comm Z should require a small pool of complete equipments to be held by the Div Log Sp Unit to cover operational commitments during this period.

It is contemplated that the divisional logistic support unit would hold less than 1,000 items of supply. The small size of the inventory would ensure efficient management of the combat essential items.

In the FMA and RMA, units would place demands on a forward or rear logistic support unit, as appropriate. A single depot in each area (if the Comm Z is so divided) is contemplated. Assuming there is only one maintenance area (and one stores depot) it would be controlled administratively by one headquarters, but would be divided into two separate stores sub-depots — one handling fast moving items, the other handling slow moving items. Their geographical location is unimportant provided the normal siting requirements are observed.

The two sub-depots must be separated so that their activities, which will be at different tempos, do not interfere with each other. In the fast moving item depot, the emphasis is on the following:

- Skilled management of the inventory to ensure that the pipeline forward is kept filled and that anticipated variations from the historical usage pattern are promptly reported to the supply managers at AHQ. The assembly and despatch of the large daily convoys forward.
- In the slow moving sub-depot, the emphasis is on rapid reaction to demands, the satisfaction of requirements by the use of alternatives, sub-assemblies, or assemblies and the utilization of all available transport media.

Conclusion

The proposed logistic system calls for total supply responsibility by the AHQ supply manager. The level of theatre stocks, including reserves, is to be maintained by constant monitoring of theatre depot stock accounts and the assets in the pipeline. The responsibility of the force staff includes in-theatre distribution and advice to the main support area of impending changes in dependency.

The functional grouping of items, according to their consumption pattern and without regard to current service ownership, is an essential ingredient of the system. Only in this way can the proper priority be given to managing the commodities concerned. This grouping also allows priority in clerical handling to be given where it is warranted. At present a single line voucher for a cap badge gets the same priority for clerical processing as one for 100 radio batteries, unless staff or service priority has been obtained beforehand.

The proposal that slow moving items, mainly repair parts, be removed from workshop inventories will draw opposition. It may be that the most opposition will come from those who have experienced ill-balanced inventories and have suffered severe shortages of repair parts

as a result. As the degree of centralization rises, so does the skill in management. This, coupled to an efficient delivery system (as is practised commercially in every capital city in Australia) should prove more efficient.

The proposal that combined logistic depots be formed will attract objections, in that particular skills are required for different commodities. This aspect is appreciated, but it should also be recognized that in a large stores depot many clerical, warehousing, materials handling and administrative functions are performed by people who have no specialist knowledge of the technical aspects of the inventory. It should not be beyond our capability to place the appropriate skills in the key positions.

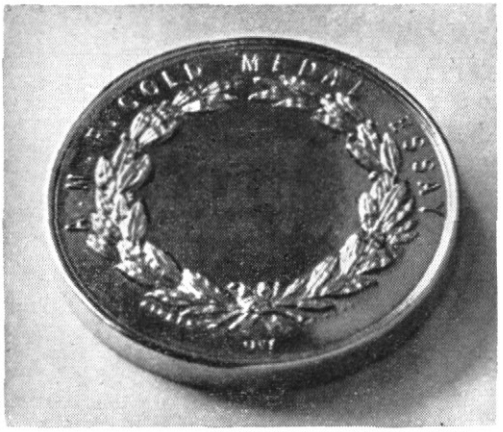
There has been no attempt in this paper to make recommendations for establishment changes to implement the proposed system. In general terms, it can be accepted that closing a number of small stores holding elements and combining the larger depots (Engr ORD MED ST) will throw up many positions, particularly in depot administrative staffs. To be offset against these savings will be the cost of providing an efficient delivery system, which must be organic to the logistic installations.

In summary, the objects of the proposed logistic system are:

- To make full use of our mechanized accounting potential.
- To ensure that combat losses are promptly replaced.
- To maintain correct levels of theatre stocks and reserves.
- To make timely adjustments to trends in theatre consumption.
- To ensure that the priority allotted to clerical processing of demands and the movement of stores is commensurate with the combat requirement.
- To reduce the logistic work force in an overseas theatre.
- To prevent non-utilization through wide dispersion of stocks.

As stated in the aim, this paper makes suggestions towards the formulation of future policy. It puts forward a concept, unsupported by statistics. It could form a useful basis for a terms of reference to a working party. No more. □

AMF Gold Medal and ASCO Prize Essay Competition 1969



The notice which appeared in the October issue of the Army Journal *is withdrawn and the conditions, as laid down in ARO 158/69 dated 15 Aug 69, will apply.*

1. Entries for the AMF Gold Medal and ASCO Prize Essay—1969 close with the Secretary to the Military Board on 31 Mar 70.

Eligibility

2. All ranks of the active and reserve lists of the Australian Military Forces are eligible to compete.

Aim

3. The aim of this essay competition is to encourage original thought and good writing on a military topic of general interest to the Army.

Subject

4. Competitors may select their own subject. As essays may be published in the Australian *Army Journal* or similar unclassified publications they are not to contain classified material.

Sections

5. There are two sections:
   a. Senior—for officers
   b. Junior—for other ranks

Prizes

6. Prizes may be awarded as follows:

   a. For best essay overall—AMF Gold Medal and $100.00.

   b. For best essay in each section (other than best overall) $50.00 each.

   c. The referees are empowered to recommend that the Medal and Prize not be awarded if, in their opinion, no essay submitted is of a sufficiently high standard.

   d. A prize of less than $50 may be awarded to the winning essay in either section if, in the opinion of the referees, the standard of the essay does not warrant the award of the full amount. In the case of two or more essays of equal merit from the same section, the prize money for the section may be shared.

Judging

7. Essays will be judged by at least three referees appointed by AHQ.

8. The decision of the referees will be final.

Submission of Essays

9. Essays are to be typewritten and submitted in quadruplicate. Units are to provide typing assistance where so requested.

10. Length of essays is to be between 3,000 and 5,000 words.

11. Authorship is to be anonymous. Each competitor is to adopt a pen name and enclose with his essay a sealed envelope with the pen name and section identification typewritten on the outside and his name and unit address inside.

12. The title and page number of any published or unpublished work to which reference is made in the essay must be quoted.

13. Essays are to be addressed to the Secretary to the Military Board Army Headquarters, Canberra, A.C.T., 2600. The envelope is to be marked 'AMF Gold Medal and ASCO Prize Essay'.

Promulgation of Results

14. The results of the competition will be promulgated in AAOs and in a Notice to AROs for display on unit notice boards. □

All that Glitters is not Gold

Lieutenant N. Gow
Royal Australian Infantry

IT was not until 20 July 1871 that the system of purchase in the British Army was abolished, and 1909 until the last case had been dealt with by the purchase commissioners. The existence of such a system, described by Fortesque as 'utterly illogical, iniquitous and indefensible', is unbelievable. The concept of a system of promotion dependent upon wealth is completely foreign to contemporary society. The system was outdated in the nineteenth century, and yet it found many ardent defenders when others spoke of its abolition. The system had a long tradition, and the army had usually succeeded in spite of it.

Although the origins of the unique system of purchase in the British Army are not clear, it is generally accepted that the practice dates from the time of the creation of a standing army in the reign of Charles II. It is certain that the system existed in 1683, for a Royal Warrant of that year acknowledged its presence. This warrant directed that parties buying and selling commissions should pay one shilling in the pound to the Pay-Master-General for the benefit of Chelsea Hospital. Notwithstanding the fact that the King was nominally head of the Army it was not effectively controlled and soldiers were recruited in a very haphazard manner. On instructions from the monarch, a gentleman would undertake to raise a regiment. The initial recruiting, arming and equipping of these troops was at the gentleman's own expense. When embodied the regiment became part of the King's Army. This almost feudal process, which had not developed much since the system of indenture was current in the fourteenth and fifteenth centuries, was in harmony with the responsibilities of society. War was a noble sport, reserved for aristocrats

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Lieutenant Gow enlisted in the Western Australian University Rifles in December 1965 and was commissioned in December 1967. He is in his final year of an Arts Degree with Honours in History.

who were certain to have abundant courage to lead their men to victory. This warlike role of the artistocracy was well established by 1660 and there was no challenge to its dual foundation: money, and the quality of natural leadership attributed to the aristocracy by the nation at large. Because this superior role was recognized by both the leaders and the led, the feeling between officers and men was excellent. As late as 1855 a commentator attributed this outlook to '... the result of that innate respect which the lower classes in this country entertain towards their superiors....'[1]

The gentleman who raised a regiment was automatically granted the commission of colonel and he then attempted to recover his initial outlay by two means: from the profits he made by arranging for the supply of uniforms to the rank and file; and the sale of some, or all, of the commissioned ranks to gentlemen of his own choice.[2] This initial sale of ranks started an endless reaction whereby each officer sold his commission when he gained promotion or desired to retire. The officer who desired promotion negotiated to purchase a higher commission. Often this was done by advertising in the newspapers. The *London Gazette* of 19 August 1768 carried the following piece:

> To be sold, a Lieutenant-Colonelcy, a Sub-Lieutenancy, two Lieutenancies of Cavalry, and an Eligible Cornetcy. Also some Ensigncies at Gibraltar, Canada, and the West Indies, and at Home.

The name of the agent was then supplied.

An attempt had been made by William III to outlaw this system but because the army was dispersed over the countryside and the senior officers had a financial interest in the perpetuation of the system the decision could not be enforced and it was withdrawn in 1701. Under George I the purchase system was officially recognized in a Royal Warrant of 8 March 1722 which established a tariff of prices and brought the whole system under Royal control. The role of the monarch as the ultimate authority in all matters of promotion and appointment was clearly defined. A set of regulations was devised under the warrant to make the system more logical. A commission could only be sold to the holder of the immediately subordinate rank to that of the seller, e.g. lieutenant-colonel to major. No officer above a lieutenant could purchase a higher rank unless he had served ten years as a commissioned officer. Only the price regulated by the Royal Warrant, the 'regulation price', was to be taken. And it was detailed that persons purchasing had no title thereby to sell. This

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[1] *The Times*. 15 February 1855. p. 5.
[2] This method of raising regiments and finding new recruits lasted into the year 1858.

last stipulation made the commission the property of the Crown and not of the individual officer. However it always seemed his own because of the practice of paying an 'extra-regulation' or 'over-regulation' price which went straight into the seller's pocket. The regulation prices of commissions were raised in 1766 and again in 1821 in an effort to stop the illegal practice of paying 'extra-regulation' prices, but these endeavours proved abortive.

The 'extra-regulation' price was not the only corruption of the purchase system. A scheme of half-pay was instituted in 1783 for the purchase corps of the Army—infantry and cavalry—which was unique to those parts of the British Army. An officer could elect to exchange onto the half-pay list and then return to full-pay almost when he willed. Half-pay was a means of retirement in the technical corps of the British Army (artillery and engineers), the Indian Army and all continental armies, but this was not so in the purchase corps. This was very convenient for officers who had any reason to be dissatisfied with their military life. They could 'retire' for a short period until it was satisfactory to take up duties again. However, due to the consequent cut in wages, half pay was an escape only for the wealthy. The half-pay list was abused in two main ways. An officer had to gain promotion by progress through each commissioned rank, but he could purchase a rank and then go on half pay until he could negotiate for the purchase of the next step, thereby avoiding service. Because efficient service was not a requirement for promotion, an officer lost nothing by transferring to half-pay if he could afford to do so. The half-pay list was also used by wealthy men to avoid overseas service. If they could not arrange to transfer into a unit stationed at home when their regiment was stationed overseas, they often exchanged to half pay.

Another anomaly of this system was that often children had commissions—sinecure commissions. Patrick Murray, fifth Lord Elibank (1703-1778) entered the army at the age of three, being commissioned captain in 1706, and in 1711 was being paid 'arrears for service in Flanders' for himself and two servants.[3]

This shows how the system was changed to suit every individual case, and the more influence, and money, an individual possessed, the more it could be changed. Because it was so malleable the system, for want of a better word, was extremely hard to understand.

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[3] A. C. Murray *The Five Sons of Bare Betty* (London, 1936). pp. 27-28. Quoted by E. Robson 'Purchase and Promotion in the British Army in the Eighteenth Century'. *History*. Vol XXXVI. 1951-54, pp. 57-72.

The whole system of purchase in the army involves so many intricacies and contradictions that . . . it requires all the keen zest of a professional man to make himself master of the subject.[4]

Patronage was as important for advancement in the early Victorian Army as in the Church, the Home or Indian Civil Service or the Foreign Service. An aspirant to a military commission in this period had his name placed on a list maintained by the Military Secretary to the Commander-in-Chief.[5] These lists were very long and unless the parents or relatives could 'generate interest' the candidate could remain there for ever. Simply stated, the Commander-in-Chief had the patronage for the infantry and cavalry of the line and the Master-General of Ordnance had the patronage for the artillery and engineers until his office was abolished in 1855. The patronage of the three regiments of Guards and Household Cavalry was entirely in the hands of the colonels of the regiments. The person who had the patronage decided who would be granted first commissions. In the artillery and engineers patronage was used to select candidates for the Royal Military Academy at Woolwich where officers were trained.

Sooner, or later, our young military aspirant received a note advising him that a commission was available—with or without purchase. If the commission was purchasable he had to tender, at an Army Agents, a certain amount, varying from £450 to £1,700 depending on the unit. He would then proceed to his regiment which may, or may not be the one of his choice—depending once again on patronage. The young man, straight from school and with no military training, then settled into his regiment and was given rudimentary instruction by his sergeant in drill —practically the sole criterion of military excellence at that time. He also entered into the social activities of the mess: balls, banquets, hunting, shooting and all the activities widely practised by the aristocracy and gentry of the period. In the forty years of peace which followed Waterloo the development of this social emphasis in military life, and resultant expense, was considerable. In the words of Sir Howard Douglas, an ex-regimental commander:

The great evil, the bane of the service, is the expense, the extravagance, I may call it, of military messes. . . . When I first entered the service the officers' mess was very much what the sergeants' mess is now. Subalterns could then live on their pay, and did in every regiment live on it, but during this long peace things have been very much altered.[6]

This way of life continued as long as the regiment remained in Britain. If ordered overseas young gentlemen usually managed to transfer out of

[4] *The Times* 7 February 1855. p. 6.
[5] There were two lists: one for promotion by purchase; one for promotion without purchase.
[6] *The Times*. 6 November 1856. p. 7.

their unit or change to the half-pay list. Overseas service[7] was coupled with the subject of army administration in gaining the contempt of the natural leaders of the country. The following affords an example.

In March 1836 Lord Brudenell (later Lord Cardigan, commander of Light Brigade of Cavalry in the Crimean War) was gazetted to the lieutenant-colonelcy of the 11th Light Dragoons, then at Cawnpore, and due to return in 1838. The purchase price was said to exceed £40,000.[8] He did not join his new regiment immediately. He stayed in London for the season and then travelled through Europe and India making many social calls on the way. He took command on 24 October 1837. However, he stayed with his unit only four weeks before he went to the hills to stay with the Commander-in-Chief and shoot tiger. He then travelled independently of his unit to England. He had been away two years and had spent four weeks with his regiment. But Lord Cardigan could not be accused of disinterest in the army. He spent about £10,000 of his own income on his regiment[9] but his standards of efficiency were showy dress and intricate drill—anachronisms in the machine age.

However, all military officers were not young aristocrats waiting to inherit the family title and estates. There was also a class of poorer officers who had joined the army as a profession in the sense that this was their sole source of income. Those men were the sons of officers and other professional men. They undertook, with great difficulty, to have their purchase money ready and often had to ask favours of their parents and relatives or borrow money from a money lender. The gentleman without a private income could usually only afford to join the infantry regiment of the line. Units were socially graded and their standing was reflected by the cost of commissions. For example, the cost of the highest purchasable rank, lieutenant-colonel, was as follows: Foot Guards £9,000, Household Cavalry £7,250, Cavalry of the Line £6,175, and Infantry of the Line £4,500. However, the outlay for a commission was not the only expense if the life of an officer was chosen. He had to buy a horse[10] (for even infantry officers were mounted), uniform and accoutrements. But, the pay of an officer was very small—a subaltern getting about £95 per annum when his expenses were reckoned at £157, leaving a deficit of £62.[11] This pay was approximately the same as that received by the lowest

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[7] Overseas service is defined as garrison duties in the colonies, not war service.
[8] C. Woodham Smith. *The Reason Why*. (London, 1953) p. 48.
[9] ibid. p. 58.
[10] This became very expensive in time of war when horses were killed or contracted diseases. See *The Times* 14 August 1855 for a letter in which a father complains that his son has had to purchase three new mounts in the Crimea and has had to borrow from his father to do so.
[11] J. W. Fortesque *A History of the British Army* vol xiii (London 1930) p. 558.

grade of Government copy clerk.[12] This tended to reserve positions of commissioned rank to those who had some form of private income. Sidney Herbert had said in the 1850s 'no one should enter the army as an officer who is not possessed of an independent income, irrespective of his pay.'[13]

This system had been workable when the British Army had remained stationed in Britain to preserve peace and order, but Britain slowly gathered an overseas Empire which had to be policed and protected. These duties absorbed about 100,000 officers and men of the mid-Victorian Army. The relatively new duty of overseas service was not popular with young men of the upper classes, but it did allow the poorer man, the man without any extra income, to make a profession of the Army. If he served overseas, away from the extravagance of home, he could afford to live on his pay and often managed to gain promotion for the mortality rate was higher overseas. Overseas service was an important dividing line in the nineteenth century British Army. Although these men continually conducted the colonial campaigns, they were viewed by the aristocratic officers at home as social, and therefore professional, subordinates. India was the base of many troops, yet 'Indian officers' was a term of disdain. These men had seen real war but Lord Raglan would have none of them on his staff or in positions of responsibility in the Crimean War. These men did not have the aristocratic charisma which Raglan thought was of more importance than experience.

Overseas the purchase system did not work with the same complications as at home. In the colonies the extra-regulation prices and frequent unit exchanges were not possible: these were activities reserved for the Army at home operating on a peace-time basis. Due to the availability of men to fulfil England's overseas obligations the young aristocrat could continue his pleasant life in England without interruption. This continued until a senior officer was promoted, retired, or died—then there would be promotions in the regiment.

It was the regulated practice to first offer the commission for sale to the holder of the senior subordinate rank in the cases of promotion or retirements. The system was in theory one of seniority by purchase. In the instance of death the commission was granted without purchase to the next senior officer. This case caused no problems, but when purchase was maintained many intricate complications had to be resolved. Consider a detailed case. When Lieutenant-Colonel X, the regimental commander, wished to retire he offered his commission to the senior major for a price

[12] 'Promotion by Purchase' *North British Review* vol xxiii, p. 523.
[13] *The Times* 14 August 1855. p. 12.

which would allow him to make a profit. If the senior major could not, or did not wish to, purchase, the lieutenant-colonel could offer his commission to the next senior major. If he could not find a purchaser he often arranged to have someone transferred into the unit to purchase.[14] This scheme of transfer was illegal, as was the extra-regulation price, but both existed and a blind eye was turned by the authorities because their own friends and relatives used these abberations to advantage. When one of the majors purchased he offered his commission to the senior captain and so on to the lowest commissioned rank in the regiment. Each officer paid the difference between his own rank and that which he purchased and the Army Agents paid a lump sum to the retiring officer. Officially they only reimbursed the regulation price but they also administered the extra-regulation price—unofficially, of course.

Within this tangle of complexities it was still possible to gain promotion without purchase in the purchase corps. If an officer was killed or died then his commission automatically passed to the senior subordinate rank without purchase. If a commission was vacant someone could be appointed to it by the Commander-in-Chief without purchase. However, a man who held a commission without purchase had the right to sell when he had served twenty years. If his period of service was less he received £100 per year up to the regulation price. Another means of gaining a commission without purchase was promotion from the ranks, granted to non-commissioned officers of long and meritorious service. In the period January 1853 to March 1855 the number of non-commissioned officers commissioned without purchase was 95. In the same period 800 gentlemen purchased commissions and about 600 were appointed to commissions without purchase, including 46 graduates of Royal Military College.[15] Also an officer sometimes gained a step without purchase when a senior officer resigned, but this was a very infrequent occurrence.

This was how the purchase system was working in mid-nineteenth century Britain, but it could not go unquestioned for much longer. Socially the system had been challenged by the acquisition of an overseas empire

[14] Being in the right place at the right time was very important to advancement in the purchase system—and those who could 'generate interest' often had meteoric rises. The Duke of Wellington purchased his way from ensign to lieutenant-colonel in 6½ years, utilizing five infantry and two cavalry regiments to effect this purpose. Sir Edward Paget rose to the rank of lieutenant-colonel in two years and one month. The reason for this extraordinary rapidity in promotion at that time was the large augmentations to the Army, consequent on the outbreak of war with France in 1793, and the opportunities were offered to young men with influence and wealth. (See Brig-General H. Biddulph 'The Era of Army Purchase', *Society for Army Historical Research Journal* (London) vol xii, 1933, p. 226.

[15] *The Times* 13 July 1855. p. 12.

and the development of the new middle classes of society. From a military point of view it had been challenged by the application of advancing technology to the machines of war. The Crimean War served to illustrate these weaknesses.

It is not within the scope of this paper to narrate the already well known history of the confusion in the Crimean War. It was the monumental mismanagement of this campaign which sounded the death knell for the purchase system. After the Crimean War there was an increasing awareness, within and without the Army, of the necessity for professionalism. This trend was exemplified by such men as Colonel (later General) Sir Garnet Wolseley, Major-General Sir Patrick MacDougall (1819-1894) and General Sir Edward Hamley (1824-1893). In 1858 MacDougall first published *The Theory of War,* which was republished many times. This was almost the first text book printed for English officers.

The men of the 'New School' faced a basic obstacle in converting their brother officers to the view that a professional and efficient approach was needed. This same problem had faced the Duke of York during the campaign with the Low Countries in 1794. The situation may be judged from this letter written by his Adjutant-General.

Major-General Craig to Sir Hew Dalrymple

Nimegeun, 12th October 1794.

> .... There is not a young man in the army that cares one farthing whether his commanding officer, his Brigadier, or the Commander-in-Chief himself approves of his conduct or not. His promotion depends not on their smiles or frowns—his friends can give him a thousand pounds with which he goes to the auction room in Charles Street, and in a fortnight he becomes a captain. Out of the 15 regiments of cavalry and 26 of infantry ..., 21 are literally commanded by boys or idiots.... [16]

Beside the problem of having 'boys and idiots' in command the fundamental problem was that promotion depended on money—not merit. When service is gratuitous, one cannot expect the best. 'Gratuitous service is almost always imperfect service, desultory service, indolent, unenlightened and perfunctory service'.[17] This commentator continues, 'Can you expect that young men of fashion and independent means will enter, at great cost, a line of life in which they have to buy their way up,... if in addition to all this, you really compel them to work at their profession, to become thorough adepts in their duty, in a word to display that capacity, diligence and devotion, which, in any other line would have

[16] General Sir R. Biddulph. *Lord Cardwell at the War Office.* (London, 1904) pp. 75-76.
[17] 'Promotion by Purchase'. *North British Review* vol xxiii, p. 524.

ensured them ample success and high reward, without any original outlay whatever? Clearly not.'[18]

Gratuitous service had been enough when courage was all an officer needed but in the second half of the nineteenth century war became more and more technical and a successful officer had to do more than lead his troops to the enemy. Although defenders of the system pointed to its successes in history (but overlooked its failures), its economy to the state, and its openings to the poorer officer through promotion without purchase they could not deny the fact that ultimately a man's qualification was his money, not his merit.

Often men did not have the money to purchase and in these cases incongruities often arose. In the 15th Foot in 1870 the senior lieutenant had longer service than all ten captains. In the 41st Foot at the same time there was one lieutenant who was senior in years of service to every officer above him, from the lieutenant-colonel down. These incongruities worked the other way for a man with influence and money. The Marquis of Salisbury's son, Lord Eustace Cecil, was promoted from nearly junior lieutenant of the 88th Regiment to Captain, without purchase, in the Coldstream Guards after barely eleven months as a lieutenant and two years as an ensign.[19] Another objection was the practice of 'leap-frogging' whereby junior officers purchased over the heads of their seniors.

Mr M. J. Higgins,[20] a journalist, stated to the Royal Commission on the Purchase System, established soon after the Crimean War:

> . . . the particular objection to purchase is the leap-frog principle which enables a man with money to jump over the head of a man who has none, without any superior merit. I think that that anomaly shocks civilians most.[21]

This anomaly was regarded by members of the non-purchase corps as the primary fault in the system of purchase. Lieutenant-Colonel Bingham, Royal Artillery, when questioned on this point replied that he would object to a young man gaining promotion 'merely because he was possessed of money'.[22]

Another strong argument against the purchase system was that it had outgrown its original bounds in expense. The over-regulation prices and cost of living in regiments rose considerably after 1815. The independent

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[18] 'Promotion by Purchase' North British Review, vol xxiii p. 225.
[19] *The Times* 25 January 1858. p. 8.
[20] He was better known as Jacob Omnium—his pen-name.
[21] Minutes of Evidence of Royal Commission established to enquire into the operation of the Purchase System. (Sessional Papers of the House of Commons 1858) (Hereafter referred to as Minutes of Evidence.) paragraph 1366.
[22] Minutes of Evidence. Paragraph 1123.

income deemed advisable for officers became a necessity. This was especially so in the cavalry.

In this corps many 'men of fashion' purchased their way to the rank of captain and sold out. The number who did this formed a 'very large proportion of officers'.[23] With this type of gentleman in the regiment the cost of living increased and it was essential that an independent source of income was available. A senior cavalry officer said that 'a prudent man, with a very moderate income, may live in the cavalry—a man having from £200 to £300 a year'.[24] Also in infantry units of the line an independent income was advisable. The Military Secretary (1854-56), Major-General Sir Charles Yorke, was asked whether £100 would be 'expected or desirable'. He answered: 'I should say that it is very desirable for his own comfort that he should have some allowance; he would be very uncomfortable if he had not'.[25]

These amounts were invariably deposited in the hands of the Army Agents. When an employee of the agents Cox and Company was questioned on allowances he answered 'Almost every officer has an allowance: I should say that every one except those who have risen from the ranks, have allowances from their friends'.[26] The amounts varied with the corps. In the cavalry not less than £300 was considered an adequate allowance for a cornet; in the infantry of the line, from £100 to £150. However many had a great deal more.

Witnesses before the Royal Commission (1856-1857) who favoured the retention of the purchase system could not point to many concrete advantages. Many favoured its retention because they saw no scheme which could operate in its place. One concrete advantage was stressed—rapid promotion. The Chairman of the Royal Commission, the Duke of Somerset, summed this up by saying, 'As I understand the advantage of the system arises from the sale of commissions, allowing officers to retire from the Army when they have served a certain time, and so increasing promotion'.[27] A young man with money and influence could rise to be a lieutenant-colonel at a relatively youthful age. The supporters of the system seemed to rest more weight with an officer's youth than his competence.

The other justification for retaining the system was that it was cheap. Because of the class of men who were officers in the army pay could

[23] Minutes of Evidence. Paragraph 3217.
[24] Minutes of Evidence. Paragraph 3218.
[25] Minutes of Evidence. Paragraph 815.
[26] Minutes of Evidence. Paragraph 979.
[27] Minutes of Evidence. Paragraph 257.

be kept at a minimum and retirement benefits were almost non-existent. If a modern system was introduced pay would have to be increased, and retirement payments made and this was not favourably regarded by a nation straining for economy in regard to her army.

Although it was obvious that the purchase system could not survive nothing was done about its abolition until 1871. The reason that reformers backed away from abolishing the system was the great cost involved. It was estimated in 1856 that £8 million was necessary to recoup the officers of the British Army their monetary interests in the purchase system. Edward Cardwell could not avoid clashing with the system when Secretary of State for War (1868-1874). This far-sighted public servant introduced plans to reform the complete army system but everywhere he was stopped by the vested interests created by the purchase system. After a great struggle the system was abolished by Royal Warrant on 20 July 1871. □

MALAYA, DECEMBER 1941

The dispositions for the defence of Malaya were fundamentally unsound in December 1941. Although they were based on the assumption that Malaya would contain an air force strong enough to inflict crippling losses on an invading convoy, such an air force was not present; yet the army was deployed over a wide area largely to protect outlying airfields. It was realised that the enemy might land on the Kra Isthmus and advance down the west coast, or at Kota Bharu and capture the three airfields there, or at Kuantan where there was another airfield, or in the Mersing area with the object of taking Singapore from the north, or on the island itself. The army was dispersed so as to meet every one of these possible attacks. In a force including ten brigades only one was retained in Force reserve. Thus it was practically inevitable that wherever the enemy made his initial attack he would be in superior strength as soon as he had put his main force ashore; and that, if he gained a success in the early stages, the defender's reserves would be drawn into the battle, but only gradually, because of poor communications, and the enemy would be given an opportunity of defeating the defending army piecemeal.

Lionel Wigmore, *The Japanese Thrust* (1957)

Quality Control in Australia

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Introduction

AUSTRALIA has a rapidly expanding manufacturing sector, in which increasing attention is being given to the significance of total quality control as a management system, and to the application of modern quality control techniques. Any observations on the status of quality control in Australia must be assessed against the current background of national manufacturing activity, if a true picture of the Australian situation is to be obtained.

Manufacturing Industry in Australia

The population of Australia passed 12,000,000 during 1968 with an estimated work force of 5,000,000. Manufacturing employs 28% of the Australian work force and produces nearly 30% of gross national product. Preliminary official statistics for 1967-68 show that the value of output of manufacturing industries was 17,088 million dollars (value of production 7,426 million dollars) and that there were 62,967 factories. It is interesting — if not essential — to note in the context of this paper that 92% of these factories employ less than 50 workers and that only 278 factories, according to the 1966-67 figures, employed over 500 workers and of these only 91 factories employed over 1,000 workers. Production figures on some key industries show the advances since 1948-49:

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- Generation of electric power from 9,000 million kW hours to 42,000 million kW hours in 1966-67.
- Ingot steel production from 1,178,000 tons to 6,065,000 tons in 1966-67.
- Portland cement from 1,031,000 tons to 3,639,000 tons in 1966-67.
- Brown coal from 7,027,000 tons to 23,387,000 tons in 1966-67.
- Refined aluminium from nil to 91,000 tons in 1966-67.

Overseas capital has played a significant part in the development of Australia's manufacturing industry. It is estimated that between July 1947 and June 1967, private overseas investments in companies in Australia totalled $A5,675 million, more than half of which has been devoted to manufacturing industry. This extensive participation in Australian industry by overseas interests has had a significant influence on the attitude of Australian industrial management to quality control, engendered, naturally enough, in many instances by the policies of their overseas principals or affiliates, and by the activities of national and international organizations operating in the field of quality control overseas.

Defence Production and its Influence on Quality Control

Australian production of defence equipment outside of government factories is not at such a level as to exert a significant influence on the nation's manufacturing economy, except in some special areas. It can be said however, that a significant impetus to the quality control movement has come from the quality assurance activities of those government organizations concerned with the procurement of military supplies. It is appropriate therefore to dwell a little on the activities of the Defence Services inspectorates and to discuss features of these organizations which influence quality control generally in Australia.

No doubt such manufacturing industry as existed in the country in the second half of the last century engaged in the relatively unsophisticated product inspection activities which were characteristic of the production and marketing facets of industry of those times. There would have been no separate inspection departments and each worker would, in the main, have performed production and assembly work and inspected his own products. It is interesting therefore to note that formal independent inspection of military stores commenced in 1888 when the Colonial Ammunition Company manufactured .450 ball ammunition for the Australian military forces. At that time there was no organized government inspection but the products were partially inspected as completed stores and proved by officers of the Victorian Permanent Artillery, assisted

by officers of the Instructional Staff at Victorian Army Headquarters. Federation of the Australian States took place in 1901. Subsequently, organized inspection of general stores for the military forces commenced in 1911, and in 1912 an organization was set up by the Commonwealth Government to inspect ammunition and weapons. This organization has continued till the present day, undergoing many changes of 'ownership' and location, and is now the Australian Army Inspection Service within the Branch of the Master-General of the Ordnance. As such, it is the largest organization in the country and indeed, probably in the southern hemisphere, engaged in the quality control field.

Until, and even during the war years 1939-45, the Australian Army Inspection Service operated predominantly as an accept/reject inspection organization leaning fairly heavily to end product inspection on a one hundred per cent basis, but engaging in certain incoming material and intermediate product inspection on a somewhat similar basis. There were little, if any, formal factory inspection departments operated by contractors for defence supplies, but final product quality depended almost exclusively on the screening operations of the Army Inspection Service. Such operations were, naturally enough, labour intensive and at the stage of peak employment during World War II, the Australian Army Inspection Service had some 8,000 employees as compared with 128 in 1938. In retrospect, one must observe that the inspection skills of many of these would have been rather dubious. There was also a limited ability, on their part, to comprehend the emerging techniques of statistical quality control, which were being vigorously introduced by the then Ministry of Munitions and the production authorities of the various government factories engaged on mass production of ammunition in particular. There is little doubt that the government instructional courses during 1944 on statistical methods of inspecting and controlling quality, and the application of such methods in the government factories, laid the foundation of modern quality control in Australia; for then, as indeed now, Commonwealth Government factories engaged in the production of military supplies gave a lead to the industrial community at large in the matter of up-to-date manufacturing and industrial management techniques.

The post-war years saw the further development of separate inspection departments in both government and private manufacturing enterprises, and during the 1950s the responsibilities of manufacturers to control product quality at all stages of production began to be recognized. Thus, it was that in 1960 the Australian military forces introduced a policy which was aimed to make contractors develop effective quality control procedures. Subsequently, Specification Army (Aust.) 448 was

promulgated in 1966, laying down inspection requirements and conditions for contractors and so giving legal emphasis to the quality control policy of the army. The intent of this specification is the same as that of the well known USA MIL.Q 9858A but it tends to delineate inspection requirements, rather than specifically demand a total quality control system. Notwithstanding its relative lack of severity compared to MIL.Q 9858A, the specification, which at the time of this writing is the only formal defence specification in Australia setting out quality control requirements, has met with resistance or apathy from some manufacturing organizations in Australia, both large and small, who thus have yet to appreciate the need for and the benefit of effective quality control.

World War II saw the beginning of the aircraft production industry in Australia and, in all, some 6,000 aircraft were built in Australia during the war years. With the commencement of the Wirraway project about 1939, it became necessary for the Royal Australian Air Force to formalize its quality assurance activities, which up till then had consisted of inspection carried out on outside service work by RAAF serving personnel based at Richmond in New South Wales and Laverton in Victoria. The Aeronautical Inspection Directorate was therefore formed about that time as a separate civilian branch of the RAAF with a nucleus of service personnel. The organization virtually adopted the procedures of the United Kingdom A.I.D. organization, and these were applied in the first instance at the works of the Commonwealth Aircraft Corporation. Today, the branch known as the Quality Control Branch, Department of Air, operates what is known as the Approved Firms System.

Approval of a contractor means that the contractor's organization and system for the quality control of its own products, or a given range of its own products, is considered satisfactory and it is maintained while the contractor is engaged on work for which the Quality Control Branch is nominated as the inspecting authority. As a general principle, the Approved Firms System of quality control has, as its object, the co-ordination of production and inspection at all stages of manufacture from the raw material to the finished article. It aims at contributing, with a minimum of staff, towards a simple flow of production, resulting in acceptable end products, rather than merely screening these products and rejecting those that are faulty. There are three categories of approval: Part 1 — for the control of manufacturing and servicing; Part 2 — for the control of stockists; Part 3 — for the control of laboratories prepared to operate or sell laboratory services as required. The Approval Scheme functions as a system and with uniform procedures permits the system to operate freely between contractors and sub-contractors. As with the Army and Navy procedures, there is continuous monitoring and surveil-

lance of quality control, and product verification appropriate to the projects involved.

Quality assurance activities in the Royal Australian Navy had their genesis in the inspection work of the Directorate of Ordnance, Torpedoes & Mines during the mid-1920s and were based then, as indeed they are today, largely on British practices. Today, quality assurance responsibilities for the Royal Australian Navy are discharged variously by the Naval Ordnance Design and Inspection Branch, the Overseers and Superintendents of Inspection, the Naval Air Engineering Overseeing Organization, the Inspectors of Victualling Stores and the Medical Branch staff.

Some attempts have been made to rationalize the activities of the various Defence inspectorates in Australia, but much remains to be done, if only to make for overall efficiency and the elimination of those areas of confusion on the part of contractors, arising from the implementation of differing policies and procedures relating to quality control in the field of defence procurement. The lack of a single Australian Defence standard specification, setting out contractor quality control requirements, with the necessary supplementary and complimentary documentation is, to put it mildly, unfortunate, and in the writer's estimation is impeding the development of effective national quality control practices.

Other Government Considerations

Operating actively in the quality control field on a national basis is the Australian Post Office wherein, in recent years, there has been an admirable acceptance of modern quality control philosophies and consequential application of enlightened techniques. The Australian Post Office operates an Approved Firms Scheme which, whilst differing in a number of features from the scheme of the same name operated by the Quality Control Branch, Department of Air, has also as its basic aim the provision of confidence in the quality of goods produced by a contractor, and for which adequately documented evidence is maintained. As far as possible the Australian Post Office, like most other government agencies, would like to place orders for its supplies with those industrial organizations which provide an integrated system of control of quality which ensures that products will qualitatively and functionally satisfy specified standards. However, many manufacturers, including those in specialized fields, who cannot be avoided in the business of placing contracts, have unacceptable quality control. Under such circumstances, government acceptance authorities such as the Defence Service Inspectorates and the Australian Post Office have little alternative but to resort

to relatively unsophisticated inspection operations. As yet, the provision of an acceptable quality control system has not been made a mandatory prerequisite to the awarding of the great majority of government placed contracts, and until such a situation emerges, emphasis is being placed by those responsible for the quality assurance operations of government purchasing agencies, on the continued education of Australian manufacturing industry and its orientation towards the acceptance of the quality control message.

Standards in Australian Industry

It is of course recognized that the manufacture of goods of the requisite quality, as far as the customer is concerned, depends fundamentally on the degree of conformance of the manufactured item to the design as delineated by drawings, specifications or other standards of supply; provided the design is one, which if conformed to, satisfies the quality needs of the customer. Surprisingly enough, attention to, and the provision of adequate design and specification detail, are often poor even in what may be regarded as brand name products. This indicates a failure on the part of some Australian manufacturers to realize that modern quality control is not a collection of inspection techniques, but a complete management system in which such things as market research, design, production, inspection, sales and shipping, and field feed back are integral components. It might be averred that mediocre quality is not necessarily a result of technical inadequacy but rather a matter of economics in a highly competitive sales field. But I am prepared to believe that in too many instances there is a reluctance on the part of manufacturers, particularly those engaged in the manufacture of consumer goods as distinct from capital equipment, to introduce sound quality control on the grounds that 'it costs money' and that the application of the principle of *caveat emptor* is a sufficient answer to consumer complaints.

It should not be thought, however, that there is a national unawareness of the importance of adequate standards of supply against which quality criteria can be assessed. On the contrary, most government departments and instrumentalities issue purchase orders against fairly adequate specifications. The defence services, in particular, make extensive use of detailed specifications, some of which arise out of local design and development, others being national or even international standards. For instance, standards issued by the British Standards Institution, The American Society for Testing and Materials and by USA and British defence authorities are regularly employed, and there is an appreciable amount of Australian involvement, even if somewhat indirect, in the

activities of the International Organization for Standardization (ISO) and authorities with similar aims. Dominating the Australian scene in the field of standards is the Standards Association of Australia, and whilst there are a number of trade associations which promulgate their own standards in their respective fields, most of these aim to have their standards issued in due course under the authority of the Standards Association of Australia.

The Standards Association of Australia (SAA) was founded in 1929, following on the amalgamation of the original Australian Commonwealth Engineering Standards Association founded in 1922 and the Australian Association of Simplified Practice which had been formed in 1927. It is the national standardizing organization for the Commonwealth and issues Australian standard specifications and codes. It is an independent body recognized by governments through annual grants and by more than 3,000 subscribing members representing a wide range of Australian industry. It engages intensively in standards developments in Australia and overseas. Whilst it has the fullest recognition and support of government and private enterprise, it is free from government control. The Association authorizes the use of its Standards Mark by a manufacturer, subject to approval of the manufacturer's quality control in production, and on the results of independent tests arranged by SAA; but its ability to ensure continued compliance of the product with the required standards is somewhat limited. There have, incidentally, been suggestions by government leaders to institute a national quality mark under government authority but as yet their ideas have not been translated into any positive action. Mention should, however, be made of the effectively controlled 'Certizinc' quality mark authorized for use on acceptable die castings by the Zinc Alloy Die Casters Association of Australia.

Laboratory Testing and Measurement Standards

Some critics have observed that one of the characteristics of the impressive post-war industrial development in Australia has been the provision, by large and small firms, of admirable manufacturing facilities in the way of buildings and modern plant, but less emphasis on the provision of up-to-date test facilities to assure the quality of their products and/or services. This is a situation which, happily, has significantly improved in recent years under the pressure of major buying agencies, and as a result of the realization that a firm's competitive position in both local and export markets is severely prejudiced by its failure to provide objective evidence of conformity to the required quality standards. There would appear to be no lack of representation in the country, either

by branches or by agencies, of leading overseas suppliers of standards or specialized measuring and test equipment.

There is also a fairly satisfactory availability of technical advisory services from both government and private sources in this respect. Despite the comparatively recent trend of manufacturing industry to provide itself with adequate test equipment, it has long been realized in Australia that, unless such equipment is effectively installed, maintained, calibrated and operated, little confidence can be placed in test figures and statements purporting to indicate conformance to the relevant standards. This realization on the part of an enlightened group of national leaders in their respective fields of science and industry led to the creation of a national organization, operating virtually as the watchdog of test laboratory effectiveness, which at the time of its formation in 1946 must surely have been unique in world industrial history.

The National Association of Testing Authorities (NATA) has become the recognized Australian organization for co-ordination of testing facilities, through registration of testing laboratories operated by individuals, partners, companies, local government and state and commonwealth departments. It is an independent non-profit association with about 85% of its revenue provided by the Commonwealth and State Governments. It registers laboratories which meet its required standard of performance and authorizes registered laboratories to issue NATA endorsed test certificates. Laboratories may be registered for the performance of tests in the fields of Metrology, Mechanical Testing, Electrical Testing, Optics and Photometry, Heat and Temperature Measurement, Non-Destructive Testing, Chemical Testing, Biological Testing and Acoustic and Vibration Measurement. NATA assesses the qualifications and experience of staff, laboratory practice, equipment and its calibration, and laboratory accommodation, and conducts regular assessment of laboratories to ensure that the standard set for registration is maintained. Control by a widely representative Council ensures a sound approach to the requirements of industry, commerce and governments, and the contribution NATA has made and continues to make to the status of quality control in Australia, particularly now that the provision of NATA certificates is a mandatory provision of many purchase specifications, is of a particular high order of effectiveness.

Government participation in the matter of measurement standards has long been effective, albeit somewhat fragmented because of separate state government responsibilities. However, now overriding state legislation in the field of measurement standards is the Commonwealth Weights and Measures (National Standards) Act, first passed in 1948 but replaced

by the current Act of 1960, which is now being implemented. A hierarchy of prescribed standards is involved and the means by which measurements of the prescribed physical quantities can be made and provided for, so that unification of weights and measures can be achieved throughout the commonwealth. A National Standards Commission has the continuing responsibility for the physical standards of length and mass required by the community, and in discharging this responsibility leans heavily on the National Standards Laboratory, the Defence Standards Laboratories and those other authorities of the state or commonwealth concerned with the matters covered by the acts and regulations. Australia has good reason to be proud of the National Standards Laboratory which, established in 1938, is responsible for the maintenance of Australia's standards of measurement and provides means for testing gauges and instruments and calibrating them in terms of the national standard which are, of course, based on international standards.

Education for Quality Control

The stimulus given to production engineering as a result of wartime manufacturing activities, and the post-war growth of industrial engineering generally in Australia, led to an increased awareness on the part, not only of individual manufacturers, but of learned institutions and societies, of the emerging concept of total quality control. Admittedly, much of this awareness took the form of a somewhat patronizing attitude to the traditional industrial inspection function. The realization of the much wider and deeper significance of total quality control embracing both production/process control and product quality assurance was, in most instances, to come later, and even today much is yet to be recognized by many of them. It was not until the early 1960s that one began to see positive manifestations of an ever-widening appreciation by organized bodies of the concept of total quality control, and the sponsoring by them of programmes aimed at educating their members and influencing others in this field. The several Australian branches of the Institution of Engineering Inspection, taking a lead from their parent body in the United Kingdom, now engage actively in quality control indoctrination and education. They must be given no small amount of credit for the fact that certificate courses in various subjects in the quality control field are now part of the curriculum at several of the major institutes of technology in the country. The Institution of Production Engineers, through its Australian branches, has also contributed to national interest and the branch based in Sydney pioneered a successful Quality Control Seminar during 1967. The Institution of Engineers, Australia, through its Industrial Engineering Branch in Victoria at least, has recognized

the importance of dissemination of information about quality control. The Society of Automotive Engineers held a lecture series on Quality Control too during 1968.

Indicative also of the developing state of the art was the formation in 1965 of the Non-Destructive Testing Association of Australia which continues to grow from strength to strength through growing and active membership. Other organized bodies of a trade association nature are now becoming anxious to promote a more effective knowledge of quality control in their spheres of influence and their activities programmes quite often reflect this laudable attitude. One views, however, with some regret the apparent failure of the government sponsored Productivity Councils and the Industrial Design Council of Australia to recognize in a more practical manner the relationship of productivity and design with quality control. It is believed that this situation will be improved following on developments now taking place in respect of the national promotion of quality control appreciation.

Whilst there has been a proliferation of management consultants in Australia over the past ten to fifteen years, operating successfully over most management fields, quality control has, to a great extent, been quite neglected by them. The reason could well be in the fact that the essential knowledge and experience have yet to be developed, and because there are few 'specialists' working in the field of total quality control in Australia. However, one of the older established firms of management consultants has sponsored visits to Australia by that doyen of quality control experts — Dr J. M. Juran — and the enthusiastic response given to his presence was a positive indication of the growing interest on the part of Australian industrialists. Dr Juran's visit, particularly in 1967, was a virtual 'shot in the arm' to the quality control movement in Australia.

Improving the Status of Quality Control

In the government sector the emergence of 'inspection engineering' as it was being referred to in the late 1950s and the 1960s, as a separate technological discipline, directed the attention of associations representing the employees to the need to gain recognition in the form of more favourable salaries, based on a realistic delineation of the duties and responsibilities of those who were discharging the quality assurance function. There had, indeed, been no review of the relevant position and salary structure within the Defence Services inspectorates since 1951,

and it had to be recognized that these organizations not only collectively represented the major quality assurance activity in Australia, but in fact set the pattern for quality control attitudes throughout the nation. Thus it was that the Commonwealth Public Service Board set up in 1966 a three-man working party — now referred to as the Stoner Committee after the name of its Chairman and, incidentally, including the writer — to study and report on the inspection services of the Navy, Army, Air and Supply departments as well as the Australian Post Office and the Department of Civil Aviation. As a result a 'new deal' eventuated in 1967 for quality assurance practitioners engaged in the Commonwealth Public Service and the status of quality control as an essential national activity was considerably enhanced thereby.

The Australian Organization for Quality Control

It was inevitable that the growing awareness of the importance of quality control would highlight the absence in Australia of a national organization devoted specifically to the promotion of quality control in all its aspects. The example set by such overseas organizations as the American Society for Quality Control, the National Council for Quality and Reliability in Great Britain, the European Organization for Quality Control, the Union of Japanese Scientists & Engineers, and the International Association for Quality Control was not gone unnoticed by a few enthusiasts who had followed the activities of these organizations with more than passing interest. As a result of their efforts, and through the good offices of The Victorian Chamber of Manufactures, the Australian Organization for Quality Control came into being early in 1968 and quickly attracted an enthusiastic and influential membership, which is now steadily enlarging into all major fields of industrial activity in Australia. Links were quickly established with the overseas organizations referred to and a number of activities, including lectures, discussions, training courses and plant visits were engaged in. The response from both government and private sectors of industry and commerce has been enthusiastic to the point almost of embarrassment to the council members of the organization, which is obviously satisfying — in part at least — a definite national need.

In New South Wales an organization with aims similar to those of The Australian Organization for Quality Control is consolidating itself with linkage to the New South Wales Chamber of Manufactures. The affiliation of this organization with the Victorian based A.O.Q.C. and the eventual formation of a truly national quality control organization, with branches in each State of the Commonwealth, can be anticipated.

Quality and the Consumer

Clearly, quality consciousness is now being manifested in Australia by the increasing attention paid to the subject of quality control in manufacturing industry and the more educated response to quality criteria by consumers. It should, however, not be overlooked that for some considerable time there has been government activity relating to quality aspects of those products of the nation's primary industries being exported. In addition, the policing of certain quality aspects — primarily weights and measures and safety features — of a fairly wide range of consumer products has long been effected by the separate state government authorities under local legislation. Moving into the wider field of the quality of consumer goods and services, the Victorian Government now operates a Consumers Protection Council, and the rather extraordinary number and variety of complaints directed to this body during its short existence can only be regarded as evidence of serious shortcomings in the quality approach of some suppliers at any rate.

There is in Australia too the independent Australian Consumer Association (A.C.A.) which was set up in 1959, modelling itself on the British Consumers' Association (C.A.). Like C.A., A.C.A. is a limited company both non-profit and non-political. It has attracted a membership of some 50,000 subscribers, has some testing facilities of its own but relies largely on its trained members who have access to outside laboratories. Its journal *Choice*, now a monthly publication, publishes the results of tests on acquired sample products. These tests cover both locally manufactured and imported products, and whilst there is often strongly voiced criticism of the test reports, some of which no doubt has significant validity, the mere presence of A.C.A. induces manufacturers of popular consumer goods to strive for and maintain desirable quality.

Yet the outward manifestations of increasing quality awareness referred to still remain to be matched by many Australian manufacturers, through the intensive application of total quality control procedures throughout their various departments. Many manufacturers are still at the more elementary stage of transforming the traditional inspection activity into an effective Quality Control system. Not enough manufacturers have formal quality control objectives and procedures set out for the guidance of their staff, not enough employ vendor rating systems or otherwise insist on effective quality control by their sub-contractors. Few, too, are able to identify quality costs as such or to estimate with reasonable accuracy the costs to them of defects, appraisal, and prevention. Thus it is that estimates of the national cost of inadequate quality control must be based largely on conjecture, together with some informed opinion

arising from a fairly close association with a representative sample of Australian manufacturing industry. Based on a figure of defective production amounting to 5% of national production — a figure which has emerged in relation to the British manufacturing economy — the cost to the Australian economy is of the order of $A400 million per annum. Experiences of the Defence Services inspectorates indicate that this figure would, if anything, be on the conservative side. Whilst complete elimination of such a cost is hardly practicable, nor under some circumstances warranted, the fact of its existence provides a salutory lesson to those who must bear a measure of responsibility for the quality of the nation's manufactured products.

The Future

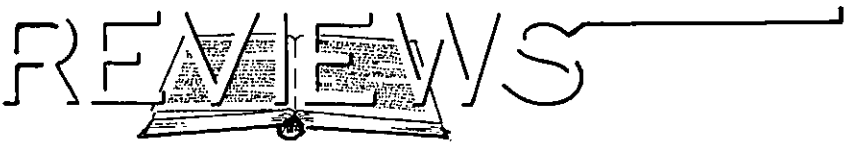
Whilst admitting to no complacency in respect of the existing status of quality control in Australia, the writer believes that the present surge of active interest in this vital subject and its continued practical application by a growing number of the industrial leaders of the nation, presage the ability of Australia to proclaim, without fear of contradiction, that the term 'Made in Australia' is synonymous with reputable quality. □

MONTHLY AWARDS

The Board of Review has awarded prizes for the best articles published in the August and September issues of the Army Journal to:

August: Baron Geyr von Schweppenburg ('Military Review and Appreciation of the Year 1968') $10.

September: Major E. S. Holt ('The Quiet One from Dong Tam') $10.



NO EXIT FROM VIETNAM, by ROBERT THOMPSON.
(Chatto & Windus, London, 1969, $4.70).

Reviewed by Colonel J. R. Salmon, AHQ Canberra.

WHO really knows what is at stake at the Paris Peace Talks or has an understanding of the difficult choices and the consequences facing the Free World Forces in Vietnam? Certainly few politicians, public servants, prelates, academics or journalists have been able to explain clearly the relationship between the conduct of the war, the political aims that were originally intended and those which are still practicable. How then can the man in the street, offered one side of the story subjectively, or the soldier, even if he has seen it first hand in Vietnam, grasp what is involved? By reading *No Exit From Vietnam* by Sir Robert Thompson.

No Exit From Vietnam ranks with the late Bernard B. Fall's *Street Without Joy* and *Two Vietnams* or Denis Warner's *Out of the Gun* and *The Last Confucian*[1] as one of the important chronicles of the nature and progress of Communist Revolutionary Warfare in South-East Asia. Sir Robert Thompson, in this brief and readable book, outlines the progress of the war, analyses the decision points, criticizes the conduct of the counter-insurgency campaign and courageously indicates a feasible future strategy—public opinion permitting. The book is not so much a sequel to his excellent *Defeating Communist Insurgency*, as an authoritative explanation of the Vietnam scene, based on the author's deep understanding gained as Deputy Secretary and Secretary for Defence, Federation of Malaya 1957 to 1961 and as head of the British Advisory Mission to South Vietnam from 1961 to 1965.

The main theme of the book is whether or not the war was fought in the right way and United States power applied correctly (page 92). The author alleges that the United States government and its advisers, including soldiers, failed to benefit from the French experience and gain a deep appreciation of the true nature of the threat—Communist or Peoples Revolutionary Warfare.[2] Failure to understand resulted in failure to explain; hence 'the credibility gap' and loss of public support.

The check given overt Communist expansion in Korea is surely the key to understanding. Having once directly confronted the might of

Western technology in a conventional limited war (which could be so easily explained by journalists using a series of continuous front lines on a map) the Communists determined not to repeat the experience. Why should they, when the indirect approach of Peoples Revolutionary Warfare, so successful against the Kuomintang, again proved a winner against the French. While the West argues about the true nature of Communist Revolutionary Warfare and lacks an effective counter to it, Communism can be relied on to repeat the pattern *ad nauseam*.

Having criticized the United States for failing to understand the nature of the conflict and the enemy, it is not surprising that Sir Robert also alleges that the decision to intervene in 1965 was made without a clear definition of war aims and a clear idea of how they were to be achieved. He stresses the importance of nation building as the real counter and the role of the armed forces in supporting it. With this in mind and drawing principally on his Malayan experience, the author is critical of a lack of control, of failure to deal promptly with the Viet Cong infrastructure, of failure to build up a single intelligence and internal security organization based on a sound police force, of ineffective search and destroy tactics, and of indiscriminate use of firepower.

He also stresses the need for unity based on legality, unity for which democracy is no substitute. Was there ever a chance of such unity after the death of Diem? Was there any chance before his murder? If 1961 and 1962 were the years in which the war could have been won, 1963 was the year when lack of unity led inexorably to the decision to intervene in strength in 1965, the Tet offensive of 1968 and the present dilemma.

In evaluating Sir Robert's criticism the reader must decide for himself whether the author has fully recognized the problems faced by the Free World Forces. To what extent are problems of dealing with successive Saigon governments, the difficulties engendered by the constant infiltration and the scale of operations, the enigma of leaving an inviolate sanctuary in North Vietnam or of bombing it, the reality of the threat in 1965, the geographic and ethnic differences, the problem of developing experience within a short 12 months tour, all of which he acknowledges, adequately assessed in comparison with Malaya/Malaysia? Those who

[1] See *Australian Army Journal* No 192, May 1965 for a review of this book containing relevant comments on the Thompson Plan for Vietnam and insurgency elsewhere in the region.

[2] The following is extracted from *The Living Thoughts of Clausewitz* by Lt Col Joseph I. Greene USA (Cassell and Company Limited) Page 129: 'Now, the first, the grandest, and most decisive act of judgment which the Statesman and General exercises is rightly to understand in this respect the War in which he engages, not to take it for something, or to wish to make of it something, which by the nature of its relations it is impossible for it to be. This is, therefore, the first, the most comprehensive, of all strategical questions.'

will agree with his recognition of the effective results achieved by Australian Special Air Service patrols (page 173) may find it hard to retain their objective judgment. So too will those soldiers who have had a hand in developing or applying Australian doctrine,[3] which accords with Thompson's five basic principles of counter-insurgency (page 163). But are the problems of their application in Vietnam fully appreciated?

In examining the consequences of negotiations and the limited options open to the Free World, Sir Robert advocates a 'long haul low cost strategy' (page 197) and states 'the chief enemy will always be impatience' (page 198). That he should dwell on the protracted nature of such a solution should be well understood by serving soldiers; at least one senior Australian Army officer publicly pleaded in Washington for patience as long ago as May 1964. However it is doubtful if public opinion, mesmerized by mass media, will grant the time essential for such a strategy. (Recognizing this, perhaps 'Public Opinion' should at last be included in our Principles of War.)

If public opinion is unable to accept *No Exit From Vietnam*, the consequences of alternatives are no more palatable. As these evolve they will present some difficult questions for politicians and defence planners both in South-East Asia and much nearer home. These and the lessons from this book deserve to be seriously answered and analysed both in structuring forces and in developing procedures for crisis management. If the Free World as a whole failed to grasp the lessons from the Viet Minh defeat of the French, we must ensure we fully understand the Vietnam war in which we have been engaged. That is why this book deserves to be read. Agree with *No Exit From Vietnam* or not, it adds greatly to understanding. □

REVOLUTIONARY WARFARE AND COMMUNIST STRATEGY —THE THREAT TO SOUTH-EAST ASIA, by GEOFFREY FAIRBAIRN. (Faber and Faber, London, 1968, $6.65).

Reviewed by Colonel J. R. Salmon, AHQ Canberra.

THIS book offers a convincing explanation of Communist revolutionary warfare and the threat to South-East Asia within the wider historical context of the total Communist threat to the West. The author examines the reasons for the effectiveness of Communist revolutionary warfare in ex-colonial and under-developed countries; he relates this type of warfare to complementary Communist methods which are being employed simultaneously in more highly developed societies.

[3] *Division in Battle, Pamphlet No 11*—'Counter Revolutionary Warfare, 1965'.

Geoffrey Fairbairn is a Lecturer in History at the Australian National University. He is well known for his views on this topic; he has written numerous articles, including a Current Affairs Bulletin,[1] and has frequently spoken on it both in debates and on TV. As he was one of the first academics in this country to make a deep study of the subject he could be labelled a 'right wing intellectual' and 'trouble maker', two of his own terms, by some of his contemporaries.

The book examines the differences between traditional guerilla warfare and Communist revolutionary warfare. The author is fully aware of the political nature of the latter and the need to defeat the Communist infrastructure. 'It is not at all a primary objective of counter-insurgency to kill armed guerillas; it is to destroy a political organization.[2]

Geoffrey Fairbairn is at his most persuasive when exposing the complete picture of the global Communist threat; a picture against which other books or individual news items are the small scenes or separate pieces of the jigsaw. He sees the threat to the West, a West obsessed by the nuclear deterrent, as the disintegration of society from within—aided and abetted by an external source. He relates this threat to the disinclination of Western society to continue the struggle. Consequently, irrespective of the success of the counter-revolutionary campaign in the field, it must fail if not sustained by public opinion. He quotes Giap and other Communist leaders to show they are fully aware of this; one hopes that Western political leaders are equally so.

Fairbairn covers the consequences in South-East Asia of the Free World Forces failing to win in Vietnam. He finds them no less sobering than Sir Robert Thompson did in *No Exit From Vietnam.* As he has accurately predicted the course of peace negotiations from when the book went to print (October 1967) until now, the reader cannot ignore these pessimistic portents.

The military scholar will find the initial chapters covering international Communism more revealing than those dealing specifically with counter-insurgency and the two Vietnam campaigns—Viet Minh and Viet Cong. Admittedly he merely uses the latter 'to underline' certain facets of his broader thesis which is amplified in a final 'Retrospect'.

Revolutionary Warfare and Communist Strategy is liberally sprinkled with quotations, references and footnotes which do not make it a light diet. But they do serve to convince the reader of the vast research under-

[1] CAB Volume 35, Number 10, 29 March 1965: 'Revolutionary Guerilla Warfare'.
[2] ibid., p. 174.

taken and add credence to an awesome exposé. An index and extensive bibliography are included.

The book must become a standard reference on this topic. At $6.65 not all will wish to own a copy but a place must be found for a number in every service library. Even those who are unable to study it now should not fail to spend an evening scanning it to gain an idea of its extensive contents. Many will find it sufficiently fascinating to delay its return. □

OTHER WARS

The war in South Africa was in many ways an anachronism; few wars have offered more chances for mobility, and in few before the outbreak of the World War have so many men been employed on static duties. The reason for this is obvious, though when the war broke out it was not even dreamed of: that the theatre of war was so vast and the enemy so mobile that unless the size of the former were restricted the speed of the latter could not be slowed down. The only way to reduce the area strategically was to partition it off into comparatively small sub-areas, and to clear the enemy out of each in turn. This was accomplished by dividing up the theatre of war by wire fences and by building blockhouses along them, closely spaced so that each fence could be swept by the fire of neighbouring blockhouse garrisons. Once an area was rendered horse-proof, so to speak, the next operation was to sweep it clear of the enemy, and when this was done, to establish another horse-proof area and to clear that in turn. Considering the size of the theatre of war and the enormous labour this system demanded, it redounds to the courage of our military chiefs that they ever put it in practice. For instance: to decide upon building a defended line three hundred miles long is no mean project; yet during the war this was done by establishing a blockhouse line from Victoria Road station, close to Victoria West in Cape Colony, to Lambert's Bay on the Atlantic.

Another great advantage of this system was that it automatically established defended lines of communication, and so it greatly diminished the need for escort work. For example, it was possible to send the largest convoy along the above-mentioned line—provided that there was a sufficiency of water—under the smallest escort. The whole system was closely related to that of the Great Wall of China, which was simultaneously a fortified wall and a defended thoroughfare.

J. F. C. Fuller, *The Last of the Gentlemen's Wars* (1937)

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