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WAGING TOMORROW'S WARS
THE EMERGING STYLE OF TWENTY-FIRST CENTURY WESTERN WARFARE

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INTRODUCTION

As the new century approaches, the nature of war in the 21st century is being determined. The concepts and doctrines which will guide the application of military force in the next twenty to thirty years are being created and formulated now. The considerable time taken, especially in periods of peace, to field new technologies, equip military forces, train personnel to use increasingly sophisticated machines, and devise appropriate doctrines mean that the future is being built on the strategic decisions of the present and the past.

The three great civil wars of Western civilisation during the 20th century have shaped the modern world and will continue to have a major impact into the early part of the next century. The veterans of World War I have almost all passed on, but the horrors of trench warfare remain a part of our culture. The influence of World War II is gradually passing with Germany reunited, the Soviet Army returning to pre-war positions and a peace treaty between Russia and Japan beckoning. The 21st century will be some decades old before the impact of the last of the century's major conflicts, the Cold War, diminishes significantly.

The military strategies which will dominate and prove influential in the post-Cold War world are as yet indeterminate but, as Clausewitz observed in the early part of the last century 'every age [has] its own kind of war, its own limiting conditions, and its own peculiar preconceptions. Each period [holds] to its own theory of war.'[1] The emerging strategies, which will guide the employment of military forces in the next century, will be based upon and evolve from the strategies of the present age. The new strategies are most likely, as many other strategies have, to evolve out of older concepts rather than suddenly and unexpectedly arrive. The broad outlines of those strategic concepts which will provide the dominant paradigms in the 21st century may be able to be discerned by a shrewd glance at the main features of this particular age.

Within this paper ethnocentrism rules, partially to restrain possibilities within easy bounds, but also because Western concepts dominate military thought at present. In the later part of the 21st century this dominance will probably be under threat but, at least at the start of the century, Western concepts will have sway. Of course, if Francis Fukuyama is correct,[2] and the political theory that evolved from Hellenic civilisation into the modern Western liberal democracies with their market economy, is the 'final form of human government', then Western strategic concepts may be the best departure point for future strategic concepts - but history warns against this thought.

A final reason for ethnocentrism is that warfare is so inter-twined with culture, and the civilisation which practices it, that particular strategic concepts are often appropriate only to the specific civilisation which practises them. As a member of Western civilisation, attempting to define the strategic concepts appropriate for other civilisations may be most unwise.

[1] Clausewitz, Carl von, *On War*, Michael Howard and Peter Paret (ed), Princetown University Press, Princetown, New Jersey, 1984, p 593.
[2] Fukuyama, Francis, *The End of History and the Last Man*, Hamilton, London, 1992.

This paper also places particular emphasis on air power - a vexatious term for some. The use of air power has become progressively more important throughout this century. The trend established from World War I to the Gulf War appears set to continue. The future does not appear to lie, at least for Western nations, with a reversal of this direction and a consequent steadily diminishing role for air power. Some of the reasons for this are directly related to the civilisation the West has built, the broad goals of Western states during conflicts and the way this civilisation approaches warfighting. Before examining the application of air power, it is useful to first discern some long-lasting features related to the West's concepts of war.

ENDURING FEATURES OF THE WESTERN WAY OF WAR

The Quest for Decisive Battles

The defining point of the Western way of war is the emphasis on the concept of wars as being decisive, as achieving a particular goal and definitively resolving a problem. Like many Western concepts, the idea of a contest of arms being decisive arose in Greece. Fifth century Greeks invented not only the central idea of Western politics - that power in a state should reside in the vote of the majority - but also the central act of Western warfare, the 'decisive battle'.[3]

Democratic ideals and the concept of decisive battles are closely inter-connected. In the small democracies of the Geek era, those who voted for war also committed themselves to fight in it as militiamen. These individuals were also voting for a new kind of warfare dedicated to the same outcome as the democratic process - an unequivocal and immediate result. The Greek citizen-soldiers whose life was rooted in his city, his farm, and his family could not, unlike the dispossessed and the un-propertied, commit himself to an open-ended campaign. The risk of death or glorious victory tomorrow, was greatly preferable to the possibility of winning through an interminable, deracinating and wealth draining guerilla conflict.[4]

The quest for decisive battles with quick victories, or defeat, has led Western forces to be characterised by firepower, heavy defensive armament and not merely the ability, but also the desire, to deliver fatal blows and then steadfastly to endure, without retreat, any counter-response. Not for the West, the art of the assassin and the way of the terrorist seeking eventual reward in this world or the next; these have not been the style of Western warfare. Terrorist actions are viewed in the West as repugnant and cowardly in nature; this form of warfare relying on indiscriminate killing of soldier and civilian alike is seen as dishonourable and criminal.[5] Instead, the Western way of war since the Greeks has been for a 'single, magnificent collision of infantry, for brutal killing with edged weapons on a battlefield between free men'; such a goal has

[3] Hanson, Victor Davis, *The Western Way of War: Infantry Battle in Classical Greece*, Oxford University Press, Oxford, 1989, p xii.
[4] *ibid.*, pp xii-xiii.
[5] Bunker, Robert J., 'The Transition to Fourth Epoch War', *Marine Corps Gazette*, September 1994, p 28.

'baffled and terrified our adversaries from the non-Western world for more than 2,500 years...'.[6] As Victor Davis Hanson continues:

> Whatever the future of infantry in the nuclear age, this inner craving for a clear decision, despite the carnage, will not fade; it cannot since, as the Greeks discovered, it resides in the dark hearts of us all. Yet it is essential to remember, its moral imperative is to end the fighting quickly and efficiently, not simply to exhibit brave resolve.[7]

Equally the demands, as well as the aim, of the Greek Phalanx should be remembered. The Phalanx's success rested greatly on training, discipline and courage; these were qualities best found in free men, not slaves or indentured serfs without a shared stake in their society. The goal of a short decisive battle, the combat method devised and the nature of Greek society were in harmony.

Reliance on Professional Military Forces

Since the Middle Ages, there developed a steadily increasing reliance within Western nations on professional military forces. This feature is not some recent, short term development but an enduring feature of Western societies and the way the West wages war.

Western military professionalism in the modern era dates back to the middle of the 15th century when, in the generation just prior to the important battle of Breitenfeld in 1631,[8] appointment to officership started to depart from the criterion of socioeconomic class used in the medieval age of knighthood. Instead, officership began to be based on talent and expertise developed through a specialised education in the management of war. Officership became less of a social perquisite and consequently warfare became less of a craft and more of a science.[9]

The trend steadily deepened and broadened with the Industrial Revolution, introducing constant technological change to Western society while bringing enduring changes to the social and economic structure. As the process of industrialisation advanced, the importance of highly skilled professionals steadily grew. By the 19th century true professionalism, in the modern sense, had emerged. After 1900 no significant Western nation, either in the old world or the new, was without a professional officer corps guiding and directing peacetime preparations and combat operations.[10]

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[6] Hanson, *The Western Way of War: Infantry Battle in Classical Greece*, p 9.
[7] *ibid.*, p 13.
[8] The victorious Swedish army, fashioned and commanded by Gustavus Adolphus, had characteristics and features that reflected the impact of military revolution that occurred in Europe during the 17th century and which have shaped all Western military forces since. The battle of Breitenfeld was the first time since the Roman Legions, a well trained, disciplined, combined arms force was used in a major European battle. The battle, a pivotal event during the Thirty Years War, eventually led to the Treaty of Westphalia which forms the basis of the current international system of nation states.
[9] Weigley, Russell F., *The Age of Battles*, Pimlico, Random House, London, 1991, p xiii.
[10] Hackett, General Sir John, *The Profession of Arms*, Sidgwick and Jackson Ltd, Great Britain, 1983, p 99.

Although quickened by the Industrial Revolution and the societal changes it caused, the pace of professionalising a nation's armed forces depended on the degree to which the particular state's security was threatened, or was thought to be. In Prussia, the impulse to truly professionalise the officer corps followed the Jena defeat but weakened following Napoleon's defeat; the movement quickened again with the failure of Prussia against Denmark in 1848. In France the movement towards professionalism was accelerated after the humiliating defeat of 1815 and later by the disaster of 1870. The startling incompetence of the British forces in the Crimea and India stimulated professionalism after 1856 and the later Boer War disasters in South Africa had a further impact.[11]

While military professionalism developed at different rates within the Western world, general conditions in the 19th century were favourable to its growth. These conditions included a steady increase in the complexity of military skills, the growing economic strength and competitiveness of the major states, the growth of power of the middle classes at the expense of landed aristocracy, and the development of democratic political institutions which demanded a more responsive articulation in armed forces.[12] Professional military forces were a reflection of the kind of societies the West built, and a necessary response to the progressive application of technology to war.

Such military forces will remain a feature of Western combat operations into the next century. The stunning effectiveness of Allied Forces in the war against Iraq demonstrates that relatively small professional military forces, with high quality equipment, can inflict severe defeats on large forces lacking highly competent and trained personnel. The professional nature of Western military forces can compensate during conflict for their relatively small numerical size.

However, small professional forces are most adversely affected by heavy combat losses. With high personnel losses replaced by partly trained personnel, the ability of a nation's military forces to employ technologically advanced equipment using complex tactical concepts can decline precipitously. Western military forces based on quality, rather than quantity, are vulnerable to personnel attrition. Such forces can only withstand limited manpower losses before overall capability declines, requiring compensation by sharply increased force size and a return to simpler, but less effective and more costly, tactics.

The strategic options available alter with the reduction in force size. Military forces with few men but much equipment have only a limited ability to control conquered territory; time works against such a force after the initial shock of a successful invasion has dissipated. In large, politically hostile countries the activities of small forces may have no more effect than Hannibal's army after his victories against the Romans in Italy. Only by a Mongolian strategy of terror and extermination could such an army subdue a determined opponent.[13] While such a strategy was relied upon by the West during the Cold War to deter possible communist aggression, the actual use

[11] *ibid.*, p 133.
[12] *ibid.*, pp 133-134.
[13] Jones, Archer, *The Art of War in the Western World*, University of Illinios Press, Chicago, 1987, p 715.

of such methods by Western forces seems unlikely, although threatening strategic circumstances can make even the most benevolent society malevolent.

Pre-Eminence of Advanced Technology

The Industrial Revolution born in the West during the 18th century conquered the world and led to technology being increasingly applied to conflict. Western military concepts became interlinked with advanced technology. The dominant Western power during the 20th century, the United States developed a tendency to view wars as engineering problems seeking reductionist solutions grounded in technology.[14]

Aviation has been the leading edge technology throughout most of the 20th century. Indeed, in the first half part of the century, the air power which a State possessed was considered an indication of modernity and a measure of how advanced that nation was.[15] However, intrinsically the very nature of technology and that of war are fundamentally opposed. Technology is built on the 'uniform, repetitive, predictable, character of physical nature'. The only reason why even simple technology, a hammer for example, is constructed is because of the certainty the hammer will always have the same effect on a nail. If technology did not have repeatable effects no tool or machine would be conceivable.[16]

However, wars are not simply an exercise in the application of technology, rather they are primarily a contest between two intelligent, adaptive belligerents. The principles of war are inherently different to the principles of technology as the nature of war is not linear, but paradoxical. The same action does not necessarily always lead to the same result; the opposite is more likely. Wars are undertaken against thinking, well motivated opponents fully capable of learning from a hostile act and able to devise responses and countermeasures so that a similar act does not necessarily have the same effect.[17]

With technology and war being based on a logic not only different but actually opposed, the very concept of 'technological superiority' is somewhat misleading when applied within a combat context. The interaction between the technologies used by the opposing sides is the crucial factor, not the absolute technological differences. As Martin Van Creveld grasped:

It was not the technical sophistication of the Swiss pike that defeated the Burgundian knights, but rather the way it meshed with the weapons used by the knights at Laupen, Sempach, and Granson. It was not the intrinsic superiority of the longbow that won the battle of Crecy, but rather the way in which it interacted with the equipment employed by the French on that day and at that place. Using technology to acquire greater whatever, is very important and may be critical. Ultimately however, it is less critical and less important than achieving a close 'fit' between one's own technology

[14] This view is advanced strongly by Weigley, Russell F., *The American Way of War: A History of United States Military Strategy and Policy*, Indiana University Press, Bloomington, 1977.
[15] Overy, R.J., *The Air War 1939-1945*, Europa Publications Ltd, London 1980, p 3, pp 207-210.
[16] Van Creveld, Martin, *Technology and War: From 2000BC to the Present*, Free Press, New York, 1989, p 315.
[17] Luttwak, Edward N., *Technology and War Strategy: The Logic of War and Peace*, Harvard University Press, Cambridge, Massachusetts, 1987, pp 3-31.

and that which is fielded by the enemy. The best tactics ... are the so-called Flaechen-und-Luecken (solids and gaps) methods which ... are based on bypassing the enemy's strengths while exploiting the weaknesses in between. Similarly, the best military technology is not that which is 'superior' in some absolute sense. Rather it is that which 'masks' or neutralises the other side's strengths even as it exploits his weaknesses.[18]

High technology combined with a professional military allows Western military forces to be small but highly effective. Small forces intelligently using the strengths of modern technology against the weaknesses of an opponent can accomplish significantly more than much larger forces using the 'brute force' tools of the past.

However, the complex weapons and equipment of these high quality, 'new age' military forces might be very difficult to maintain and replace during combat. The rate at which precision guided munitions were used in the Gulf War indicated that in some conflicts the small stocks of expensive, intelligent weapons may be expended quite rapidly. Moreover, with the end of the Cold War, most nations are not building large weapon stockpiles, or maintaining an industrial base able to move to high rate weapons production quickly. The trend to most military forces having relatively few precision guided weapons available for combat operations may grow. Similar considerations apply to equipment.

Combat in a future conflict may start as high technology warfare, but then gradually revert back to the styles of that of earlier ages as the battle progresses. A transition back to World War II, or even World War I, combat conditions may occur until replacement equipment begins to make possible a partial return to the initial conditions of battle.[19] The older styles of conflict were manpower intensive and usually were waged using methods that inflicted heavy casualties, even on the victors. Post-industrial Western societies may be ill-structured and wrongly organised to fight the types of wars older societies once fought. A post-industrial nation faced with such a dilemma may need to alter its basic societal structure to survive.

Given the West's successful application of technology to warfare since the Renaissance, a non-Western opponent may undertake terrorist warfare to counter the overwhelming military power the West can employ. The fate of Iraqi forces during Desert Storm proves that the West should not be engaged on the West's terms. Terrorist warfare because of its decentralised nature and stealth-like attacks is inherently difficult for Western forces to deal with but could undermine the resolve and morale of Western states during conflicts where society was not mobilised and the stakes were low. Western high technology warfare and terrorist warfare are diametrically opposed and cannot be easily reconciled.[20] However, the future of terrorist warfare may not be as certain as some consider.[21]

During the Cold War, terrorist warfare could be waged against the West because of the Western desire to avoid escalation and risk such actions causing a major, possibly nuclear, war. In the post-Cold War era, the West does not have such restrictions, and

[18] Van Creveld, Technology and War, *Technology and War: From 2000BC to the Present*, pp 319-320.
[19] Jones, *The Art of War in the Western World*, p 714.
[20] Bunker, 'The Transition to Fourth Epoch War', pp 24-29.
[21] See esp. Van Creveld, Martin, *On Future War*, Brassey's UK, London, 1991.

can strike directly with its high technology forces at a state conducting terrorist warfare. If civilians are directly attacked by state-sponsored terrorists with the goal of extracting a stated political aim, the West may feel morally obliged to strike back with all available force. The moral outrage of Western societies has not been harnessed since World War II which reflects the lack of real threat to those societies since then; terrorist warfare may be the catalyst to unleash strong, violent emotions again. If a non-Western state uses terrorist means to attack, the West may be well advised to choose to employ the methods of warfare with which it is most competent.

A DIFFERENT COMBAT ENVIRONMENT IN A DIFFERENT WORLD

During the 20th century the type of warfare practised by advanced Western states, particularly in Europe, became markedly different to that practised elsewhere. The type of high technology electronic and missile warfare typifying the NATO/Warsaw Pact stand-off in the later stages of the Cold War had few equals elsewhere in the world. Western military thought focussed on the perceived needs of combat along the Inner German Border but the intense mechanised warfare anticipated, bred military concepts inappropriate for many other wars. It was a cardinal error for Saddam Hussein to try to fight a war whose nature was similar to that for which the West had equipped, trained and thought about for almost fifty years.

The Cold War's end means international politics leaves the Western phase where it has been since the 17th century. The interactions between Western states no longer dominate international relations exclusively. The central elements of international politics are now the interaction between the West and non-Western civilisations, and amongst non-Western civilisations. Non-western states no longer remain only the objects of history as regions of Western colonialism, but join the West as movers and shapers of history.[22]

The world seems headed back to previous eras when there was a diversity of military styles with warfare varying according to the economic, political and social circumstances of the combatants. The global military situation may resemble Medieval Europe with each region having methods that meet its specialised needs. The current resurgence of heterogeneity and regionalism in warfare has echoes in the past. Similar diversity existed some three centuries ago when Europe began to accelerate its global expansion during the Columbian era.[23]

The Tofflers have observed that there are now three basic types of civilisation co-existing around the world: agricultural, industrial, and the knowledge-based third wave. Such a global structure has resulted in a radical diversification of the kinds of war fought across the world.[24] In the language of the marketeer and economist, the single giant industrial wars of World War I, World War II or the Cold War have been replaced by niche wars with the transformation of the major societies into knowledge-

[22] Huntington, Samuel P., 'The Clash of Civilisations?', *Foreign Affairs*, Summer, 1993, p 23.
[23] Jones, *The Art of War in the Western World*, pp 715-716.
[24] Toffler, Alvin and Heidi, *War and Anti-War: Survival at the Dawn of the 21st Century*, Little, Brown and Company, Boston, 1993, p 81.

based third wave types. Niche wars parallel the niche industries and niche markets developing in the post-industrial societies; no longer are wars across the globe similar but are instead smaller and differentiated from each other. Instead of a mainframe conflict there are now distributed conflicts.[25]

In wars where a particular type of civilisation fought an older form, the more advanced should be able to inflict shattering battlefield defeats with few losses to the winning side; the colonial wars of the late 19th century and the recent Gulf War are examples.[26] However, the distinctions between battlefield success and strategic victory should be carefully considered. Small, highly effective combat forces may win campaigns but prove unable to achieve the political victory sought particularly when fighting in distant far-off lands. US forces during the Vietnam War inflicted severe battlefield defeats on Viet Cong and North Vietnamese forces, but at the end the tanks of North Vietnam conquered the South.

Niche conflicts, each with quite different characteristics, call for military forces to be increasingly flexible in terms of both force structure and professional competence.[27] Future military forces are likely to need operational and tactical concepts, multi-role equipment and competent personnel, all capable of adapting rapidly to new and novel conflict types. The protracted equipment development and acquisition process, inherent difficulties in re-organising complex bureaucratic organisations, and the time needed to train personnel effectively, all pose problems for Western forces attempting to re-orient themselves quickly to the demands of differing niche conflicts.

The 'new age' military forces of the West while possessing historically unparalleled firepower and expertise may be most effective only when fighting similar 'new age' forces. Against opponents using the tactics and equipment of an earlier times, modern forces may find the precision guided missile costing more than the target. Major parts of such modern forces could resemble the elite cavalry of the Middle Ages: they could usually dominate quickly wherever they went but were dependent on poorly equipped, although numerous, infantry for sieges and for garrisons to control the country.[28] Such infantry are difficult to find in post-industrial societies and in some future coalition actions there may be a resort to the forces of less developed societies for some roles.

[25] *ibid.*, p 90.
[26] Not only Allied Forces suffered a low casualty rate. The numbers of Iraqi casualties, while disputed, seems to have been remarkably low. Modern technology forces focus on destroying equipment and military support infrastructure, rather than indiscriminately killing. Prolonged 'low intensity conflicts' using low technology equipment may be considerably more bloody than conflicts using high technology. See Heidenrich, John G., 'The Gulf War: How Many Iraqis Died?', *Foreign Policy*, Spring, 1993, pp 108-125, and related letters to the editor in the Summer 1993 edition.
[27] In wars against, and in coalition with non-Western states, particular attention will need to be given to overcoming the deleterious effects of ethnocentrism. Civilisations, other than just the West, are also subject to ethnocentric myopia and thus this may be an area where the West can gain a qualitative advantage. For an incisive discussion of the topic see Booth, Ken, *Strategy and Ethnocentrism*, Holmes and Meier Publishers, New York, 1979.
[28] Jones, *The Art of War in the Western World*, p 715.

NEW DIRECTIONS: WHERE IS WARFIGHTING GOING?

Winning Not Just Fighting

The low probability of winning a war in the European Central Front led to an emphasis on war-fighting rather than war-winning. This focus was hardly surprising when analysis of the opposing force ratios consistently indicated that the only dispute was how soon nuclear weapons would have to be used. War-winning seemed an unrealistic goal.

The imagined Central Front conflict was strongly influenced by the large force to space ratios existing in a very confined area. High force to space ratios left little opportunity for innovative military thought as attrition seemed the only practical option. Force to space ratios have drastically altered in Europe and elsewhere in the world with the end of the Cold War. Western strategic concepts are now less constrained and consequently there is a re-orientation of military thinking away from the Cold War war-fighting concepts, that focused on static attrition based concepts, to war-winning concepts using manoeuvre warfare.

Military forces now exist once again to win wars not just fight them. The two different choices call for quite different force structures: war fighting attrition warfare requires large conscript and militia forces with mass produced arms; war winning manoeuvre warfare requires well trained professional forces with technology skilfully matched to counter that of an opponent. War-winning is in tune with the desire amongst Western nations to engage in wars in order to achieve a decision, to fight decisive battles and to resolve conflicts quickly and efficiently. In seeking to win conflicts, though, Basil Liddell-Hart's advice is sound. He noted:

> The object in war is to attain a better peace - even if only from your point of view.[29]

Manoeuvre War

The focus on manoeuvre concepts is a positive development for the West for attrition war does not play to the West's strengths of small, high quality forces with high technology equipment. Manoeuvre warfare takes advantage of the strengths of the Western way of war while being compatible with changing geo-strategic circumstances.

Manoeuvre warfare has an offensive orientation and seeks to apply strength against carefully selected enemy weaknesses. The purpose of manoeuvre is to gain an advantage relative to an enemy's centres of gravity so as to control, or destroy, these centres of gravity. Manoeuvre involves moving faster in space and time than an opponent; manoeuvre in space gives a positional advantage while manoeuvre in time gains a temporal advantage. The combination of both allows a numerically inferior

[29] Liddell-Hart, B.H., *Strategy*, 2nd Revised Edition, Signet Books, New York, 1974, p 353.

force to achieve decisive superiority at the necessary place and time. The United States Marine Corp's definition of manoeuvre warfare is apt:

> Manoeuvre warfare is a warfighting philosophy that seeks to shatter the enemy's cohesion through a series of rapid, violent and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot cope.[30]

An opponent's ability to fight as an effective, coordinated whole is destroyed making him incapable of resisting further. Tactical manoeuvre aims to gain an advantage in combat. Operational level manoeuvre aims to gain an advantage which bears directly on the outcome of the campaign or theatre as a whole.[31]

The Need for a Mobile Arm

Successful manoeuvre warfare requires mobility superior to that of an opponent. In European conflicts before the Napoleonic Wars, infantry gave armies tactical solidity and sustained power. However, in that distant age of battles potentially deciding conflicts, 'whenever an army developed an effective cavalry, that army became capable of the winning tactical decisions of the battlefield by margins in favourable casualty rates and psychological advantage wide enough to create at least a possibility that strategic decisiveness might follow as well'. [32]

Such a generalisation about the need for a mobile arm to make combat decisive applies also to warfare after Waterloo. The wars fought predominantly by infantry were particularly indecisive. World War I offers an appalling example where the lack of an effective mobile arm attuned to modern conditions led to a tactical and strategic stalemate of nightmarish proportions. By the later part of the 19th century, the advent of the bayonet and the appearance of a homogenous body of infantry superior to cavalry, had turned the tactical balance in favour of the defence. Commanders, deprived of mobile forces able to undertake offensive roles, bought the tactical defensive to an apogee during World War I.[33]

The success of German mobile, mechanised forces at the start of World War II offer a sharp contrast to the failures of the Wehrmacht's predecessors at the end of the World War I. Modern combat operations require mobile forces which can manoeuvre and strike against an opponent's vulnerable flanks and rear. As Russell F. Weigley concluded from his study of campaigns:

> The military commander in quest of decisiveness needs an effective arm of mobile war.[34]

At the tactical level, mobility is the ability to move in combat within the engagement or battle. At the operational level, mobility is the ability to move between engagements and battles within the context of the campaign or theatre.[35] If Western

[30] *FMFM 1, Warfighting*, US Marine Corps, Washington, DC, 1989, p 59.
[31] *FMFM 1-1, Campaigning*, US Marine Corps, Washington, DC, 1990, pp 64-65.
[32] Weigley, *The Age of Battles*, p xiv.
[33] Jones, *The Art of War in the Western World*, p 709.
[34] Weigley, *The Age of Battles*, p xiv.
[35] *FMFM 1-1, Campaigning*, p 71.

forces seek decisive battle, the forces employed must be capable of both tactical and operational mobility.

The mobility of men alone is inadequate for an effective mobile arm. Mobile arms have always required the harnessing of alternative sources of power whether it be horsepower, windpower or fuel-powered machines. The application of technology to warfare has meant that the older forms of mobile arms based on chariots, mounted cavalry or sailing ships have been superseded. The gradual evolution of mobile forces continues with air power now arguably the mobile arm of the forthcoming century. Air power will be the manoeuvre force of choice at both the operational and tactical levels of war in the 21st century.

Joint Warfare

As cavalry was rarely decisive alone, so air power acting alone is unlikely to be decisive. The exception is during nuclear warfare, but the quest for a decisive war and genocide have different goals. Air power must act in concert with surface forces if a decision is sought. Surface forces are essential to give modern armed forces tactical solidity and sustained power but effective air power is also needed if a nation seeks victory, or even just simply to prevent defeat in a modern war. Anvil and hammer operational concepts are particularly apposite. In the next century surface forces will be the anvil against which the hammer of air power will shatter an opponent's armed forces.

Joint warfare offers the vision of placing an opponent on Liddell-Hart's horns of a dilemma. An adversary can act to constrain and defend against the threat posed by land, naval or air forces alone as a single dimensional threat is easily outflanked. The defeat of infantry, mechanised land forces, submarines or surface ships is a comparatively straight-forward task when they operate independently. Alexander the Great defeated the massive Persian Empire because of his adept handling of an integrated army composed of heavy and light infantry, skirmishers and heavy and light cavalry. Alexander conducted his battles with all arms carefully coordinated to support each other, and present an adversary with a diverse threat impossible to counter with one arm alone.[36]

Air, land and sea operations must be integrated to produce a cumulative, synergistic effect on an opponent's ability to continue a conflict; when they are, decisive conflicts such as Desert Storm are possible. Relying solely on air attacks leaves the initiative with the enemy to accept, or refuse, political demands. An opponent may be willing to absorb punishment and could take advantage of being allowed to concentrate on defeating a single threat.

Air campaigns uncoordinated with complementary surface force actions can be of little more than nuisance value and may be ridden out. Surface campaigns uncoordinated with complementary air actions can be inconclusive and costly in manpower and materiel. However, the defeat of joint forces acting in concert with a

[36] Alexander's integrated army was actually fashioned by his father Phillip II; the concept was a military revolution of the time. Ferrill, Arthur, *The Origins of War: From the Stone Age to Alexander the Great*, Thames and Hudson, London, 1986, pp 149-186.

single strategic aim is very difficult. This simple axiom has been abundantly proven time and again in the wars of the 20th century; it has also been the way the West has prevailed.

Joint force operations will become increasingly important in the next century for a very simple reason: with joint forces victory is possible, while without them wars degenerate into attrition contests. The combination of modern Command, Control, Communications and Intelligence (C^3I) methods, and professional military commanders, provides the opportunity of being able to employ the right force at the right time. Quantitatively small, but high quality, very diverse joint forces can offer a large range of force application options able to be used for defence or attack as the tactical situation requires. An opponent can remain consistently unbalanced by the timely employment of friendly forces which offer the precise capability against which his chosen force application method is particularly vulnerable. The future for Western forces is with heterogenous, joint forces rather than with large homogenous forces offering only single-dimensional capabilities. Flexible joint forces will be an especially useful force structure in a time of niche conflicts.

However, successful joint warfare requires all force components to be considered as coequal and interdependent so that the right combat element is used at the most appropriate time. The chosen arm should not be selected for reasons of longevity, size or geographic proximity but rather combat effectiveness. With comments equally applicable to surface forces, Major Pivarsky, United States Air Force, noted;

> We need to acknowledge that one branch or service may take centre stage for a portion of, or an entire operation. When that happens, all the other members of the team are in support. For a Joint Force Commander to see when it is appropriate for air power to take centre stage, air power ... needs to be treated as an equal partner ... .[37]

A Dispersed Advance?

With modern technology joint forces, the manoeuvre strategy of dispersed strategic advance offers considerable potential. The vulnerability of all forces to hostile air attack, combined with the need to mystify an adversary and draw the full value from friendly mobile forces, suggest offensive actions should be distributed as widely geographically as is compatible with joint operations, but be dispersed as much as is compatible with cohesion. The simple idea of a concentrated stroke by concentrated force, while appropriate for the older attrition based conflicts, does not make the best use of the operational options available to modern joint forces.

A choice should be made, according to the circumstances from Liddell-Hart's three variants of dispersed 'strategic' advance; these operational level options are either:

a. a dispersed advance with a concentrated single aim that is against one objective;

[37] Pivarsky, Major Carl R., USAF, 'Dangerous Doctrine', *Military Review*, September 1993, p 51.

b. a dispersed advance with concentrated serial aim that is against successive objectives; or

c. a dispersed advance with a distributed aim that is against a number of objectives simultaneously.

These methods aim at permeating and dominating areas rather than capturing terrain or lines of advance; at the practicable object of paralysing an adversary's actions rather than the theoretical, Clausewitzean object of crushing his armed forces.[38]

A dispersed advance relies for success on friendly forces moving faster and operating at a higher tempo than an opponent. The friendly forces aim to achieve an unexpected surprise and pose multiple threats rather then a single one-dimensional threat. However, a dispersed advance is potentially vulnerable to defeat in detail. A dispersed advance needs protection by consistently moving faster than an enemy can react. With both sides in a conflict having access to similar technology, having an operational and tactical tempo faster than an opponent can react requires the waging of the strategy of information war in concert with manoeuvre warfare.

Information War

Information war focuses on an opponent's decision-making so he is unable to use his forces in an effective and efficient manner to engage friendly forces. Information war seeks to get inside an enemy's decision-making cycle so that he cannot react to friendly force initiatives or direct his forces to carry out his strategic choices. Being able to undertake combat operations consistently faster than an opponent can react, requires inflicting strategic and operational paralysis on an adversary by striking key nodes in his war making capability.

Modern war is war about time, not about ground; there is a shift away from the old orientation on space to a new orientation toward time. However, the issue in battle is not absolute speed, but speed relative to an adversary. Timely information becomes critical for an adversary to discern friendly force activities and to be able to manoeuvre his forces to react. Information war seeks to prevent an opponent realising the real threats, until it is too late to react. An opponent subject to a successful information assault should be uncertain of the whereabouts of both hostile, and his own, forces. Sun Tzu advised a commander in such difficulties:

> If ignorant both of your enemy and of yourself, you are certain in every battle to be in peril.[39]

Information is a strategic asset of great value. During modern 'knowledge warfare' each side will try to shape the opponent's actions by manipulating the flow of intelligence and information.[40] Successful information war allows the turning of the 'balance of information and knowledge' in one's own favour and is especially critical when the balance of forces is adverse. The intelligent use of knowledge during

[38] Liddell-Hart, *Strategy*, p 333.
[39] Sun Tzu, *The Art of War*, Samuel B.Griffith Translator, Oxford University Press, New York, 1982, p 84.
[40] Munroe, Neil, 'DoD Creates Information Doctrine', *Defence News*, 2 December 1991.

combat operations means less resources, both materiel and personnel, need to be employed.[41] Smaller forces can have a combat effectiveness disproportionately large for their size.

Information and knowledge may win wars but any superiority in these factors is exceedingly fragile. Knowledge as a resource differs from all others in being inexhaustible and being able to be used by both sides simultaneously. Moreover, knowledge is non-linear with small inputs able to have disproportionate consequences; a small amount of the right knowledge can have immense strategic or tactical advantage while the denial of a small piece of information can have catastrophic effects.[42] A comprehensive knowledge of strategy will have to deal with all four information functions: acquisition, processing, distribution, and protection, with each inter-related.[43]

The new term of 'information war' has become attractive and fashionable because it seems to mirror the fast-changing and exciting information technology of the time. Denying an opponent knowledge of friendly military actions is as old as warfare itself; winning the high ground has always been important. Information warfare is only a subset of other strategies; it complements and assists other strategies, information war is not an independent strategy but is a becoming a vital part of modern manoeuvre warfare.

EMERGING AIR POWER CONCEPTS

New air power concepts are slowly emerging with the changes in the nature of war and technological developments. However, there are some basic principles in air power which have been proven during the 20th century. The use of air power as a mobile arm relies on achieving an acceptable level of air superiority to allow freedom of friendly force manoeuvre and force application. Moreover, air power is rarely effective when aircraft are employed as scattered, fragmented forces. Air power to be effective has to a reach a certain critical mass; this mass will vary with the nature of the campaign being undertaken. The so-called 'penny packets', so disliked for historically well-proven reasons by navies, artillery men, and armour enthusiasts, are unlikely to lead to successful air operations. Moreover, as with these other forms of machine warfare:

> Air power, to be used properly, is not to be used like a rain shower, sprinkled all over the battlefield. Air power has to be thunderstorms hitting various spots hard.[44]

[41] Arquilla, John and Ronfeldt, David, 'Cyberwar Is Coming', Draft Discussion Paper, RAND International Policy Department, June 1992, quoted in Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century*, p 141.
[42] Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century*, p 148.
[43] *ibid.*, p 152.
[44] Lorber, Major General John, USAF Director of Plans, quoted in Scott C.Truver, 'Four Air Forces ... Indeed', *Proceedings*, February, 1993, Volume 119/2/1080, pp 78-82, 79-80.

Parallel War

Air power can now have a major impact at all three levels of war. The distinctions, based on aircraft technology, used in the first part of the 20th century relating the heavy bomber to the strategic level of war, and the light attack aircraft to the tactical level are no longer appropriate. There are different concepts for air power employment at each level but the concepts are complementary, not competing or exclusive.

Traditionally, air power has been massed at the tactical level to produce operational and strategic level effects which were cumulative in nature. Air attacks were concentrated on a key target set gradually dismantling that target set and having an operational, or strategic, effect over time. However, modern air power has developed a unique attribute of being able to undertake parallel warfare allowing commanders the option of simultaneously attacking an opponent on all three levels of war. During Desert Storm three separate phases, strategic bombing, establishment of air supremacy in the Kuwaiti theatre of operations and battlefield preparation, were conducted simultaneously.[45]

The ability to simultaneously attack an opponent throughout his entire depth, at a high operational tempo, is causing the strategic, operational and tactical levels of war to overlap and interpenetrate to a substantial degree. The various levels may effectively merge with actions at every level instantaneously affecting each other; rear, close and deep combat operations may be compressed into a continuous fight. As this trend continues, the three levels of war, as separate and distinct loci of command and functional responsibilities, could disappear in the next century.[46]

Parallel warfare though relies on having adequate numbers of suitable equipment and personnel able to employ precision guided munitions against key defended targets wherever they are located. Without the requisite technology, adequate mass and a carefully crafted air power application system, parallel warfare cannot be undertaken.

Strategic Level Air Power Application

The focus of strategic level air operations is increasingly on the national command, control, communications and intelligence (C^3I) system with the aim of paralysing the political-military establishment.[47] Air power can wage highly effective information warfare. High precision weapons now allow 'de-massified' destruction, custom tailored to inflict exactly the damage required but with minimised collateral damage.[48]

Strategic air operations can destroy an adversary leadership's ability to exercise control, by killing the political leadership, by making it impossible to communicate

[45] Mann, Lt.Col. Edward, USAF, 'One Target, One Bomb: Is the Principle of Mass Dead?', *Military Review*, September, 1993, pp 33-41.
[46] Macgregor, Lt.Col. Douglas A., U.S. Army, Future Battle: The Merging Levels of War, *Parameters*, Winter, 1992-93, pp 40-42.
[47] A comprehensive discussion may be found in Layton, SQNLDR P.B., 'The Strategic Application of Air Power in the New World Order', *Air Power Studies Centre Paper Number9*, Royal Australian Air Force, Fairbairn, 1993.
[48] Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century*, p 73.

with subordinates, or by destroying the means by which orders were carried out. National political and military command headquarters can be engaged using increasingly effective air-delivered weapons; even deeply buried bunkers are now vulnerable to the emerging specialised hard structure weapons. Unlike the Chateau generals of the World War I who, while relatively close to the Front, were invulnerable, modern politicians and high-level commanders must now consider themselves prime targets for attack.

The control system can be attacked and degraded by both soft and hard kill measures although in an era of instant global communications by commercial means, where leaders can transmit to tactical commanders through devices as simple as fax machines, attacks on communication networks must be broad and well coordinated. The distinction between civil and military technologies and functions is becoming increasingly blurred. Military information functions may be undertaken with equipment used, or designed, for civil and military purposes. Dual-use products and technologies are expanding rapidly in the information systems, computing and communications fields; all of which are increasingly inter-related and interdependent. In the future military forces will 'swim in the sea of civil technology'.[49]

An important part of denying an enemy information will be denying an opponent the ability to undertake surveillance and reconnaissance. Once blinded and reliant on sources outside his control the potential for deception and creation of confusion and uncertainty is vastly increased. Again, blinding an opponent at the strategic level will require more than just attacking the military intelligence network.

Commercial satellite systems now provide remote sensing users a capability only possessed previously by the Superpowers. Commercial satellite systems can now detect large military build ups and monitor force dispositions globally. Denying an adversary access to such information resources will be critical in any scheme to paralyse, bewilder, perplex, mystify and generally confound an opponent's national C^3I system.

Operational Level Air Power Application

At the operational level of war, the combination of advanced aircraft and the precision guided munition (PGM) have transformed combat. The mobility, flexibility and ubiquity of modern air power combined with the selective destructiveness of PGMs has fashioned an instrument of force quite different to the traditional surface forces. Modern air power can undercut an enemy's basic ability to wage war by denying opposing surface forces the ability to execute their scheme of manoeuvre, while inflicting heavy attrition on those forces that choose either to remain stationary, or move.

Air operations can keep the combat situation fluid, preserving the initiative for the attacker by isolating or immobilising defending units while delaying and disorganising the enemy's reserves at critical junctures. Von Schlieffen argued that 'flank attack is the essence of the whole history of war'; air power now attacks from the vertical flank. The deep battle concepts of the late 20th century, involving

[49] Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century*, p 185.

attacking at great distances from the front, makes the traditional vision of the weak points of an opponent's forces being the flank and the rear irrelevant.[50]

The increasing emphasis throughout the 20th century and into the future on offensive operations deep in an enemy's rear is reflected in the US Army doctrine which states:

> Formerly, deep operations supplemented the close operations; the tie was direct and unbreakable. Now ... the deep operation ... may even be designated the main effort. In the first place, deep operations orient on functions rather than forces. Second, commanders may pursue separate battle objectives by using deep and close combat operations, either of which may be the main effort.[51]

For surface forces such doctrine is radical, and shows that the lessons of Desert Storm and the Cold War have dramatically altered conventional surface force employment concepts with ramifications well into the future. At the operational level of war, the US Army's doctrine now conforms with the position of air power advocates, that actions far beyond the forward line of friendly troops can decide battles and campaigns. Such a concept comes close to agreeing with the air theorists who hold that ground operations may well be subordinate to, and dependent on, the effects of the air campaign.[52]

Aircraft, however, need airfields and supporting infrastructure, and surface forces cannot win without air power, thus air and surface operations have become intimately connected. A modern war can take the form of 'a war for aerodromes'.[53] The Pacific War revolved around the joint force capture of island airbases to allow the ever greater projection of air power to cover further island assaults; the ebb and flow of the Falklands conflict was set by the need to protect and keep operating the Royal Navy's precious aircraft carriers, and prevent the Argentines from operating aircraft in the Falkland Islands.

Air power can so greatly affect the surface battle, that joint forces acting as one now achieve significantly more than surface forces alone and with much fewer casualties. At the operational level the mission for air power is to:

a. wage information war with attacks on operational level C^3I systems,

b. destroy the enemy military force's mobile arm, and

c. prevent the effective employment of enemy operational level reserves.

The aim of these activities is to prevent effective higher level command and control and fix, in both time and space, an adversary's offensive and reserve forces to allow them to be destroyed piecemeal and at lower own force attrition. An adversary loses

[50] Jones, *The Art of War in the Western World*, p 714.
[51] *US Army Field Manual (FM) 100*-5, *Operations*, Washington, DC: Headquarters, Department of the Army, 1993, pp 6-12.
[52] Holder, Major General L.D., US Army, 'Offensive Tactical Operations', *Military Review*, December, 1993, pp 51-52.
[53] Terraine notes this theme through the North African, Italian and Western European Campaigns of the Second World War. Terraine, John, *The Right of the Line: The Royal Air Force in the European War 1939-1945*, Sceptre Books, London, 1988, p 313.

totally his ability to control the nature, or tempo, of a war if he is denied knowledge of the intentions, disposition or movement of the opposing forces. He is unable to reinforce his own forces under attack, and cannot apply force against the enemy. With loss of initiative comes loss of the conflict, and forced acceptance of the victor's terms and conditions.

The effects of modern air power at the operational level of war now allow friendly forces to operate well inside an adversary's decision making cycle. Friendly joint forces employing air power can now operate virtually unimpeded across an opponent's territory, while the adversary is unable to react in any meaningful manner. Friendly forces can make their dispositions, supply and administrative arrangements without any fear of enemy interference - as the televised pictures of long, 'traffic jam' like queues of Allied tanks and mechanised fighting vehicles snaking across Iraqi 'held' territory testify. Allied land forces seemed, and were, remarkably vulnerable to counter-attack but Iraqi forces, victims of modern air power, were powerless to react.

This vision reflects the changed nature of modern air interdiction. Previously air interdiction aimed primarily to delay, disrupt and disorganise an adversary's military activities. However, now and increasingly into the future, the trend is towards air power destroying hostile combat forces.

The ability of modern aerospace surveillance to give commanders a near real-time picture of the battlefield and rear areas allows the precise application of air power where an adversary is most vulnerable, and when an attack will have the greatest impact. PGMs allow the opportunities offered by deep surveillance systems to be exploited. With such weapons, aircraft can successfully engage large naval combatants, hardened land targets, and mobile and stationary mechanised forces on the first pass, every time.

A significant ground battle of Desert Storm in terms of portending the future may have been the unseen battle of Khafji on 22 January 1991. An E-8A JSTARS orbiting over Saudi Arabia detected on sophisticated ground surveillance radar an Iraqi armoured division assembly area deep inside Kuwait. The coupling of this battlefield intelligence with the responsiveness of air power allowed the JSTARS crew to promptly vector attack aircraft into the area and destroy 58 of the 71 vehicles detected. With 82% of the available targets destroyed, the Iraqi attack failed before it began.

Operational level warfare theories and practice in the next century will be heavily influenced by the promise of the integration of near-real-time surveillance and reconnaissance information with fast reacting, PGM equipped air power. However, gaining the maximum utility from such technology calls for rapid decision making based on electronically gathered information whose ambiguities or shortcomings may not always immediately apparent. The accidental destruction of an Iranian Airliner by the *USS Vincennes* may be an omen of future mistakes caused by tightly coupled sensor and weapon systems. Moreover, the abundance of data and the ability to act on

it, day or night in good or bad weather can drive commanders to attempt to maintain constant control at the cost of sleep and acuity.[54]

Vertically integrated intelligence and strike systems can pose significant command and control dilemmas. The coupling of multi-service units, governmental organisations and civilian contractors which such concepts require, can create interconnections that violate traditional military command structures and the smooth flow of authority. A structurally complex command and control system may be unintentionally developed which diverges sharply from the classical military hierarchy devised after centuries of warfare. There may be unsuspected vulnerabilities or problems caused by crossed lines of authority, confusion or ineffective integration of military and civilian decision making. The problems may include a propensity during a time of tension, or conflict, for authority to cascade downwards leading to unintended military actions and difficulties terminating hostilities.[55] Making the full use of the tight coupling of near-real-time surveillance and reconnaissance information with PGM equipped forces will require new command and control concepts and structures.

A second Desert Storm operation rich in portents was the envelopment and entrapment of Iraqi forces by the airborne formations of XVIII Airborne Corps. 101st Airborne Division in concert with the French Fifth Attack Helicopter Regiment moved faster, captured more enemy territory, and bought about the surrender of more enemy forces than any comparable land force in history. From its pre-attack assembly area, the air cavalry moved more than 1150 kilometres to block the escape routes of the Iraqi Army from Kuwait.[56]

An analysis just before Desert Storm showed that over the last four centuries, the rate of advance of ground forces has changed little despite the invention of the internal combustion engine. Under combat conditions, mechanised and infantry forces generally advanced only about five kilometres a day,[57] even under most favourable conditions mechanised forces were unlikely to cover more than 70 kilometres a day.[58] By comparison, XVIII Corps advanced almost 320 kilometres a day.

The use of heliborne forces during Desert Storm in deep operational manoeuvre operations confirmed the late Brigadier Richard Simpkin's belief that a new form of warfare is emerging with helicopters causing a 'rotary wing revolution' because of two key elements. The first is the ability to use ground tactically without relying on it for mobility; the second is an operational tempo significantly faster than conventional

[54] Cohen, Eliot A., 'The Mystique of U.S. Air Power', *Foreign Affairs*, January/ February 1994, pp 113-114.
[55] Such difficulties have been succinctly analysed in Bracken, Paul, *The Command and Control of Nuclear Forces*, Yale University Press, New Haven, 1983, pp 215-229.
[56] Kennedy, Colonel William V., U.S. Army Reserve, 'The Tank Is Dead: But the Cavalry Lives On', *US Naval Institute Proceedings*, November 94, p 51.
[57] Helmhold, Robert L., *Rates of Advance in Historical Land Operations*, U.S. Army Concepts and Analysis Agency, June 1990, pp 1-9.
[58] Van Creveld, Martin, *Supplying War: Logistics from Wallenstein to Patton*, Cambridge University Press, New York, 1986, pp 234-235.

surface forces are capable.[59] Bundeswehr General von Senger und Etterlin considers the widespread use of helicopters will utterly change surface warfare. He noted:

The many advantages offered by this new dimension would include a ten-fold increase in deployment speed compared with any given land weapon system or formation. There would be an almost unlimited capability to disperse in the depth of a theatre or region whilst on the move and on the battlefield itself. Compared with land mechanised forces, there would be a superiority in the capability to concentrate firepower quickly.[60]

Several factors are important to deep operational level assaults including accurate operational level intelligence, achieving a critical mass appropriate to the operation and sustaining heliborne and motorised mobility throughout the depth and duration of the attack. Limiting heliborne deep assault is the vulnerability of helicopters to surface-based air defence systems, the essentiality of gaining air superiority, and the difficulties in sustaining logistics. The latter is likely to prove the Achilles heel of deep heliborne manoeuvre, unless genuine heavy lift helicopters are available in adequate numbers.[61]

Tactical Level Air Power Application

At the tactical level, combat is becoming more dynamic with an increasing tempo; well-defined front lines are disappearing and warfare is becoming non-linear. Surface forces are becoming increasingly mobile allowing them to fight and move inside an opponent's decision making cycle. The cost of high mobility is that such surface forces generally have reduced organic fire support, but air power in providing close air support offers some possibilities in making up this shortfall.

Close air support is not a specific role only of a particular aircraft type, but rather a function able to be undertaken by any aircraft, fixed or rotary wing; all that is necessary are good procedures and adequate communications. Air power can bring overwhelming firepower to a battle, but this firepower must be correctly placed at the crucial time. Friendly air power in a non-linear war can pose a significant risk to friendly forces unless proper doctrine is in place. Close air support in the next century is likely to fall into three major categories:

a. Large scale operations planned in detail by operational level headquarters to concentrate massive firepower at a decisive breakthrough point in the surface battle.

b. Special operations extending over a longer period of time to provide protection and support of a particular surface formation.

[59] Simpkin, R., *Race to the Swift***:** *Thoughts on Twenty-First Century Warfare*, Brassey's Defence Publishers, London, 1985, pp 120-121.
[60] von Senger und Etterlin, General Dr. F.M., *The Battlefield Helicopter: Mobility and Firepower*, Extract from 1983 Presentation, *RUSI Journal*, April 1994, p 27.
[61] Dempsey, Col Thomas A., U.S.Army, 'On the Wings of the Storm: Heliborne Manoeuvre during the Gulf War', *Defense Analysis*, Volume10, Number 2, pp 174-178.

c. Unsung, unheralded specific missions, scheduled or on call, flown in response to the daily requests of surface commanders.[62]

The role of armed helicopters in providing light, but timely and intimate, fire support appears set to be enlarged significantly in the forthcoming decades. Helicopters can operate well forward and conduct day and night, all weather operations closely integrated with friendly surface force activities. By comparison, fixed wing aviation inherently has problems working in close coordination with the lower level commanders of local surface forces on a regular basis.

Relatively small heliborne combined arms teams can exploit the shock and surprise of fast moving forces to envelop and overwhelm much larger concentrations of well-equipped, dug-in enemy troops. Air assault formations of attack helicopters, heliborne infantry and artillery, and close air support aircraft can rapidly concentrate fire, and when necessary ground forces, at the right time and place. Analysis of Desert Storm operations suggests that the agility and tempo of heliborne combined arms teams on the tactical battlefield may be able to defeat the weight of armour and firepower associated with mechanised heavy land forces.[63] Perhaps, indeed, 'the tank is dead, ... as dead as the horse cavalry that preceded it, ... [the victim of the] devastating effectiveness of precision guided munitions and ground attack aircraft like the AH-64 Apache ...'.[64]

As well as greater use of helicopters, surface forces are likely to become equipped with long range missiles allowing the fire support of distant formations. Tactical Missile Systems may allow artillery units to support infantry battalions more than 100 km away; Tomahawk cruise missiles can engage targets hundreds of kilometres from the launch point. Such over-the-horizon weapons place a premium on C^3I requirements, but may provide a more timely response to changed tactical conditions than fixed wing close air support.

Military aircraft were born at the start of this century and their use has expanded exponentially until, for the West, combat operations are almost unthinkable without them. In the next century, all the indications are that aviation will become increasingly more important as armies and navies race to expand their aviation arms to allow them to undertake the traditional combat functions of surface forces more effectively. At the tactical level, aviation may become the dominant combat arm of surface forces by the middle of the 21st century.

THE CONTOURS OF FUTURE WAR

The nature of the next conflict is impossible to predict precisely, but the way the conflict may be fought is more certain, for the methods to be employed are part of the history of Western civilisation. In the early part of the next century the West will still seek to make wars decisive and undertake conflicts accordingly. The use of

[62] Cooling, Benjamin Franklin, *Case Studies in the Development of Close Air Sup*p *ort***,** Office of Air Force History, US Government Printing Office, Washington, 1990, p 2.
[63] *ibid*., pp 166, 176.
[64] Spurgeon, Major H.L., U.S. Army, and Crist, S.C., Armour, January-February, 1994, pp 12-14 quoted in Kennedy, 'The Tank Is Dead: But the Cavalry Lives On', p 53.

numerically small professional military forces, rather than mass militia forces, will continue to increase together with an emphasis on the application of advanced technology.

These features are in harmony with the emerging future combat environment where there may be quite diverse conflict styles from one region to another, and winning a conflict, not just fighting one, is now possible. The era of winnable, niche warfare means the future for western force structure is with heterogenous, joint forces rather than with large homogenous forces offering only single-dimensional capabilities. Such forces, when employed using manoeuvre warfare concepts at the tactical and operational levels of war, will allow Western nations the political option of a decisive war. The mobile arm of joint forces conducting such wars, in at least the first half of the next century, seems to be air power.

The focus of future wars will be on defeating an enemy rather than simply holding ground. The operational level concepts of dispersed advance which aim to permeate and dominate areas rather than capturing terrain or lines of advance seem promising. An adversary's actions will be paralysed and negated, rather than his armed forces being progressively crushed in a war of attrition. In such wars of manoeuvre the sub-strategy of information war has a particularly important place.

Air power concepts must be both appropriate to the Western way of war, and fit the combat conditions of the new century. The focus of strategic level air operations will increasingly be on engaging the opponent's national C^3I system with the aim of paralysing the political-military establishment. At the operational level, the application of air power will aim to paralyse and destroy an adversary's combat forces preventing him from effectively applying military force, using manoeuvre forces and adequately responding to friendly force activities. At the tactical level, air power will aim to destroy an opponent's forces and compensate for the declining organic fire support available to friendly surface forces as they become more mobile. With the proper air power concepts, the potential and perceived threat from small, high quality forces can be disproportionately large. An opponent may terminate the conflict convinced he is trapped and powerless to reply to the military threat he faces.

CODA

The stunning success of the Allied forces during the Gulf War was primarily the result of being ready for the right war at the right time. Allied forces were well-equipped with well-trained and highly competent personnel. The reason these forces were available was because of the recent finish of the Cold War. Without the threat of conflict Western forces are unlikely to maintain, or be allowed to maintain, the force structures and professional personnel to allow quick, low cost victories.

The end of the Cold War also means the finish to the long series of European civil wars dating back many centuries, but which honed Western forces to an edge without equal in the remainder of the world. Without the constant threat of intra-civilisation conflict the military forces of Western nations are likely to atrophy, at least to some extent. Without an immediate, apparent need, why devote resources, in all senses of the word, to such a costly area of government expenditure?

As Lord Rutherford once observed, without money we have to think more. Western military forces will need to devote particular attention to devising and maintaining leading edge military concepts which offer the promise of effective combat operations if warfare re-occurs at a later date. In many respects, re-equipment can be completed, if the national will is present, comparatively quickly. Developing the war-winning concepts to apply new equipment most effectively can be far more difficult.

Western military thought must not become fixated on the past. While history can teach lessons, military concepts need to keep abreast of an increasingly dynamic world and its demands. To maintain the necessary edge in future conflicts the West must in warfare, as in economic life, pick and choose from world best practice.

Other civilisations will be conducting wars, Western military thought must incorporate lessons from these which are appropriate to Western culture. The military thought of the West has a strong heritage of successfully adopting the concepts of other civilisations which have demonstrated superior combat skills, particularly those concepts arising in Central Asia. As John Keegan eruditely observed:

A long telescope allows us to see that the fighting powers of the Europeans who waged the nineteenth-century opium wars against China had been sharpened long ago and far away by their ancestors' encounter with the Manchu's horse people ancestors. The European armies of the age of imperialism owed one pillar of their efficiency to a principle established off the steppe: that of bureaucratic organisation, founded in Sumer and Assyria, translated through Persia to Macedon, Rome and Byzantium, and artificially revived from the classical sources at the Renaissance. They owed another, that of commitment to the pitched battle, to the Greeks. All the others - long range campaigning, high speed manoeuvre on the battlefield, effective missile technology, the application of the wheel to warfare and, above all, mutuality between horse and warrior - had their origins on the steppe and its borderlands.[65]

The successful incorporation of the military thought of other Civilisations within the strategic, operational and tactical doctrines of the West has served us well in the past. Between the end of the Peloponnesian War in 404 BC and the accession of Alexander the Great in 336 BC, a military revolution swept the Greek world and produced one of the finest armies in the ancient world. The military revolution owed much to intelligent fusion of Persian military concepts and arms with the best of Greek military institutions.[66] Such strategic plagiarism may serve the West well again in this time of 'deep peace'.

[65] Keegan, John, *A History of Warfare*, Hutchinson, London, 1993, p 216.
[66] Ferrill, *The Origins of War: From the Stone Age to Alexander the Great*, pp 149-150.