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Front Cover
The Reading of the Scripture at a Defence Service during National Aboriginal and Islander Day Observance Committee Week 8-14 July 1996.
Dear Editor,

Issue Number 117 (March/April 1996) of Australian Defence Force Journal contained a controversial article by Lieutenant J.A. Weatherill, RA Inf. entitled "Gender Awareness within the Australian Defence Force". Lieutenant Weatherill has some interesting ideas regarding the combat employment of women in the Australian Defence Force.

I must however draw your attention to one glaring inaccuracy in Lieutenant Weatherill's otherwise excellent article. In the section of his article entitled "Proper Training", Lieutenant Weatherill makes the statement that "Although every member that joins the ADF volunteers for combat, after mental and physical testing some men are deemed suitable, while others who fail the test are allocated supporting roles in other Corps."

I would be very interested in discovering how Lieutenant Weatherill came to this conclusion. During my time at recruit training I cannot recall ever undergoing this testing process. I was required to undertake a psychological examination that would help determine what Corps and employments I would be suitable for, but the kind of rigorous testing procedure described by Lieutenant Weatherill must have gone by unnoticed.

At the end of my recruit training I was given an option of going to a wide variety of Corps employments but I chose to go to RAAOC. I realise that Lieutenant Weatherill must take pride in being an infanteer but this should not cause him to believe that Corps allocation is specifically aimed at sending the best soldiers to infantry and "lesser beings" to other employments.

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War Crimes: How Do We Define Them and Punish the Criminals?

By Frank E. Thorogood

Introduction

War crimes are as old as humanity and even biblical accounts are replete with stories of the barbarity of “man against man” (sic) during armed conflict. But, from time-to-time, beginning with the ancient civilisations, an individual culture or an enlightened ruler has displayed a compassion and generosity of spirit which shone like a beacon amid the surrounding savagery. However, these humanitarian ideals, as we would now call them, were fleeting and rare. It was not until the middle of the 19th Century that States began to recognise and develop what eventually came under the rubric of international humanitarian law.  

International humanitarian law (or law of war or law of armed conflicts) is usually identified as a partnership of what is commonly referred to as Hague law and Geneva law. The law of The Hague is usually distinguished from the law of Geneva by the assertion that the former governs the methods and conduct of warfare; while the latter deals with the victims of armed conflict noting that both essentially apply only during armed conflict. The writer would argue international humanitarian law is the very basis of, and forms part of, Human Rights law; however, having defined the corpus and the relationships the point is beyond the scope of this article.

It is problematic, nowadays, whether the distinction between Hague and Geneva law serves any useful purpose or function. For the purposes of examining war crimes it is of little interest except in describing briefly the genesis of international humanitarian law and war crimes.

Development of International Humanitarian Law

A number of events and dates could be chosen as start points to trace the modern development of international humanitarian law, but there are two matters of particular significance.

Hague Law

Hague law probably had its genesis with the little-known Lieber Instructions of 1863 prepared by Francis Lieber which represent the first attempt to codify the laws of war. The Code was prepared at the request of President Lincoln during the American Civil War and was binding upon the Union forces. It is generally agreed the work of Dr Lieber was the origin of the Brussels Conference of 1874 and stimulated the Hague Conventions of 1899 and 1907.

Geneva Law

During the Franco-Sardinian war against Austria a bloody battle was fought at Solferino in 1859. In its aftermath, a Swiss citizen Henry Dunant came upon the battlefield and was so appalled at what he saw that he rallied the nearby villagers to assist the wounded. He was so moved by the experience that he wrote a book, Un Souvenir de Solferino which was published in 1862 and, it is said, so stirred the soul of Europe that his ideas and recommendations resulted in the establishment of the Red Cross and the (first) Geneva Convention.

The Geneva Conventions were not referred to by a numerical prefix until 1949 and there are now four Geneva Conventions and two Additional Protocols of 1977.

Table 1 illustrates the development.

War Crimes: How Do We Define Them?

The Lieber Instructions of 1863 at Section II had provisions for dealing with “war crimes”, but it must be recalled that these articles applied only to Union forces. Perhaps the two most noteworthy articles are:

Article 44. All wanton violence committed against persons in the invaded country ... all robbery ... pillage or sacking ... all rape, wounding, maiming or killing of such inhabitants, are prohibited under the penalty of death, or such
other severe punishment as may seem adequate ... a soldier ... committing such violence [who disobeys an order to abstain] may be lawfully killed on the spot.

**Article 47.** Crimes punishable by all penal codes [*inter alia arson, murder, rape etc*] if committed by an American soldier in a hostile country against its inhabitants [*are punishable as at home*].

Lieber thus identified “war crimes” and that the responsibility for dealing with the offenders belonged to the Union army. This was not an altogether surprising arrangement, but the question of what constitutes a war crime, the jurisdiction for investigation, trial and punishment has, since then, been somewhat equivocal and controversial with revenge by the victors sometimes outweighing justice.

The 1864 *Geneva Convention* did not identify conduct which might be construed as a breach of the *Convention* and, for that reason, was obviously silent on responsibilities for punishment. Instead, perhaps consistent with notions of chivalry, a set of rules was agreed with the hope, and expectation, that states parties would feel obligated and behave.

The *Hague Conventions* and Regulations of 1899 and 1907 made some developments in the area of breaches, but it is convenient and adequate to mention only the 1907 *Regulations*. The *Regulations* have many prohibited acts listed, but the language of the *Regulations*, in its own terms, makes no provision for penal sanctions except in two cases, as noted in the International Committee of the Red Cross Index, under the heading “War Crimes – acts warranting or requiring penal sanctions under treaty law.” Article 41 deals with violation of an armistice by a private person and article 56 for specific property offences which, in modern terms, would be recognised as the precursor to the protection of cultural objects. The most well known and enduring articles are:

**Article 22** [*the right of belligerents to adopt means of injuring the enemy is not unlimited.*

**Article 23(e)** [*it is forbidden [to employ arms, projectiles, or material of a nature to cause superfluous injury.*

but there is no provision for dealing with any breach.

**Development of the Geneva Conventions of 1929**

The next useful area for examination is the two *Geneva Conventions* of 1929. The earlier *Geneva Gas Protocol* of 1925 is worthy of only passing notice in that it contained prohibitions without penalties and reservations to permit retaliatory usage against first use by an enemy. A controversial issue has been the use of Agent Orange in Vietnam, which the United States held was permitted under the terms of the *Gas Protocol*. 

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**Table 1**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1864</td>
<td>Geneva Convention (for the amelioration of the condition of the wounded in armies in the field)</td>
</tr>
<tr>
<td>1899</td>
<td>Convention No III of The Hague (adaptation to maritime warfare of the principles of the Geneva Convention of 1864)</td>
</tr>
<tr>
<td>1906</td>
<td>Geneva Convention (revision and development of Geneva Convention of 1864)</td>
</tr>
<tr>
<td>1907</td>
<td>Convention No X of The Hague (adaptation to maritime warfare of the principles of the Geneva Convention of 1906)</td>
</tr>
<tr>
<td>1949</td>
<td>Geneva Conventions (for the amelioration of the condition of the wounded and sick in armed forces in the field Convention I) (for the amelioration of the condition of wounded, sick and shipwrecked members of the armed forces at sea Convention II) (relative to the treatment of prisoners of war Convention III) (relative to the protection of civilian persons in time of war Convention IV)</td>
</tr>
<tr>
<td>1977</td>
<td>Protocols Additional to the Geneva Conventions of 1949 (protection of victims of international armed conflicts Protocol I) (protection of victims on non-international armed conflicts Protocol II)</td>
</tr>
</tbody>
</table>
The [First] Geneva Convention of 1929 sets out to deal with the problems observed during and after the First World War when attempts to deal adequately with alleged war criminals were a failure.

The process started in 1919 when the Preliminary Peace Conference in Paris created a Commission of 15 members to enquire into “responsibilities relating to the war” and it generated a list of 32 war crimes. The most cursory of examinations will reveal that the pre-First World War instruments, which were largely silent on war crimes, were apparently now to be displaced by a lengthy list of offences. The Commission also decided the Central Powers had carried out barbarous or illegitimate methods in violation of the established laws and customs of war and the elementary laws of humanity thus creating two types of offences. The Commission recommended the Treaty of Peace contain articles to deal with offenders by a High Tribunal, constituted by the Allied States, and the Treaty of Versailles at article 229 sanctioned the principle of trial by the courts of the [Allied] adversary. Implementation, however, was a different matter and the Allies ultimately agreed that prosecution and trial would be conducted by the German Government. The outcome verged on the farcical as demonstrated by the case of the sinking of the hospital ship the Llandovery Castle. In another case of a hospital ship sinking, the Dover Castle, the commander of the U-boat was acquitted on the grounds of acting in obedience to superior orders, which, by German law was a good defence. The war crimes trials were a failure, only ten accused were punished, with penalties out of proportion to the gravity of the crimes, and the sentences were never served. In the words of Telford Taylor, writing on the war crimes provisions of the Versailles Treaty, “the mountain laboured and brought forth a mouse.”

The difficulty was the seemingly insurmountable problems in international law. Germany invaded neutral Belgium in violation of a neutrality treaty which contained no criminal sanctions and when Belgium resisted she lost her neutrality! The killing of hostages was not covered under the Hague Convention. The same Hague Convention prohibited bombardment of undefended cities, but London was defended and hence the Zeppelin raids were not illegal, particularly, as the Hague Convention of 1907 which prohibited the discharge explosives from balloons, had not been signed by either Germany or France. The U-boat sinkings of merchant ships were not subject to any international law. And even the Hague Convention prohibiting the use of gas was limited to its delivery by projectiles. The Turkish massacres of their own Armenian citizens were not relevant to the Hague Convention.

The [First] Geneva Convention 1929 was based upon the experience of the First World War and described in its 39 articles numerous requirements to be observed by the belligerents, but no breaches were identified. States parties were required only to [at]:

**Article 29.** propose to their legislatures should their penal laws be inadequate, the necessary measures for the repression in time of war of any act contrary to the provisions of the present Convention.

**Article 30.** On the request of a belligerent, an enquiry shall be instituted, in a manner to be decided between the interested parties, concerning any alleged violation of the Convention; … [and] shall put an end to and repress it as promptly as possible.

The [Third] Geneva Convention 1929 was created to deal with the deficiencies for the treatment of prisoners of war revealed in the Hague Conventions of 1899 and 1907. Like the [First] Geneva Convention there were no breaches identified and the 97 articles described how prisoners of war should be treated.

**The International War Crimes Commission**

It was no surprise that the whole process for dealing with war crimes had to be created near the end of, and following the conclusion, of the Second World War. The United Nations War Crimes Commission was created by a Diplomatic Protocol from the London Conference held at the British Foreign Office on 20 October 1943 and met for the first time on 11 January 1944. On 8 August 1945 an Agreement was concluded in London to establish an International Military Tribunal.

One of the earliest questions was how to define war crimes and to find sources of law. The International Military Tribunal Charter defined, *inter alia*: war crimes at article 6:

(a) **Crimes against peace**: namely, planning, preparation, initiation or waging of a war of aggression, or a war in violation of international treaties, agreements or assurances, or participation in a common plan or conspiracy for the accomplishment of any of the foregoing.

(b) **War Crimes**: namely, violations of the laws or customs of war. Such violations shall include, but not be limited to, murder, ill-treatment or deportation to slave labour or for any other purpose of civilian population of or in occupied territory, murder or ill-treatment of Prisoners of
War or persons on the seas, killing of hostages, plunder of public or private property, wanton destruction of cities, towns or villages, or devastation not justified by military necessity.

(c) **Crimes Against Humanity:** namely, murder, extermination, enslavement, deportation, and other inhumane acts committed against any civilian population, before or during the war, or persecutions on political, racial or religious grounds in execution of or in connection with any crime within the jurisdiction of the Tribunal, whether or not in violation of the domestic law of the country where perpetrated.

However, several articles were also discovered in both the Hague Convention of 1907 and the [Third] Geneva Convention of 1929 and by the terms of the Charter of the International Military Tribunal were held to be “war crimes” under international law.

The International Military Tribunal also said:

The law of war is to be found not only in treaties, but in the customs and practices of states which gradually obtained universal recognition, and from the general principles of justice applied by jurists and practiced by military courts....in many cases treaties do no more than express and define...principles of law already existing.

Unlike the post-First World War experience the Nuremburg and Tokyo Trials proceeded and many alleged war criminals were punished. Other trials were conducted by military tribunals or national courts in the countries which Germany and Japan had occupied during the Second World War.

**The Geneva Conventions of 1949**

In 1949 the three Geneva Conventions were once again reviewed and developed based upon the experience of the Second World War. A fourth Geneva Convention was agreed Relative to the Protection of Civilian Persons in Time of War in recognition of the great suffering of the millions of civilians who were victims of the Second World War. This time “grave breaches” were identified as international crimes (and since the Additional Protocols of 1977 as war crimes).

The four Geneva Conventions have the same or similar articles regarding grave breaches as shown in Table 2:

The four Geneva Conventions have a common article 3 which deals with armed conflict not of an international character which describes groups of persons taking no active part in the hostilities and prohibits certain acts against them; viz:

(a) violence to life and person, in particular murder...mutilation, cruel treatment and torture;
(b) taking of hostages;
(c) outrages upon personal dignity...humiliating and degrading treatment;
(d) passing of sentences and the carrying out of executions without previous judgment pronounced by a regularly constituted court, affording all the judicial guarantees which are recognised as indispensable by civilised peoples.

**Table 2**

<table>
<thead>
<tr>
<th>First Convention article 50, Second Convention article 51, Third Convention article 130 and Fourth Convention article 147: Grave breaches... shall be... acts, if committed against persons or property protected by the Convention: wilful killing, torture or inhuman treatment, including biological experiments, wilfully causing great suffering or serious injury to body or health;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fourth Convention article 147 continues: unlawful deportation or transfer or unlawful confinement of a protected person;</td>
</tr>
<tr>
<td>Third Convention article 130 (re prisoner of war) and Fourth Convention article 147 (re protected person) continue: compelling a (prisoner of war)(protected person) to serve in the forces of the hostile Power, or wilfully depriving a (prisoner of war)(protected person) of the rights of fair and regular trial prescribed in this Convention</td>
</tr>
<tr>
<td>Fourth Convention article 147 continues: taking of hostages;</td>
</tr>
<tr>
<td>First Convention article 50, Second Convention article 51 and Fourth Convention article 147: continue: and extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly.</td>
</tr>
</tbody>
</table>
The codification of grave breaches was an improvement on what had gone before, but there were still problems left unattended. The definition of war crimes was still ambiguous and its probable, but not certain, that the offences at common article 3 for non-international armed conflicts would be regarded as grave breaches. Rape was still not included even though it was identified as a war crime, among the list of 32, as early as 1919 by the Commission established by the Preliminary Peace Conference in Paris. Other equally serious crimes against women are also omitted such as forced prostitution, forced pregnancy and sterilisation. It could be argued that these crimes against women are covered as grave breaches of international humanitarian law, or violations of the customs of war, or crimes against humanity, or torture or even genocide. But it is a remarkable thing that rape, which must be a crime in every criminal code world-wide, is not so specified as a war crime [grave breach], albeit the Fourth Geneva Convention at article 27/2 requires women to be protected against rape. It will be shown below that the Additional Protocols of 1977 proscribed rape as a breach only and while crimes against women may be implicit as a grave breach in terms of torture, inhuman treatment, great suffering or serious injury it is submitted that humanity and justice would be better served if these undoubted crimes were expressly identified.

The Additional Protocols of 1977

By the 1970s the Geneva Conventions were showing their age and many gaps (lacunae) and imperfections were becoming clear and the Hague law from 1907 dealing with the conduct of war and use of weapons had never been revised in any significant way. The Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949 were the product of a Diplomatic Conference which met in four sessions from 1974 to 1977. The International Committee of the Red Cross through successive International Conferences of the Red Cross (which includes states parties), discussions within the United Nations and other conferences and diplomatic initiatives produced two draft protocols which were sent to Governments in 1973 and the successful diplomatic conference followed.

There was substantial development, not the least being the identification of grave breaches of the Geneva Conventions as war crimes at article 85/5 of Protocol I. However, in this context war crimes are dealt with in Protocol I only and not at all in Protocol II. Jean Pictet in his General Introduction to the Commentary on the Additional Protocols observes:

it was not possible to entirely avoid some politics being brought into debates….thus it was not possible to escape this tension between political and humanitarian requirements…[which]…is in the nature of the law of armed conflict…which is based…on compromise.85

This article suggests there is no point in separating Geneva law and Hague law, which is a view with implied support in much of the material produced by and activities of the International Committee of the Red Cross.86 But given the need for compromise, properly noted by Pictet above, it is appropriate to note the criticism of the “laws of war” made by Jochnick and Normand.87 They were careful to classify Geneva law as the “humanitarian laws” and Hague law as the “laws of war”,88 noting Pictet includes both Geneva and Hague law under the rubric of “laws of war,”89 but they observe:

"The effectiveness of Geneva laws can be attributed in large part to the fact that they serve the interests of the more powerful nations. For instance, Geneva laws prevent weaker states from compensating for military disadvantage by threatening to mistreat enemy soldiers and civilians."89

This is an ambiguous proposition which may be construed as critical of Geneva law by alleging it gives an advantage to the powerful at the expense of the weak, or conversely that Geneva Law is good as it prevents abhorrent conduct. States embrace international law for a variety of reasons, but enlightened self-interest is an important factor and usually leads to compliance with international law in general and, in particular, the very low standard which is an important feature of Geneva law. It is suggested comprise by all the actors, as noted by Pictet, is a better explanation for the effectiveness of Geneva law than any alleged advantage to the powerful.

In terms of war crimes considerable development was achieved in Protocol I.

Protocol I

Grave breaches are identified in a number of articles.

Article 11- Protection of persons

1. ... persons in the power of the adverse Party...
2. ... prohibited to carry out... even with consent:
   (a) physical mutilations;
   (b) medical or scientific experiments;
   (c) removal of tissue or organs for transplantation.
3. Exception to...2(c)...donations of blood...or skin for grafting...
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4. ... violations of paragraphs 1 and 2 ... requirements of 3 shall be grave breaches of this Protocol.

Article 85 – Repression of breaches of this Protocol

2. ... grave breaches ... if committed against ... [protected] ... persons ... protected.\[41\]

3. ... grave breaches ... causing death or serious injury to body or health:
   (a) ... making civilians ... the object of attack;
   (b) ... indiscriminate attack ... excessive loss of life ... to civilians ... (c) ... attack against works ... containing dangerous forces...
   (d) ... non-defended localities ... object of attack ...
   (e) ... person object of attack [when] hors de combat.
   (f) ... perfidious use ... of ... Red Cross ...

4. ... grave breaches ...
   (a) ... transfer ... of own civilian(s) ... into [occupied] territory ... or deportation or transfer ... of population in the occupied territory...
   (b) ... unjustifiable delay in repatriation of prisoners of war or civilians ...
   (c) ... apartheid ... and other degrading practices ...
   (d) ... attacks on cultural property ...
   (e) depriving protected person...of fair and regular trial.

5. ... grave breaches ... shall be regarded as war crimes.

As noted earlier, distinctions between Geneva law and Hague law have become irrelevant insofar as grave breaches/war crimes are concerned. In the First and Second Geneva Conventions the property offences are arguably of Hague law type together with perfidy and attacks on cultural property in Protocol I. But the real gain of Protocol I is how the reach of international humanitarian law has been extended in times of armed conflict.\[6\]

States have been slow to ratify\[5\] and important Powers such as the United Kingdom and the United States, while signatories, have not ratified either Protocol. The United States is active in its attempts to persuade other states not to ratify and President Reagan in his Letter of Transmittal to the United States Senate dated 29 January 1987\[5\] said:

I ... recommend that the Senate grant advice and consent to this agreement [Protocol II] ... and conclude[d] that the United States cannot ratify ... Protocol I...

The United States was of the opinion that Protocol I gave comfort to terrorist organisations by giving them legitimacy as international actors.\[48\] A spirited rebuttal was mounted by Hans-Peter Gasser in an appeal for ratification by the United States,\[50\] but the United States has remained unmoved. By mid-1994 Protocol I was ratified by 135 states, Protocol II was ratified by 125 states and, by comparison 185 states were parties to the Geneva Conventions of 1949.\[51\]

Protocol II had the more difficult passage at the Diplomatic Conference and was nearly still-born.

Protocol II

Protocol II is silent on war crimes, which is a matter of great regret, given its field of application to non-international armed conflicts as a supplement to and development of common article 3 of the Geneva Conventions.\[52\] The conflict in the Former Yugoslavia was, for a period, of a non-international character and history has shown that civil wars are usually among the most bloody and cruellest of conflicts. Protocol II is relevant not for what it contributes to dealing with war crimes, but for the opportunity lost.

Protocol II began with a 48 article draft which was diminished to 28 articles when it was finally adopted. Of the 28 articles three deal with the scope of the Protocol and 10 articles are for final provisions leaving a mere 15 for the issues. The travaux preparatoire\[53\] show the problem surfaced at the 49th Plenary Meeting on 2 June 1977 when the President advised that since the 48th meeting the previous day it had become evident there was a general wish that a simplified version of the draft of Protocol II was wanted.\[54\] The problems were a fear the draft did not provide sufficient guarantees for the respect of national sovereignty and that some of the rules seemed too detailed to be realistic or to be capable of genuine application in the specific context of armed conflict.\[55\] The impasse was resolved by the introduction of a simplified draft by the Pakistan delegation\[56\] and the Protocol was finally adopted by consensus. The resultant Protocol is probably best described by Mr Ofstad of the Norwegian delegation who said:

the [Protocol] was a seriously amputated version...[and] where humanitarian guarantees were concerned it did not go beyond the provisions of the International Covenant on Civil and Political Rights...from which no derogation could be made...including internal armed conflict...better, instead...to pass a resolution urging all States to ratify the ICCPR...\[57\]
The Australian delegation said Protocol II was "satisfactory and represents an extension of the principles of humanitarian law."

Nevertheless it took Australia until 21 January 1991 to ratify both Protocols, which action was opposed by the Opposition, but the Australian Defence Forces have regarded themselves as bound from the time Australia became a signatory. Australia's position in regard to Protocol II is problematic given that the policy of the Australian Government is that international law is not incorporated into domestic law and requires an overt act of adoption according to the High Court in Bradley v Commonwealth. However, the High Court in Teoh's case introduced some doubt in deciding that entering a treaty without legislating could give rise to a legitimate expectation. In response the Government introduced the Administrative Decisions (Effect of International Instruments) Bill 1995 which makes it clear that "international instruments do not give rise to legitimate expectation." Remembering, the Executive alone, without parliamentary approval, can commit Australia to a treaty obligation brings us to the curious situation where the Hon Michael Duffy, Attorney General advised the Parliament that:

when Australia ratifies Protocol I it will, at the same time, ratify Protocol II....however, Protocol II...does not require legislative action to enable its ratification.

Parliamentary approval is required to amend the Geneva Convention Act (Cth) 1957, but only Protocol I has been introduced by amendment to the Geneva Convention Act (Cth) 1957 and the position of Protocol II is, in consequence, problematic.

How Can War Criminals Be Brought to Justice?

It has been shown that after the First World War attempts to deal with breaches of international humanitarian law effectively came to nothing. With this experience in mind the International War Crimes Commission set up the International Military Tribunal to deal with the alleged war criminals after the Second World War and a number of the indictments were based upon offences against the Geneva Conventions. It should be noted that the only similar action since has been the establishment by the United Nations of the International Tribunal for the Prosecution of Persons Responsible for serious Violations of International Humanitarian Law in the Territory of the Former Yugoslavia since 1991. Subsequently a similar provision has been made for Rwanda.

It is regrettable that war crimes per se are embodied in such a diverse variety of international instruments, each covering a different catalogue of criminality, albeit with some constants. This caused the United Nations to re-invent a list of crimes for the ad hoc International Tribunals. They also suffer a serious disability in that there can be no trials in absentia and it will be extraordinarily difficult to bring alleged criminals into the jurisdiction of the Tribunals.

Some would argue the problems would be less had the international community brought into existence the International Criminal Court first suggested in 1899. The League of Nations produced a draft statute in 1935 and the International Law Commission began a study in 1950 and have also produced a draft statute.

The question is what, apart from trials, can be done to enforce international humanitarian law and punish criminals? McCormack and Simpson refer to the difficulty in characterising international criminal behaviour in the absence of an agreed meaning as to the term. They observe the options as being: particularly serious state acts; a state act giving rise to individual responsibility; and individual criminal acts. They also note the majority of crimes in the International Law Commission Draft Code are already crimes under international law. Given the long time it has taken for the International Law Commission to produce its Draft Code and observing how long it will take to have a final form agreed by a significant number of states it may be prudent to seek out a better short term solution as a stepping stone to the ultimate aim.

It would seem desirable for a sponsor, ideally the International Committee of the Red Cross, to test the preparedness of states to agree an Additional Protocol to the Geneva Conventions Declaratory of War Crimes and to therein set out the definitions and elements of what are already internationally accepted as war crimes. This should not need to await the establishment, if it ever comes about, of an International Criminal Court and would require nothing more that collecting into a single document that which has gone before with a proper regard to lacunae or other crimes known to the law.
Enforcement or Control Options

There are a number of strategies available to enforce or to implement international humanitarian law and deal with war crimes, albeit with various degrees of effectiveness. The strategies are:

- obligations of states parties and military commanders;
- protecting powers, pursuit and trial of wrongdoers;
- penal sanctions;
- international enquiry;
- fact-finding commission; and
- dissemination.

Obligations of States Parties and Military Commanders

Ratification imposes obligation by states, but this does not necessarily lead to observance and the world has witnessed the abandonment by states of even the most basic rules of humanity. Even those states who would wish to observe the requirements of international humanitarian law will find among their citizens, both military and civilian, people who are prepared to eschew the law and commit grave breaches. For this reason the obligation of supervision is imposed upon states parties. Yves Sandoz notes that the Committee on International Medical and Humanitarian Law of the International Law Association together with an enquiry by the Centre d'études de droit international medical into the meaning of the obligation to "ensure respect for international law" contained in article 1 of each Convention and Protocol I found it meant more than domestic application and involved an obligation to ensure that other states respect the Conventions, an idea which was confirmed at the International Conference on Human Rights in Teheran 1968. At best this can mean diplomatic pressure or denunciation of violations, but in practice this provision has not really been implemented.

Military commanders under Protocol I articles 87/1 and 87/3 have a duty to suppress breaches and are unquestionably in the best position to ensure that breaches and grave breaches do not occur and if they do that they are dealt with. It is of interest to observe that the records of the United States Army Judge Advocate during the Second World War show that rape, which has effectively been ignored as a war crime, was the crime for which most servicemen were executed. The preparedness of the United States military to deal with the crime of rape is laudable, but somewhat dampened when the record shows the executions were more likely if the offender was black and the victim was also murdered.

Modern commanders also have access to specialist legal advice as provided by Protocol I at article 82. The provision is not arduous requiring advice "when necessary," but the responsible commander will use this source to ensure appropriate application of international humanitarian law in both the operational and dissemination contexts. The Australian Defence Force refer to the focus on "operational law" which is a cognate term and it is assumed its usage makes international humanitarian law more likely to be received by the military; however, it would be a pity if it also obscured the source of the law which is, of it itself, essential to understanding and hence compliance.

Protecting Powers

It was hoped that scrutiny would ensure compliance with international humanitarian law and the four Geneva Conventions of 1949 contained provisions for a Protecting Power whose duty it is to safeguard the interests of the Parties to the conflict. Although Protecting Powers were not part of the Hague Convention they nevertheless played an important role in the First World War and, for this reason, were introduced to the Geneva Convention of 1929. During the Second World War difficulties arose because: there were so few neutral states many had to act for more than one country and some were representing adverse parties as arbitrators; while millions of prisoners of war had no protecting power and there was no protecting power for civilian detainees. After the Second World War the International Committee of the Red Cross successfully proposed and saw adopted the idea that Protecting Powers be provided for in the four Geneva Conventions of 1949; a common article designates substitutes for a Protecting Power, and the system is obligatory, at least in theory. Since 1949 the system has not worked well because of: fear the adverse party will be recognised when it is not already; unwillingness to admit the armed conflict exists or as to its character; the maintenance of diplomatic relations: the pace of the unfolding events and problems in finding neutral states to accept the commitment.

Pursuit and Trial

After offences have been committed the process of dealing with wrongdoers is re-active and much depends upon getting the wrongdoer into a jurisdiction which is willing and able to deal with the case. The four Geneva Conventions of 1949 provided that:
The High Contracting Parties undertake to enact any legislation necessary to provide effective penal sanctions for persons committing grave breaches...

...obligation to search for persons alleged to have committed grave breaches... and shall bring... regardless of their nationality... before own courts... or hand over... for trial to another High Contracting Party... if prima facie case. ...

...shall take measures necessary for the suppression of all acts contrary to the provisions... other than grave breaches... accused shall benefit... of proper trial and defence...

Protocol I at article 88 requires the parties to afford one another the greatest measure of assistance in connection with criminal proceedings, cooperation with extradition and the law of the High Contracting party requested will apply.

Penal Sanctions Protocol I

Until 1977 penal sanctions applied only to persons who committed, or ordered committal of grave breaches of the Conventions. Protocol I makes governments responsible to repress grave breaches and suppress all other breaches. There is no defence, in the claim by a superior, that a breach was committed by a subordinate if the superior knew, or ought to have known about it and did not take all feasible measures to repress the breach. This is based on the precedent and practice of the war crimes trials following the Second World War and there is no modern example of its effective application.

International Enquiry

The Geneva Conventions of 1949 provide for an enquiry procedure which was not successful in repressing violations. Its failure is attributed to the controversy that arises when breaches are alleged and widely publicised. Moreover, practice has shown that confidential enquiry and negotiation are more likely to secure the required outcome.

Fact Finding Commission

Article 90 of Protocol I provides for an International Fact-Finding Commission of 15 members which may be established when not less than 20 states are party to the Protocol. The Commission could investigate grave breaches and through its good offices restore respect for the Conventions and Protocol I. Article 90 arose from a discussion concerned with reprisals even though that issue is neither explicit nor implicit in the text.

Cooperation with United Nations

Protocol I at article 89 allows for cooperation with the United Nations to deal with serious violations, but the article is unclear in its terms and it has never been tested.

Dissemination of International Humanitarian Law

In the final analysis prevention of war crimes by dissemination (education) is better than cure (which is probably enforcement and punishment by which time the damage is done) and the vital need for dissemination is not novel or even optional. It is abundantly clear that dissemination is the most effective method to ensure compliance with international humanitarian law by individuals in the first instance and states in the ultimate.

Conclusion

The codification of war crimes by an international instrument declaratory of war crimes drawing upon that which is currently variously agreed, in a variety of international instruments, together with the addition of such notable omissions as rape, would be an international endeavour, of great value, which should be capable of achievement without too great an effort on the part of the international community.

In the meantime the importance of dissemination cannot be over-stated. If the values of international humanitarian law become cultural values then appropriate conduct might be a more realistic expectation from the most junior front line soldier to the highest in the land.

Knowledge of international humanitarian law is important to front line soldiers as it is these combatants who must react instantly, often instinctively, in the heat of battle. War crimes, at this level, are not able to be excused, but perhaps can, sometimes, be understood. The case of Lieutenant William Calley is noteworthy in that the United States Army in 1971 tried and convicted Calley for the premeditated murder of Vietnamese civilians at My Lai in 1968. It was exceptional because an army tried one of its own, but this uncommon action was really driven by public outcry, and political expediency, and many others were charged and not convicted. It highlights the possibility of criminality and culpability of the “highest in the land” together with the superior commanders who countenance war crimes by embracing criminal policies or simply neglect their responsibilities.
NOTES

1. Jean S Pictet, “The Laws of War” International Review of the
Red Cross (September 1961) p297.
2. The terms are used interchangeably by many writers.
Law” (first published in International Review of the Red Cross
(September-November 1966) p10.
5. Often simply called the “Code”.
6. A German immigrant to the United States and, at the time of
the American Civil War, a professor of law at Columbia
College in New York.
7. Dietrich Schindler and Jiri Toman (eds). The Laws of Armed
8. Ibid, the Brussels Conference produced two documents: I.
Final Protocol and II. Project of an International Declaration
Concerning the Laws and Customs of War with 15 European
Signatories.
9. The Hague Convention (I) with Respect to the Laws and
Customs of War on Land 1899.
10. The Hague Convention (IV) Respecting the Laws and Customs
of War on Land 1907 which revised the earlier Convention.
11. Dunant used the anglicised spelling.
12. J Henry Dunant, A Memory of Solferino (1847) trans from first
collection of 1862.
13. The Geneva Convention of 1864 for the Amelioration of the
Condition of the Wounded in Armies in the Field.
14. Based upon the Historical Background chart in the
International Red Cross Handbook (1983) opposite p433. It is
convenient to refer to the Geneva Conventions as the First
being for armies in the field, the Second for maritime warfare,
the Third for prisoners of war and the Fourth for civilians.
16. Waldemar A Soff and J Ashley Roach (eds), Index of
17. “A violation of the terms of the armistice by private persons
acting on their own initiative only entitles the injured party to
demand the punishment of the offenders or, if necessary,
compensation for the losses sustained.”
18. “The property of municipalities, that of institutions dedicated
to religion, charity and education, the arts and sciences, even
when State property, shall be treated as private property. All
seizure of, destruction or willful damage done to institutions of
this character, historic monuments, works of art and science is
forbidden, and should be made the subject of legal proceedings.”
19. Article 16 of Protocol II Additional to the Geneva Conventions
1949 with direct reference to the Hague Convention for the
Protection of Cultural Property in the Event of Armed Conflict
1954.
Nations War Crimes Commission and the Development of the
Laws of War (1948) p32.
21. Ibid, states were: United States, British Empire, France, Italy,
Japan each with two members and Belgium, Greece, Poland,
Roumania and Serbia each with one member.
22. Ibid p34-35. Murders and massacres, systematic terrorism;
putting hostages to death; torture of civilians; deliberate
starvation of civilians; rape; abduction of girls and women for
the purpose of enforced prostitution; deportation of civilians;
interment of civilians under inhuman conditions; forced
labour of civilians in connection with the military operations of
the enemy; usurpation of sovereignty during military
operations; compulsory enlistment of soldiers among the
inhabitants of occupied territory; pillage; confiscation of
property; exaction of illegitimate or of exorbitant contributions
and requisitions; debasement of currency and issue of spurious
currency; imposition of collective penalties; wanton devastation
and destruction of property; deliberate bombardment of
uninhabited places; wanton destruction of religious, charitable,
educational and historical buildings and monuments; destruction of merchant ships and passenger vessels without
warning and without provision for the safety of passengers and
crew; destruction of fishing boats and of relief ships; deliberate
bombardment of hospitals; attack on and destruction of hospital
ships; breach of other rules relating to the Red Cross; use of
deleterious and asphyxiating gases; use of explosive or
expanding bullets, and other inhuman appliances; directions to
give no quarter; ill-treatment of wounded and prisoners of war;
employment of prisoners of war on unauthorised works; misuse
of flag of truce and poisoning of wells.
23. Ibid p36.
24. Ibid p49 Lieutenants Dithmar and Boldt were officers on the U86
commanded by Oberleutnant Patzig charged with sinking the
hospital ship Llandovery Castle in June 1918 in a place where
orders forbade firing on any hospital ship. They shelled the
lifeboats, but one escaped, and tried to conceal the crime by
falsifying the course of the submarine and the log while
pleading all the crew to secrecy. Patzig was never found but the
two lieutenants were tried and sentenced to four years which was
never served as they were treated as heroes and both escaped
with the help of officials.
29. Schindler and Toman, above p325.
31. Acting in the interests of the United Nations participating
governments were Great Britain and Northern Ireland, the
United States of America, France and the United Soviet
Socialist Republics.
32. Articles 46 - rights and property to be respected, 50 - no
general penalties unless jointly and severally liable, 52 -
requisitions in kind and services and 56 - protection of property.
33. Articles 2, 3 and 4 - treatment of POW, 46 - penal sanctions re
POW and 51 - escapes by POW.
36. Protocol I Article 85/5.
37. International Committee of the Red Cross, Commentary on the
38. Ibid xxxv.
39. International Committee of the Red Cross activity in the area of
landmines and blinding weapons are examples of Hague law by
definition.
40. Chris of Jochnick and Roger Normand, “The Legitimation of
41. Jochnick and Normand, above p52.
42. Pictet, “The Principles of International Humanitarian Law”,
above diagram at p63.
43. Jochnick and Normand, above p52 at n. 8.
44. Protocol I - persons in the power of an adverse Party protected
by:
Article 44 - combatants who become prisoners of war.
Article 45 - non-combatant who becomes a prisoner of war.
Article 73 - refugees and stateless persons.
45. Ibid Commentary, above xxxiv-xxv noting improved protection
of civilian populations which had been neglected since 1907;
civitan medical personnel and civil defence services protected similarly to military medical personnel; attention to wars of liberation and guerrilla fighters and codification of much of the customary rules from Hague law.


48. Ibid p912.

49. Legal Adviser to the Directorate, International Committee of the Red Cross.

50. Agora, above pp912-925.


52. Common article 3 provides, inter alia: “In the case of armed conflict not of an international character ... minimum provisions [are]:

(1) Persons taking no active part in the hostilities ... shall be treated humanely ... and following acts shall remain prohibited:

(a) violence to life and person ... murder, mutilation, cruel treatment and torture;

(b) taking of hostages;

(c) outrages upon personal dignity...humiliating and degrading treatment;

(d) passing of sentences...executions [only by] regularly constituted court according all the judicial guarantees which are recognised as indispensable by civilised peoples.


56. The draft was identified as document CDDH/427 and Corn 335.

57. Ibid above pi35.


61. (1973) 128 CLR 557 per Barwick CJ and Gibbs J.


67. First, Second, Third and Fourth Geneva Conventions at articles 49/3, 50/3, 129/3 and 146(3) and Protocol I at article 85/1.

68. Centre for Studies of International Medical Law at Liège.


72. First, Second and Third Geneva Conventions at article 8, Fourth Geneva Convention at article 9 and Protocol I at article 2(c).

73. Later Protocol I article 5 provided for Protecting Powers.

74. First, Second and Third Geneva Conventions and article 11 Fourth Geneva Convention.

75. Usually the International Committee of the Red Cross.


77. First, Second, Third and Fourth Geneva Conventions at articles 49, 50, 129 and 146 respectively.

78. Article 86.

79. Ibid at common articles 52, 53, 132 and 145 respectively.

80. Yves Sandoz, above p278.

81. Commentary on the Additional Protocols, above p1032.


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Lieutenant Colonel Thorogood resigned from the Royal Australian Survey Corps to become Executive Director of the Australian Red Cross Society, Victorian Division in 1981 and retired in 1991 to study law full-time at the University of Melbourne. He graduated Bachelor of Law with Honours in 1995. Colonel Thorogood attended the International Institute of Humanitarian Law in Sanremo, Italy in 1989 and was a member of the directing staff for the international military course in 1990.
Classical Strategists and the Indirect Approach

By Major Michael G. Krause, RAAC

"You know, you never beat us on the battlefield."
"That is true, but it is also irrelevant."

The strategy of the indirect approach has been associated with the British military critic Sir Basil Liddell Hart. Although he did not claim to have invented the strategy he has been credited with organising and blending lessons from history into an elevated doctrine. His aim was to use historical analysis to influence contemporary military theory and practice. This stemmed from his revulsion at the carnage of World War I and his attempts to avoid a repetition. Therefore, the indirect approach was firstly a reaction to "the tenacious clinging to the age-old practice of frontal assaults" and the "belief in brute force rather than the clever ruse" so characteristic of World War I. The strategy was most simply expressed in two maxims: "no general is justified in launching his troops to a direct attack upon an enemy firmly in position. [Secondly] that, instead of seeking to upset the enemy's equilibrium by one's attack, it must be upset before a real attack is, or can be successfully, launched."

Sun Tzu, the ancient Chinese military scholar, has also been credited with describing an indirect approach to warfare. He wrote that the general "who is free from errors directs his measures toward [certain] victory, conquering those who are already defeated." Similarly: "The victorious army first realises the conditions for victory, and then seeks to engage in battle." Sun Tzu's strategy was to ensure the conditions for success before fighting, as Liddell Hart suggested in his theory. The two share similarities and their writings are a start point for understanding the theory of the indirect approach.

The aim of this article is to discuss the principles of the indirect approach as described by Liddell Hart and Sun Tzu.
though the enemy has high ramparts and deep moats, he cannot avoid doing battle because I attack objectives he must rescue. Thus both writers saw that a physical move against an enemy’s weakness would cause him to react to the friendly plan and therefore be off-balance. Once off-balance, an enemy was far easier to attack and defeat. Dislocation is the art of rendering the enemy’s strength irrelevant. Instead of having to fight or confront the hostile force on its terms, the friendly force avoids combat in which the enemy can bring his strength to bear.

An historical example is the Gulf War of 1991. Instead of attacking the Iraqi strength in southern Kuwait, the mass of the Coalition forces struck at the Iraqi weakness, the open West flank, and then advanced on the line of least resistance to cut the Iraqi withdrawal. Before any serious fighting took place, the Iraqis had been outmanoeuvred, forced to react to the Coalition, and then gave battle with their supply and withdrawal line cut.

**Psychological Attack**

If we were to confine a study of the indirect approach to a physical attack across the lines of supply, then we would have only part of the answer. Liddell Hart warned that:

> "the mere fact of marching indirectly towards the enemy and on to the rear of his dispositions does not constitute a strategic indirect approach. Strategic art is not so simple. Such an approach may start by being indirect in relation to the enemy’s front, but by the very directness of its progress towards his rear may allow him to change his dispositions so that it soon becomes a direct approach to his new front."

There are other elements to the strategy. The first are the supporting ideas of dispersion, distracting moves and alternative objectives. The second are the essential psychological elements of surprise and deception.

Liddell Hart wrote that the first aim in strategy was to disperse an enemy’s force by not making clear where friendly forces were strongest and where they planned to attack. This would often be achieved if friendly forces were also dispersed at the beginning of a campaign. Sun Tzu had also written that:

> “The location where we will engage the enemy must not become known to them. If it is not known, then the positions they must prepare to defend will be numerous. If the positions the enemy prepares to defend are numerous, then the forces we will engage will be few.”

Once an enemy was dispersed, and unsure of where friendly forces planned to attack, the enemy would be engaged by a distracting force whose aim was to deprive the enemy of his freedom of movement. Sun Tzu wrote of this force as being the orthodox force. Its aim was to fix an enemy in place to allow the decisively intended move, or the unorthodox force, to prosper. Thus Sun Tzu wrote that: “In battle one engages with the orthodox force and gains victory through the unorthodox”.

The decisively intended move would advance on the line of least resistance but would have far more impact because it was also advancing on the line of least expectation. The combination of these two was critical. One, the line of least resistance, is a physical move, while the other, the line of least expectation, is a psychological surprise. “Only when the two are combined is the strategy truly an indirect approach, calculated to dislocate the opponent’s equilibrium”, wrote Liddell Hart. Thus, while the form may be a physical move, the effect is the dislocation of the opponent’s mind and dispositions.

The ultimate target is not the enemy’s supply but, by threatening or capturing it, the enemy’s command and control is targeted. Once the command and control system, the “nervous system”, is disrupted, the strength or “body” is rendered far less powerful. This was recognised by Guderian, a disciple of Liddell Hart. His concept and execution of blitzkrieg was the practical expression of the strategy of the indirect approach. The aim of the armoured force:

> “is to turn a tactical advantage into a strategic one. This is achieved by means of the indirect approach: the enemy’s army is destroyed not by direct killing, wounding or wearing down, but by rendering inoperative its power of command. Whereas the former is costly, time-consuming and uncertain, the latter is economic, quick and, in the conditions which were to prevail in the first half of the [Second World] war, relatively sure. Action without the proper direction loses co-ordination: troops without headquarters, or with one that is bewildered and panic-stricken, are reduced to a mob.”

A physical movement avoids the strongest part of an enemy army and becomes a psychological attack against the weakest part. Sun Tzu would have identified the actions of Guderian’s armoured force as
the actions of the unorthodox force and the attack against the enemy's command structure as an attack against the key weakness of an army. Targeting the enemy’s ability to respond in an appropriate and timely manner is the key to victory. He wrote that: “The general is the supporting pillar of state... if the supporting pillar is marked by fissures, the state will invariably grow weak.”

If leadership was absent or ineffective then paralysis would set in and morale would suffer. Sun Tzu had recognised this when he wrote:

“The morale of the... armies can be snatched away; the commanding general’s mind can be seized... thus one who excels at employing the army avoids [the enemy’s] ardent morale and strikes when it is indolent or exhausted.”

Once the enemy’s command and control had been shaken it was kept off-balance by the speed and unpredictability of the decisively intended move. The move would threaten alternative objectives and continue to take the line of least resistance. Liddell Hart wrote: “you can gain [an... advantage by adapting your line of effort to the degree of resistance that is met, and exploiting any weakness that is found.” Sun Tzu wrote that: “the army is established by deceit, moves for advantage, and changes through segmenting and reuniting.” In this way the enemy would be continually off-balance and distracted as each response it makes becomes more and more ineffective. Eventually paralysis would set in making the enemy army vulnerable.

If we return to our Gulf War 1991 example, these elements are well illustrated. The Iraqi reinforcement of Kuwait can be seen as a precipitate move in reaction to the threat, or “bailed gambit”, of amphibious landings from the Gulf and against the most likely invasion route along the coast. The Marines and Coalition forces who attacked along the coast on the direct route to Kuwait City were the orthodox force. When they had pinned the Iraqis in Kuwait, the VII and XVIII Corps of the Coalition took the line of least resistance, and expectation, around the open flank west of the Wadi al Batin. Once the Coalition had broken through, it upset Iraqi plans to block its move by continually moving and by threatening the alternative objectives of Baghdad and Basra. The effect on the Iraqi Command was one of almost total paralysis. The Iraqi Command was surprised by an unexpected attack and then remained paralysed by an attack with ever increasing tempo whose objective the Iraqi Command could not discern. It was an example of preparing an enemy for defeat by outmanoeuvring him before joining battle, and then keeping him off-balance once battle was joined. It well illustrates Sun Tzu’s maxim: “The victorious army first realises the conditions for victory, and then seeks to engage in battle.”

## Conclusion

The strategy of the indirect approach is more than just a physical move against the rear of the enemy. Its essence is a psychological attack against the command and control system of an enemy. This attack is a combination of physical and psychological factors that not only creates an opportunity but also exploits it. It is as much about forcing the enemy to do something wrong as it is about friendly forces doing something right.

Dispersion of both forces, that leaves an enemy unclear as to the line of attack was the start point. Once dispersion had been achieved, an enemy was held in place by a distracting force and, if possible, lured into a precipitate inappropriate move. Once the enemy had been dislocated then opportunity was created. This opportunity was exploited by a decisive move against the enemy’s weakest points using unexpected speed and timing. This would threaten a number of the enemy’s vulnerable points and force him to react off-balance. Once off-balance, an enemy could be more easily defeated. The potential strength of the enemy’s army was made irrelevant by defeating the command and control system that motivated it. Battle was only joined when absolutely critical to the outcome of the campaign and only after an enemy was already off-balance. Sun Tzu wrote: “Supreme excellence consists in breaking the enemy’s resistance without fighting”.

The strategy of the indirect approach was a combination of ideas that rested on an understanding of the human dimension of war. As Sun Tzu wrote: “one who knows the enemy and knows himself will not be endangered in a hundred engagements.”

## Notes

1. Exchange between an American and Vietnamese General after the Vietnam War.

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Major Michael Krause graduated from RMC in 1983 to Armored Corps where he served as a tank troop leader with 1 Arm Regt and as a reconnaissance squadron commander with 2 Cav Regt. He served with the UN in Iran/Iraq in 1990 and completed Staff College in 1995. He is completing a Masters of Defence Studies through Deakin University and is currently posted to Force Development (Land) in HQ ADF as the Staff Officer Grade Two Close Combat Heavy.
Manoeuvre Warfare and Authoritarianism

By Lieutenant Colonel G.M. Tamsitt, RFD

"Our command and control systems have to be suited to widely dispersed manoeuvre operations. In these types of operations, commanders will need to utilise broad operational directives which explain clearly their overall intention, rather than seeking exercise minute to minute direction of the activities of their subordinates. Thus subordinate commanders will be required to act with initiative and to take advantage of opportunities as they arise. This is the concept known as directive control. It takes a decentralised approach to command and control, and hinges on well-trained subordinates being given tasks and resources and being expected to operate with minimal supervision. The spirit is that high level commanders monitor operations and refrain from interfering, but use those resources not initially assigned to subordinates to reinforce success. Directive control requires a high degree of trust and understanding between commanders at all levels, with the understanding of the commander's intentions and initiative being of central importance."

Lieutenant General J.C. Grey, AO, address by CGS on 7 May 92 to JSSC course 45/92 on Land Aspects of Australian Strategy

The Australian Army is developing an enthusiasm for "manoeuvre warfare" as opposed to traditional attrition warfare. Adopting manoeuvre warfare would be a welcome development, but I question whether we can achieve much progress without fundamental changes in our leadership culture. To practise manoeuvre warfare we need a leadership culture which unambiguously favours initiative. At the moment we have, at best, an ambiguous leadership culture retaining some authoritarian traits.

In this article I examine the relationship of manoeuvre warfare with the qualities of incompetent commanders, developing the theme of favouring initiative over blind discipline.

Two Stories about Initiative

The first took place in 2 Para's action at Goose Green in the Falklands. Lieutenant Colonel "H" Jones, 2 Para's CO, had given orders for a complex, six-phase attack. His style was that of "controlling everything tightly from the centre". The battle began on the night 27/28 May 1982. The main line of Argentinian resistance was Darwin Ridge which ran across the narrow isthmus north of Goose Green. A Company, commanded by Major Farrar-Hockley, had not met opposition. It had the opportunity, with an hour's darkness to go at 5.20am on 28 May, 1982, to occupy Darwin Hill on the Eastern side of Darwin Ridge and outflank the Argentinian positions. But A Company halted. I now quote from Mark Adkin's account:

"So why did A Company sit waiting...? To have pushed on without permission on his own initiative was an option, but, as Farrar-Hockley well knew, Colonel "H" ran a very tight battalion. He maintained complete personal control and expected strict compliance with his orders. Farrar-Hockley saw the opportunity, but his request to exploit it was met with the order to wait until his commanding officer could come forward to assess the situation."

Colonel "H" died at about 9.30am that morning near Darwin Hill. He was trying to rush Argentinian pits blocking A Company's progress.

The second story is one reported by von Moltke (the elder) about an incident observed while visiting the headquarters of Prince Frederick Charles:

"A major, receiving a tongue-lashing from the Prince for a tactical blunder, offered the excuse that he had been obeying orders, and reminded the Prince that a Prussian officer was taught that an order from a superior was tantamount to an order from the King. Frederick Charles promptly responded: 'His Majesty made you a major because he believed you would know when not to obey his orders.' This simple story became guidance for all following generations of German officers."

To me, these stories demonstrate opposing approaches to leadership and command. The Goose Green incident shows a traditional authoritarian approach requiring strict obedience to orders, while the Prussian story, in contrast, shows a positive demand for initiative.
Colonel "H" showed some of the characteristics Norman Dixon described in his book *On the Psychology of Military Incompetence*. The Prussian story is often quoted to illustrate *Auftragsstrik* (“mission tactics”), a key tool for practising “manoeuvre” warfare. I will explore some relationships I see between Dixon’s book, and the requirements for manoeuvre warfare.

### Manoeuvre Warfare

"Manoeuvre warfare" is a confusing term, because it seems that “manoeuvre” in the sense of “movement”, is not a crucial element. However, the term has some currency as describing a grab bag of ideas for winning in war without resorting to attrition.

None of the ideas expressed to be a part of “manoeuvre warfare” are new. Sun Tzu expressed some of them around 400BC, for example:

> “What is of the greatest importance in war is extraordinary speed...”

> “All warfare is based upon deception.”

> “Use the most solid to attack the most empty.”

> “...one able to gain the victory by modifying his tactics in accordance with the enemy situation may be said to be divine.”

> “When you see the correct course, act; do not wait for orders.”

Perhaps the central concept is that of “tempo”:

> “The essence of the concept is that the enemy becomes incapable of reacting in any meaningful or effective way...”

The other ideas are really ways of achieving this state of enemy incapacity. These ideas include:

- deciding and acting more quickly than the enemy;
- using surprise and deception; and
- applying your strength against the enemy’s weakness and therefore:
  - finding the enemy’s weakness (by wide reconnaissance);
  - using the indirect approach;
  - keeping a large reserve to be able to react swiftly to opportunities as they present; and
  - having commanders well-forward and using a decentralised command and control system to allow maximum use of opportunities.

In more modern times, most of the concepts of manoeuvre warfare developed in Prussian and then German doctrine from the Napoleonic wars through to the Second World War. Starting with their bitter defeats at the hands of Napoleon, the Prussians worked on ways of defeating the larger forces they were likely to encounter in Continental wars. They knew they could not afford to fight wars of attrition. Their efforts bore fruit in the often stunning tactical and operational successes of the *Wehrmacht* against superior forces in the Second World War. The Germans’ fatal strategic errors and the apparent success of attrition warfare for the Allies, have perhaps delayed our serious study of the German methods. Not so the Israelis, who, feeling the same pressure to avoid attrition warfare, have been enthusiastic practitioners of the German methods.

### On the Psychology of Military Incompetence

Norman Dixon’s book was first published in 1976. Despite some sensationalism, it is generally a serious attempt to describe a type of leader associated with military disasters. Dixon describes this type of leader as “authoritarian” with the associated characteristics of the closed mind and obsessiveness. He lists a number of reasonably specific characteristics of such leaders.

One would have thought that armies generally, including our own, would have studied Dixon’s book closely to see what implications it might have for selecting and training leaders. That does not appear to have happened. These issues are certainly not taken up in our current training pamphlets related to leadership because they predate Dixon’s book!

I assume the reason for the military silence about Dixon’s book is that it could be taken as insulting. I must admit that I had known of the book’s existence for many years but only read it about three years ago. I had assumed it was a catalogue of stupid military mistakes made by stupid military leaders: military leaders are stupid by definition. Nothing could be further from Dixon’s point. He actually shows that the “bloody fool theory” of military incompetence is wrong. Dixon’s incompetent leaders were generally intelligent, but they were authoritarians.

Now, as well as Dixon’s work, it seems that the authoritarian is the opposite of the leader required for manoeuvre warfare. The authoritarian leader is also well and truly out of fashion in civilian management theory. Let us examine the characteristics of Dixon’s incompetent, “authoritarian” commanders, to see how they fit with manoeuvre warfare and civilian management requirements. In his book, Dixon gives two lists of relevant characteristics: “what military incompetence involves”; and the personality traits of
authoritarians). I will use the first list as a structure and refer to the other list as necessary.

1. A serious wastage of human resources and failure to observe one of the first principles of war – economy of force. This failure derives in part from an inability to make war swiftly.14

Manoeuvre warfare is cited as an alternative to “attrition warfare”. Manoeuvre warfare aims to achieve victories cheaply, by the skill of commanders at all levels. William Lind introduces the theory of manoeuvre warfare with a discussion of speeding up warfare by reducing the “Boyd Cycle” or “OODA Loop” (observe, orient, decide, act).15 The idea is to make relevant decisions and act faster than your enemy.

2. A fundamental conservatism and clinging to outworn tradition, an inability to profit from past experience (owing in part to a refusal to admit past mistakes). It also involves a failure to use or tendency to misuse available technology.

Manoeuvre warfare, by contrast, emphasises creativity: doing something different or unexpected. According to Lind “(m)anoeuvre warfare means you will... generate confusion and disorder” and “(t)all patterns, recipes and formulas are to be avoided”. General Franz Halder listed “free creativity” as one of the main objects for military education.16 Dixon states a related quality in his list of authoritarian traits:

“The inability to sacrifice cherished traditions and accept technical innovations. The history of the machine gun, the tank and the aeroplane contains striking evidence of this disability.”16

Of course, the successful German andIsraeli practitioners of manoeuvre warfare have profited by their creative and flexible use of military technologies.

3. A tendency to reject or ignore information which is unpalatable or conflicts with preconceptions.”

This related to the closed-minded trait of authoritarians of whom Kelvin comments: “These tendencies reflect on a type of individual who needs to feel that his environment is highly predictable.”

The “recon pull” of manoeuvre warfare orientsthe whole approach to gathering information and responding to it: finding “surfaces and gaps”. This is instead of the “command push” of traditional attrition warfare.

4. A tendency to underestimate the enemy and overestimate the capabilities of one’s own side.”

Manoeuvre warfare boldly seeks to “psyche out” an opponent. It does so by creativity and strenuous action: surprise, speed, and concentration of force.

While the desired outcomes of manoeuvre warfare are victories without the cost of attrition, there is no sense of complacency or easy success. In a sense, manoeuvre warfare is “enemy focussed”, rather than being preoccupied with ground or own forces. Ground and own forces simply become some of the means of dislocating the enemy.

5. Indecision and a tendency to abdicate from the role of decision-maker.”

Shortening the Boyd Cycle or OODA Loop is a key element of manoeuvre warfare. Commanders taking quick, relevant decisions is essential. General Halder again lists fostering decisiveness as one of the main objects of military education:

“Making whole i.e. clear and unambiguous decisions and carrying (them) out by concentrating all forces.”

6. An obstinate persistence in a given task despite strong contrary evidence.”

Flexibility and agility are the relevant manoeuvre warfare qualities. With “recon pull” the idea is actively to seek evidence on which to change tasks; to reinforce success, not failure. Von Schlieffen’s view was that the “aim of the commander...was to recognise and take advantage of the mistakes committed by enemy.”

7. A failure to exploit a situation gained and a tendency to “pull punches” rather than push home an attack.”

Manoeuvre warfare aims to create an advantage and exploit it. Finding the “surfaces and gaps”, or the “indirect approach”, is part of creating the advantage. Then, nominating the Schwerpunkt, or main effort, concentrates force in exploiting the advantage.

8. A failure to make adequate reconnaissance.”

With “recon pull” rather than “command push”, manoeuvre warfare obviously emphasises reconnaissance.

9. A predilection for frontal assaults, often against the enemy’s strongest point.

Again, manoeuvre warfare emphasises surfaces and gaps, or indirect approach.2 The idea is apply your strength against your enemy’s weakness.

10. A belief in brute force rather than the clever ruse.”

11. A failure to make use of surprise or deception.”

These two issues appear to belong together. Manoeuvre warfare attempts to use surprise to avoid attrition. In the following passage Brigadier John Essex-Clark, in critiquing his time as a tactics instructor at Canungra, highlights this aspect of manoeuvre theory:

“Many of our students do not understand...and
equate winning tactics with the correct application of formulae – which, in fact, makes us predictable and might lead to disaster in war. At Staff College I had read in Hobbes’s Leviathan that, ‘Force and fraud, are in war the two cardinal virtues’. But the use of fraud, cunning or deception never enters into the tactical equations in the Tactics Wing courses...Cunning is too hard to measure and too nasty to accept as a military tactical virtue.”

“12. An undue readiness to find scapegoats for military set-backs.”

Manoeuvre warfare theory emphasises trust between superiors and subordinates. It accepts that some mistakes will happen. This is the price to pay for the initiative which will produce much better results overall. If subordinates are afraid of being blamed for set-backs, they will not display the necessary initiative. The following passage from Lind illustrates the point:

“...to be able to outfight the enemy using maneuver warfare, you need a command and control system based on leadership and monitoring...Both leadership and monitoring are valueless without trust...trust by the commander that his subordinates will understand and carry out his desires and trust by those subordinates that they will be supported when exercising their initiative...”

Among his list of traits of the authoritarian personality Dixon includes:

“An emphasis upon the importance of blind obedience and loyalty, at the expense of initiative and innovation, at lower levels of command.”

This trait is, of course, the antithesis of the institutionalised initiative required in manoeuvre warfare as these words inserted by von Moltke the elder in the Prussian tactical manual for senior commanders show:

“A favorable situation will never be exploited if commanders wait for orders. The highest commander and the youngest soldier must always be conscious of the fact that omission and inactivity are worse than resorting to the wrong expedient.”

These principles are the basis for Auftragstaktik or “mission orders” or “directive control”.

“13. A suppression or distortion of news from the front, usually rationalised as necessary for morale or security.”

This facet is not one that manoeuvre warfare theorists comment on directly. I can only comment that successful manoeuvre warfare practitioners like von Manstein and Guderian appeared to be extremely frank and forthright in reporting from the front.

“14. A belief in mystical forces – fate, bad luck, etc.”

Manoeuvre warfare seems to be more about creating your own luck, than relying passively on it.

The comparison of Dixon’s characteristics of the disastrous military leader with manoeuvre warfare theory shows a strong negative correlation. The traits of the disastrous authoritarian military leader are the other side of the coin to the requirements for successful manoeuvre warfare. All the key elements of manoeuvre warfare emerge in the comparison.

Norman Dixon is only talking about the personalities of individuals. If we believe what Dixon says and what manoeuvre warfare requires, the logical consequence is that we should avoid selecting and promoting authoritarians.

Beyond this, there is also a sense in which organisations as well as individuals can be authoritarian, perhaps with similarly unfortunate results.

**Armies as Authoritarian Organisations**

Blind discipline and unquestioning loyalty to superiors are key requirements of Dixon’s authoritarian commanders. These qualities still get prominent billing in our current leadership publications. Samuel P. Huntington has given a classic statement of the disciplined nature of armies:

“When the military man receives a legal order from an authorized superior, he does not argue, he does not hesitate, he does not substitute his own views; he obeys instantly. He is judged not by the policies he implements, but rather by the promptness and efficiency with which he carries them out. His goal is to perfect an instrument of obedience; the uses to which that instrument is put are beyond his responsibility.”

There is a clear conflict between this view and Lord Nelson’s view which could be taken as an early illustration of Auftragstaktik:

“I find few think as I do, but to obey orders is all perfection. What would my superiors direct, did they know what was passing under my nose? To serve my King and to destroy the French I consider as the greatest order of all, from which the little ones spring, and if one of these little ones militate against it, I go back to obey the great order.”
One explanation for the idea of instant, unthinking obedience is that the paradigm for military decision-making is the life threatening situation. Michael O. Wheeler has put the view that only a small proportion of modern military situations actually require instant obedience to save lives. Taking that idea further, it may be that armies developed much of their command and control systems and "culture" during the sixteenth, seventeenth and eighteen centuries, when foot and rifle drill were crucial tactical techniques. Drill required instant, unthinking obedience to work. This was also a period when soldiers did not generally have a personal motive to fight. Harsh discipline may have been necessary just to keep them on the battlefield.

S.L.A. Marshall’s disturbing statistics showed that consistently less than a quarter of U.S. infantry soldiers in the Second World War fired their weapons when their companies were in combat. To deal with this problem, he advocated a “thinking soldier...who is trained for self-starting”. He denied any relationship between drill and fighting proficiency and asserted that:

"...it is chiefly when command is exercised as if it were based on some military magic known only to officers that it precludes that form of obedience which is distinguished by intelligent and aggressive action."

During the First World War the Germans largely abandoned close-order drill in recruit training. It was not compatible with the new methods of warfare where men were not in formed bodies within earshot of an officer giving orders. The need was for independent action. I believe the Israeli Army also does not emphasise drill in training. For the Germans and Israelis the emphasis is on the capacity for independent action with the self-discipline “glue” of the commander’s intention and the Schwerpunkt keeping things together. We still see the authoritarian “imposed discipline” of recruit training as a necessary step towards “self discipline” on the battlefield.

A Culture of Initiative?

Part of the ANZAC myth is that the Australian soldier is big on initiative. Culturally, we like to think of ourselves as anti-authoritarian. The "great man" theory is anathema. We cut down tall poppies; especially if they are full of themselves. Manoeuvre warfare emphasises initiative and self-discipline rather than blind discipline. This sounds like a natural arrangement for the Australian Army. Some suggest that manoeuvre warfare can only be practised by highly trained and motivated soldiers. If an army is of doubtful quality, an authoritarian system is safer. Surely we view ourselves as well-trained and motivated, and so, capable of practising Auftragstaktik.

Brigadier George Mansford’s pamphlet, Junior Leadership on the Battlefield, is full of examples of successful battlefield leaders whose unifying features are independence and initiative in carrying out their commander’s intention. But this pamphlet is only for junior leaders and its status in relation to the main leadership pamphlets is unclear. They give much more space to discipline and loyalty than to initiative.
We have generally accepted that senior leaders should fit the traditional British model which Martin Samuels calls “restrictive control”. Even Monash, our most celebrated senior wartime commander, you would have to classify as a talented and energetic planner and a restrictive controller.

In a sense, this reflects another side of the Australian coin. While we like to think of ourselves as larrikins, we are distrustful of too much freedom; particularly for other people. We think that regulation is the answer when something goes wrong. Peacetime favours micro-management and blame for mistakes, rather than trusting subordinates to take risks. So, I suspect that some of Norman Dixon’s authoritarians are among us and that we have many authoritarian threads in the fabric of our leadership culture. How many of us admire leaders like Colonel “H” for his “tight rein”? Would we instantly disobey orders to take advantage of a tactical opportunity as Prince Frederick William expected the major to do?

According to Colonel Trevor Dupuy, the Wehrmacht institutionalised good tactical and operational leadership:

“Perhaps the most remarkable thing about the command exploits of men like Senger, and like Student and Manstein, is that such performances were not unusual. Close examination of German combat operations in World War II reveals – with occasional lapses and exceptions – the same kind of cool, competent, bold, imaginative, opportunistic leadership on the part of practically all German division, corps, army and army-group commanders, in success as well as in adversity, in defense as well as attack.”

Can we achieve something similar? Having decided manoeuvre warfare is the bold path to military competence, can we prepare ourselves in peacetime to practise it in war? Can we adopt a culture of initiative?

NOTES

2. ibid p160
5. ibid p69
7. ibid p91
8. ibid p101
9. ibid p112
12. Dixon, op cit p152
13. ibid p264
14. ibid p152
16. ibid p7
18. Dixon, op cit, p265
19. quoted in Dixon, op cit, p266
20. van Creveld, op cit, p39
21. Samuels, op cit, p87
22. Lind, op cit, p73
24. Lind, op cit, p22
25. Dixon, op cit, p267
26. quoted in Dupuy, op cit, p116
27. It is interesting to note some comments about WWII German Army officer selection procedures made in van Creveld, op cit.
29. ibid, p75
32. ibid p40
33. ibid p41
34. Samuels, op cit, p100
36. ibid p1-3
39. Samuels, op cit, p137
40. Dupuy, op cit, p285

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The Technological Dimension of War – from Machiavelli to Mahan

By Wing Commander A Forrest, RNZAF

It would be a mistake to think that, because present-day society is often obsessed with the impact of technology on every aspect (including the military aspect) of its life, this obsession has always been shared by all people everywhere.

Introduction

One of the defining characteristics of modern warfare is the degree to which its preparation and conduct have been affected by rapid changes in military technology. The last few decades have brought a period of unprecedented advancements in electronics, materials and design technologies that have yielded precision and stand-off munitions, global navigation systems, satellite reconnaissance and communications, electronic warfare and stealth. Some of these technologies challenge our existing assumptions about the morality and psychology of international war. However, they all contribute to changing the operational art of war, providing weapons systems of vastly increased killing power to smaller units (providing another perception of the principle of mass) and enabling military forces to target precisely the enemy’s decision-making centres without the precondition of confronting his own forces. So pervasive has been the impact of technology change that the dominant weapons on the battlefield only superficially resemble the ones that they have replaced. Nations that have failed to maintain technological currency have lost the “qualitative edge”, i.e. the leverage that high technology offers a nation confronting another sophisticated opponent.

It is axiomatic to students of contemporary warfare that technology is a major dynamic of war – a certainty clearly illustrated by the inability of military theorists to keep pace with rapid technology change and to incorporate it into tactical and operational doctrine. However, while technology has always been present in war, concern for the relationship between technology and war is a relatively recent phenomenon. Not long ago, entire generations of combatants could enter and exit the military profession with little or no concern about having to adapt to new weapons. And if practitioners were slow, and at times hesitant, to introduce new technology onto the battlefield, strategists seemed even more reluctant to revise their theoretical models to reflect the new devices of battle. Why was this the case? What was it about the technology or about the prevailing political and organisational conditions that induced theorists to minimise the impact of new technology on the nature of war? This article addresses these questions by considering the theoretical approaches to technology change from Machiavelli at the start of the sixteenth century to Mahan at the end of the nineteenth. The parameters of the article exclude the twentieth century since, in this age of the technologists, a relationship between technology innovation and war is not only assumed, but taken for granted.

The Sixteenth Century

In retrospect, the period at the close of the fifteenth century and beginning of the sixteenth century appears to be something of a watershed in European military development. In his book, Technology and War, Martin van Creveld selects the year 1500 as the division between two periods – the age of tools and the age of machines, noting that “…after 1500, the most important weapons employed derived their energy not from biological sources but from sources that were inanimate, specifically chemical.” According to Michael Howard, 1494, the year that Charles VIII invaded Italy, marked the passing of the wars of the knights in favour of wars of the mercenaries, and he notes also that 1494 is usually regarded by historians as the beginning of the period of modern history. Although these transitions were much more evolutionary than is implied by arbitrary dividing dates, it is clear that warfare was undergoing a metamorphosis around this period. Though “…few men at the end of the fifteenth century were conscious of a new era dawning”, one
theorist in particular, Niccolo Machiavelli, detected the need for a different approach to the new conditions of war.

Yet Machiavelli’s prescriptions for successful operational tactics did not accommodate military technology as a changing factor of war. The _Ordinanza_ legislation (1506) and _The Art of War_ (1521) were part of Machiavelli’s primary objective to reorganise the army, revealing that the basis of this aim was to foster emotional and psychological bonds that must be present within a state in order that warfare can become the concern of the whole of society. Machiavelli laid out the advantages and the structure of a citizen militia – it would be less expensive than the condottiere, it would stimulate nationalist and patriotic sentiments that would make it a unifying social tool and a more loyal and durable instrument of foreign policy, its composition would have a substantial infantry bias, it would be drilled and regularly exercised, and it would be arranged as discrete locality-based units under control of a single commander. But although he detailed the sort of weapons his army should bear, Machiavelli seemed unwilling to incorporate new technological developments, firearms and artillery in particular, into his military scheme.

Several explanations have been proffered for what, at face value, seems to be an inexcusable oversight. One suggestion is that the new arms were depreciated because they discounted the role of valour in combat. Van Crevels lends weight to this view, noting that a reason for the “furious resistance” that the new arms met throughout the fifteenth century and beyond was because they failed to fit into existing battle protocols. Firearms and artillery degraded war by putting “… noble men-at-arms at the mercy of the vile and base born”, in the process assisting to upset the balance of the social order. So vehement was the opposition to the technology that in 1498, the condottieri Paolo Vitelli ordered that captured harquebusiers have their hands cut off and eyes pierced because it was unworthy for nobles to be killed by common foot soldiers. And due to artillery, Fronsberger observed that “… hardly any man of courage is needed any more in the matters of warfare.”

Machiavelli’s approach to the new weapons displays something of this sensibility, indicating that while he substituted morality with expediency in politics, his tactical prescription for modern war retained a strong moral element. According to Felix Gilbert, for example, Machiavelli minimised the importance of artillery in order to better represent the role of courage (virtu) and to demonstrate that the man was the more important war factor than the weapon. Azar Gat concurs that “Machiavelli’s emphasis on moral factors (over technical ones) is indeed undisputed.” although he argues that the technology gap in Machiavelli’s theory is more explicable in other terms. What Gat is referring to is Machiavelli’s cyclic view of history, into which fundamental and unprecedented change did not fit. Machiavelli could not admit technology as a variable in his military theory because he was concerned with unconditional verities, i.e. universal factors that would hold good for all time. Machiavelli’s judgement on weapons, as well as on other military matters, was affected by his concern not to disturb the applicability of the Roman military, political and social model which, for Machiavelli and contemporary humanists, was the source of these universal factors. There were, then, significant cultural, social and political considerations at the basis of Machiavelli’s disallowing of technological change.

There were also practical, military reasons. Perhaps the most compelling reason for the static attitude towards weapons technology was that the balance between the new arms and the old was yet to be decided. The cost of artillery put it beyond the means of any ruler not backed by national revenues; its immobility kept it from the battlefield and limited its use to breaching and defending fortifications; it was inaccurate, and its rates of fire were slow and uncertain. Similarly, hand-guns performed poorly, with reliability, accuracy, rate of fire and range problems. In contrast, the pike and phalanx (revived from antiquity) was proving effective, as was the counter measure, the Roman-style sword and buckler men – a solution “… much admired by Machiavelli.” Even the decisive use of hand-guns at La Bicocca (1522) and Pavia (1525) did not unequivocally confirm the new technology over the old. In 1547, the English bow defeated the Scots at Pinken Cleugh; a French work of 1559 recommended re-adopting the crossbow because it had advantages over cavalry in rain and in sudden attacks: in 1616, archers were employed in battles between Venice and Austria; and in 1627, the English appeared at La Rochelle armed with bows and arrows.

Accordingly, the function and nature of war in the sixteenth century gave military innovators (practitioners and theorists) little reason to stress technology as a dynamic of war. For the reasons that affected Machiavelli, Maurice of Orange, an influential reformer in the latter part of the century, focused on the human elements of military success – obedience, loyalty, and service to the state and it was these factors “… rather than technology (that)
provided the fundamental parameters ... of the early modern era."

**Seventeenth and Eighteenth Centuries**

With respect to changing warfare technology, the themes that dominated the preceding one hundred years carried over into the seventeenth century. Although the wider acceptability of firearms in Europe led to a limited recognition of historical change, no theories emerged that attempted to explain the relationship between technology change and war. Raimondo Montecuccoli (1609-80) attempted to derive a universal science of war which would yield fundamental and permanent axioms allowing war to be calculated and predicted. Yet Montecuccoli acknowledged the difficulty of reconciling technological change with universal laws:

> The universal rules of war encompass “the whole of world history from the beginning of things ... (There is) no remarkable military deed ... (that) cannot be reduced to these instructions ... Disregarding the invention of artillery (my bold) which has somewhat changed the forms of war, the rest of the rules remain correct and valid.”

Far from providing a dynamic theory of war, Montecuccoli’s concepts “... tended toward a rigid dogmatism” — his ideas on military technology “... hardly unique and basically reflecting the contemporary state of military thought in Western and Central Europe.”

But if the contemporary state of military thought failed to recognise a dynamic technology-war relationship, it is hardly surprising. The pace of military technological change was so slow as to make it almost imperceptible. Certainly, the Netherlands’ princes and Gustavus Adolphus did introduce a number of technological refinements and accompanying tactical reforms. One of the intended effects was toward greater standardisation. In order to reduce costs and to standardise drills, Maurice of Orange, in 1599, required his armies to be equipped with uniform hand-guns. When Gustavus replaced the arquebus with a matchlock musket, he standardised the calibre and made standard the paper cartridge. He simplified his artillery, which at the time included a number of variants, by adopting three standard guns — siege, field and regimental. However, the trend toward standardisation ran counter to subsequent technological change. Once an army standardised its equipment, it had a heavy investment in the *status quo*. The introduction of new designs or new equipment types would be either at the expense of uniformity, which would erase the advantages of standardising in the first place, or at the expense of a total re-equipping to the new standard. Referring to the example of artillery, McNeill notes that “... there was little incentive to experiment with such devices, on the contrary, anything that might tend to make existing artillery pieces obsolete must have seemed wantonly wasteful.” Technology change did not impose equipment costs alone; the loss of uniformity introduced penalties in drill, training, maintenance and supply. Collectively, the disadvantages of re-equipping were “... reinforced by affectionate attachments to familiar weapons and routines.”

Thus, reason and sentiment combined to re-confirm the *status quo* and to inhibit technological innovation.

Developments in naval warfare in the seventeenth century similarly did little to stimulate thinking on new technologies. Despite the extent to which cannons were installed on navy ships, navies continued to emphasise the “land battle at sea” idea of naval warfare, as Nelson was still to do 100-150 years later. The lack of fundamental technology development was one reason for this approach; that command at sea was exercised by land officers (the General-Admiral) was another. As a consequence, perhaps, little theory of any sort emerged on naval warfare. Naval writers functioned primarily as chroniclers rather than strategists, with a focus on narrative rather more than on analysis. This was to remain the case until well into the nineteenth century.

Around the beginning of the eighteenth century, some significant developments in weapons technology occurred. The replacement of the matchlock musket (“... with its cumbrous and erratic loading procedure”) by the flintlock increased the rate of fire to three rounds a minute and enabled the establishment of three ranks capable of simultaneous fire. An accompanying innovation was the ring bayonet, which freed up infantry movement by allowing for the elimination of the pikemen. Although in retrospect, these developments have been regarded as a “major turning point”, they failed to convince eighteenth century limited-war strategists that technology change could be a significant war variable.

The eighteenth century military theorists wrote in the context of limited war, where resources, the social structure of armies and the lack of a popular motivation to fight restricted the capability of rulers to conduct decisive warfare. The dominant concerns of the theorists were political and organisational, focusing on the foreign policy roles of an army that
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existing to offer the threat of battle or to wage "... a
strategy of small successive advantages," and
focusing on the organisational changes needed to
allow the army to man itself, train, manoeuvre, and
"fight" accordingly. None of them gave any
significant emphasis to technology factors. Puysegur,
in the Art of War by Principles and Rules (1748)
dismissed the challenge of historical change, noting
that there could be no greater mistake than to believe
that firearms introduced "... a new type of war for
which the military thinking of the ancients was no
longer relevant ... Despite all changes in armaments,
the science and art of war remained the same." In
the Reveries of the Art of War (1757), de Saxe dealt
mainly with human factors - with conscription as a
means of raising forces, with tactics and with
leadership. Although he looked ahead to a future with
breech-loading guns and muskets, he looked back by
recommending a return of pikemen to protect
musketeers and to give them confidence while they
take aim. Frederick the Great reacted to the latest
developments in artillery (particularly those instituted
in France) by turning against "... rational
experimentation and technical reform of the sort
Gribeauval carried through" and by giving emphasis
to "old fashioned" military virtues such as discipline
and honour. Because the new vogue for artillery "... was a veritable abyss for the state's finances,"
Frederick would not give it the status of a separate
arm; only that of an auxiliary. There were,
undoubtedly, internal social and political elements
within the army that would be resistant to attempts to
raise the status of gunners to equality with the infantry
and cavalry, and this would have contributed to
Frederick's conservatism. McNeill notes, for
example, that middle class, educated officers were
attracted to artillery, and suggests that Frederick down
played his artillery because "... he distrusted the
calculating spirit that he associated with men of
bourgeois background." de Guibert adopted
Machiavelli's recommendations for a citizen army
that would promote, and be promoted by, patriotism;
and he was reformist with drills and in his tactics for
manoeuvre. However, he "... echoed Frederick's
lamentations" on artillery, recommending that
artillery should remain an auxiliary and should be
kept to a minimum because it hampered mobility.
According to R.R. Palmer, Guibert never fully
appreciated the possibilities offered by the emerging
technology, particularly those developments in
artillery that would soon be shaping the mind of the
most successful of all artillery officers, Napoleon
Bonaparte.

But the lack of emphasis on technology change
by eighteenth century theorists and their tendency to
treat technology as a constant amid the determining
variables of morale, training, tactics and leadership,
was not a case of negligent oversight. Little could
promote any great degree of confidence that
technology change was an inevitable factor of warfare
or that the new technology offered any significant
advantages above that which it replaced. As it had
done in the seventeenth century, military technology
was still proceeding at a pedestrian pace. There were
significant resisting factors. Although eighteenth
century armies were small by the standards of the
armies of the Revolution, the cost of equipping them
with new standards of weapons was a heavy burden
on state treasuries. Another barrier was the artisanal
methods of industry, which limited the capacity of
industry to respond to new developments in science
and its capacity to achieve scales of production
necessary to manufacture in large quantities. Perhaps
even more of an impasse was the threat posed by new
technology to military traditions and to existing social
and cultural patterns. Aspects of chivalry remained a
counter to pure military pragmatism - in the navy,
where the practice was customary of boarding an
enemy vessel of similar rank ("everyone choosing his
mate, reserving the Admiral for my Lord Admiral")
and in the army, where considerations of hierarchy,
obedience and individual courage were central to the
military ethos. The new tools of war did not fit into
the existing ethos. They were regarded as impersonal;
they killed at a distance; and they gave primacy to
skills of "... an obscure, mathematical and
technological kind ... (over) old-fashioned courage
and muscular prowess." Such a technological
transformation, incipient and partial as it was by the
standards of the nineteenth and twentieth centuries,
offended deep-seated notions about propriety and
decorum. As conservative institutions, armies resisted
the transformation. The lack of military technological
progress was not only due to the struggle to exploit
technology through finance and industry limitations,
but in good measure it was because armies were
actually unwilling to exploit it.

Part of that unwillingness was a degree of doubt
about the benefits that the new arms could actually
confer. Smooth bore muzzle-loading muskets, which
were the technological basis of the eighteenth century
infantry, were slow and unreliable; effective about
two times in five at 100 yards; and had no accuracy at
all at 200 yards. An historian, Colonel Trevor Dupoy,
has constructed a Theoretical Lethality Index (TLI)
which gives the eighteenth century flintlock a TLI of
43; only marginally above the longbow at 36 and the
crossbow at 33, and marginally below the early nineteenth century rifle with which it was to be replaced. Clearly, this casts doubt on the degree of advantage that new technology was able to deliver to eighteenth century armies. Echoing this doubt, Kenneth Macksey noted that "... in terms of accuracy and rate of fire, the long-bow that dominated battlefields in the fourteenth and fifteenth centuries remained superior to the seventeenth century musket still in front-line service at the Battle of Waterloo in 1815." These observations that eighteenth century technology change might not necessarily have been progressive was not just a retrospective one. In 1775, as the American colonists prepared to fight for their independence from Britain, Benjamin Franklin recommended the use of bows and arrows in preference to muskets. This was not just because a short supply of black powder seemed a distinct possibility:

Going back to the bow and arrow of medieval times was not so ridiculous as might first appear. A good Bowman could aim as accurately as a man with a musket. Four arrows could be discharged in the time it took to load and fire a bullet, and no smoke obscured the Bowman's view. A rain of arrows hurrying at an enemy had a terrifying effect. The most convincing argument of all was that bows and arrows could be supplied much faster than musket, ball, and powder."

As for artillery, the cannon as cast in the eighteenth century was too slow to keep up with marching troops. One historian has noted that even Gribeauval's developments were no more than "... improvements in detail (and that) in principle, the guns with which Napoleon invaded Italy in 1796 did not differ greatly from those with which Charles VIII had done the same almost exactly 300 years earlier."

Eighteenth century theorists might have taken technology development as a more influential factor had cases of technological superiority leading to victory been clear. However, because none of the major European armies possessed a decided margin of technological superiority, military success could be attributed less to the tools of war than to an army's ability "... to combine hardware, training, doctrine and organisation into a single, decisive whole." Indicating where the priorities of armies lay, Michael Howard noted that the significant changes to eighteenth century warfare concerned the structures of the armies themselves and of the states that employed them, "... not in the tools with which the armies operated." Theodore Ropp concurred, observing that eighteenth century armies were characterised by "... a static military technology." van Creveld noted that the pace of military technological development was so slow as to be almost imperceptible to contemporaries, and concluded:

Such a state of affairs was scarcely conducive to reflection on the subject." 9

The Nineteenth Century

Around the beginning of the nineteenth century, amid the cataclysmic social and political events of the French Revolution, Napoleon Bonaparte emerged to initiate a revolution of his own in the nature of warfare. War became a conflict between nations rather than between rulers. The two main ingredients of the new national army were mass and enthusiasm. The people, "... having seized the state, were now summoned to its defence." Never before in European history had the means existed to wage national, unlimited war. At the turn of the century, the means, provided by the mobilisation of the resources of the whole of the state (the nation at arms), were at Napoleon's disposal. So significant was the development of the Napoleonic system of warfare that Major General J.F.C. Fuller described it as "... the greatest political and military transformation the world has yet seen." 10

Napoleonic warfare provided source data for the two great military theorists of the nineteenth century - Jomini and Clausewitz. Antoine Henri Jomini set out to establish basic maxims for the massive, offensive use of force that the Wars of the Revolution and of the Empire had demonstrated. In the process, Jomini aimed to simplify the art of war by giving strategy a scientific explanation and a working formula. The essence of Jomini's recommendations was a strategy that would apply mass against weaker enemy forces at their decisive point, requiring adherence to such principles as mobility, speed, concentration, deception, pursuit, and initiative in the application of tactics. However, as with theorists before him, Jomini paid little attention to the impact of technology of the time, insisting that "... not even the most radical changes in military technology can alter the principles"; that the fundamental principles "... will remain unaltered ... the same as under the Scipios and Caesars, Frederick and Napoleon, since they are independent of the nature of the arms and the organisation of the troops." While Jomini attempted to distil the basic, scientific essence of strategy, Karl von Clausewitz, operating at a level above his
contemporary, sought to establish the philosophical essence of war. Clausewitz focused on the spirit bred into warfare during the Napoleonic Wars, which pointed to a new understanding of the relationship between war and society. Drawing heavily on themes outlined much earlier by Machiavelli, Clausewitz interpreted war as essentially a political event. In theory, war was unlimited or total, although in practice, it was constrained by imponderables (friction), by limits in the means available to wage it and, since war was not an isolated act, by political considerations. Far less constrained than Jomini by any mission to locate everlasting axioms to explain the conduct of war, Clausewitz may have been in a better position to explore the relationship between technological fluidity and war. Like Jomini, however, Clausewitz virtually ignored the factors of changing technology. His emphasis on the precedence of moral factors over rules and mechanistics ruled out any significant discussion on the technological dimension of war. Van Creveld observes that, “Writing in the 1820s, Clausewitz only devoted a passing glance to the question of armament, and then only to belittle its importance.”

The historian then summarises the technological perspective of both theorists thus:

“When Jomini and Clausewitz wrote their great theoretical works in the 1820s, they based their reflections on the assumption that technologically, things would continue much as they always had ... Neither had an inkling that military technological progress might be decisive to the outcome of wars.”

These theorists gave little account of a changing technology factor because it could not be made to fit into either a formulaic (Jomini) or a philosophical (Clausewitz) theoretical framework. However, there were also more basic and compelling reasons, relating directly to how they observed and interpreted the events of the preceding 20 year period. Neither theorist saw the military revolution as a technological one; it was social, organisational, and above all, political. It was part of the fusion of government and people, since when people participated in the army or assisted in the war effort, they felt they were participating in the state. The character of the military revolution from Clausewitz’s point of view is clear from the following observation:

Now war stepped forth in all its raw violence, dragging along an immense accumulation of power, and nothing meeting the eye but ruins of the traditional art of war on the one hand, and incredible successes on the other ... War was returned to the people who to some extent had been separated from it by the professional standing armies.”

What was quite clear was that the success of Napoleon’s national army in shattering the old system had little to do with technological innovation. In some ways, Napoleon applied an “… arch-reactionary (approach) towards new weapons and technological progress in the materiel of war,” disbanding the balloonists in 1799 and rejecting the use of shrapnel, developed in 1808. Kenneth Macksey has said that the Anglo-French wars of the eighteenth and early nineteenth centuries only “flirted” with the new technology; and that the weapons with which the opposing forces started out in 1793 were, in the main, those with which they ended. Jomini and Clausewitz did not identify a technological factor simply because they did not witness one.

However, developments from yet another revolution promised to make military technology a much more palpable factor of nineteenth century war. The new methods of industrialisation (developments in wrought iron, steel manufacturing and in other metallurgies; the invention of machine tools and screw-cutting lathes; and advances in chemistry and physics) brought innovations that promised increased and more accurate fire power, mobility and communications. For the infantry, barrels could be produced on a large scale and they could be rifled. Other developments included smokeless powder, the percussion cap, conoidal bullets, the breech-loader, high velocity rifles, magazine weapons and the machine-gun. Artillery developments included hydraulic recoil, TNT-filled explosives, timing mechanisms, single piece rounds and mass production of interchangeable parts. Rail promised rapid mobilisation and the ability to sustain an army in situ, and telegraph offered a means of controlling an army that was dispersed along a wide front. At sea, iron cladding offered increased strength and steam propulsion offered freedom from the constraints of wind, current and tide. Increased fire power and flexibility was promised by the development of larger barrels, improved projectiles, gun turrets, electrical ignition, submarines and torpedos. Yet in their theoretical works, neither Henderson or Hamley in Britain; Moltke or Schlieffen in Prussia, du Picq or Foch in France, nor the navalists Corbett and Mahan seemed to consider the implications for the military of such industrial and technological development. So, what was it about military technology developments in the nineteenth century that caused the theorists to be so circumspect?

One limiting factor was that the Concert of Europe brought relative peace on the Continent; certainly because the European states were war-weary, but also due to the fear that a military conflict
might again unleash a popular enthusiasm for the right to a greater participation in the state. This reluctance to solve disputes militarily resulted in a diminished requirement for new war technology. It meant also that whatever new technology was introduced had little chance of thorough battle testing and thus, little chance of making an impression on military thinkers. A related reason was a deliberate military trend against innovation. The survival beyond 1815 of the old military order resulted on a reactionary reconfirmation of the traditional forms and patterns of the eighteenth century military. Because these traditions “... accorded oddly with the changeability and growing mechanical complexity of industrial society,” professional soldiers were opponents, not proponents of change. As a consequence, the equipment of the European armies remained fundamentally conservative.

Part of this conservatism towards technology was the continued elevation of the moral aspect as the determining factor of war. Even as late as 1859, Napoleon III used columns to attack and break the Italian rifle lines, indicating to Napoleon that the key to victory lay in elan and courage rather than in the equipment of war. This view, sustained by successes against weak opponents in Algeria, Mexico and Asia, kept the French army “... loyal to tactics that took no account of the enhanced firepower of the new weapons (of the time).” The theme was captured by du Picq (“Battles, wrote du Picq, were won not by weapons but by men, and nothing could be effectively planned in an army ‘without exact knowledge of this primacy instrument, man, and his moral condition ...’”) and echoed by Foch (quoting the French philosopher de Maistre: “A battle lost is a battle one thinks one has lost; for ... a battle cannot be lost physically”). The English took the same approach to the relative importance of moral over materiel factors. British army strategist, Colonel George Henderson, said that despite improvements in weapons “... the moral element remains the same” – a psychological view shared by General Sir Ian Hamilton:

War is essentially the triumph, not of a chassepot over a needle-gun, not of a line of men entrenched behind wire entanglements and fire swept zones over men exposing themselves in the open, but of one will over a weaker will.

With such attitudes prevalent, it is little wonder that technology developments met resistance. One of the bastions of resistance was the cavalry, even in the mid part of the century accustomed to view itself as the elite arm of land forces. The conviction that willpower was the instrumental factor of battle was identifiable in the Charge of the Light Brigade and in cavalry actions during the Franco-Prussian War (1870-71) where cavalry charged as if needle-guns, chassepots, mitrailleuses and breech-loading artillery did not exist.

There was more to the failure to innovate than philosophical issues and bloody-minded conservatism. Firstly, the rates of industrial development throughout Europe had been uneven, leaving many states, France included, well short of an industrial war base sufficient to maintain technological currency. Secondly, practical problems of re-equipping gave little encouragement to either practitioners or theorists that technological change was particularly progressive. Especially in the first half of the century without the impetus of a major war to give direction, weapons development was uncertain and haphazard. Consequently, it was seldom clear “... which device would be successful and which one end up as a failure. Hence, their combined impact was impossible to foresee, an aspect of technological dynamism that contemporaries were quick to comment on and complain about.” Pragmatic considerations included problems with rates of production and associated doubts about the margin of advantage that technological innovation would provide. A case in point was the decision by Prussia in the late 1840s to re-equip with breech-loading rifles. Seven years after the initial order of 60,000 units had been placed, the artisanal methods of production were only producing 10,000 rifles per annum; many of these afflicted by quality control problems. Since the army (with reserves) had 320,000 men, the change-over at this rate would have taken thirty years to complete. By 1866, with the aid of improved production techniques, all units were supplied with breech-loaders in time for the war with Austria. The process, which had taken twenty years, led McNeill to conclude: “no wonder ... governments had left hand-gun designs unchanged save for trivial details since the seventeenth century.” Furthermore, there were concerns about the reliability of the Prussian breech-loader (the breech was not perfectly tight and the needle prone to break) and about decreases in range and accuracy in comparison to the Minie gun. And the rates at which breech-loaders were being produced in other countries by the 1860s ruled out any decisive advantage to the Prussians of innovating in the first place. Weapon development such as this could scarcely have persuaded theorists that technology was a progressive and decisive factor of war.

Nor were military theorists particularly persuaded by the experience of the American Civil War – the first great war to be fought with the tools and
weapons of the industrial revolution. Despite its clear
demonstration of the radical way that new technology
(e.g. rail and river transport, telegraph, heliographs,
balloons, and iron-clad ships) affected the nature of
war, the example of the Civil War was dismissed. 
The war was regarded as a clumsy, amateur affair;
"Spit and polish were conspicuously absent. Battles
were untidy and confused ... (and) no ruling class
existed."

The Crimean War, ten years earlier than the Civil
War, did promote some sense of urgency about
technological improvement, but the impetus was less
in weaponry than in technologies that had
commercial application. Significant use of rail, for
example, was made initially by the French (at
Sebastopol in 1854, on the Italian Peninsula in 1859,
and against the Germans in 1870-71) and later by the
Prussians who used rail to mobilise against the Danes
(1864), the Austrians (1866), and the French (1870-
71). Yet rail was another technological innovation
that failed to gain prominence in military theory. This
was explicable on two counts. Firstly, some level of
opposition to railways existed within the military in
the first half of the century, especially in Prussia
where generals recalled Frederick's dictum that more
and better roads would only invite invasion, implying
that rail would do likewise. And secondly, railways
were not an unequivocal success. Some of the
advantage of using rail to mobilise was negated by
the problem of movement from the railhead to the
theatre, as experienced by the French in Italy (1859).
In theory, a state had the option to shape its civilian
railways to match its strategic aims, but in practice no
state did so to any great degree. As a consequence,
mobilisation by rail deployed troops not to where they
were most needed, but to where the lines and
 terminals happened to be. Although von Moltke ("not
a great theorist") recognised the potential of rail at
the centre of the nation's mobilisation strategy, he
recognised that the success factor was less a
 technological one, since the French had better rail and
rolling stock, than one of superior coordination and
use. Moltke's concept of strategic envelopment,
elaborated by von Schlieffen in his "Great Wheel"
scheme, was essentially a matter of scientifically
based organisation and management.

Many of the reasons for the lack of a positive and
coherent approach to technology change on land
similarly affected the work of the sea-power theorists.
 Even as the industrial revolution began to offer
radical change in design, construction, propulsion,
weapons and command and control systems, there
was a lot of inertia within the navy. For example,
nineteenth century supremacy of the British navy was
guaranteed by ship and sail technologies that had not
fundamentally altered since the seventeenth century.
Not only was there little to be gained by embracing
new technology, but doing so could involve a
significant negative dividend:

The battleships of each century were passed in
review, showed the flag, and figured large not
only in a proliferating professional literature but
in children's books and advertisement ... the loss
of one came to be thought of as a minor national
disaster that could seriously affect the morale of
the armed forces as well as that of the general
public."

Without any such doubts, however, was Captain
Alfred Mahan the pre-eminent American naval writer
of the late nineteenth century. Mahan's objective was
to demonstrate that the world order, politically,
economically and strategically, was shaped and
interpreted by dominance at sea. To attain such
supremacy, Mahan based his entire strategy on a
single technology - the technology of the battleship.
The "ship of the line" would engage in fleet-on-fleet
action in a bid, at the earliest stages of war, to
establish command of the sea, i.e. the singular and
absolute condition where the victor can use the sea for communications but the vanquished cannot. Clearly, Mahan's was a static approach to technology. Mahan ignored the technology that, in the latter half of the century, was already challenging his strategy for world order. He failed to take into account the changes in transport and communications, brought about during the industrial revolution, that freed continental nations from reliance on the sea and reduced their vulnerability to naval pressure. He failed also to appreciate the degree to which technological changes had led to the rise of land power, despite the reality that decisions in the Crimea and in the German wars of unification were largely beyond the influence that navies could wield, and despite clear warnings by "Heartland" strategists such as Sir Halford MacKinder. Nor did he acknowledge the extent to which technological progress enabled continental power, utilising developments such as mines, submarines, torpedos and fast cruisers, to wage successful discursive strategies capable of challenging the naval supremacy of sea powers. In France, there was a school of thought that the age of technology itself. Furthermore, theorists had profound technological change during which the principles of maritime strategy were changing".

Mahan’s theoretical rejection of technological variability perpetuated some of the themes that had changed little over the 400 years since Machiavelli. Like Machiavelli, Mahan maintained that the basis of strategy is to be found in historical precedent, and like Machiavelli, he selected one example (Rome and England respectively) to derive a theory of general application. He could not successfully accommodate contemporary technology into his model, and like Machiavelli, he chose to down play the former in favour of the latter. Like Jomini, Mahan took a scientific approach to strategy, maintaining that fundamental and unconditional principles of strategy existed that could not be affected by technological advances.

However, what distinguishes Mahan from the preceding theorists is that his dismissal of the innovative technical factor of war derived little justification in an age where the weight of evidence was very much in its favour. Prior to the latter part of the nineteenth century there were technological, social, economic or political considerations in terms of which the treatment of technology by the theorists was explicable. The rate of theoretical change was either too slow, too erratic, or of doubtful advantage; either it could not be afforded, it challenged traditional military values or it upset the social balance of society. But few of these conditions could have affected Mahan in any significant way. If we accept Professor Barry Gough's advice that "... Mahan deserves to be evaluated in the context of the times in which he was writing, which were those of profound technological change during which the principles of maritime strategy were changing"., then the reasons for his dogmatic approach in denying those changes must continue to remain a mystery.

**Conclusion**

From the time of the early air power theorists who based their strategies on future weapons, to the Gulf War where opposing technologies separated by just a decade were so unequal in battle, the development of warfare in the twentieth century has elevated technological change as an inevitable and essential ingredient of war. So pervasive has technology change been that we can be tempted to interpret the development of warfare solely in technological terms, and to casually accept that this has always been so. However, this can only be a relatively modern perspective. The theoretical works of some of the leading military theorists from the beginning of the period of modern European history to the end of the nineteenth century express a consistent understating of the technological factor of war. And with few exceptions, they do so because they are preoccupied with more palpable factors and more important considerations, militarily, economically, socially and politically.

Theorists were slow to identify the changing technology factor because the rates of change were often barely detectable; certainly too slow to challenge the forms and patterns of technology that had survived from antiquity. They were slow to reflect the technology factor because military services were slow to implement it; for reasons of sheer blindness; because the new technology did not fit with traditional values, or standardised drills or tactics; and through fear that it would impact negatively on the structure of military organisation, on the structure of society, or on the status of individuals within society. The introduction of military technology, then, carried social and political costs quite apart from the actual economic costs of the technology itself. Furthermore, theorists had justifiable doubts about whether technological innovation gave any great advantage, since new weapons were seldom significantly superior to those
they were supposed to supplant. And finally, if theorists looked just to the battle, it was clear that the human factor impressed them as one of greater significance. No weapons, despite their lethality, seemed as important for the winning of battle or war as the men who controlled them; which perhaps explains, in part, why Clausewitz "... showed more interest in the man (Napoleon) than he did in the revolution." On the whole, it seems, the earlier theorists had a far less imperfect concept of technology than we customarily suppose:

The (modern) habit of referring to technology in terms of its capabilities may, in the context of war, do more harm than good. This is not to deny the great importance of the things that technology can do in war. However, when everything is said and done, those which it cannot do are probably even more important.65

NOTES
3. ibid., p. 81.
5. ibid., p. 20.
15. ibid., p. 62.
17. ibid., p. 142.
19. Such was the estimation of Clausewitz; see van Creveld, op.cit., p. 95.
21. Gat, op.cit., p. 34.
23. In the mid-part of the century, Jean Maritz perfected barrel boring, giving a straight and uniform bore, contributing to accuracy by making artillery lighter and more manoeuvrable. Jean-Baptiste de Gribeauval's artillery reforms included a screw device for adjusting gun elevation, more scientific powder mixes, a reduced barrel and interchangeable parts.
27. ibid., p. 109.
28. loc.cit.
29. Artillery caused particular moral problems since gunners could target infantry; themselves remaining out of range. The risk "...ceased to be symmetrical in such a situation, and that seemed unjust." McNell, op.cit., p. 172.
30. loc.cit.
31. loc.cit.
35. van Creveld, op.cit., p. 87.
36. ibid., p. 97.
40. Zook and Higham, op.cit., p. 149.
41. loc.cit.
44. van Creveld, op.cit., p. 167.
45. ibid., p. 219.
49. McNell, op.cit., p. 244.
50. loc.cit.
54. ibid., p. 521.
55. van Creveld, op.cit., p. 171.
56. McNell, op.cit., p. 236.
57. ibid., p. 241.
59. van Creveld, op.cit., p. 159.
61. van Creveld, op.cit., p. 207.
62. ibid., p. 204.
64. Paret, P. op.cit., p. 342.
65. van Creveld, op.cit., p. 320.
THE TECHNOLOGICAL DIMENSION OF WAR – FROM MACHIAVELLI TO MAHAN

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This is the 8th in a series of books produced by the Australian Defence Force Journal commemorating anniversaries of Australia’s participation in war.

Australia Remembers is available from the Office of the Australian Defence Force Journal at a cost of $49.95
The Management of Unexploded Ordnance

By Major D. S. Williams, RAAOC

The premise of this article is that the management of ammunition extends beyond the end of the barrel. Unexploded ordnance and the hazards which it poses to military operations and peacetime activities is an inevitable result of ammunition usage. The article addresses the implications of this observation as it relates to manufacturers, procurers, operational planners and users.

Definitions

The definition of unexploded ordnance (UXO) used in this article is the simplistic, if accurate one - “an item of ammunition that has been deployed, by firing, dropping or laying, and has failed to function as intended”. This definition specifically excludes two related areas:

- Mines, which are still fully functional and are waiting for the correct triggering stimulus. The management and disposal of land mines has been the topic of much discussion and research and is outside the scope of this article; and

- Misfires, which are taken to mean ammunition which has failed in such a manner as to prevent the projection of the ammunition e.g., primer or propellant failure in gun ammunition. The problems caused by misfires while similar to the considerations raised in this article relating to UXO do not have the same significance or long term effects and therefore are not further discussed.

Explosive ordnance (EO) and hence UXOs may be deployed from ground, air or seaborne platforms. Most UXO are found on land but some can be found below the high water mark creating underwater hazards.

Unexploded Ordnances

Causes of UXOs

Ammunition is often a complicated mechanism consisting of many interrelated and dependent functions. In relation to UXO the primary point of failure is the fuzing system. It is the fuze through which the required stimulus is transferred to the energetic material causing the round to function. Fuzes can be designed to function in response to a range of stimuli including: impact, time, proximity, changes in pressure or acceleration. If the fuzing system fails then the round will not function and the ammunition will remain in the impact area as a UXO. Fuzes tend to be more complex than other elements of the round, they:

- are of comparatively small size;
- must contain safety mechanisms for protection during transportation and storage;
- contain methods of removing the safety mechanisms and arming the sensor elements; and
- contain methods of accepting the correct stimuli and converting that to initiation of the firing train by which the main charge can be functional.

Fuzing mechanisms can be mechanical, pyrotechnic, electrical or a combination of these. In each case the operation of the fuze is linear in that certain functions must occur in sequence. Fuzes rely upon the forces of the projection system to arm and activate the internal mechanisms. In the case of a fuze for an artillery high explosive round, the fuze may utilise the forces of setback and acceleration on launch, rotation of the round, deceleration in flight and impact to release the safety mechanisms, to align the explosive train and to initiate the detonators. The forces to which an artillery fuze of this type is subjected are extremely violent. Acceleration forces can range from 1,600 to 25,000 g, the rate of spin can be as high as 40,000 RPM and the muzzle velocity of a 155 mm Field Gun can reach 853 m/s. From the initial design through manufacturing, transport, storage, firing, projecting, launching, ejection or dropping the round to the target effects, actions can occur to stop the ammunition from working. It is not surprising that a percentage of fuzes fail to function as designed.

Even fuzes of the most simple design such as the Australian F7 Mortar fuze can fail. The F7 had no moving parts and relied solely on impact to generate adiabatic pressure to ignite a stemming of RDX
which would burn to detonation and initiate the explosive train. The fuze failed to operate if it did not strike a solid surface at the required angle of attack, an occurrence which often happened on soft ground. The fuze was removed from service.

Acceptable Limits?

Those who procure ammunition recognise that it is not possible to design or manufacture perfect rounds. Ammunition design is always a compromise between the requirements of safety and terminal effect. The fact that ammunition does fail is well documented and accepted. There are recognised and agreed failure rates. Based on the requirements of QSTAG No 105, the British and Australian Armies use a Service Quality Requirement (SQR) for HE ammunition of 97.5% per cent. This is the acceptable standard for new ammunition being delivered into service. The minimum acceptable limit for serviceable HE ammunition, known as the Functional Limiting Quality (FLQ), is 95 per cent. below this level ammunition is supposed to be removed from use. Even new ammunition is permitted a 2.5 per cent defect rate, equating to one round in forty. While not every defect will result in a UXO, as discussed below, the long term problems resulting from the UXO are greater than those from other types of failure. Statistics gathered by the Directorate of Land Service Ammunition in the UK indicate that the actual rate of failure reported from proof and training is lower than that permitted, with UXO averaging 0.05 per cent but failures do occur.

Different natures of ammunition have different UXO potential. Anti-armour solid shot projectiles will remain in the impact area but pose no risk of exploding. (The UXO considerations for the material from which some of these penetrating projectiles are made are discussed below.) Ammunition that delivers numerous submunitions will also deliver a greater number of UXO. The 227mm Multiple Rocket Launch System (MRLS) fires six rockets, each delivering 644 M77 bomblets (Phase I rocket loading). Even with a 2.5 per cent failure rate each launch of a set of six rockets has the potential to deploy 97 UXOs. Indications from the Gulf War are that the actual UXO rate was much higher.

The potential for a nature of ammunition to become a UXO and the resultant effects, on the operational and peacetime environments, is the factor upon which the UXO element of ammunition management is based.

Purpose Designed UXO

There is also the consideration of “purpose designed UXO”, those natures of ammunition in which the fuzing system contains anti-handling mechanisms and are designed not to function on impact but to act as detergents to the explosive ordnance disposal (EOD) teams. Purpose designed UXO are usually included in area denial weapons such as airfield destruction and denial systems where a percentage (between 10 to 30 per cent) of submunitions are of this type. Purpose designed UXO, although being somewhat aligned to mines in that they are awaiting the triggering stimulus, require the same responses for planning and disposal as other forms of UXO. Within this article purpose designed UXO will be considered in conjunction with unintentional UXO.

Non-Explosive Hazards

Even non-explosive rounds can create hazards similar to those of UXO and requires similar management considerations. Some anti-armour, solid shot projectiles are made of depleted uranium (DU) due to its exceedingly high density and strength. Solid shot ammunition is not fuzed and relies on kinetic energy to penetrate and damage the target, therefore it can not result in explosive UXO. Ammunition of this nature creates radiological hazards and the ammunition and its residue can contaminate land areas. In this case the problem is easier to define as 100 per cent of the rounds fired will result in a hazard. The range construction, identification and possible collection and disposal need to be considered as part of the whole-of-life management plan.

Non-explosive ammunition components can still require the expenditure of resources to dispose of them. Items such as tail fins, carrier shell casings and practice rounds usually require the attendance of EOD or other trained personnel to identify and remove them. Even though they offer no actual risk the presence of ammunition-like items can generate the same concerns and responses as “live” UXO.

Problems Caused by UXO

General

The problem of UXO is usually considered in terms of disposal after conflict or training but as the lessons of the coalition forces in the 1991 Gulf War demonstrated this is not a valid or efficient approach.
Disposal of UXO is a difficult and dangerous, specialist task to which military forces commit considerable resources in training and equipment. The Australian Defence Force recognises the nature of EOD support through specialist training and a specific financial allowance for those dealing with unpredictable explosives.

The primary risk posed by UXO is that an explosive device has failed to function but given the required stimulus could explode killing and injuring people as well as damaging equipment and property.

Consideration of UXO as part of a larger management system rather than as an isolated post activity response has the potential to reduce the cost of EOD support as well as reducing operational and training losses. It would also assist in the reoccupation of land by those displaced by war.

**Operations**

The actual or expected presence of UXO presents a range of hazards and limitations that must be considered during the planning and preparation phases of conflict. This planning will usually require specialist advice from EOD staff. Encountering an area that is littered with UXO may delay or prevent a planned manoeuvre or activity. The presence of UXO in a critical area such as a bridge access, runway or water point may limit or preclude the use of the area until the UXO hazard is rendered safe.

**Mobility**

One lesson illustrated in Kuwait in 1991 was that the presence of UXO on the line of advance could have been predicted as it was the coalition forces that put the UXO there. In the training of ground forces, weapons such as the Multiple Rocket Launch System (MRLS) are fired into a clearly defined impact zone to which access by foot troops and vehicles is severely limited. In operations, the impact areas for such weapons is the very terrain over which the troops are expected to advance. Given that each MRLS launch should result in 97 UXOs (based on a 97.5 per cent SQR) an intense bombardment such as that which preceded the coalition advance will result in a large number of UXOs. If a UXO contaminated area is to be encountered then prior assessment and planning will indicate the number of equipment and personnel casualties that can be expected. More United States military personnel were killed by UXO than by any other cause: 21 killed and 53 injured by UXO.

UXO are used as an effective method of area denial, hence the development and manufacture of "purpose designed UXO". As stated above, these items of ammunition, usually submunitions, are designed not to function on impact but are fitted with anti-disturbance, influence or long delay time fuzes. They are normally mixed in with impact or delay fuzed munitions. Their purpose is to hinder, for as long as possible, the reclamation of the targeted area. Operational planners should be aware of the risks and limitations that these munitions pose. The forward deployment of adequately equipped, trained and informed EOD teams may be required to counter the UXO threat.

**Weapon Effect**

An increase in the UXO rate for a nature of ammunition means that the designed terminal effect of that system is reduced. In times of conflict it is often necessary to use whatever assets, including ammunition, are available. The use of old ammunition or that in which the performance has fallen below the FLQ must be carefully considered. A knowledge of the standard of the enemy's ammunition will assist in determining the effectiveness of their systems. Many armies have stockpiles of old ammunition, some of it dating back to World War II. The cost of replacing some of these items can be prohibitive but the cost of ineffectual systems can also be high.

**Resources**

The cost, in finance, personnel, equipment and other resources, of finding and disposing of UXO is considerable. Another example from the 1991 Gulf War was the firing of some 400 rounds of 155 mm HE with incompatible fuzes. The fuzes used (the M577 rather than the M557) had no booster element to connect the fuze to the HE filling, the fuzes functioned but could not initiate the main charge. Although there was minimal risk from the remaining residue (UXOs), the Royal Engineers were still required to enter the impact zone to locate the rounds (initially from the air), confirm their status, recover and dispose of over 400 damaged artillery shells. The cause of this incident was a combination of the projectiles being issued to the deployment area prior to the fuzes and the acquisition and fitting of the incorrect fuzes by non-logistic staff. This was a simple error that resulted in the UXO problem occurring during the preparation and training phase of the operation. The expenditure of personnel, air hours, equipment and explosives to resolve this error was considerable and removed the assets from other tasks."
The UXO hazard was most starkly demonstrated in the Gulf War on two occasions. In one instance seven US servicemen were killed while moving UXO as part of a clearance of an enemy airbase that had been occupied by coalition forces. In this case the troops were disposing of US deployed area denial submunitions. In the other case a British medical team was killed while apparently collecting UXO souvenirs. In both instances it is possible that better use of available intelligence may have saved lives.

**Peace**

**Returning to the Land**

In peace, the presence of UXOs limits the ability of people to return to the land and to make full use of their country. UXOs prevent the re-establishment or implementation of agriculture, engineering developments such as power supply, water supply, transport and communication infrastructure. There is a considerable amount of literature on the threats and limitations posed by mines but the effects of UXOs are similar and can require even greater resources. Even in countries with large numbers of mines, the battles that have been fought over the terrain have resulted in huge amounts of UXOs remaining in the same areas. The primary example of UXO limiting the people from returning to a stable and safe environment in which to conduct agricultural and social development is Cambodia. In Cambodia 319,816 UXOs have been recovered compared to only 40,063 mines\(^1\). This imbalance may be partially due to the fact that most UXOs will be easier to find than buried mines and that the UXO figures may include some inert components, but it still suggests that the identification and disposal of UXOs is a considerable problem.

In Kuwait there were more casualties after hostilities ceased than during the war itself. Most of these casualties were from UXO. Losses to service personnel from UXOs often occurred outside the combat zones and were unnecessary losses. One UK report states that at least 70 people were killed and 300 injured by UXO during the clearance of Kuwait.\(^12\)

**Training Areas**

Military training areas are littered with UXO that have accumulated over the years. EOD trained staff are required to identify and dispose of the UXO as they are found. Countries have different methods of managing range areas. Some of the military ranges in Eastern Europe indicate that one form of management was to fire into the impact area with no intention of disposing of UXOs. The UXO problem has not disappeared due to inattention and the task of land clearance has now fallen to civil ordnance remediation companies.

Australia is a continent on which no land battles have been fought, but in the State of Queensland 413 military range areas have been identified as of September 1995, with 187 contaminated by UXOs\(^13\). Much of this contamination resulted in the intense training during World War II and the Australian Department of Defence is continuing to spend resources on identifying these areas and in providing EOD support to dispose of UXOs as they are found. UXO on range areas pose a number of hazards. There have been cases of people entering range areas and removing UXO placing themselves and others at risk. There is the possibility of accidental initiation of UXOs by fires on the range area. The very presence or possibility of UXOs can limit the ability of personnel and vehicles to enter an area to provide services such as environmental, road and fence maintenance. There is a requirement to provide adequate fencing and signs around range areas as well as UXO awareness training for all those who need to enter the range, including civilian employees and contractors.

Disused and sometimes forgotten range areas can come to light during construction tasks. Areas that were once isolated ranges are now on the edge of populated areas and UXOs are being discovered by building contractors. Discoveries of this nature can have long term financial effects on the government, the builders and the occupants of the houses. Some of the implications resulting from these UXO include, determination of liability for the site, insurance considerations and property value adjustment. The discovery of, or in the worst case, death and injury, from a UXO could raise serious questions over the liability of the manufacturer, procurer and user of the ammunition. Once again an adequate and comprehensive plan that addresses the fact of UXO existence can help alleviate problems which may arise.

**Domestic Collections**

Although Australia has never had a land battle the military conduct two EOD tasks a day on average (1994 figures)\(^14\). This figure does not include UXO found and disposed of on military training ranges. The majority of EOD tasks are recoveries from the public where the ammunition has been returned from combat zones overseas by participants or removed from military training areas. The percentage of these
tasks that involve UXO as opposed to items which have not been projected or fired or are inert components is not detailed but is estimated to be approximately 50 per cent.

**Solutions to the UXO Problem**

The use of ammunition will result in UXO. The presence of UXO creates risks to military and civilian personnel. Considerable expenditure of resources is required to identify and dispose of the resultant UXO. The existence of UXO can not be ignored, as demonstrated in the current UXO projects in Eastern Europe, but the UXO problem when recognised as an element of the ammunition inventory can be properly managed. An adequate management system that addresses the many facets of the creation and disposal of UXO will result in a lessening of the actual numbers of UXO, the risks they pose and the resources needed to dispose of them. Such a management system will need to consider the following topics.

**Design**

Ammunition design and development continue and as changes occur to explosive material, fuzes and delivery systems so the resultant UXO will change. For example, the use of plastic bonded explosives (PBX) in HE rounds has already limited the methods of rendersafe. PBX cannot be melted or steamed out of cases, a traditional and effective EOD technique. Designing in features that will limit the number and types of UXO that will result will greatly reduce the risks posed by UXO.

**Fuzes**

The use of sophisticated fuzes with multiple sensing systems will probably increase the chances of a failure. The probability of an original Boxer fuze failing was quite low as the fuze only required contact with the propellant gasses and for the gunpowder filling to burn. The fault tree analysis of an electric proximity fuze is much more complex. The F7 fuze mentioned above, was extremely simple and had some significant advantages from the UXO management perspective. If a round of ammunition fitted with the F7 failed to explode then the resultant UXO was relatively safe to remove from its current location to a prepared disposal area, if necessary. The qualification “relatively safe” is used because any explosive filled object which has been subjected to the forces of launch and impact can become dangerous due to stressing of the explosive material. In the case of the F7 the fuze itself was safe as the forces needed to achieve the required temperature rise could not be generated by handling. Even with a fuze of this type there is still a requirement for the fuze to be (correctly) identified prior to disposal.

The importance of fuze design in limiting the number and nature of UXOs is stressed. Some of the new pyrotechnic fuzes, such as the Raufoss pyrotechnic fuze for the MultiPurpose ammunition, have UXO benefits. Because of its simplicity of design the Raufoss fuze should have a high success rate. If any chance the round fails to strike the target then there are no sensitive elements in the fuze to function if the round is moved for disposal. A self destruct version is also offered. The necessity for a round to have a self destruct capability will also reduce the number of UXO as most of those which fail will destroy themselves. It is not possible that every round will either function or self destruct and therefore the fuzing mechanism should become insensitive upon failure.

Another design feature which would assist in the management of UXO is an ability to easily identify the fuze and determine its state of arming.

**Insensitive Munitions**

The introduction of insensitive munitions (IM) will result in changes to the problem of UXOs. IM rounds contain energetic material that is less sensitive to external stimuli than current explosives. IM rounds will require much greater force to initiate the detonation of the energetic material. This may require larger and more powerful fuzing systems which in turn will increase the danger to EOD operators and others who encounter the UXO. The effect of IM on UXO proliferation and disposal should be considered as part of the design concept. The use of IM may mean that some UXO become safe to move but in these cases accurate identification of the item will be required.

**Procurement**

Materiel sections responsible for the procurement and introduction into service of ammunition should, indeed must, consider the UXO aspects of the ammunition. The UXO factors may last well beyond the service life of the ammunition. The UXO
rate for the ammunition may affect the design and management of range areas, as discussed below. Disposal of UXO will require personnel and equipment that may have knock-on effects for other materiel programs. Ammunition procurement specifications should address:

- the UXO rate of the ammunition;
- the type and risk posed by the UXO;
- the operational implications of the UXO;
- the methods required to dispose of the UXO;
- design information to assist EOD operators;
- the type of impact area best suited to limit the number of UXOs;
- the potential long term effects of UXO contamination by this nature;
- fuzing systems which actually decrease the probability of a UXO occurring e.g. self destruct systems.

Manufacturers’ claims about UXO rates and the effects of UXO should be qualified by independent agencies such as the Australian Ordnance Council, the UK Ordnance Board or the US Department of Defense Explosive Safety Board.

When selecting natures of ammunition for procurement, the need for Purpose Designed UXO should be questioned. Given that a percentage of ammunition will become UXO anyway and that EOD tasks tend to be dangerous and time consuming, is the additional cost of purpose designed UXO rounds really warranted or will the operational necessity to deny an area for a period of time be achieved by the normal UXO rate? If purpose designed UXO are required then they also should have a self-destruct capability (probably time based) so as to lessen the risk to personnel after the conflict.

Sometimes new weapon systems are deployed for the first time in battle after minimal testing by the procurement agency or user. In these cases the manufacturer’s claims about UXO rates must be carefully considered and balanced against known rates for similar systems. As a general rule manufacturer’s will under-play UXO rates to emphasise the high standard of design and manufacture.

**Intelligence**

Intelligence on the probable UXO rate for the munitions being used by both sides of the conflict will lead to a consideration of possible and acceptable casualty rates. The effect of the terrain on the fuze systems of the different rounds will also affect the UXO rate, soft or swampy soil may not cause point detonating fuzes to function. Technical intelligence on all the weapon systems, their ammunition natures and fuzing systems is required if a complete and effective picture of the battlefield over which the troops will move is to be generated.

Knowledge of the ammunition, fuzing systems and UXO rates should be available to operational planning staff and to EOD operators. Also required is information and instructions for the appropriate, safe EOD procedures and techniques to be used against each nature of ammunition. Therefore, a suitable intelligence system is required. This EOD intelligence system (EODIS) must be accurate and current containing all the items and variations that will be found in the region. The system must contain information on newly procured ammunition that can and should be provided by the procurement sections. Information on enemy ammunition is also required, as is historical ammunition to be found in the region.

**Operational Planning**

Operational planning staff should be aware of the UXO hazards that will exist in the area of operations and the limitations that they will impose on the plans. For the UXO element to be built into the planning factors it is necessary for the staff to know, the UXO rates for their own and enemy weapons, the expected location and the effects of these UXO. The existence of UXO contaminated areas may well limit the mobility of certain troops and vehicles.

On the assumption that the military operation will be a success, the UXO areas will fall under the control of their own troops. Plans and resources to tackle the resultant UXO problem should be considered at the same time and even in conjunction with the operational plans. Long term, post conflict clearance can also be prepared for during the operational planning phase. Even if it is probable that land clearance will be conducted by civilian companies the information on the types of weapons used, impact areas, estimated UXO rates, fuzing systems, hazards and safety considerations can be compiled during the planning and operations phases. The prompt provision of this information to the clearance contractors will demonstrate that the victor is concerned with returning the battlefield to useable land as quickly as possible and is concerned for the well being of the local populace.
The EODIS needs to be portable and useable in the field so that the information can be accessed where it is most needed. A number of countries are addressing the requirement for such a system and some computer based systems are being developed.

EOD intelligence is a specialist area that provides valid support to operational planners, EOD operators, logistic agencies and land clearance teams both military and civil.

An EOD intelligence section to provide advice and intelligence to the staff as well as to maintain the technical intelligence required by EOD personnel should be an integral part of any major headquarters.

**Range Construction**

The design and construction of firing ranges and impact areas can affect the frequency of UXOs and the ability to locate and dispose of them. The impact area should be designed so that if the round fails to hit the target it will still receive enough stimulus to function the fuze. For example, the early model 84mm Anti-Tank rounds would fail to function if the round missed the target and impacted the ground at a low angle, resulting in a particularly dangerous UXO. Firing into a rising slope would alleviate this problem.

Firing point detonating fuzes into swampy ground will ensure that a high number of UXO result and usually in difficult to reach locations. The impact area for this type of fuze should be solid ground. Firing into densely forested areas makes the locating and identification of UXO difficult. Even firing out to sea does not necessarily remove the UXO problem, it may only transfer it underwater where it can become a hazard in other ways.

Range design should also address the ability to observe and record UXO as they occur and to provide safe access to the impact area. The impact area should be designed so that location and identification of the rounds is easily achieved.

**Management**

If all those involved in the design, manufacture, procurement, logistic control and use of ammunition accept that UXO do occur and do have significant effects, then the problem of UXOs can be managed. Through the management of UXO, from initial design through all phases of its service life to final firing, those rounds that do become UXO can be greatly reduced and their hazards limited.

The primary responsibility for considering the whole-of-life implications of the UXO resulting from a particular nature of ammunition most reasonably rests with the materiel procurement agencies. It is at the point when the options of rounds are being considered that the UXO problem (possibly 2.5 per cent of the population) can best be addressed.

Those that are responsible for managing the ammunition inventory can lower the UXO rate by ensuring that adequate and relevant surveillance of ammunition performance is conducted. Stock which falls below the Functional Limiting Quantity should be removed from service. If it is not disposed of the UXO rate will increase and the effectiveness of the ammunition nature in operations and training will be reduced and the UXO hazards will increase.

Managers of intelligence must ensure that relevant and current EOD intelligence is provided to the operational planners so that the UXO element of the battle can be considered and managed.

**Conclusion**

When ammunition is purchased UXOs are introduced into the system. The presence of UXOs will affect operations on the battlefield, the ability of people to use their land constructively and require military and civil resources to manage and dispose of them. The problems posed by UXO should and can be considered as part of the holistic approach to ammunition management. In such a manner the number and effect of UXOs can be reduced.

**NOTES**

1. Booby trap switches, because of their function and design are arbitrarily taken to be more closely aligned to mines.
2. In some cases fuzes have parallel mechanisms or actions but as part of a larger sequential process.
3. Royal Military College of Science Handbook of Ammunition, Appendix I.
10. Author's observations and subsequent report on UK ammunition supply during Operation Granby.
11. Cambodian Mine Action Centre (CMAC) Information Sheet No.3 dated 19 April 1995 and author's observations at CMAC.
12. "The Post War Clearance of Munitions from Kuwait - The RAF and UK Involvement" SQNLDR D.J. Lloyd-Rowe, Air Clues, Vol 46 No 8 August 1992, Director of Training (Flying) RAF, London.

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Vietnam Sieges: Dien Bien Phu and Khe Sanh – Any Comparison?

By Chris Welburn,

“They had to be pounded with artillery and bombs ... if they were not ... to remain a threat”.
– General William C. Westmoreland

“Strike to win, strike only when success is certain.”
– Vo Nguyen Giap

Introduction

The struggle for Vietnamese independence from 1945 to 1975 can be divided into four periods. The First Indochina War was fought from 1945 to 1954 between the French and the Viet Minh. Then came the “Geneva Period” in which United States’ military advisers and special force units were involved in a “special war”. The third period, the Second Indochina War, from 1965 to 1973, saw United States’ armed forces, supported by the Republic of Vietnam Armed Forces (RVNAF), engage units of the Viet Cong (VC) and Peoples Army of Vietnam (PAVN) in limited war. The fourth period, from 1973 to 1975, was a period of civil war between the Republic of Vietnam (RVN) and the Democratic Republic of Vietnam (DRV) in which the latter was eventually triumphant.

A number of common threads run through the entire period of conflict. The war was fought, in loose terms, between the supporters and opponents of communism, although those who fought for the communists were not necessarily communist themselves. The DRV worked through a number of broad fronts and appealed to peoples’ senses of patriotism, patrimony and nationalism. Their struggle was presented as a fight for independence and unity against colonial and imperialist aggression. Many of the individuals who fought the French also fought against the Americans – Ho Chi Minh, Truong Chinh, Vo Nguyen Giap, Pham Van Dong and Le Duc Tho to name a few. Consequently the DRV had a vast corporate knowledge of the mistakes and lessons that had been learnt dating back to their early opposition in the 1930s.

The United States also had a long involvement in Indochina, having provided financial and material support during the entire period, supplied advisers during the second period and finally combat troops in the third period. While the Americans could also draw on their own mistakes and lessons, they were also aware of the mistakes and lessons of the French.

While each of the four periods produced significant battles, operations and campaigns, such battles or campaigns are not the ones that are remembered by the world at large. The First Indochina War is remembered for the 55 day siege of Dien Bien Phu, the loss of which led to the demise of French control in Indochina. The Second Indochina War is remembered for the Tet Offensive of 1968 and the siege of Khe Sanh. This latter siege was haunted by the spectre of Dien Bien Phu and the consequences of its loss, but it was the Americans who, having successfully raised the siege, evacuated the base in June 1968.

There is no denying that the siege of Dien Bien Phu was instrumental in ending the First Indochina War. But does the siege of Khe Sanh deserve to be ranked with that of Dien Bien Phu? Was it significant to the overall resolution of the Second Indochina War? Does it have any special significance of its own? This article will examine these questions and other issues by comparing the events associated with, and the sieges of Dien Bien Phu and Khe Sanh.

Superficial Similarities

The events of Dien Bien Phu were never far from the minds of most Americans in Vietnam. The admonition “Remember, we don’t want any Dien Bien Phu, not one, not even a little one” could be heard on the lips of commanders from the President to officers in the field. Westmoreland was so concerned with Dien Bien Phu that he even commissioned a command study “to discern tactics or methods the enemy might use at Khe Sanh.” Such concern grew from the physical similarities of both bases.
Both occupied remote locations, one in the north west of Bao Bo, the other in the northwest of central Trung Bo. Both were isolated in terms of ground lines of communication and their airfields could be interdicted by artillery fire from the surrounding heights. While Dien Bien Phu was situated in a valley and Khe Sanh occupied a plateau, both relied on the defence of a number of strategically important outposts for their survival. Despite the condemnation of the French occupation of a “chamber pot”, Giap put Dien Bien Phu into perspective when he said it was “a mere hollow only for those who have at their disposal planes, lorries and long range artillery. For those on foot, it is indeed a vast plain ... the access to which is by no means easy”. Rather Dien Bien Phu was “a strategic position of the first importance” influencing operations in north-western Bao Bo and northern and central Laos.

Although Khe Sanh overlooked the main infiltration route to Quang Tri, it was of no real significance to the North. However, for the Americans it guarded the western flank of their anti-infiltration barrier comprising “McNamara’s electronic barrier” and the fortified camps of Gio Linh, Con Thien, Cam Lo, Camp Carroll, the Rockpile and Lang Vei.

**Background Events to Dien Bien Phu**

The build up to Dien Bien Phu can be traced back to Giap’s unsuccessful attacks on the de Lattre Line in the Red River Delta. Successive Viet Minh attacks at Yinh Yeh (13-17 January 1951), Mao Khe (27-28 March 1951) and Ninh Binh/Day River (29 May – 18 June 1951) were defeated by the French who were able to concentrate their forces against Giap’s uncoordinated assaults. The French assumed that the Viet Minh were broken as a military force and consequently sought to expand their area of military influence. Hoa Binh was selected as their starting point and was held from 14 November 1951 to 22 February 1952. However, Giap adopted an indirect strategy against the French lines of communication and supply – Route Colonial 6, the Black River and Hoa Binh airstrip – and guerilla attacks within the Red River Delta itself – and forced the French to evacuate Hoa Binh. Both sides claimed victory and both drew lessons from the battle.

The French pointed to Giap’s inability both to take a fortified camp and to prevent its evacuation. But Giap’s analysis of the French performance was less superficial. Firstly the French had had difficulty in resupplying their forces at any great distance from the de Lattre Line: their air force was tied to the protected airfields of the Delta and its effectiveness was reduced by distance while road and river convoys were vulnerable to ambush. Finally, the French could be lured away from the Delta area by Viet Minh threats to areas of importance to the former. This analysis led directly to Giap’s Winter-Spring 1952-1953 Black River Campaign and the siege of Na San. Again both sides drew their own lessons from this campaign season, some of which would be remembered.

The French fixation with fortified camps was reinforced as Na San weathered three major human-wave assaults in early November and was successfully evacuated by air after nearly a year of occupation. The French also concluded that the Viet Minh logistic system was unable to operate over great distances and support simultaneous activities on a number of fronts.

On the other hand, Giap experienced the futility of human wave assaults, a lesson that would be relearned at Dien Bien Phu. The failure of the French Operation Lorraine, directed against the Viet Bac safe area, illustrated for Giap the difficulty the French had in conducting simultaneous operations on different fronts. This lesson was further reinforced by the French inability to cope with diversionary attacks on An Khe, Kontum, Pleiku and Phat Dien.

Echoing Truong Chinh’s principles for protracted guerilla war, Giap summed up the lessons his forces had learnt prior to Dien Bien Phu when he said “our strategy ... was the strategy of a people’s war and of a revolutionary army ... concentrating our forces in the enemies relatively exposed sectors at annihilating their manpower and liberating a part of the territory, compelling them to scatter their forces ... The enemy found himself face to face with a contradiction; without scattering his forces it was impossible for him to occupy the invaded territory; in scattering his forces, he put himself in difficulty.”

**Background Events to Khe Sanh**

Giap sought to impose the same contradictions on the American forces in Vietnam in 1966 and 1967. Diverse threats in geographically disparate areas would force the United States to fight a protracted war in which their “forces ... become small and ... fail[ed] to yield adequate strength.” American involvement in the remote northern provinces would disperse their main forces and involve them in jungle
warfare against the Viet Cong on ground of the latter's choosing.23 O'Neill states that during 1966 and 1967 it was Giap's intention to annex the provinces of Quang Tri and Thua Thien as major infiltration routes from Laos to the Western Highlands traversed these provinces while operations against the Americans could be supported from secure bases in Laos and the De-Militarized Zone, (DMZ). Furthermore annexation would draw American forces away from Saigon and other more populated areas, would enable the DRV to establish de facto control over a sizeable portion of the RVN population and would allow the National Front for the Liberation of Vietnam (NLF) to establish an alternative government in the south.21

However, it is more likely that early American successes around Saigon forced the NFL to seek alternative areas in which to continue their struggle. US operations such as Birmingham, Atleboro, Cedar Falls and Junction City hit hard at previously secure safe areas and forced the PLAF main force units to seek sanctuary in Cambodia and the more remote border areas. Isolated attacks throughout 1966 and 1967 on Con Thien and Gio Linh near the DMZ, Dak To and Duc Co in the Central Highlands and Song Be and Loc Ninh near the Cambodian border all sought to draw America forces away from Saigon and other population centres.

Westmoreland correctly anticipated his enemy's strategy: "I believe that the enemy opened this new front [Tri-Thien] in order to divert our forces from the area that has always been his preferred objective - the heavily populated region around Saigon."22 But if conflict in remote jungle areas suited the communist-led forces, it also suited Westmoreland as American "firepower made it vastly more desirable that they fight in remote unpopulated areas if the enemy would give battle there. This would enable the full United States firepower potential to be employed without the danger of civilian casualties".23

Indeed Westmoreland had examples to prove the efficacy and supremacy of American firepower. The April-May 1967 "Hill Fights" around Khe Sanh were defeated by the use of B-52 strategic bombers used in the tactical role, as was the battle of Con Thien, September-October 1967. In Westmoreland's words the enemy were "broken by aggressive marines and by a new concept in marshalling firepower known as SLAM - seeking, locating, annihilating and monitoring ... off and on for 489 days SLAM strikes pummelled the enemy around Con Thien and demonstrated that massed firepower was in itself sufficient to force a besieging enemy to desist".24

Westmoreland believed he had found the answer to defeat the PLAF main force and PAVN regular units if he could force them to give battle, regardless of location. The communist-led forces, however, were still trying to find their answer, with two generals, Giap and Nguyen Chi Thanh supporting vastly different solutions.

### Political Support for Operations

The French Government of Laniel was ambivalent over Indochina. The French people were becoming increasingly weary of the war and sought an early end to the conflict. Laniel never explained to Navarre that all he sought was a stabilisation of the situation so that negotiations could begin; that Navarre should "above everything else ... insure the safety of our Expeditionary Corps".25 Such safety could have been realised by simply remaining within the Red River Delta. Navarre received contrary directions which he found difficult to resolve. Laniel "would be happy to accept a diplomatic solution to the conflict,"26 but wanted to negotiate from a position of strength. Bidault, on the other hand, wanted Navarre to "force the Communists to negotiate from a position of weakness".27 Consequently Navarre chose to follow his own counsel.

The American Government of President Johnson supported Westmoreland's "big unit" strategy and the use of border posts to inhibit infiltration from the North. Yet President Johnson became increasingly agitated as the battle for Khe Sanh progressed, ignoring the chain of command through the Joint Chiefs of Staff to speak with Westmoreland direct.28 Johnson also pressed the Joint Chiefs for assurances that Khe Sanh would not fall. Nalty states such assurances were offered spontaneously,29 but Pisor and Karnow both dispute this interpretation.30 Johnson's pre-occupation with Khe Sanh continued until the relief of the base was announced.31

Giap was involved in both Dien Bien Phu and Khe Sanh. In the case of the former, the Party Central Committee approved the northern battlefield as the area of prime military importance and endorsed a strategy of "destroying the enemy effectives and striking only when success is certain."32 The Central Committee saw in Dien Bien Phu the opportunity to inflict a sizeable military defeat on the French in the lead up to the May Geneva talks.

Party support for the Khe Sanh operation is more difficult to isolate as this battle was embroiled in the heated debates over the Tet 1968 General Offensive and the struggle for supremacy between Giap and Thanh.33 McGarvey, in *Visions to Victory*, believes
that Tet, and implicitly Khe Sanh, was “almost certainly designed to precipitate the next stage of the war, that of fighting and talking simultaneously.” To this end the Tet Offensive was successful and we must assume that Khe Sanh had Party support.

Military Strategy: The Navarre Plan

General Navarre, despite a number of difficulties, produced, in its original format, a very sound long range strategy. Firstly, Vietnam was divided at the 18th parallel into two theatres of war. The French were to go on the strategic defensive in the north and were to institute a major pacification programme in the Red River Delta. The Vietnamese National Army (VNA) was to be brought to a sufficient standard to relieve the French of garrison duties; which troops, together with reinforcements from Europe would constitute a mobile force. In the south, the French would go on the offensive during 1953-1954 and this campaign would be followed by a similar one in the north during the 1954-1955 campaign season.

The occupation of Dien Bien Phu was part of the northern defensive strategy. Despite the “success” of such heavily fortified herson or “hedgehogs” as Hoa Binh and Na San, Dien Bien Phu was not designed to be such a fortified place. Rather, “everyone had agreed that sealed off ‘hedgehog’ positions were hardly worth the cost of maintaining them”. Dien Bien Phu was supposedly too large for the Viet Minh to seal off and was intended to support mobile operations, long range patrols and tribal guerrillas, “to spread a sufficient degree of insecurity into the enemy’s own rear areas so as to compel him in turn to disperse his troops for the purpose of protecting those areas.”

The initial order for Dien Bien Phu explicitly excluded the heavily fortified option when it directed “the creation of (sic) Dien Bien Phu of a defensive system designed to insure the protection of the airfield to the exclusion of any system aimed at creating a belt of strong points around the airfield.”

Yet when it came to Operation Castor and Dien Bien Phu, Navarre exceeded his capabilities. The French were convinced of the inadequacies of the Viet Minh logistic system but overlooked their own logistic shortcomings. Navarre ignored the advice of his Air Transport Commander, Nicot, who itemised the difficulties the French would have in supporting Dien Bien Phu by air. Navarre’s reaction to such advice was that the airforce would just have to adapt to the situation. Yet if the French could adapt then so too could the Viet Minh.

Dien Bien Phu never became an offensive base after the failure of such operations as Pollux, Regate and Ardeche; and by mid-February Cogny had restricted light reconnaissance to the valley itself to keep losses down. According to Roy, Dien Bien Phu became an “entrenched camp” by 1 January 1954. Maclear quotes Navarre on this point that “I chose the solution of the ... entrenched camp because with the state of my forces, which were inferior to those of the Viet Minh in terms of mobile forces, this solution was the only one which seemed to be reasonable.” The alternative, a withdrawal, was estimated as too costly, given that French intelligence had estimated that Giap would have at least four divisions around Dien Bien Phu by the end of December 1953.

Navarre’s overall strategy could have been successful had he made his theatre commanders adhere to it. Instead Navarre failed to adjust his objectives to his means and allowed Dien Bien Phu to be turned into a fortified camp, ill-defended and dangerously at the end of a tenuous support line. Instead of a defensive strategy, Navarre was now seeking an attrition battle with Giap’s forces.

Giap’s Reply

Giap was aware of Navarre’s operational concept, and his problem was in deciding whether to “concentrate our forces to cope with the enemy or despatch them to launch offensives in other directions.” In supporting the latter strategy, Giap drew on his earlier observations that the French had difficulty operating at considerable distance from the Red River Delta in “Mountain fronts, [where] he was relatively weaker, and the topographic conditions there were favourable to us and unfavourable to the enemy.”

Giap’s 1953-1954 Winter-Spring campaign was consequently based on the annihilation of the French forces. He compelled Navarre to react to threats throughout Indochina, thereby dissipating his forces and overstretching French resources. Navarre reacted accordingly and his mobile reserve was quickly reduced from 44 to 20 battalions. This force was reduced even further by Navarre’s insistence that Operation Atlante go ahead as planned in January 1954 against the Viet Minh’s Military Region V, an area of little strategic importance to Giap.

A net assessment of French and Viet Minh Assets at Dien Bien Phu then led to the decision to “wipe out at all cost the whole of the enemy force at Dien Bien Phu.” This decision was endorsed by the Parties.
Central Military Committee at a Conference in late November 1953. Discussion then centred on how this was to be achieved.

At this stage Giap was also aware of France’s desire for a political settlement and of moves by the major powers (United States, United Kingdom, Soviet Union and China) to hold a five power conference to settle Asian problems in mid-1954. Ho Chi Minh had signalled, on 29 November 1953, that “the Government of the Democratic Republic of Vietnam [is] ready to examine the French proposals” for armistice and settlement of the Vietnam problems. Thus Giap knew that if he was to achieve a military victory it had to be done between November and May 1954. “It did not matter ... if he became locked in a desperate and bloody battle ... at a cost of considerable casualties to his own decisions, provided that he could thereby inflict equal damages to the French.” For Giap, Dien Bien Phu was the right target, at the right time at the right place. Every effort would be made to ensure the Viet Minh were victorious by the time the Geneva conference had finished its deliberations.

But American forces in 1966 and 1967 were insufficient in terms of manpower, helicopter and logistical support to accomplish this end, especially in the troublesome northern provinces. Consequently a strong-point obstacle system was developed on a “series of fire support and patrol bases, designed to channel the enemy into well-defined corridors where we might bring air and artillery to bear and then hit them with mobile ground reserves”. Westmoreland, in his foreword to Shore’s book The Battle for Khe Sanh elaborates further when he writes “our decision to defend [such bases as Khe Sanh] also held the prospect of causing the enemy to concentrate his force and thereby provide us a singular opportunity to bring our fire power to bear on him with minimum restrictions.” Westmoreland firmly believed that American firepower and helicopters could overcome any strategy devised by the communists, regardless of timing, force concentration and location.

### Westmoreland’s Strategy

Westmoreland had initially adopted a three-pronged strategy to deal with the communist-led threat in the south, comprising a war of attrition against the enemy’s main force units, a campaign of pacification and nation building to combat the NFL political infrastructure and a policy of building up the RVNAF so they could take their place on the battlefield. A fourth prong, a quest for a political solution was added in 1966.

Westmoreland’s attrition strategy could only succeed if the communist-led forces were brought to battle. As such Westmoreland’s strategy was very similar to Navarre’s final decisive battle concept. In answering criticism that American forces reacted to communist initiatives, Westmoreland stated that “if the enemy did indeed lure us into remote regions, he at the same time afforded us an opportunity to bring him to battle and inflict the damage we had to impose if we were to achieve our objective of destroying his big units with minimum damage to the population.” Westmoreland fully believed in the advantage conferred to him by superior American firepower and “had learned conclusively that it was when the enemy were out of hiding to make some major attack that American firepower could be brought to bear with tremendous effect”.

### The DRV’s Reply

The struggle to formulate a strategy to defeat Westmoreland’s sledge-hammer approach to battle was fought between the “North Vietnam firsters” and the “South Vietnam firsters” represented by Generals Giap and Thanh respectively. The latter was “one of the Party’s most vehement spokesmen for reunification at any price” and was supported by Le Duan, Le Duc Tho and Pham Hung. Thanh had analysed the American successes of 1966 and 1967 and his solution to redress the imbalance of forces was the use of equally large forces in close range attacks which would nullify US firepower. While Thanh’s strategy met with initial success, it did not stop US forces from establishing a presence in the highlands and other important regions of the country. At this stage Giap’s proposals to prosecute a protracted guerrilla war were becoming more attractive. But Thanh was unwilling to “slacken the main force offensive or adopt a solely guerrilla-based strategy”.

The argument between Thanh and Giap became very acrimonious, as evident in the articles in McGarvey’s document collection Visions of Victory. Debate continued until agreement was finally reached to combine guerrilla and large scale offensive tactics, the former in the south, the latter in the north. The death of Thanh in July 1967, after he had initiated the planning for the 1968 Tet offensive left Giap in command, charged with implementing an offensive of which he had his doubts.
The DRV's military strategy in the months preceding Tet 1968 was a repeat of Giap's classical tactics at Dien Bien Phu. Efforts were made to dissipate American strength throughout southern Vietnam, including attacks on Khe Sanh. Such action clouds the relationship between Khe Sanh and Tet 1968. The timing for Khe Sanh suggests the operation may have been used to draw attention away from the pending Tet Offensive. The fact that Khe Sanh continued after the Tet Offensive collapsed suggests there were other reasons for the battle.

Davidson believes that Khe Sanh was to be the final large unit conventional battle that would force the Americans to negotiate, while McGarvey believes Tet was to be "a Dien Bien Phu of sorts, which would place the United States in the weakest possible bargaining position". Turley suggests that "aside from providing a strategic diversion, [it] was a test of the US reaction to the PAVN's use of the DMZ." The true relationship may only become clear when the DRV releases its official war histories. Regardless of why the battle was fought, Giap drew on his experiences against the French and sought to enmesh Westmoreland in the classic contradiction faced by Navarre – of territorial occupation versus military concentration.

**Tactics – Defending Forces**

The defences of Dien Bien Phu and Khe Sanh both relied on the holding of strategic outposts. In the case of Dien Bien Phu these were Beatrice, Gabrielle, Anne Marie, and parts of Dominique, Eliane and Huguette. The higher surrounding hills of the valley itself were too far away for the French to incorporate into their defensive position. Khe Sanh's defence rested on Hills 881S, 861, 861A, 558 and 950. In both defences lip service to a degree was paid to the support all Khe Sanh's defended areas.

The actual preparation of defences at both sites was somewhat tardy. Both garrisons were manned by what Beaumont describes as elite troops. In the case of Dien Bien Phu these were primarily paratroopers, either French, Foreign Legion, Colonial or Vietnamese and in the case of Khe Sanh, Marines.

Such troops are trained and equipped to perform specialist roles and are generally unsuitable for straight infantry tasks, especially prolonged defensive operations. Furthermore, Navarre's instructions to de Castries had precluded the construction of strong points and proper defence works which were already hampered by a lack of readily available natural resources and the logistic impossibility of bringing such materials in by air. It was only after the battle for Dien Bien Phu began that greater efforts were made in relation to defence works.

A similar disregard for defence requirements was exhibited by the marines of Khe Sanh. Davidson, in a visit to the base, comments that "tents, fuel ammunition dumps and command post – [were] all above ground and unprotected ... the general lack of preparation to withstand heavy concentrations of artillery and mortar fire" was appalling. The Marines lost their main artillery ammunition dump in a very early bombardment because of the lack of protection. Both the Americans and the French had sufficient warning that well prepared defensive positions were required and both chose to ignore those warnings.

The main defensive weapon of both defences was to be firepower – artillery and air power to be precise. Piroth, the French artillery commander, boasted that "I've got more guns than I need". But it was not just a case of guns but also of ammunition resupply and the French were unable to keep ammunition up to their guns in the quantity required.

At Khe Sanh the defenders could call on forty-six artillery tubes, which, in contrast to the artillery pieces of Dien Bien Phu, were dug in and revetted. Consequently they were very difficult to hit, even with the number of rounds fired on Khe Sanh and in fact only three artillery pieces were destroyed during the battle. In contrast only one gun survived the battle of Dien Bien Phu.

Both defending garrisons could call on offensive air support to augment their own firepower and this area is one in which there are major differences in scale. The French flew approximately 3700 combat missions by some 100 aircraft in support of Dien Bien Phu with the most missions on one day totalling 40. French aircraft capabilities were restricted due to distance, flying time, the weather and enemy air defences.
The Americans, on the other hand, made overwhelming use of their air power. The Air Force conducted 9691 fighter bomber attacks, the Marines 7078 and the Navy some 5337 attacks delivering a total of 39,178 tonnes of bombs, rockets and napalm. These attacks were supported by 2602 B-52 strategic bomber sorties delivering 75,000 tonnes of bombs. The American use of firepower was coordinated in an operation named Niagara II and this produced a veritable avalanche of bombs. Niagara II was supported by Niagara I, an intensive intelligence gathering operation utilising all the latest technology to garner information on enemy activity around Khe Sanh.

Logistic support also played a major role in the defence of both Dien Bien Phu and Khe Sanh. Both garrisons had to rely on air resupply and both had to resort to para-drop techniques when their airfields became unusable. The problem with para dropping supplies is that not all the supplies arrive at the right destination, a factor the French were to experience to their cost. Daily French requirements just to exist totalled some 150 tonnes but on average only 90 to 100 tonnes was delivered. The French transport force flew some 6700 supply and troop transport sorties but were never able to keep the garrison fully replenished. Nicot’s earlier warnings to Navarre that French air assets were insufficient proved correct.

At Khe Sanh, Westmoreland restricted the size of the garrison to four marine battalions, a marine artillery battalion and an ARVN Ranger battalion to be sure that his air transport assets could meet Khe Sanh’s logistic requirements. Yet even with this self imposed restriction Khe Sanh often went short of essentials such as fuel, food and ammunition. The air transport assets under Momoyer, Westmoreland’s deputy for air operations, delivered 12,430 tonnes of stores, 8,120 tonnes by parachute, low level extraction or ground proximity extraction with a further 4310 tonnes delivered by air landing. A further 4661 tonnes was delivered by helicopter direct to the Khe Sanh outposts from Hong Ha and other supply bases. Air transport was also utilised to evacuate wounded to hospitals in the support area thereby providing a much needed morale boost to the garrison.

**The Attackers – Dien Bien Phu**

Giap used all but one of his main force units for the battle of Dien Bien Phu. He spent some three months preparing for the battle with particular emphasis on the movement of artillery and logistic supplies. Despite French staff projections that Giap would never be able to amass sufficient artillery and supplies to support an operation of long duration at such a distance from his supply bases Giap did just that. Although estimates differ as to the amount of artillery Giap had available at Dien Bien Phu, consensus would support twenty-four 105mm howitzers, fifteen 75mm howitzers, twenty 120mm and forty 82mm mortars and up to twelve Katyusha rocket launchers. These pieces were protected by up to eighty 37 mm AA guns and about one hundred anti-aircraft machine-guns. Giap’s artillery was superbly handled and quickly established superiority over its French counterpart.

Initially Giap was unsure how to attack Dien Bien Phu – the Viet Minh had never attacked just over ten French battalions concentrated in the one position before. Despite the disadvantages Giap decided on a slow and steady piecemeal approach to the problem, a move known in today’s military parlance as “salami tactics”.

The battle was fought in three phases with the northern outposts of Beatrice, Gabrielle and Anne Marie falling on the 13, 14 and 17 March respectively. These battles were particularly bloody and savage and fought with a tenacity and ferocity that is not evident in the fighting around Khe Sanh. There was a lull in the fighting until 30 March as Giap’s troops sought to isolate the central sector by sapping and entrenchment. Phase Two began on 30 March and ended on 4 April with parts of Huguette, Dominique and Eliane in both sides’ possession. The intensity of the fighting is well illustrated in Fall’s *Hell in a Very Small Place* and in two Vietnamese essays “The Capture of Hill AL” and “Operations on the Stomach” in *Contributions to the History of Dien Bien Phu*.

Giap comments on the effect of such bloody fighting on his troops when he says “that, even when the Dien Bien Phu battle was at its height, negative factors … appeared. … after a series of resounding victories, we found in our ranks signs of underestimation of the enemy … negative rightist thoughts cropped up … to the detriment of carrying out the task.” Such “negative rightist thoughts” included fear of casualties, losses, fatigue, difficulties, hardships, subjectivism and self conceit.

Phase Three opened after a further three weeks had been spent digging trench works around Dien Bien Phu. The battle for the central sector was fought over the period 1-6 May with Dien Bien Phu finally falling on the 7 May 1954.
The Attackers – Khe Sanh

Khe Sanh had been attacked intermittently by regular PAVN units during 1967 as part of Giap’s strategy to draw American forces away from the more populated areas of South Vietnam. The formal “siege” of Khe Sanh started on 21 January 1968 and while Giap could draw on the resources of up to nine PAVN divisions to prosecute the battle, only two were really involved. As at Dien Bien Phu, Giap made much use of well concealed artillery (located near the Laotian Mountain of Co Roc and from within the DMZ) that was virtually impossible to interdict. Nalty suggests Giap could call on twenty-four 105mm howitzers and twenty-four 122mm howitzers but these figures are only a best guess.

The battle for Khe Sanh was fought in a similar fashion by Giap’s forces as had been the battle for Dien Bien Phu but with one significant difference. Efforts were concentrated on the outposts and the virtually undefended village of Khe Sanh, the latter being abandoned on 22 January 1968. The only other success the attackers achieved was the destruction of the Lang Yei Indigenous/Special Forces camp on the 7 February with up to 80 per cent casualties for the defenders. There were numerous lulls during the conflict, especially during the opening days of the Tet Offensive and the battle was fought in a rather lacklustre fashion. The Khe Sanh Combat base was reinforced during the first week when helicopters were used to ferry 1st battalion 9 Marine Regiment and 37 ARVN Ranger Battalion to the base. It was this latter unit which bore the brunt of some of the heaviest fighting when three separate attacks were mounted against their defensive position over the period 29 February to 1 March.

Yet at no time was the base likely to be overrun – the intensity and application of force that was present at Dien Bien Phu was missing at Khe Sanh. As an illustration Ewing estimates that the average weekly total of incoming shells at Khe Sanh was 2500 rounds as compared with 45 000 rounds a week for Dien Bien Phu. A total of only eight battalion sized attacks were launched against Khe Sanh and its outposts, none of which matched the human wave assaults of Dien Bien Phu. Indeed, regiments from both the attacking divisions were moved towards Hue during the Tet Offensive to support operations there.

No attempt was made at Khe Sanh to establish the overwhelming superiority of anti-aircraft fire that ringed Dien Bien Phu. Certainly the Marines were forced to use a “super gaggle” of helicopters supported by A-4 Skyhawk ground attack aircraft in order to deliver supplies but these were usually delivered daily. Despite the success of Dien Bien Phu’s trench warfare system only half-hearted attempts were made in this direction at Khe Sanh and fewer than a dozen trenches were built, nothing like the maze of diggings that had strangled Dien Bien Phu.

It is possible that Giap wanted to keep Westmoreland’s attention focused on Khe Sanh for as long as possible. An indicator to this end is the North Vietnamese failure to cut the Khe Sanh water supply which was located some 500 metres outside the base’s defensive perimeter. Indeed the head waters of the Rao Quon River rose in PAVN controlled territory and could easily have been contaminated. The burden of having to transport water to the base would have overwhelmed even the American logistic system.

However, by 15 March the North Vietnamese had accepted failure and began to thin out their ground troops. Khe Sanh would not be an American Dien Bien Phu.

Relief Operations

Three relief operations were prepared for Dien Bien Phu but none were successful. Only one, Operation Xenaphon conceived 29 December 1953, stood any chance of success, requiring the French forces to undertake a fighting withdrawal before they were decisively committed to combat. The other two operations, Condor and Albatross were authorised too late in the battle and involved too few troops to have any chance of success.

Westmoreland initiated planning for the relief of Khe Sanh on 29 January 1968, only four days after the first sustained artillery attacks on the base. Any implementation was interrupted by the Tet Offensive and by the time new plans for Operation Pegasus were drawn up in early March, the besieging troops were already being thinned out. Nevertheless, nothing was left to chance and Operation Pegasus was finally initiated on 1 April 1968 after a new logistic support base had been established at Ca Lu, only twelve kilometres from Khe Sanh and thirty-one artillery batteries had been deployed in support.

This complex operation, and its diversionary supporting plans, is described in great detail by Willard Person (The War in the Northern Provinces) with one exception: he failed to discuss the necessity
for such an operation in the first place." Pisor, on the other hand, states that the "Commander of the 1st Air Cav ... knew it was a charade ... he did not expect to find any North Vietnamese at Khe Sanh". General Cushman, the III Marine Amphibious Force Commander responsible for I Corps also opposed the need for a relief operation. Khe Sanh was in no danger of falling and the PAVN were in the process of disengaging. While the calamity that befell Dien Bien Phu could perhaps have been avoided if Operation Xenaphon had been put into effect, Operation Pegasus was more a public relations exercise than anything else.

The Marines at Khe Sanh were never ever in danger of suffering the same ignominious fate as the defenders of Dien Bien Phu. Firepower and the use of helicopters saw to that. Yet, in the end the Americans left Khe Sanh, after a "decent interval" and withdrew their garrison to Ca Lu, out of reach of the ever insistent North Vietnamese artillery and rockets. Westmoreland agreed with this final decision once President Johnson had overruled any American move into Laos using Khe Sanh as an operational base. Route 9, the DMZ and the populated coastal areas would be secured against the depredations of the enemy through mobile defence.

The loss of the garrison of Dien Bien Phu was a blow the French were unable to absorb both militarily and politically. The loss of Dien Bien Phu itself was of no real consequence in the events that followed from 8 May 1954. While the enemy could finally lay claim to Khe Sanh, its loss to the Americans was inconsequential - apart from having to explain why the 77 day siege was fought in the first place.

The Nuclear Option

The use of nuclear weapons was considered in support of both Dien Bien Phu and Khe Sanh. A Pentagon study group concluded "that three tactical atomic weapons, properly employed would suffice to smash the Vietnamese forces at Dien Bien Phu", but the proposal was quashed by the State Department. However Roy argues that Operation Vulture, a proposed American B-29 bombing raid against the Viet Minh forces around Dien Bien Phu was purely to exercise the nuclear option. Fall presents a more rational argument in that the nuclear option was to be only part of an American bombing effort. However fears over escalation of the war and the possible involvement of China, concern for the international conference on Indochina in May and a reluctance on Britain's part to become involved finally quashed Operation Vulture.

A small group of staff officers in Westmoreland's headquarters were authorised to investigate the use of nuclear weapons at Khe Sanh. However, once "Washington" found out about the study it was immediately cancelled because of concern over escalation, the involvement of China and adverse domestic opinion - virtually the same reasoning that had prevailed at Dien Bien Phu.

Final Assessment

Dien Bien Phu and Khe Sanh both started out as patrol bases, although Dien Bien Phu was certainly the larger of the two. Neither Navarre nor Westmoreland initially sought a decisive battle against Giap at these locations, but both readily accepted battle once the challenge was thrown down.

Both battles became the focus of attention and absorbed enormous quantities of materiel, time and effort until they were resolved. Dien Bien Phu was the decisive battle of the First Indochina War, tilting the military balance in favour of the Viet Minh. But if Navarre had received the reinforcements he had requested to launch his other operations in the southern parts of Vietnam events might have ended differently. It is interesting to note that the garrison at Dien Bien Phu comprised only 4 per cent of the total force available to the French. However this force managed to tie down nearly 60 per cent of the Viet Minh total main force for nearly six months and stretch their logistic supply lines to nearly breaking point. If Navarre had had his requests for reinforcements actioned it is possible that renewed French attacks into Viet Minh base areas would have forced Giap to abandon the battle. Events turned out differently however and Giap fought a tactically sound battle that brought convincing results to the winner.

The battle for Khe Sanh, on the other hand, ended in a rather desultory fashion. The Americans retained possession of the base, but at great material cost in firepower and then abandoned it some three months later. The Deputy Commander of 3 Marine Division described Khe Sanh as a "trap that the enemy could use whenever he wanted to force you into the expenditure of absolutely unreasonable amounts of men and material to defend a piece of terrain that wasn't worth a damn."
Westmoreland, ever since 1966, had believed that the “North Vietnamese ... were convinced that military victories at least as significant as Dien Bien Phu had to precede negotiation.” He believed Khe Sanh was to be one of these victories and consequently was determined to hold it at all costs. American fire power, especially unparalleled air power and the use of helicopters would ensure that Khe Sanh would never fall in battle. To term Khe Sanh a “siege” is technically incorrect as the base was never isolated from its support area - helicopters made practically daily visits to the main base and its outposts.

Navarre saw Dien Bien Phu as the key to the northwestern areas of Indochina and Laos, in the same way that Westmoreland looked on Khe Sanh as the key to the two border provinces of Quang Tri and Thua Thien. As events turned out, neither of these hypotheses were put to the test.

Both battles were fought on ground selected by Navarre and Westmoreland on the one hand and Giap on the other as suitable to their concept of operations. However, while Navarre’s intentions foundered on the mismanagement of his firepower, Westmoreland’s proved successful through his use of massed artillery and air strikes, although he was never able to commit Giap’s divisions to a decisive battle.

While Giap’s intentions at Dien Bien Phu were clearly stated - he intended to destroy his enemy to a man, his intentions at Khe Sanh are still obscure. Was he trying to conquer the northern provinces? Was Khe Sanh to be followed by attacks on Hue and Da Nang? What was the relationship between Khe Sanh and the Tet 1968 Offensive? If Khe Sanh was supposed to hold American attention during the Tet Offensive why was there a halt in fighting during the Tet period? Were the PAVN divisions located in the Tri Thien area there to stop any attempted American move to cross the DMZ? Certainly Giap had more forces in the area than were actually committed to the battle around Khe Sanh.

While both defenders looked to their firepower and ability to generate combat power to anchor their defence, Giap used the strategy he had devised for Dien Bien Phu at Khe Sanh. In both cases in the months before battle was joined, bases throughout the country were attacked in an effort to dissipate the defender’s strength, to draw it away from the concentrated population centres and into the more remote regions of the country. Giap also looked to his artillery to crack the defences of Dien Bien Phu and Khe Sanh. He was successful in the first but not in the second. Giap successfully concentrated his forces against the outposts of Dien Bien Phu and was able to reduced them piecemeal. He had to resort to World War I trench warfare when it came to dealing with the main position but he was prepared to prosecute the war to its end, regardless of the cost. This commitment was missing at Khe Sanh and is one of the marked differences between these two battles. Giap had about the same size force at his disposal in both battles yet the siege of Dien Bien Phu was fought with an intensity, ferocity and commitment that was missing at Khe Sanh.

Giap was determined to achieve an overwhelming military and psychological victory at Dien Bien Phu before negotiations on a settlement began in Geneva. Both sides were aware of the impending conference - the French were attempting to hold out until a ceasefire was ordered while the Viet Minh fought to give their negotiators the upper hand. However at Khe Sanh, Giap had no such goal in sight. The Tet Offensive had failed to achieve its aims - there had been no general uprising as had occurred in August 1945. Nor was it likely that an alternative victory would be achieved at Khe Sanh as the Americans were just too strong. Westmoreland was well aware of what happened at Dien Bien Phu and was not prepared to suffer similar consequences.

At Dien Bien Phu, Giap won both a military victory and a political one. At Khe Sanh he lost the military battle but again won the political one, this time the battle for American public opinion. Comparisons were continually drawn between Dien Bien Phu and Khe Sanh without due consideration of the important differences that would ensure the survival of the Khe Sanh garrison. Rather, because the French lost Dien Bien Phu, ipso facto the Americans would lose Khe Sanh.

Both the French and the Americans mis-employed elite style forces in fixed defensive positions and this aggravated the conditions under which both battles were fought. Long term positional defence is the domain of straight infantry, not marines nor paratroopers which are trained for specialised tasks. It is a waste of their talents and capabilities. General Rosson, the Commander of Provisional Corps, Vietnam, after visiting Khe Sanh, suggested that the marines were “not sufficiently prepared ... for the kind of war ... that has evolved along the DMZ.”

At Dien Bien Phu both the French and the Viet Minh had to survive at the end of long and somewhat tenuous lines of logistic support. In the end the Viet Minh won the logistic battle as the French air force was unable to meet all the demands placed on it. Navarre had been told that Dien Bien Phu would be
impossible to support before the force was lodged but he chose to ignore his staff advisors.

Westmoreland, on the other hand, was always conscious of the importance of logistics. The size of the Khe Sanh garrison was determined by the ability of his air assets to support the base. The timing of the relief operation was determined by the rate of the logistic build up at Cu Lu. Westmoreland's transport aircraft were also more capable than those available to Navarre and helicopters were used to advantage. Even though Khe Sanh suffered from some shortages during its 77 day ordeal it would never fall through lack of logistic support.

The French and the Americans were also well served by their intelligence services, especially radio intercept. Navarre knew how many divisions he would be facing at Dien Bien Phu as did Westmoreland at Khe Sanh. Westmoreland again had the advantage of technology and was able to react to tactical intelligence almost immediately. Navarre never enjoyed such an advantage.

Westmoreland was right in looking to Dien Bien Phu for lessons that the Americans might draw, to identify mistakes to avoid and strategies of which to be wary. Superficially there were similarities between Dien Bien Phu and Khe Sanh, at both the strategic and tactical levels and it would be prudent not to repeat Navarre's mistakes. Yet those who sought to make the Khe Sanh America's Dien Bien Phu failed to make the two significant distinctions between these battles: firstly the fighting at Khe Sanh never approached the ferocity and extremes of ground combat that marked Dien Bien Phu, and secondly Westmoreland's use of firepower proved decisive.

Giap's Viet Minh force at Dien Bien Phu fought with a commitment that was never duplicated by the PAVN units at Khe Sanh. The 77 day siege of Khe Sanh was prosecuted in a rather tardy fashion; in comparison the 55 day siege of Dien Bien Phu was fought to the bitter end. Consequently, in the annals of the Indochinese Wars the siege of Dien Bien Phu stands alone.

NOTES
4. Such fronts include the Viet Minh, the Lien Viet, the National Front for the Liberation of Vietnam and their associated volunteer organisations and associations.
5. Examples of such battles, operations and campaigns range from the August Uprising of 1945; to the Chinese border battles of 1950 and the battles of the Red River Delta of 1951; to the battles of Ap Bac (January 1963), Binh Gia (December 1964), and the battle of Ap Bac (January 1963), Binh Gia (December 1964), and the battle of La Drang Valley (October 1965); to Operations Attleboro (October 1966), Cedar Falls (January 1967), and Junction City (February 1967); to the Battle for Hue (January 1968) and finally the Ho Chi Minh Campaign of April 1975.
7. Ibid., Chapter 5.
8. Ibid. p. 139.
12. Hou Binh was the capital of the Muong, a tribal group loyal to the French. It was also a key Viet Minh communication centre.
18. Ibid., p. 36.
19. Ibid., p. 33.
23. Ibid., p. 132.
25. Fall, Street, op. cit., p. 315.
30. Pisor, op. cit., p. 138; Karnow, op. cit., p. 541. It is difficult to understand why the Joint Chiefs would volunteer such a statement in the first place. If they lacked confidence in Westmoreland they could have sought his resignation.
34. Ibid., p. 50.
36. Ibid., p. 30.

59. Turley, op. cit., p. 75.

60. McGeorge, op. cit., pp. 44-444.


63. Miller, op. cit., p. 555.

64. The French could call in twenty-four 105mm guns, four 155mm guns for counter-battery fire and twenty-four heavy mortars apart from battalion mortars. They were also supported by ten M24 Chaffee 75mm gun tanks and four quad-50in multiple machine-guns. Roy, op. cit., p. 123.

65. The artillery at Khe Sanh comprised three 105mm batteries (18 guns), one 155mm battery (6 guns) and one battery of 4.2in mortars at Khe Sanh itself and one 175mm battery (4 guns) at the Rockpile and a further three 175mm batteries (12 guns) at Camp Carroll. This firepower was augmented by six M-48 Patton 90mm gun tanks, four “dusters”, ten Otos and numerous 106mm recoilless rifles. Major-General D. E. Ott, *Vietnam Studies: Field Artillery 1954-1973*. Washington: Department of the Army, 1975, p. 150.


67. Pisor, op. cit., p. 239.

68. The disadvantages Giap faced in adopting this approach were: a long drawn out campaign, an increased demand on logistic support, especially munitions; additional stress on his troops and problems associated with the weather. Giap, *Dien Bien Phu*. (Second Edition), op. cit., p. 24.


71. In the vicinity of Khe Sanh were: 325C NVA Division located north of Hill 881N, 304 NVA Division located south west of Khe Sanh (and a veteran of Dien Bien Phu), a regiment of 324 NVA Division located in the DMZ north of Khe Sanh, and 302 NVA Division north of Rock Pile. The 2nd NVA Division was in the Da Nang area, and 324B NVA Divisions were near Hue and elements of 308 and 341 NVA Divisions were in the northwest region of I Corps. However, the brunt of the battle was borne by 325C and 304 NVA Divisions. Willard Pearson, *The War in the Northern Provinces: 1966-1968*. Washington: Department of the Army, 1975, pp. 29-30.


74. Ibid., p. 233.

75. Ibid., p. 241.

76. Ibid., p. 156.


81. Fall, op. cit., p. 290.


84. Pisor, op. cit., p. 239.


86. Pisor, op. cit., p. 259.

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Reviewed by Lieutenant Colonel R. E. Bradford

In his opening statement in the book, Mike O'Brien suggested that the work set out to be a serious study of what service in the battalion meant and what the war in Vietnam was like. He wanted the reader to get an understanding of what life was like in an infantry battalion and believed that this would best be done by allowing the participants to tell their own story in their own words. As a reviewer of the book, I cannot really say whether he achieved the serious study aspects of his aim, however, I believe he has succeeded in his secondary aim. To read the stories of the many battalion members allows the reader to gain a good impression of the experiences of soldiers in combat situations.

The morality of Australian involvement in the Vietnam War, the conscription introduced to support that involvement and the later issue of Agent Orange would all be familiar to readers but the author has managed to ensure that they have not become central to his writing. Those commentators and lobbyists looking for information or data to support their particular issues will gain little from the book. What will be gained, however, is the personal views of the members of the battalion during both tours and after the fact. In addition to the many and varied comments on training and operational activities, the book provides many other comments on a range of other matters. A few examples of note are, the ability of the diggers in the battalion, "the Digger was magnificent – regular or national serviceman. He endured hardship, stress and physical danger with good-natured humour": on mateship "A trust and faith, a bond of mateship, had been built up and upon, during our training together in Australia. I knew they wouldn't let me down": and the Army "Upon looking back on my time in the Army, it seems that everything I learned about life goes back to those years. I learned about myself and other men".

The main theme of the book, however, remains that of the members of the battalion and their recollections of the operational activity of 7 RAR during its two tours in Vietnam. These recollections cover the full gambit of emotions that time has not been able to erase. Throughout the telling, however the camaraderie and closeness of the unit brought about by tough training and shared experience come to the fore. If anything, I believe as the central essence of the book it makes it so readable and enjoyable.

The author, Brigadier Mike O'Brien served with the battalion in Vietnam in 1970/71 as a platoon commander and intelligence officer. He is a 1968 graduate of Duntroon and at the time of the writing of the book was Commander Army Technology and Engineering Agency.

Mike put to good use the shared common experience he had with the many members of the battalion he was able to contact whilst conducting his research for the book, and I am certain he experienced a deal of trouble deciding what to include. I am sure there were many members who were disappointed that their particular story or little piece of history was not utilised. In reading the finished product I am sure that they would not remain disappointed for long as the operational story of the battalion and more importantly its members is well told and a pleasure to read.