

Land Warfare Studies Centre

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DISTRIBUTED MANOEUVRE: 21ST CENTURY OFFENSIVE TACTICS

by

Justin Kelly and Mike Brennan

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Comment on this paper is welcome and should be forwarded in writing to:

The Director, Land Warfare Studies Centre
Ian Campell Road, Duntroon ACT 2600
AUSTRALIA

Telephone: (02) 6265 9890

Facsimile: (02) 6265 9888

Email: <lwsc.publications@defence.gov.au>

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About the Authors

Justin Kelly retired from the Australian Army in 2007 as a Brigadier. An Armour officer, his last postings in Australia were Director General of Future Land Warfare in Army Headquarters and Commander of the Land Warfare Development Centre. His operational appointments included command of the Peace Monitoring Group on Bougainville, deputy command of the UN peacekeeping force in East Timor and Director of Strategic Operations in HQ MNF-I. He is a graduate of the Royal Military College Duntroon, Royal Military College of Science (UK), Army Command and Staff College, Joint Service Staff College, and US Army War College.

Mike Brennan currently holds the appointment of Director General Simulation in the Australian Department of Defence. His recent appointments include periods as Research Leader Human Systems Integration within Australia's Defence Science and Technology Organisation and Scientific Adviser – Army. He has a PhD in Physics from the Flinders University of South Australia, and was attached to the USMC Warfighting Laboratory during 1998–99.

The authors have collaborated for over a decade on aspects of capability and concept development and in the development of the Australian Army's military experimentation system.

Preface

This paper comes after a decade of collaboration between the two authors—a soldier and a scientist—on aspects of capability development. It was written as a result of an afternoon of discussion about the implications of the 2006 war between Israel and Hezbollah for capability development and became a mature draft shortly before the Israeli incursion into Gaza in 2009. Had the original discussion been directly recorded and transcribed, the afternoon’s discussion—a discourse/tutorial on the interplay between tactics and technologies—might have had the title ‘It is still about lines and columns’. However, it quickly became evident in our discussions that this treatment had little merit as a framing guide—alternative frameworks of equal value could be offered (e.g. fire and manoeuvre). Noting the aspects of our approach, however, what emerged was an observation that the evolution of tactics has seen a continuous dilation of the ‘defensive line’, in both breadth and depth, and that this has simultaneously reduced the opportunities for the ‘offensive column’ to manoeuvre around it, while increasing the difficulty of penetration. As a result, noting the 2006 war, probably at no time since 1916 has the defence had the wherewithal to be so clearly dominant over the offence.

Capability development seeks initially to identify the implications of technological and tactical innovations that might shape land combat. The past decade has seen some technological opportunities taken up and others declined by the soldiers of the world. In approaching this paper we have ‘re-discovered’ that the current state of tactics is marked much more strongly by evolution than by revolution, and that there is only a small handful of attributes that defines the tactical possibilities of any and all eras. Invariably, tactical innovation has been shaped not by the emergence of some new technology, but by the thoughtful combination of a number of more or less ‘existing’ technologies. One can infer that for every technological advance, a tactical countermeasure has been (or will be) found.

Because of the variety of technological and social conditions that prevail in different countries and groups, waves of military innovation tend to have a jagged leading edge and impact at different times on different groups. In the Darwinian competition to survive and prosper, early-adopters (of technology) and early-adapters (to changed circumstance) tend to enjoy an important advantage. The extent to which this advantage is fleeting is determined by the extent to which early adaptation becomes a normal mode of existence for militaries—whether they belong to a nation-state or not.

The paper explores a thread of logic in land combat, established over a decade, but examines only a few points. First, throughout modern land warfare, advances in technology have offered a fascinating, but fleeting opportunity to develop a capability edge. The constant evolution of tactics is shaped by the thoughtful recombination of technologies in response to equally thoughtful, but earlier combinations. Second, the paper examines a contention that tactical innovation for mid-intensity land combat has slowed, stalled or stopped, with the last innovation lying in the hands of non-state actors who can now deploy defences in a fashion and of a power that was, until recently, the exclusive domain of the nation-state. The implication is that the current fascination with counterinsurgency is masking this reality from due attention. Third, solutions to these challenges can be assembled from what has gone before. Finally, these challenges demand the development of new tactics for combined arms teams to restore striking power to the tactical ground offensive. In considering the implications of the 2006 Israel and Hezbollah war for our own capability development, it has been necessary to review the crucible of the capability development of NATO (and Warsaw Pact) forces—the strategic and tactical environment of Western Europe. In this paper, we have taken this view, as it is easily translated into Australian Army capability thinking.

In providing comment on this paper during development, some of our colleagues have mused on the consideration that the analogies made and some conclusions may have broader application to Naval and Joint warfare. To the extent that the concepts argued herein are valid and extensible, a broader treatment would require a small book, requiring concurrent treatment of tactics, the operational art and military strategy.

Rather than addressing the broad, the paper is instead aimed squarely to inform an interested readership concerned with capability planning for land forces; though it is hoped that the professional soldier and some deep technology scientists will draw something from the paper, if only as a basis for discussions between practitioners of the art and the supporting sciences. As a ‘conversational tutorial’, we have involved the work on Distributed Operations of our collaborators from the USMC Centre for Emerging Threats and Opportunities. Additionally, we offer thanks to the many others, unacknowledged, who have acted as tactics instructors and technology advisors.

Introduction

Warfare reverted to a primeval scrimmage where brute bravery and fox-like cunning on the part of individuals or groups won the day.

– Ashmead Bartlett
The Times, 1905

Even a superficial review of the historical record demonstrates that warfare has been changing. The constant search for asymmetrical advantage over an enemy will ensure that it continues to do so. However, the future is unknown and the task of anticipating and preparing for even the next step, let alone subsequent steps, in the evolution of warfare is exceedingly difficult. The bookshelves of those involved in this process are usually crammed with the products of experts explaining this innovation or that, and proposing that a period of great change is upon us. At times these periods of great change are characterised as revolutions. The nature of revolutions is that they engender change that is so rapid as to be, in practice, discontinuous and so the task of prognostication becomes especially fraught. As a result, in the development of land combat forces, there is a litany of technological and tactical blind alleys that have resulted from guesses proved wrong by the advance of time, or more commonly through trial by ordeal on the battlefield. Although looking for what is changing over time is essential, looking at what is not changing can arguably provide the best conceptual foundations upon which to launch ourselves into the future. In particular, if it is possible to identify what is not changing, or perhaps slowly evolving, the areas that do change, and what needs to be done about them, should become clearer.

While the application of technology to warfare has introduced some notable temporary marked advantage for the early adopter, the evolution of tactics is marked by very strong continuities that invalidate notions of revolutions in military affairs. These continuities lie in the nature of tactics and they form the framework within which technological, organisational and tactical innovations have been found to succeed or fail. By following these continuities it is possible to understand why contemporary tactics are as they are and what their next evolutionary step might be.

Through time, the ebb and flow of technical and tactical innovation has occasionally created situations in which tactics have been 'broken', in that the array of tactical actions available were unable to contribute collectively to a strategic decision. By examining the evolution and interplay of defensive and offensive mechanisms, and

the role of technology in the evolution of basic tactics through modern warfare, taking the European theatre as a crucible for development, this paper argues that such a situation prevails today. In particular, nations are arriving at a situation in which the array of tactical options available to modern armies is not able to provide useful tools to strategists. To do this, the paper begins at a most basic level, to lay bare the fundamentals and provide a commentary on how these have been built upon. The paper highlights key historical examples and strategic problems to describe the maturation of the 'distributed defence' and examines how this sort of tactical defence became a strategic tool of Hezbollah in 2006 as a quasi non-state actor. The paper concludes with a discussion of what an army, forced into the offensive against a distributed defence, must do to prevail tactically (and therefore strategically). This conclusion should act as food for discussion for practitioners and technologists alike—for there is much to do.

This failure of tactics to serve strategic ends has been experienced before, notably in the First World War. It results in wars of exhaustion, where victory belongs to the side best able to endure the attrition of men, materiel and time. Such wars highlight one of the perceived vulnerabilities of contemporary Western societies. Accordingly, it would be reasonable to expect situations to arise in the future, provoked by putative enemies, that are less than tolerable, but not enough to fully mobilise the passions of Western populations. These enemies would seek to exhaust the West's attention span and provide opportunities for influential media to invoke the horror of 'Quagmire'. Resolution of this type of war, as much as any other, requires tactics that are genuinely useable by strategists. Such tactics would provide the prospect of decisive outcomes at a reasonable cost. 'Reasonableness' has to be measured against the unique context of any specific war, but would likely involve quick resolution with minimal casualties. There is a body of evidence to suggest that the tactical options the West has available today are manifestly inadequate when measured against this yardstick. When they failed previously, tactics recovered—usually through the innovative combination of organisations, technologies and techniques. Again, this paper argues that the bases of a recovery are available today if they can be thoughtfully assembled.

Strategy and Tactics

Strategy proposes but tactics disposes.

– Colin Gray

All strategic planning rests on tactical success alone and ... whether the solution is arrived at in battle or not—this is in all cases the basis for decision.

– Clausewitz

Having proposed above that the evolution of tactics is key to understanding what in warfare is constant and what is ‘revolutionary’, it is necessary that tactics be seen in their proper context. Although militaries are traditionally trained in the tactical, operational and strategic arts separately and at different career maturities, examination of decisive events in war does not lend itself to analysis by levels and, to be understood, needs to be viewed in the round. In this vein Scharnhorst noted ‘one must habitually consider the whole of war before its components’.¹

Noting the inseparability of ‘the levels of war’, the context for the tactical battlefield is set in an understanding of the strategic. In discussions of strategy the idea of the Ends–Ways–Means continuum provides a good starting point.² In this continuum, strategy sets the ends to be achieved. Strategic ends are invariably abstract; that is, they deal with political outcomes that are the results of group psychology, such as ‘regime change’, coercion, compellence or deterrence. At the other end of the continuum—Means—is tactics, which applies localised physical measures to achieve concrete changes in the actual situation at a time and place. Although tactics must serve strategy, strategic ambitions are necessarily subject to tactical possibilities, and

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- 1 Herbert Rosinski, ‘Scharnhorst to Schleiffen: The Rise and Decline of German Military Thought’, *Naval War College Review*, Summer 1976, p. 85. At the same time it is true that one cannot understand the whole of war without an understanding of its constituents, and especially the relationship between those constituents.
 - 2 The notion of a continuum is used here for convenience but at the risk of perpetuating an error. Art Lykke in an influential article in 1989 described strategy as consisting of *ends*: objectives towards which one strives; *ways*: courses of action; and *means*: instruments by which some end can be achieved. So rather than a continuum cascading through the levels of war, strategy rightly consists of ends *and* ways *and* means so that the ways and means are nested within the ends rather than enjoying an independent existence. A F Lykke, ‘Toward an Understanding of Military Strategy’, *Military Review*, May 1989, p. 3.

the interplay between ends and means is a two-way conversation between the abstract and the physical. Strategy without tactics is words without actions, and tactics without strategy is senseless violence.

Since Napoleonic times, on occasion, the scale and geographic spread of war has created situations in which the intimacy of the relationship between strategy and tactics became unacceptably stretched. To recreate the closest possible connection there arose the idea of 'operational art', which is the art of sequencing physical tactical actions in order to achieve abstract strategic ends. Operational art mediates the conversation between strategy and tactics and aims to set the physical conditions deemed most likely to achieve the abstract ends of strategy. While noting the mediating role of operational art, it is important to recognise from the outset that the ultimate measure of the utility of tactics, and by extension the capabilities used in the tactical battle, is the extent to which they are able to serve strategic ends.

Lines and Columns

In seeking the simplest method of explanation, one can explain the inter-relationship between 'lines' and 'columns' as the basic mechanism of tactics. It is universal, has been continuous since pre-history, and remains evident even on the relatively formless battlefields of today. Picturing a nineteenth century battle can help visualise it for the uninitiated. Lines consist of soldiers standing shoulder to shoulder. Their frontage is proportionately greater than their depth. Because they enable a large proportion of those present to point their weapons at the enemy, lines maximise the firepower produced by the army. They are, however, relatively difficult to move and manoeuvre, and are relatively vulnerable at the flanks because they can produce only a very small proportion of their fire in that direction. Lines are essentially defensive. Columns, on the other hand, consist of men arrayed in files with a frontage that is smaller than their depth. Columns enjoy the advantage that they are relatively easy to manoeuvre, being able to 'follow the leader' to more readily overcome terrain obstacles and spending less time and effort in maintaining formation. Columns are an essentially offensive formation. The drawback of columns is that, because their frontage is small, only a few can point their weapons at the enemy and so they have limited firepower relative to that of the equivalent mass of nineteenth century soldiers in line.

Offensive tactics use the speed of movement of a column to flank or penetrate the opposing line. Once this has been done, the relative firepower advantage of the line is removed. By performing a simple left or right turn, the column can transform itself into a line and use the resulting firepower advantage to create a gap through which cavalry or other forces can overcome the enemy position. This mechanism has been in place since at least the times of Alexander the Great—albeit with pike power replaced by firepower—and remains in place today.

These fundamental interactions are amply demonstrated throughout history, but two specific examples—Leuthen (1757) and Desert Storm (1991)—are suitable bookends. At Leuthen the Prussian Army, which was on the offensive, was confronted by a markedly larger defending Austrian force. The Prussians, in line, feinted at the Austrian right, causing them to move their reserves to support it. The Prussians then right turned to form columns and marched towards the Austrian left. By speed of manoeuvre and skillful use of terrain they arrived at the Austrian left flank before the Austrians could develop a stable line facing in that direction. As a consequence, the Austrians' strength was unhinged and they were forced to abandon their positions. In Desert Storm, the famous 'end-run' resulted from a sharp sidestep by the Coalition force that moved its strength to a part of the Iraqi line that was comparatively weak. Having penetrated the line at that point, the Coalition column moved to threaten the Iraqis' lines of communication in south-eastern Iraq, forcing them to abandon their positions in Kuwait.³

Since Alexander's time there has been steady improvement in the weapons used by armies. The incremental steps from pike to musket, to better musket, to rifle, to machine-gun, have steadily increased the range and lethality of fire. The challenge is that these improvements have been applied to both offence and defence equally, with the result that the strength of the 'defensive line' has grown more rapidly over time than has the strength of the 'offensive column'. Consider, for example, a line of 100 men with a frontage of 100, in a battle against a column of 100 men with a frontage of, say, ten. If we double the firepower of both groups equally, the line becomes able to produce 200 fire units compared to the column's twenty. Over time, this increase in the marginal advantage of the line enabled it to begin to offset some of its vulnerabilities, by gradually lengthening in order to put its flanks beyond the reach of a marching column. At the same time, the impact of other vulnerabilities of the line—the seams

3 Both are examples of what Liddell Hart called 'dislocation'. In this case both the local penetrations made the relative firepower advantage of the line, as a whole, irrelevant.

between units or areas of concealment immediately in front of them—could be at least partially offset by the enhanced coverage provided by weapons with greater range, accuracy and lethality.

Other improvements in weaponry have had a similar effect. The cannon was initially a direct fire weapon that provided a means to reach out further than a musket and which was used to strengthen the line. Because they mostly had to be towed around by horses, unlimbered, and brought into action before becoming effective, cannons did not magnify the power of the column as much as they did that of the line.

By the time of the Boer War (1899–1901), the same defensive line had become so strong compared to the offensive column that, at Colenso in December 1899, 4500 Boer rifleman, with a handful of guns in support, were able to extend their line over a frontage of some 12,000 metres while remaining impervious to attempts by 16,000 British troops to penetrate their position.⁴

This discussion raises the basic paradox of tactics. Defence has essentially a negative purpose—it is about resisting the impulse of the enemy and, in normal circumstances, unless an enemy is willing to cooperate by battering himself to death against a line, defence itself cannot lead to a decision. The strength of the line compared to the column, however, means that it is stronger than the offence. The offence, on the other hand, has a positive purpose—being able to deliver a decision without the cooperation of the enemy—but relies on the actions of relatively weak columns. The result of this interaction of lines and columns is that, unless some other factor intervenes, the positive purpose of the column is overwhelmed by the strength of the line and stasis results.

Clearly, throughout history stasis has not been the norm, and an array of other factors—surprise, miscalculation, chance, uncertainty and friction—which we may collectively take as comprising opportunities for ‘manoeuvre’, intervene to provide the side with the initiative the opportunity to overwhelm an enemy’s line. If these other factors do not arise, however, stasis does indeed result, as was demonstrated on the Western Front of the First World War.

⁴ J F C Fuller, *Decisive Battles of the Western World, Volume 2: From the defeat of the Spanish Armada to the battle of Waterloo*, Eyre & Spottiswoode, London, 1954–56, Editor’s Note #4.

The Search for Solutions to Stasis on the Western Front

A nation's existence depends upon the uninterrupted continuation of trade and industry, and a quick decision is necessary to start the wheels of industry moving again. A strategy of attrition is impossible when the maintenance of armies of millions requires the expenditures of billions.

– von Schlieffen

The Schlieffen Plan, which shaped the manner of the German invasion of France in August 1914, sought to send the attacking column, thirty-six corps strong, through neutral Belgium, effectively outflanking the defending French line and invalidating its strength. For a number of reasons the German column was unable to complete this manoeuvre and, by early October 1914 the two sides had come to a halt—each unable to muster the strength to move forward. As the front stabilised, the ‘collective shovel’ came into play and a continuous line of entrenchments ran from the English Channel to the Swiss border. The lack of an assailable flank, or of apparent areas of sufficient weakness in the opposing lines, seemingly removed opportunities for manoeuvre; the strength of the defensive lines overwhelmed the positive purpose of attacking columns and stasis resulted.⁵

Put simply, the problem was that the technological improvements to weapons had strengthened the defensive line far more than it had the attacking column. In combination with the size of the armies resulting from national mobilisations, this created a defensive strength that presented few apparent vulnerabilities. As a result, the negative purpose of the line overwhelmed the positive purpose of the column, tactics could not provide the means to achieve strategic ambitions, and a stalemate developed.⁶ The frantic search for tactical combinations to overcome the power of the

5 The discussion of events in the First World War is based on the following works: Timothy Lupfer, *The Dynamics of Doctrine: The Changes in German Tactical Doctrine During the First World War*, Combat Studies Institute, Fort Leavenworth Kansas, 1981; James S Corum, *The Roots of Blitzkrieg*, University of Kansas Press, Lawrence, Kansas, 1992; and Johnathon Bailey, *The First World War and the Birth of the Modern Style of Warfare*, Strategic and Combat Studies Institute Occasional Paper No. 22, Camberley, Surrey, 1996.

6 One of the results of this stalemate was the adoption of a strategy of exhaustion by the Entente Cordiale which rested on a perception of the relative economic and demographic strengths and was intended to merely bleed Germany into submission. In retrospect this very nearly failed and,

line and restore the utility of tactics arguably made the First World War the period of the most rapid technological and tactical change in military history.

In the face of the defensive power of an entrenched line it was apparent that the striking power of the offence needed to be augmented if it were to achieve any significant penetration. Augmenting striking power by supporting the offence with artillery was already a common practice. It was understood that if attacking infantry were to overwhelm the defensive line, it was essential that artillery support be used to destroy the defender's artillery, fighting positions and machine-gun emplacements. In practice, this required heavy guns in large numbers and huge quantities of ammunition. The difficulties of moving heavy guns and their ammunition while maintaining communications proved to be substantial, and made all the more difficult because the artillery eventually had to move forward over the ground into which it had just fired. As a result, experience showed that artillery was unable to support the infantry beyond the initial range of the guns. Beyond this range, to maintain forward momentum with only the firepower of rifles and light machine guns, attacking infantry had to move in large, concentrated groups.

In contrast, the innate strength of the defensive line meant that, even if most of the positions had been destroyed by enemy fire, the few remaining were often enough to sufficiently slow the progress of the attack. This would allow the defending artillery, firing from beyond the range of counter-battery fire, to inflict severe casualties on the massed attackers. As a result of these casualties, the attack became weaker and less coordinated as it progressed, while the defenders were accorded time to move additional forces to the point of the attempted breakthrough. Consequently, attackers found themselves fighting through what was, in effect, infinite depth, with a deteriorating force against a strengthening enemy. Few such attacks were successful.

As this new reality of warfare continued, both sides learned more about it. For the defence, the importance of depth was immediately apparent and, over time, both sides greatly increased the distance through which an attack would need to penetrate a deep line to achieve a degree of success. For the Germans, this led to the adoption of the 'elastic defence' based on strong points, distributed through the defensive zone in preference to the linear trench-based defence of the British and French. Based on this

without US intervention, probably would have. As a rule such strategies tend to be strongly reliant on perceptions of how the enemy polity might evolve over time and are therefore inherently fraught with risk. They are best used by the weak, such as the Confederacy in the US Civil War or Hezbollah confronting Israel.

experience, the Germans took elastic defence into their post-war doctrine and hence into the Second World War.

Despite technological advances in artillery and improved coordination between artillery and ground forces, the fundamental challenges faced by the attacker remained largely insoluble. As a result, although the duration and intensity of artillery preparation prior to an attack increased throughout the war, the defending line retained its advantage over attacking columns until the end. Attempts to find ways to provide the attacking column with enough striking power to maintain forward momentum through the defensive zone at a speed that would offset the defenders shift of forces was a major driver of innovation. Two of the most important were the introduction of the tank by the Allies and the development of ‘Storm Troop’ tactics by the Germans.

Both of these attempted to solve the problem of increasing the comparative striking power of the column—but in different ways. The tank was based on the simple premise that if artillery could not provide sufficient support to attacking forces, they would have to take that support with them. The tank enabled some of the power of machine-guns and artillery to be advanced in conjunction with attacking infantry.

Storm Troop tactics were an altogether more lateral approach to the problem. In these new tactics, small groups of around seven men replaced the much larger eighty-man platoons that had been the standard manoeuvre element. Each of the men in the storm sections were specially trained and the group more heavily armed with flamethrowers, grenades and automatic weapons, than were standard infantry. The small agile groups and heavy weapons meant that Storm Troops did not present a large massed target for defending artillery, yet had the combat power to deal with defensive strongpoints where necessary. At the same time, it was intended that they would move swiftly, flowing around strong-points, to develop the attack into depth faster than the defender’s adaptive mechanisms could counter.⁷ This would push the defending artillery away from the penetration, reduce the cohesion and strength of the line, and thereby set the conditions for the following conventional troops, who had the tasks of reducing the strong-points and exploiting the penetration that had been initiated.

Both of these innovations proved to be important, but neither was crucial to the outcome of the war. In the end, tanks were neither plentiful, nor reliable enough to

7 To allow this kind of fluidity it was necessary to devolve responsibility for decision-making down to the squad level. This was facilitated by a number of simple, widely understood decision rules. As far as can be ascertained there was no corresponding willingness on the allies’ side to allow section commanders to decide to either attack or not.

provide the means for a decision before German counter-measures in the form of weapons and tactics began to appear. In the case of Storm Troops, while they achieved substantial success at the local tactical level, their endurance was insufficient to carry their impact into significant depth. In the end, the power of the defensive line remained more than a match for that of the attacking column.

The stasis on the Western front was finally broken with the Michael Offensive (or 'Kaiserschlacht'⁸) of March to June 1918, in which a massive German offensive, led by Storm Troops, blew gaps in the allied lines. Although this recreated the conditions for manoeuvre on the Western front, the effort involved exhausted the attackers before they were able to push the issue to a decision and they smashed their strength against the anvil of a weakened but sufficiently intact allied defence. The extent of this effort so weakened the German Army that it was never able to re-establish a continuous defensive line—leading to its eventual defeat.

The example of the First World War is important because it demonstrates many important ideas. The technological conditions under which the First World War was fought were not a surprise to anyone. The magazine rifles, machine-guns, smokeless powder, improved artillery, barbed wire, mines and entrenchments had all been assimilated into the thinking of the armies of the time. Both sides recognised that a decision rested on the offensive, and therefore developed doctrine that emphasised the importance of the offensive. However, the size of the armies engaged and the failure of the initial German and French offensives led to the stabilisation of the line, and it was only then that the problems with the tactics of the time were fully exposed. Because the defensive lines proved to be massively stronger than the attacking columns, the positive purpose of the offence was overwhelmed by the negative purpose of the defence. As a result, tactics could not provide useful options towards strategy—stasis resulted and a war of exhaustion ensued.

8 'Kaiserschlacht' would today be translated as 'The Mother of All Battles'.

Blitzkrieg

In the immediate aftermath of the First World War all of the belligerents sought to analyse and distill the lessons that it offered. The French confidence in the offensive had been shattered during the war and France settled for a defensive doctrine that anticipated the close cooperation of all arms in a tightly defined defensive zone. The approach they chose was entirely reasonable given the constraints that were placed upon them at the time.⁹ The British came to the conclusion that large-scale commitment of land forces to European wars was a bad idea and sought alternatives, and the Germans developed what was to become known as Blitzkrieg.¹⁰

The German analysis of the lessons of the First World War was comprehensive, marked by great objectivity and engaged a relatively large proportion of the rump of the German profession of arms.¹¹ Although the ‘stab in the back’ theory held credence in some sections of the military and population, the majority of the army accepted that it had been beaten on the battlefield and sought to identify how that could be avoided in the future.¹² Clearly, Germany’s fundamental strategic problem of managing a two-front war had not changed, and the conclusion that only a rapid victory on at least one of them could resolve this problem remained in place. The achievement of this rapid decision relied on the offensive, and so they sought an improved offensive doctrine. This pre-disposition was reinforced by the German experience on the Eastern and Italian fronts in the First World War, where offensive manoeuvre had remained viable and where numerous examples of successful offensives were recorded.

9 Elizabeth Keir, *Imagining War: French and British Military Doctrine Between the Wars*, Princeton University Press, Princeton, 1999 is a good discussion of how the French arrived at their doctrine.

10 According to Matthew Cooper, *The German Army 1933–1945*, MacDonald and Jane’s, London, 1978, p. 116, ‘Blitzkrieg’ was not a German doctrinal term but was seemingly coined by *Time* magazine on 28 September 1939, which used it to describe the type of war fought by the Wehrmacht in Poland.

11 The German Army maintained a level of independence from its political leadership that enabled it to comply minimally with the demands of the treaty of Versailles while working vigorously to prepare for the time at which that would no longer constrain its actions. Therefore, although the treaty denied it tanks, combat aircraft and heavy artillery, the use of all of these was included in the Army’s doctrine. James, in *The Roots of Blitzkrieg*, provides a detailed description of this process and its results.

12 The ‘Stab in the Back’ refers to the proposition that the German army had not been defeated on the battlefield but by political and social collapse in the rear.

Storm Troop tactics had demonstrated that penetration of a fully developed defensive zone was possible if small agile groups could be provided with sufficient striking power. However, the problem that had been demonstrated during the Michael Offensive was that these groups lacked the endurance and mobility to turn a local tactical success into something operationally or strategically significant. Here the German experience of countering Allied tanks in the First World War was instructive. Tanks seemingly offered the ability to take the fundamentals of Storm Troop tactics and sustain them through the depth of the defended zone and into the undefended territory beyond. At the same time, the problems of sustaining artillery support beyond the initial range of the guns was to be countered by the use of aircraft in close support of the attacking forces. To maintain the speed of penetration necessary to offset the movement of defending forces to the point of penetration, the offensive would flow around centres of resistance, relying on follow-on forces and the moral collapse of the defenders, to consolidate and sustain the gap created. The net result was to restore to the attacking column the ability to penetrate the defensive line at speed, with sufficient residual striking power to turn local tactical success into a tool useable to strategy.

The power of these techniques was demonstrated in the invasions of Poland in 1939, France in 1940, and in Yugoslavia, Greece and Russia in 1941. Based on this success, Blitzkrieg became the dominant model for offensive operations. All the the Second World War armies, particularly in the European theatre, used similar techniques—if not in direct emulation then because it represented the optimum way to combine the capabilities of the various arms under the technological conditions of the time. Improvements in tank technology, radio communications and the effectiveness of aircraft, combined with the advent of self-propelled artillery, enhanced the effectiveness of the basic model (small, powerful, mobile columns) and provided the means for attacking columns to retain a general advantage over defending lines.

As the war progressed and German relative strength declined, the Wehrmacht became the target of Blitzkrieg more often than its initiator. Their responses to this role reversal are particularly instructive. The First World War experience of the stupefying artillery bombardments that routinely preceded attacks led the Germans to adopt an elastic defence, in which the main defensive zone was based on strong-points. These strong-points were shielded from observation by an outpost zone that, in practice, greatly increased the depth of the defence. In post First World War doctrine, the German elastic defence was described as consisting of four discrete zones with a total depth of up to 15 kilometres. The four zones were advanced positions, combat

outposts, main defence line (which in the later stages of the war was a series of strong-points rather than any form of continuous line), and reserves. It was usual for the main defensive line to be sited in front of natural or artificial obstacles.¹³ German defensive doctrine also emphasised the use of continuous local counterattacks by all levels from squad upwards. This defensive scheme was intended to reduce the effectiveness of preparatory air and artillery fire by making each component of the defending force both harder to find and harder to hit when found. However, the real success of the elastic defence was that, rather than limiting the battle to the tip of the attacking spear, with the troops immediately around the point of penetration, it enabled the defender to constrict the whole attacking column. Defending troops fought on familiar and prepared ground, against an enemy that was in a constant process of discovery. The effect was to erode the strength of the attacking column throughout its length, while presenting it with an ever increasing number of tactical problems until its command decision-making processes collapsed under individual and group cognitive overload and its attacking strength was spent.

An example of the working of the elastic defence is provided by Operation GOODWOOD in mid-July 1944, which was an attempt to breakout from the eastern flank of the Normandy bridgehead.¹⁴ It was spearheaded by three British armoured divisions and supported by 'the greatest air-raid of all time', utilising 2000 heavy bombers and 2000 fighter-bombers as well as 720 guns with an allocation of 250,000 rounds. The defence facing this thrust consisted of a low-grade Luftwaffe field division, manning a defensive crust based. This was based on a number of small villages which had been developed as strong-points. This crust was backed up by a zone in which

13 Such, outwardly risky, siting meant that, even if the defensive zone was largely penetrated, the attacker would still need to breach a major obstacle before the fruits of the penetration could be fully harvested. This provided time for German responses and reduced the likelihood of local tactical success being developed into something more important.

14 There has been a deal of debate about the actual intention of GOODWOOD with opinion oscillating between the attempted breakout thesis and the contending view that it was simply intended to draw German reserves away from Operation COBRA, which was the simultaneous attempted breakout by US forces on the other flank of the bridgehead. The idea that it was a massive and bloody diversion seems to be a post-facto rationalisation of a poorly conceived and executed battle. K S Davis, *Dwight D Eisenhower: Soldier of Democracy*, Konecky & Konecky, Sayerbrook, 1945, p. 503, notes that GOODWOOD was announced initially as a 'breakthrough' operation. A McKee, *Caen: Anvil of Victory*, Pan, London 1964, contains a full account of the fighting, while H von Luck, *Panzer Commander*, Dell Publishing, New York, 1991, pp. 186–204, contains a clear account from the German side.

tanks and anti-tank guns were distributed into villages and copses of trees. Behind this zone, the remnants of an SS Panzer division, greatly under strength following earlier fighting, formed a reserve. Facing a much more powerful enemy who were enjoying air supremacy and wielding overwhelming firepower, the German elastic defence worked very much as intended. Over the four days of the battle the British had some 400 tanks knocked out and 5500 men made casualties.

Despite setbacks such as GOODWOOD, the Blitzkrieg model was so successful during the Second World War that it informed the tactics of the vast majority of the world's armies until at least DESERT STORM in 1991. Indeed, the lexicon of Blitzkrieg—main efforts, mission command, moving 'as water flows'—became the lexicon of manoeuvre warfare and the study of manoeuvre theory was largely an attempt to find the 'magic dust' that would enable the tactical achievements of the Wehrmacht to be replicated. For example, the US 'Air-Land Battle' doctrine, initially published in the early 1980s, was in essence a restatement of the fundamentals of Blitzkrieg repackaged for a more modern audience. In the Soviet Union, the demonstrations of Blitzkrieg's efficacy had validated the work of a number of Soviet military theorists of the 1920s and 1930s, and by early 1942 the leaders of the Soviet Union had also begun to adopt Blitzkrieg and make it their own.

As a nation, the Soviets were arguably the strongest military theorists of the twentieth century. Soviet military theory, at least as it was described, was derived from Marxist political and social analysis. As a result of this analysis, the Soviet Union settled on an offensive model for the defence of the motherland. That is, in the aftermath of the Second World War, they would seek to resist NATO aggression by invading and destroying NATO. In a nice piece of symmetry, NATO intended to defend itself 'defensively'; that is, by absorbing and destroying the invading force.

The Soviet offensive strategy was a close relative of Blitzkrieg, but on steroids. The emphasis was on huge armies of tanks, lavishly supported by masses of artillery, driving through Europe—possibly over a carpet of destruction provided by a generous allocation of chemical and tactical nuclear weapons.¹⁵ The Soviet offensive column was arrayed in echelons, with the intention of maintaining momentum through unremitting pressure sustained by constantly feeding fresh troops into the penetrations that had been achieved. The progress of the attacking columns was supported by parachute

15 By the mid 1980s, the standing Warsaw Pact forces comprised somewhere around 1.5 million men, 25,000 tanks and 12,000 guns arrayed in some ninety-three divisions. General Sir John Hackett, *The Third World War*, Book Club Associates, London, 1978, Appendix 5.

and helicopter inserted forces and operational manoeuvre groups, intended to hamper NATO responses and secure important defiles ahead of them. The net effect was that Soviet attacking columns were several hundred kilometres long, reaching from Germany well into Poland, or even Russia, and they would simply march forward to overwhelm the NATO defensive lines by sheer mass.

The space provided to NATO to absorb and defeat this attack, from the border between East and West Germany to the Rhine, was not great—typically between 200 and 350 kilometres. In the immediate post-Second World War period, the range, lethality, rates of fire and limited effectiveness at night of the weapons available to NATO meant that tactical forces were unlikely to defeat—or even check—the massed armour of the Soviet assault from a defensive line. To do so would require the concentration of great masses of tactical forces. As commander of the Supreme Headquarters Allied Expeditionary Force, Eisenhower estimated that he required ninety-two divisions to do so—a nominal frontage of about 4000 metres per division. Such concentrations arrayed in a relatively shallow crust would present ideal targets to the massed artillery supporting the Soviet thrust, and were in any case economically and politically unattainable. Eventually, the now President, Eisenhower settled on twenty-six divisions, supported by 15,000 tactical nuclear weapons.

The Soviets had a term ‘negodnost’, which pertains to ‘inappropriateness’ or ‘unusability’ and refers to a situation in which complete military success leads to a net politico-economic loss. In this context, the answer to the question of how to defend Germany was probably never to drop 15,000 nuclear weapons on it. But, in the political and technical circumstances that prevailed at the time, there seemed no other way to provide to the NATO defensive line the stopping power it needed to halt the attacking columns of the Warsaw Pact. The relationship between tactics and strategy is well illustrated in this instance. Faced with the inability of tactics to provide the results it needed, NATO settled on a strategy of ‘flexible response’, which was based on a triad of strategic nuclear forces, tactical nuclear forces and conventional forces that could be used to deter a Warsaw Pact attack and, in the event that deterrence failed, defeat it. It is hard to imagine today how this strategy could have succeeded if deterrence had in fact failed and NATO leaders were left with the ‘red or dead’ alternatives. With tactics unable to provide a viable solution to strategy, political leaders were forced to arrive at alternatives that were, in effect, unusable and which were apparently based on wishful thinking. This is in contrast to a clear vision of how such a war might be fought, and the consequences of fighting it.

The authors contend that this period, between the first implementation of Blitzkrieg and the early 1980s, is anomalous in military history. The offensive power of the attacking column, when applied with sufficient (massive) vigour, was expected to overwhelm the tactical power of the defensive line. This was a result of the confluence of a number of factors, but principally because automotive and communications technologies enabled the creation and support of a striking mass which the advance of non-nuclear firepower had not yet been able to offset. This was to change with the explosion of computer and sensor technologies in the 1980s and beyond.

The rapid advances in computing that began in the late 1970s had, by the early 1980s, become a tidal wave of innovation that touched every aspect of daily life—at least for those living in ‘the first world’. For NATO militaries this resulted in greatly improved sensors, communications and weapons which, in combination, presented new opportunities to planners. The mantra of defence planners became: ‘if you can be seen, you can be hit, and if you can be hit, you can be destroyed’. This was true whether you were in the close fight, or remained several hundred kilometres away from the front.

Sensors, such as synthetic aperture radar and reconnaissance satellites, were increasingly able to provide effective surveillance, in real-time, deep into Warsaw Pact territory. This meant that the areas in which second and subsequent echelons would be assembling or moving in tight columns, prior to combat in Germany, and where the majority of combat supplies would be initially located, became visible to NATO planners and therefore targetable. A variety of air and ground launched weapons were also becoming available as a result of the SADARM (Sense And Destroy ARMour) program. Many of these saw the integration of the new sensor technologies into individual munitions and sub-munitions, and represented the first generation of ‘smart’ munitions. The result was that NATO air attacks were able to be planned to defeat second echelon forces well before they closed up to the NATO ground defences. Closer to the front, improved artillery rockets such as MLRS, and rapid firing artillery employing warheads able to scatter both smart and dumb sub-munitions, provided a hitherto unparalleled ability to inflict heavy casualties on massed forces, whether they were static or moving. As a result of these advances, NATO was able to adopt Follow-On-Forces-Attack (FOFA) in 1984 as their defensive concept. This aimed to start the attrition of Warsaw Pact forces while they were still deep in their own territory. This would effectively extend the depth of the defensive line by several

hundred kilometres and reduce the momentum of the Warsaw Pact columns over the terrain NATO were defending.

In the close fight, the Abrams, Leopard 2 and Challenger MBTs were replacing their much less powerful and less lethal predecessors. In addition, the defensive power of the infantry was greatly increased by the lavish distribution of individual lethality in the form of portable anti-tank guided weapons (ATGW), such as MILAN. Importantly, the increasing availability of night vision devices was, for the first time in history, providing tactical forces with a genuine ability to fight at night. This greatly reduced the relative advantage of the Warsaw Pact continuous offensive. The Soviets had previously hoped to make large territorial gains in periods of darkness, when the effectiveness of NATO weapons was much reduced, but the speed of a tank-led advance was not. The increased range and lethality of the weapons and their ability to fight at reasonable combat ranges by day and night also enabled NATO ground forces to distribute themselves in smaller units without sacrificing mutual support and without prejudicing the effectiveness of their fire. This in turn reduced their vulnerability to Warsaw Pact artillery and air attacks, and further increased the relative strength of the defensive line.¹⁶ Because of FOFA concepts, there was less chance that the tactical defence would simply be overwhelmed. Thus, by the mid 1980s, NATO was for the first time probably able to defeat a Warsaw Pact offensive without recourse to nuclear weapons—in effect gaining nuclear outcomes, in the defence, from conventional weapons.

At the beginning of this paper the point was made that technological improvements to weapons, when applied equally to the defensive line and attacking column, tended to favour the defence. For a short and anomalous period between 1939 and 1984, this was apparently not true and the Blitzkrieg-style offensive held sway. The rapid increase in the ability to find and destroy massed targets that occurred in the 1980s restored to the defensive its traditional advantage *as long as it was able to emulate the ability of the Elastic Defence to distribute its components through a defensive zone in parcels that were too small to be detected or engaged.*

Of course, if a defender were denied the ability to operate in sub-targetable parcels—by terrain, training or organisation—the Blitzkrieg model would retain or regain its

16 Interestingly in the early 1980s, to harness the improvements to defensive strength discussed above and based on their own experience of how best to defeat a tank heavy offensive supported by lavish amounts of indirect fire, the British Army adopted the 'GOODWOOD' model as their tactical concept. This involved the fortification of villages and woods through a defensive zone using ATGW to destroy Warsaw Pact armour attempting to stream between these strongpoints.

dominance. When coalition tanks crossed the berm to begin the offensive in Operation DESERT STORM in 1991, the power of the Blitzkrieg—augmented by all the technologies of FOFA, now in mature form, and employed against a ‘traditional’ defensive line—was amply demonstrated to the world. US military performance and the efficacy of modern technology that underpinned this demonstration were jointly responsible for a huge surge in theoretical debate and examination of contemporary warfare, and initiated the notion of a contemporary Revolution in Military Affairs, or RMA.

As before, around the globe, friends and actual, or putative, enemies of the United States looked at DESERT STORM and drew their own lessons from it. For those Western countries aspiring to possess modern militaries, it initiated a scramble to develop or procure the weapons and communications to emulate US network-centric warfare. They sought a new flavour of ‘magic dust’—effects-based operations—to emulate the stunning success of DESERT STORM. For those who could, or would, not aspire to emulate the United States, military confrontation with the advanced countries of the West became unthinkable—unless tactics could be found that would invalidate the advantages enjoyed by them.

Return to Normality – Defence Dominant Again

Since DESERT STORM, it is evident that the success of the technologically enhanced Blitzkrieg demonstrated in Kuwait has triggered adaptive mechanisms in a number of areas around the globe.¹⁷ The US Marine Corps anticipated emerging trends when they began Urban Warrior and Project Metropolis in 1997–98. These studies and experiments were predicated on the understanding that the US dominance of standoff targeting would inevitably lead potential enemies to confront the United States in cities. In the urban environment the greatest strengths of US technology were seen to be greatly constrained, and a perceived reluctance on the part of the United States to risk close combat, with its attendant high casualty rates, seemed to present a vulnerability that might be exploited. Another sign that the evolution of tactics was continuing was in the Kosovo campaign in 1998–99, during which Serbian tactical forces proved impervious to a sustained aerial bombardment of over 30,000 sorties by NATO air forces enjoying

17 US JFCOM *Trends and Challenges for the Future Joint Force Through 2030*, USJFCOM Norfolk Va, Dec 2007 encapsulates these adaptations, with some reservations, as ‘4th generation Warfare’.

uncontested air supremacy.¹⁸ Following in the wake of Kosovo, in 1999 the Chinese PLA published *Unrestricted War*, which proposed a new approach to strategic and operational manoeuvre in order to avoid the power of US tactics.¹⁹ In 1999, US Army experimentation recognised this evolution when it featured an enemy exploiting a ‘hedgehog defence’, comprising small combined arms teams sheltering in complex terrain and intent on inflicting casualties before dying in place. By the time of Operation IRAQI FREEDOM in 2003, the Iraqi plan was remarkably similar to that experimentation; it aimed not to fight US forces in the desert, but to draw them into urban areas and confront them with a combination of regular and irregular troops—a plan that failed in execution rather than concept.

Most tactical adaptation seeks to avoid the enemy’s strengths and exploit their vulnerabilities, while providing the greatest opportunity to exercise one’s own relative strengths. On this basis, at their simplest, the tactical adaptations that have emerged to date seek to avoid the scrutiny of technological surveillance by distributing capability into groups small enough to hide in micro-terrain. In 1999 the Australian Army proposed the notion of the ‘detection threshold’,²⁰ defined by the granularity that was reliably achievable by technological wide area surveillance assets (Figure 1). Because of the power of the coupling of detection assets with stand-off precision weapons, survival demanded that forces operated in elements that were sized below the detection threshold. Of itself, operating below this threshold is not new and similar tactics have traditionally been the basis of the actions of unconventional forces. What is ‘new’ is that this adaptation has been recently forced on both conventional and irregular forces. Further, the increased lethality of the portable weapons available to these relatively small groups is enabling them to generate fire as potent as that of the concentrated forces of an earlier age.

18 In Kosovo the NATO intention to prevent ethnic cleansing of Albanian Kosovars was thwarted by the Serbian ability to tactically operate in force groupings small enough to shelter in micro-terrain or meld into the local population. This resulted in air power being used indirectly, as a strategic lever intended to dissuade the Serbian Government from its chosen course. In the end air power in this role proved to be ‘negodnost’; despite the ability to bomb without resistance and with great accuracy, NATO experienced a net politico-economic loss.

19 Qiao Liang and Wang Xiangsui, *Unrestricted Warfare*, PLA Literature and Arts Publishing House, Beijing, 1999.

20 The Detection Threshold Concept has evolved to what is now known as the Discrimination Threshold in the contemporary Australian concept papers.

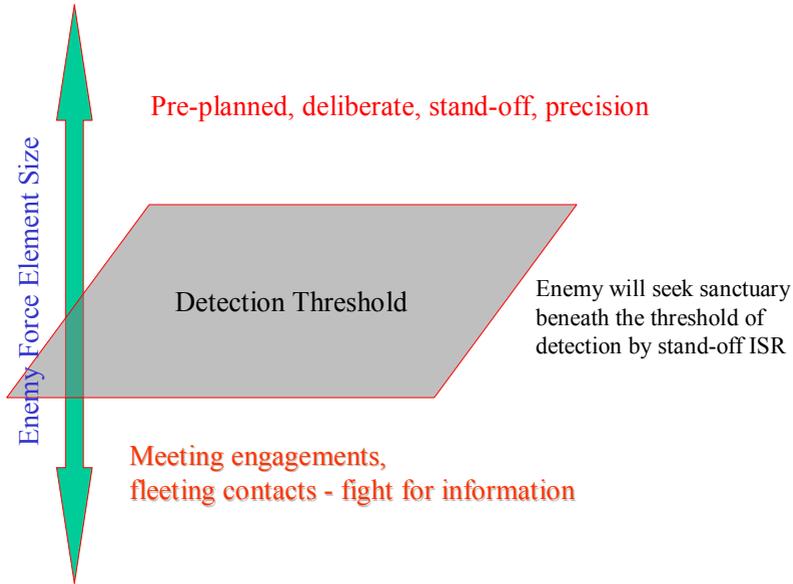


Figure 1: Extract from Australian Army Experimental Framework briefing slides – late 1999.

The most recent example of this evolution occurred in the Israel–Hezbollah War of July 2006. Hezbollah can be characterised as something more than a guerrilla movement and less than a state. In Southern Lebanon it is, in effect, a quasi-state with access, through its Iranian and Syrian sponsors, to the most modern weapons ranging from cruise missiles, advanced SAMs and artillery rockets to the very latest anti-tank guided weapons and rocket propelled grenades. In the thirty-four days of the July War, Hezbollah, with probably less than 3000 fighters directly engaged, was able to avoid the consequences of six years of intensive scrutiny by Israeli intelligence, absorb the impact of over 9000 sorties by Israeli attack aircraft, and exploit low-density urban terrain to substantially defeat an assault by three Israeli divisions.²¹ Despite the ham-fisted Israeli conduct of this campaign there are tactical lessons that can be drawn from it. Principal among these is that, all things being equal, the tactical defensive can be seen to be again ascendant over the tactical offensive *as long as it is able to emulate the ability of the Elastic Defence to distribute its components through a defensive zone in parcels that are too small to be detected or engaged*. The modern ‘Distributed Defence’ demonstrated by Hezbollah

21 See Matt Matthews, *We Were Caught Unprepared*, CSI Long War Series Occasional Paper No. 26, CSI Press, Fort Leavenworth, Kansas, 2008; and A Harel and A Issacharoff, *34 Days Israel, Hezbollah and the War in Lebanon*, Palgrave MacMillan, New York, 2008.

is a direct descendant of the German elastic defence of the world wars and of later interpretations, such as the British GOODWOOD concept for the defence of NATO, and is well adapted to the defeat of a Blitzkrieg style offensive.²²

Having argued in the preceding pages, the tactical heredity that links the conventional nation-state defensive power to the bastard child implemented by Hezbollah, it is necessary here to revisit the connection between tactics and strategy. In the Israeli–Hezbollah example, Hezbollah was mounting a strategic offensive—based on provocations such as abduction of Israeli soldiers and the rocket bombardment of northern Israel—backed by a tactical defensive. These provocations caused Israel to take ‘positive action’ at a speed that would reduce the strategic pressures on the Israeli Government. The tactical defensive, on the other hand, aimed to extend the length of the conflict while imposing casualties to undermine Israeli political will. Ideally this combination would create a vicious circle of mutually reinforcing pressures leading to a downward Israeli political and military spiral. A roughly parallel model was apparent in Kosovo, in which Serbian ethnic cleansing imposed a need for rapid action by NATO, while the supposed capabilities of Serbian ground forces threatened costs that NATO, by declining to threaten a ground invasion, proved unwilling to meet. The point to take away is that the strategic positive purpose requires tactical actions that offer reasonable prospects of success over the tactical defensive. On the basis of the evidence available at present, those options have not been developed or used.

Restating the Elements of the Current Problem

This problem is not restricted to conventional versus non-conventional or irregular forces, but exists between the tactical offensive and the tactical defensive, whatever the nature of forces engaged. In the case of forces of two nation-states (rough peer competitors) being engaged, the pressures created by the technological conditions will force adaptations along the lines of those made in the tactical nuclear era of the 1950s. The idea of ‘moving dispersed but fighting concentrated’ is attractive at first glance but, because of the impact of precise and lethal conventional weapons, fighting

22 In the early 1980s the British Army sought to harness the improvements in portable lethality typified by the introduction of MILAN and LAW 80—and to soften the impact of the hammer of Warsaw Pact artillery—to emulate the elastic defence by distributing their own defence through a deeper zone resting on a network of fortified hamlets and villages.

concentrated will still be fatal and, similarly, ‘hugging’ the enemy for protection will not work.

The evolution of tactics has brought us to a situation in which the defensive line has dilated into a defensive zone through which combat elements are distributed in force packages small enough to exploit terrain in order to hide themselves from the scrutiny of stand-off surveillance. There is ample evidence that this distributed tactical defensive is alive and well, but there has not yet been a contemporary demonstration of a distributed tactical offensive—although some published ideas infer the need. What is needed is a new tactical system that returns to the attacking column the striking power it needs to penetrate a distributed defence at a speed generally adequate to defeat enemy counter-moves while remaining dispersed. In this context the distributed defence presents a number of specific challenges to the attacker.

In order to reduce the effectiveness of technological surveillance and reconnaissance that would expose a defence to destruction by stand-off fires, it (the distributed defence) will more likely be situated in complex, and especially urban, terrain in which the presence of people and critical infrastructure offers the additional advantage of increasing the potential penalties to the attacker of indiscriminate or area fire. Most soldiers rapidly develop the ability to identify areas that, because of their size, fields of fire and overwatch positions, could be developed as killing areas. In complex terrain, killing areas may be smaller and ‘unobtrusive’, normally not being identified as killing areas until engagements occur. Under these conditions the force densities normally associated with offensive operations merely ensure that these unobtrusive killing areas are more densely populated when they become evident, with a resulting increase in casualty rates.²³ Unless casualties are unimportant, trying to defeat a distributed defensive line by washing over it with superior mass will probably lead to failure.

23 In complex, and especially urban, terrain the problem of unobtrusive killing areas arises. In complex terrain, killing areas tend to be small and largely undetectable until they are populated with targets, thereby triggering an engagement. The result of unobtrusive killing areas is that in urban battles, for example, attacker/defender combat ratios favourable to the attacking side are not historically correlated with successful outcomes but are strongly correlated with the number of attacker casualties; that is, the more people you pack into a killing area the more that get killed. Reducing force densities in complex terrain reduces casualties without reducing the prospects of success. In *The Structure of Strategic Revolution*, Presidio Press, California, 1994, pp. 11–14, Jim Schneider presents an argument that this relationship between concentration of forces and casualties is not restricted to complex terrain and has been present since the US Civil War; that is, since the wide use of rifled small arms and cannon.

Because the distributed defence is, by definition, postured so as to defeat the attacker's surveillance and reconnaissance means, merely increasing investment in these may not be productive. Indeed, there is some evidence to suggest that commitment of technological surveillance encounters the law of diminishing returns quite early. Prime examples of this are the July war mentioned above, which principally took place in an area of about 900 square kilometres. Despite the fact that the terrain was intimately known by the Israel Defense Forces (IDF) and was comprehensively overwatched by uninhabited aerial vehicles, remote cameras, aerial reconnaissance, human intelligence networks and electronic warfare assets for the six years leading up to the war, the IDF remained largely ignorant of Hezbollah defensive preparations or intentions. Another example is Operation ANACONDA conducted by US forces in Afghanistan. In the battlespace of around 200 square kilometres, these forces received intensive deliberate intelligence, surveillance and reconnaissance (ISR) preparation, but which failed to detect the majority of the most important enemy fighting positions until the first arriving forces got out of their helicopters. This, despite the terrain being rugged, but treeless, and certainly not urban. On this basis, the problem of the distributed defence is unlikely to be resolved by simply investing more in stand-off surveillance or reconnaissance. The challenge is a tactical, rather than a technical one.

The inability of the advancing force to accurately locate the individual fighting positions of a distributed defence means that the defender invariably gets to shoot first and therefore, at this minor tactical level, holds the initiative—at least at the start of the contact. We note this as unusual; the initiative, as the basics are commonly taught, lies initially with the attacker. If this advantage is retained, the conduct of the battle will inevitably be controlled by the defender, with the likely result of either the repulse of the advancing force, or the infliction of a large number of casualties, with the defender breaking contact more or less intact. Both alternatives are probably unacceptable to contemporary practitioners, leading to the need for a means to wrest the initiative from the defender.

Looking into the mechanics: as the advancing force contacts the distributed defence, both sides begin a process of discovery. This involves the iterative comparison of objective reality with the situation that was anticipated when the original plan was made and the consequent adaptation of that plan. As is normal, the greater the disparity between objective reality and anticipated situation, the greater the extent to which the plan is inappropriate. If the disparity is sufficiently large, the original plan is dislocated, the initiative transfers to the other side, and the affected side is forced to enter a

new planning cycle—probably while under the building pressure of a deteriorating situation. This means that, especially at the tactical level, these encounters take on the characteristic of a continuous meeting engagement.

Assembling a Response

With modern artillery and air support, a pair of eyes backed up by an unjammable radio . . . becomes the equivalent of at least a company combat team and perhaps a battlegroup.

— Richard Simpkin (1985)

One way to characterise this process of discovery was Boyd's OODA (Observe-Orient-Decide-Act) loop, which has been accepted for some time as a/the model for the interaction between combatants. The Australian Army has adopted the idea of the Act-Sense-Decide-Adapt (ASDA) cycle in Figure 2, which differs from OODA principally in its assumption that, at least initially, no (or little) actionable intelligence will be available to the advancing force and, therefore, the process of discovery needs to be started by taking action in order to stimulate a response from the other side.²⁴ Once the other side does respond it will necessarily begin to generate signatures. These signatures will in most cases initially only provide cues for the next minor tactical step, but as the ASDA cycles of the attacker and defender continue to interact, the resultant signatures should eventually be able to be aggregated to provide reasonable situational awareness.

The USMC Distributed Operations concept offers one approach to dealing with some of the problems of the distributed defence. In this context, it would see a large number of relatively small teams exploiting micro-terrain to infiltrate into and through a distributed defence, using excellent communications to direct precision fires at

²⁴ The ASDA cycle, which appears in Australian doctrine as 'The Adaption Cycle', accepts that combat is a complex adaptive system. As such it will develop emergent behaviour that cannot be usefully anticipated in advance. Only by iteratively and incrementally stimulating the system can its actual behaviour be at least partially understood and appropriate actions be taken to dampen undesirable emergent behaviours while positively reinforcing desirable ones. Stimulating the system requires that it be provided with energy by taking action. This is not an argument against the need for reconnaissance or planning; rather, it accepts that reconnaissance may provide facts and that planning needs to account for these facts but that the battle that eventually emerges is entirely unknowable in advance.

enemy positions as they are disclosed. In this way, the mass of the attacking column, traditionally necessary to provide the amount of fire necessary to outmatch the enemy's prepared fire and to sustain momentum in the face of the resulting attrition, is replaced by the lethality and responsiveness of indirect fire.

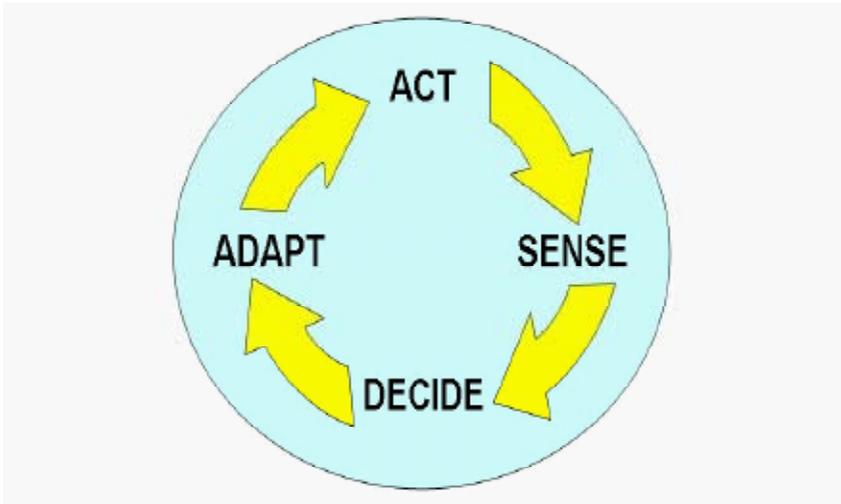


Figure 2. The Adaption Cycle

Viewed in light of the discussion above, Distributed Operations is 'right minded', in that it recognises both the imperatives and challenges of the contemporary tactical environment and describes the types of adaptations necessary to meet them. As described in open source material, however, it is not a full solution to the problem. In order to achieve the degree of stealth necessary to be fully effective, each of the manoeuvre teams needs to be sized to match the nature of the terrain. The realities of survival in the myriad chance encounters expected in the urban continuous meeting engagement create pressures to increase the size, and hence robustness, of the teams. Increasing the size of the teams, however, decreases their stealth and therefore increases their vulnerability, albeit by another pathway.

Distributed Operations attempts to harness the power of the system of systems created by extensive investment in the development of a pervasive tactical communications network. As such, it establishes a system comprising the battlespace, mission, and the forces engaged; including, in this case, the providers of stand-off

precision fires. To work, the system needs to have a very high level of confidence that when fire is needed it will be provided, in appropriate form, in timeframes previously only expected from direct fire, and the ‘cognitive wherewithal’ in the small team to command and conduct the close combat and to command and direct the indirect fire. Setting aside the demands on the small team leader for a moment, the concept of critical time—here defined as the time after which the provision of fire will fail to achieve its primary purpose—is important.²⁵ In the case of the distributed attack on a distributed defence, critical time will depend on the precise situation. If it is being used to replace the mutual support that would have previously been provided by flanking troops, it will be needed in seconds, rather than the minutes that might be satisfactory in more deliberate situations. To work in this tactical context, Distributed Operations requires indirect fire kill chains that are much shorter; more agile and have a higher guarantee than those presently in place. As published, Distributed Operations describes the majority of this fire being provided by naval and air forces, with a reliance on quite long and convoluted kill chains. This does not invalidate the Distributed Operations approach; rather, it establishes and underlines a development imperative to enable its full implementation in contests against a competent enemy.

Finally, although there is *prima facie* evidence to suggest that Distributed Operations may well be able to penetrate the distributed defence, it is not at all clear that it can do so at a speed that promises to prevent enemy defensive adjustments. There is a real prospect of it settling into a simple attritional contest which might be won by Marines tactically, but could well be lost strategically. The evidence of the effectiveness of the Distributed Operations model can be found in Iraq where US forces, who have used techniques closely akin to those described as Distributed Operations, are able to isolate, penetrate and disassemble insurgent strongholds in the presence of vulnerable population, with minimal collateral damage, and at historically low friendly casualties. However, this success is predicated on a number of conditions being met: the objective needs to have been isolated to prevent the movement of combatants or support in or out of it; it needs to be subjected to comprehensive and deliberate

25 Australian Army, *Adaptive Campaigning*, Department of Defence, Canberra, 2006, defines ‘critical time’ as that time after which the continuation of an action will fail to meet its primary purpose. An example might be an air strike intended to destroy a bridge before the enemy reserve can cross it to interfere with our own operations. If the air strike is delivered after the transit of the reserve it has failed to meet its critical time. Clearly, all military operations involve interactions of this sort but because Distributed Operations is based primarily on small unit manoeuvre, it makes the timeliness of actions even more important than usual.

intelligence preparation; and time needs to be allocated to enable the attacking force to go through its process of discovery at a rate that does not overwhelm the cognitive, or fires, systems that provide the basic enabling machinery. The Distributed Operations approach is well suited to the 'stake-out and reduce' situations often encountered in counterinsurgencies, but is less instructive on the issue of how a distributed column may maintain useful tactical tempos in a breakthrough battle.

The presently available alternative to the Distributed Operations approach is the 'M1 suck-it-and-see' gambit. This involves beginning the process of discovery by driving into the unknown in a heavily armoured vehicle, hoping and intending to survive the first shot, inevitably fired by the defender, and then go on to develop the ensuing battle while in contact. This traditional approach has the advantage that it is fast, it threatens to seize the initiative early, and it maximises the relative advantages of a modern network enabled combined arms team facing a less technologically proficient enemy. On the downside, the lethality of both direct and indirect fire available to a defender means that this approach is not without significant risk. In order to meet the need to manoeuvre below the detection threshold, while retaining the ability to conduct offensive operations at useful tempo, an amalgam of the two approaches is needed.

Distributed Manoeuvre – New Improved 'M1 Suck It and See'

For our purposes, the distributed defence can be characterised as a system comprising:

- **A matrix of strong points**, each of which is effectively a deliberate ambush waiting for its killing area to be populated by the attacker. Each of these strongpoints is relatively tactically weak but the matrix as a whole slows, and possibly canalises the attack and imposes casualties. The matrix also creates a cognitive burden on attacking commanders by presenting a large number of micro-battles without presenting recognisable patterns or templates at the local level. Because they are lying in wait, the strongpoints do not present substantial physical or electronic signatures before contact is initiated.
- **Switch combat power**, in the form of indirect fire, heavy weapons teams and counter-attack forces, used to reinforce the actions of the strongpoint,

to exploit opportunities created by the confusion they cause, to increase the cognitive burden on the attacker, and to impose sufficient casualties to stop the attack. The defender's surveillance and reconnaissance capabilities, other than those directly linked to strongpoints, are a part of this switch combat power. In some situations, it may also include local civilians formed into crowds or riots.

- **A command structure** to coordinate the actions of the previous two elements and arrange for reinforcement and replenishment. The command structure also provides the primary connection between the combat power committed to a specific tactical battlespace and the wider defence; and
- **The wider defence**, which incorporates higher command echelons, coordinates local actions with the front as a whole, and provide long range fires, reinforcement and other logistics.

This system is initially hidden and largely unknown to the attacker. Attempts to deal with the distributed defence by abrading it at the point of contact enable the defending system to work as intended, with the result that the attacker's aims are unlikely to be achieved. Although the defender's presence might be known initially, his detailed intentions, scheme of manoeuvre, and dispositions are likely to be hidden and, therefore, a Veil of Uncertainty separates the two forces. Distributed Manoeuvre seeks to do two things: to progressively develop knowledge about the enemy system, initially by prodding it into action, and then to exploit this knowledge to eventually overwhelm it. It accepts that a thoughtful defender will not be postured to be destroyed by long-range fires and will need to be rooted-out, hunted-down and destroyed.

Piercing the Veil of Uncertainty is a process of trial and error. Conventional tactics has tended to deal with this problem through mass—creating a force of sufficient robustness for it to survive the process of empirical learning while retaining its functionality. Massed forces are poorly adapted to the complex terrain in which the defence is expected and, in any case, until the counter-fire battle is won, their use is precluded by the power of the stand-off weapons that led to the distributed defence in the first place. Distributed Manoeuvre minimises risk by taking the first step across a large number of small groups, as shown in Figure 3.

The small groups that lead Distributed Manoeuvre, each a balanced combined arms team grouped according to the specifics of the terrain, threat and mission, are akin to the skirmishers of earlier times but with an expanded purpose:

- They act as sensing probes extended by the attacker to begin the process of interaction with the defending system (the attacker must process this information, as discussed below). In this way they enable the attacker, at least initially, to maintain a ‘limited liability’ posture in which the forces gambited are sufficient to prompt the defender into a response, but not so large as to allow the attacker to become decisively engaged; and
- by exploiting intensive networking to closely couple them with stand-off weapons, their relatively modest offensive and defensive power can be augmented to enable them to survive in the face of, and begin the attrition of, the strongpoints. This attrition is fundamental in forcing the defence to adapt and thereby creating signatures that the attacking force has postured itself to collect.

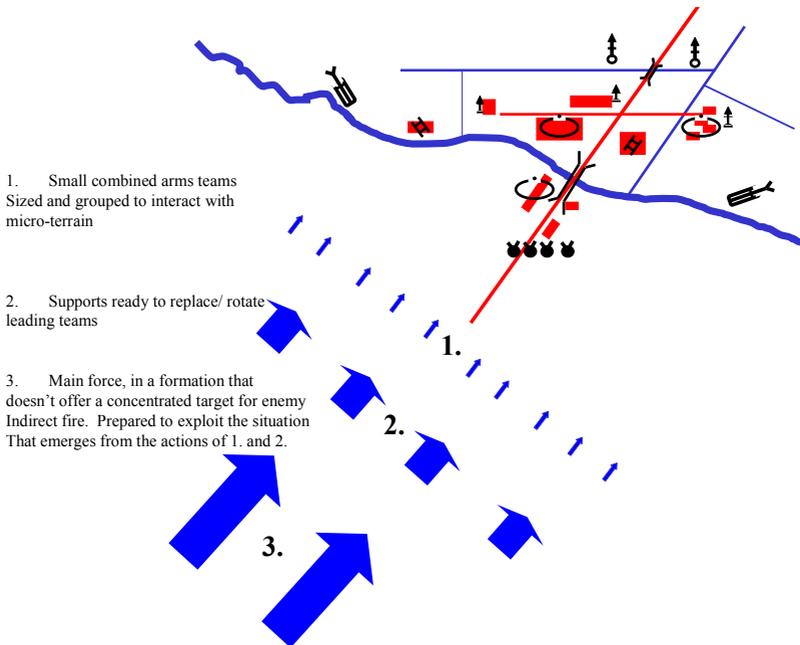


Figure 3 Distributed Manoeuvre Echelment

Once initial contact is made, high combat activity—distributed across many empowered small teams, with continuous pressure from higher command echelons and rapid decision-making—promise to transfer the cognitive burden to the defender,

thereby progressively crippling the ability of the defence for timely adaptation.²⁶ This creates a form of manoeuvre better suited to complex terrain; less prone to a single fatal error as it steps into the unknown; and more broadly applicable to a range of missions, from stabilisation through to combat against a technologically dominant nation-state.

There has been much discussion in recent years about competitions between the hierarchies that typify traditional military organisations and the swarms that are thought to typify more ‘modern’ networked structures. Distributed Manoeuvre, like Distributed Operations, by integrating BLOS fires into the close fight in the same way, for example, that a section machine-gun or a rocket launcher might be, combines the power of the network with that of stand-off precision weapons and places it in the hands of a swarm of small teams, thereby coupling the power and robustness of the hierarchy with the elusiveness and adaptability to local conditions of the swarm.

The swarm-like actions of small teams leading a distributed manoeuvre will begin to pierce, and then partially remove, the Veil of Uncertainty between the attacker and defender. As well as generating actionable information at the point of contact, the wider enemy system will begin to adapt according to the stimuli being applied. This response will generate signatures that, if detected, will enable both the identification of the next tactical step and the gradual aggregation of information into situational understanding. This ‘prod/sense’ approach to system analysis should be immediately comfortable to systems engineers trained in the analysis of impulse responses of systems.

What is crucial to Distributed Manoeuvre is that this situational understanding of the ‘greater shape’ of the defensive system is made at echelons higher than the small combat team (the impulse) in contact, in response to the adaptations of the defence. The small team tactical commander—reinforced, re-supplied or reconstituted as required—remains free to fight the close battle based on his own local understanding while simultaneously contributing to the situational understanding of higher command echelons by provoking reactions in the defensive system.

Returning to the point of the spear, the seizure and retention of the tactical initiative delivers a profound advantage to the side able to achieve it. As we have said, at least at the minor tactical level, the initiative initially lies with the defender. In the preparation of the defence—providing for the likely attacker’s approaches, formations and responses—and if the battle develops as the defender intends, no major changes

26 J Storr, ‘Real People, Real Decisions: Designing HQs to Win Wars’, *British Army Review*, No. 123, November 1991, pp. 7–19, discusses the power of rapid decision-making in some detail.

to those preparations will be needed. To offset the advantage of the prepared defence, the attacker needs to adopt an approach or a mode of operation that is sufficiently eccentric to the defender's plan to force the defender to begin to adapt. In the urban, the distributed defences likely to be encountered in the future, the restricted approaches, and the obvious manoeuvre corridors make the achievement of this type of surprise in the attack at best an occasional event. Therefore, planning on the basis of surprising the defender in the way that the battle is joined is insufficient. However, the attacker can achieve surprise in the manner in which the battle is developed. In this, the defender's plan may remain intact, but its execution may be so hampered as to make it ineffective. The attrition achieved by leading small teams initiates the competition of Adaption Cycles by creating this type of surprise. Once the competition for appropriate adaptation starts, the key is for the attacker to identify and exploit the opportunities presented by the enemy's adaptations to progressively seize the initiative.

Although small team manoeuvre is the basis of its relative novelty, Distributed Manoeuvre builds on the conceptual foundations of Distributed Operations by using the responses of the defensive system to the small team attacks. It is effectively a 'destructive test' of the defensive system and uses the analysis of the signatures provided by the adapting defensive system to cue the application of the full array of shaping and support actions provided by modern tactical formations. In particular, aspects like counter-fire, isolation of the battlespace, ISR and information management, as well as the commitment of succeeding tactical echelons, enable the progressively expanding knowledge of the defending system to be exploited to develop useful tactical outcomes. Here, the attacker's system is grappling with the defender's system and the full power of the attacker's system needs to be comprehensively engaged. Winning the competition of Adaption Cycles is achieved by crushing the defender's ability for purposeful response, shattering his cohesion, denying him refuge and setting the conditions for his piecemeal destruction. Enabled by the systematic analysis of the responding defensive system, Distributed Manoeuvre does this by seizing and retaining the initiative and is characterised by:

- **Simultaneity.** Simultaneity is the coordinated engagement of all of the accessible components of the enemy's system. Simultaneity seeks to overwhelm the ability of the enemy to sense and adapt to the situation by presenting so many problems to enemy commanders that their cognitive ability is exceeded and the physical capacity of their forces is sufficiently suppressed that purposeful and coordinated action is impractical.

- **Multidimensionality.** Multidimensionality is seeking for, and grappling with, the enemy in the physical, informational and electro-magnetic domains. It is complementary to simultaneity and is intended to ensure that there are no parts of the enemy's system left untouched and functioning, and that no refuge is offered from which the enemy can begin to recover from the shock imposed.
- **Continuous Battle.** Continuous Battle seeks to deny the enemy respite or time to understand, recover or adapt. This ensures that, once gained, the tactical initiative is retained and that the enemy's ability to respond appropriately begins to spiral down. The notion of operational or tactical pauses is inadmissible and planning needs to provide for the maintenance of unremitting pressure.

Within this grappling between two contending systems, the close fight is essential to initiate and develop the larger contest, but it cannot be allowed to become the whole contest. This separation of the responsibilities for battle can be analysed in many ways. There are important differences. We recognise the Adaption Cycle as fractal, occurring in similar ways at many levels of aggregation. To implement higher levels of adaptation, there is a need to maintain uncommitted forces and to retain tactical balance. Similarly there is a need to conduct purposeful manoeuvre at levels above the small team. The type of spread of focus areas across tactical echelons, and decisions that might be typical is shown in Figure 4.

A force is said to be decisively engaged when it is so committed to a specific action that it has lost the ability to manoeuvre. The distributed defence is intended to cause a force to become decisively engaged and then to present it with new challenges. Distributed Manoeuvre is largely independent of manoeuvre mass and avoids this challenge by, at least initially, adopting a limited liability approach to the attack, with just enough forces committed to begin to understand the enemy's defensive system and fight and win the small-team encounter battles. Once a working knowledge of the defensive system and intentions has been developed, informed decisions can be taken to deal with the situation actually presented. To this end, the retention of an uncommitted second echelon, comprising the weight of the organisation's combat power and intended as the force that will push to a decision, is important. The small team manoeuvre at the point of the spear is intended to develop sufficient situational understanding to enable the effective application of this second echelon into a battlespace that has been at least partially shaped and without creating targetable concentrations.

Level	Response	Responsibilities	Focus on Enemy
Brigade Team	10s of minutes	Surveillance management, information management, counter-fire, counter-surveillance, isolation of the Battlespace, force protection of uncommitted forces, commitment of BCT second echelon	Indirect fire, surveillance, C2, CSS, reinforcement, counter-attack forces
Unit Team	Minutes	Conduct the Surveillance Battle, Coord Offensive support, CSS and "Information Push" down. Isolation of the company battlespace, commitment of the battalion second echelon against identified	Switch and mutually supporting elements, long range direct fire weapons, and local counter-attack forces
Sub-Unit Team	Seconds	Shoot- no-shoot, rotation/ replacement of lead teams, reinforcement of successful terrain approaches, matching rates of advance with threat and offensive support system capacity	Distributed defence positional elements- the enemy's small teams, weapons and positions

Figure 4 Distributed Manoeuvre – Layering of Responsibilities

There is, of course, a downside. Distributed Manoeuvre describes the operations of a highly refined system. The small teams leading the attack represent both a gambit by the attacker and a destructive sensing probe. These teams rely, for both their survival and effectiveness, on the ability of that system to provide the types of reinforcing fires they need within a critical time, measured in seconds. Similarly, the competition of Adaption Cycles requires that the signatures generated by the defender are actually gathered (across the whole EM spectrum—acoustic and however else the defensive system might be characterised), and that the resulting information is distributed within the critical times to decision-makers for their response. It also demands, of course, that the organisations responsible for action in each case are able to act with sufficient agility to invalidate the enemy's own adaptations, and promptly enough to decide battle before the committed small teams culminate or are destroyed in the process of discovery.

Consequences and Conclusions

“Cheshire Puss,” [Alice] began... “would you please tell me which way I ought to go from here?”

“That depends on where you want to get to,” said the cat.

– Lewis Carroll

...it is more important to develop a conquering state of mind than to cavil about tactics.

– Colonel Loyzeaux de Grandmaison

The development of the ideas in this paper began essentially with Alice’s question to the Cheshire Cat. The need to identify the ‘next big thing’ in warfare is the starting point for the preparation of armed forces and, as a result, an industry has arisen around this need. At present there is a hot debate about whether war between states is a thing of the past, and whether it has been replaced by insurgency, terrorism or economic war, or some other mode of competition. A scan of the professional journals of most Western armies for ‘fashion tips’ suggests that counterinsurgency is ‘the new black’—but we tend to forget that both Afghanistan and Iraq started as conventional invasions to defeat the armed forces of nation-states and eject the regimes that wielded them.

What is tacit in this essay is that the detail of this discussion (what is the fashion?) is not important. Whatever the strategic impulse that leads to the employment of armed force, in the end tactical action will be necessary to deliver the victory being sought. This tactical action takes place in the real world, involving real people, real weapons and real terrain. Its reality makes it broadly predictable, if we have the wit to look objectively. Analysis of the current tactical environment suggests that the close fight is no longer coloured by whether the forces involved are the agents of a nation-state, an insurgency or a terrorist movement. The same weapons will be used in the same terrain, and with ‘knowable’ consequences for the forces engaged. Therefore, at the level of minor tactics there is complete convergence; the nature of the minor tactical battlespace is both clearly apparent and, practically, universal.

Above the level of minor tactics there is a degree of divergence. In the terms used in this paper, Distributed Manoeuvre against a low-grade insurgency might be decided by the actions of the small teams alone. Whereas against a more competent, Hezbollah-type insurgency, a tactical decision might rest on the ability of higher echelons to defeat the

switch combat power and win the counter-fire battle. Against a nation-state, the ability to gain air superiority and to suppress swarming cruise missiles might be necessary. However, until the conditions are fully achieved, tactical forces will necessarily have to deploy and manoeuvre so as not to present targetable concentrations.

The defensive adaptation to this reality is demonstrated regularly in various places around the world. What we have referred to as the Distributed Defence presents a great challenge to many of our notions of how an offensive might be conducted. If massed manoeuvre is no longer viable, an alternative model for manoeuvre—one that does not rely on mass—becomes necessary. The corollary of this is that new mechanisms will therefore need to be found to cope with chance, uncertainty and friction. Distributed Manoeuvre proposes one possible model.

Distributed Manoeuvre is a little more revolutionary than it appears on the surface. We are accustomed to viewing manoeuvre as being the centrepiece of any tactical plan. In Distributed Manoeuvre, except against the most unsophisticated enemies, manoeuvre remains essential, but is principally a shaping action to create opportunities to fully engage the power of the system of systems enabled by intensive networking. As an example, against some defences, freedom of action will only be developed once the counter-fire battle is won. In this tactical context, manoeuvre is principally intended to create a situation in which the enemy is forced to unmask his guns in order to present a vulnerability to what is, in effect, a counter-fire ambush. This basic mechanism of manoeuvre is intended principally to probe, goad and prompt the enemy into action in order to create opportunities for the attacker to disrupt the defending system, and contains elements of genuine novelty and engages systems analysis approaches to the tactical analysis and gutting of a defence.

Analysis of the Distributed Manoeuvre concept enables clear identification of force development needs. For example, the present organisation of offensive support in most armies reflects a supply chain approach to the management of scarcity, in the form of planes, guns and munitions. It is inappropriate to the needs of the contemporary battlespace and needs to be inverted to accept that the primary scarcities are now targets and time. Modern technologies are providing partial solutions to these problems. Increasingly, individuals are able to accurately fix their own locations, those of their comrades and flanking forces, and those of the enemy, and then automatically transmit this information through the tactical network. At the same time, automated systems for fire control are able to manage airspace and reduce the potential for unacceptable collateral damage and fratricide. Modern munitions are increasingly able to home in

on pinpoint targets with reliability and accuracy, and are increasingly independent of the delivery platform for aiming or control. Grasping these opportunities is being hampered by the tendency of all institutions, in the absence of some overwhelming imperative, to cleave from what they do now to evolve to what they need to do in the future.

There has been, for example, an argument put forward that the pilot in a low-flying jet, a forward air controller in an orbiting light aircraft, or an artillery forward observer several streets away may be better placed to judge the safety and appropriateness of an engagement than the small team leader who is in contact and calling for fire. Such arguments are clearly both banal and outdated. In Distributed Manoeuvre, the munition and the responsibility necessarily belong to the requester. Failure to recognise this repeats the types of failures that marked the dialectic between the French Methodical Battle and the German Blitzkrieg after the First World War and which was so decisively resolved in May 1940.

To meet the uneven demand in terms of quantity of fire and the need to provide an array of specialist munitions at very short notice, the offensive support architecture must be organised not around prior apportionment, but as a 'reservoir' of fire assets from which small teams may draw on the basis of need. The result is that the offensive support system needs to be shaped to facilitate the *ad hoc* coupling of manoeuvre teams—which are the principal sensors in the urban canyon—and fire providers. In the immediate future, technology will allow this to extend to the facilitation of *ad hoc* coupling between the manoeuvre teams and individual munitions. This need partially defines the command, control and communications architecture for the land force. It requires the ability for all elements to penetrate through to all levels and all branches of the hierarchy, on a needs basis, in real-time and without the intervention (but not necessarily without the scrutiny) of middle-men.

The process of stimulus and response happens continuously at every level of command and, except at the lowest tactical level, it will often be difficult to link specific actions with specific responses. This situation will be exacerbated by the presence of multiple actors and factions, and by the likelihood that the enemy, or enemies, will appear to be, or include, a swarm-like rather than hierarchical force, with a correspondingly large number of apparently anomalous actions and signatures. Indeed, at higher levels of aggregation the search for patterns and indications of intentions may be entirely fruitless, making the process of intelligence production enormously difficult. In this context, the emphasis should be on capturing and distributing relatively

unprocessed combat information with the shortest possible cycle times, which means disaggregating and distributing the problem of situational understanding to a level at which it is possible—at least initially.

There is a difficult balance to be struck between the provision of collection assets to junior commanders, in order to allow them to conduct their own Adaption Cycles, and over-tasking them. Clearly, an alternative to sending a team member across a street or around a corner to see if it draws enemy fire is needed. But, at the same time, solutions that provide masses of technology which need to be carried and operated by a small team, in contact, in urban terrain is equally unacceptable. The right balance in the devolution-centralisation dialectic will vary, dependent on threat and environment. Good information management and allowing higher levels of command to collect and distribute combat information on behalf of the lowest tactical level may provide a partial resolution of this challenge. This probably means that meeting the ISREW needs of the brigade and below is a more pressing, and potentially more rewarding, area for investment than the provision of assets to much higher headquarters.

Because Distributed Manoeuvre is sensitive to the performance of the whole attacking force system, even more than traditional tactics, less than desirable performance of the attacking system will lead to increased casualties and reduced prospects of success. This has always been the case in tactics, but the counter-balance to this sensitivity is that Distributed Manoeuvre, even when poorly conducted, is less likely to present large and attractive targets inviting wholesale slaughter, and is more likely to enable the strengths resulting in investment in networking and firepower to be applied in the real world.

Many of the putative enemies faced by technologically advanced militaries of ‘the West’ will seek to use the strengths of the Distributed Defence against them because it appears both to invalidate their technological advantage and to exploit the supposed sensitivity to casualties of liberal democracies. Distributed Manoeuvre seeks to undermine this approach by looking to initiate and fight close combat on our own terms—harnessing our strengths in a way well adapted to the likely operating environment. Against a technological peer, Distributed Manoeuvre is the only type of manoeuvre that is possible; against an irregular enemy, it is the only type of manoeuvre that will work.

The search for what to do next in order to gain an advantage over our competitors is a constant in human experience, and this extends to preparations for war. In preparing for war, the penalties for error are substantial and history is replete with examples of

these penalties being incurred. Deciding what to do next is one of the most difficult yet important decisions that militaries can make.

In an era of rapid technological and social change, looking for what is different between today and yesterday can be both confusing and overwhelming. This paper has argued that there is much to gain by first looking for the continuities on the basis that recognition of what is not changing may provide a sound platform to deal with what is changing. That is not to say, however, that such an approach can be exclusive. The epigram of Loyzeaux de Grandmaison that opened this section represented such an exclusive approach. The importance of human spirit in war—a constant—was used as an excuse to ignore the impact of technology, with disastrous consequences.

In this context it could be argued that the changes to tactics over recorded history have been largely superficial. The outcome of individual battles is indeed often decided by the application of willpower, but tactics is shaped by the interplay of communications, battlefield mobility and weapon lethality. Over time, this interplay has resulted in remarkable consistency, with the defence being innately stronger than the offence, and with improvements in technology consistently adding to the advantage enjoyed by the former.

The consequence of this state of affairs is that the strategic positive purpose is today demonstrably thwarted by the tactical negative, with a consequent reduction in the strategic options available to governments. If military history is shaped by the interaction of strategic needs, tactical possibilities and technological opportunities then, at present, the array of tactical possibilities does not offer enough to meet the strategic need. This is not a new experience; as recently as the middle of last century a similar situation prevailed. In that instance, the technological opportunities of the day were combined to create Blitzkrieg—offensive tactics that, in the wake of the First World War, presented options to support a strategic positive purpose. A similar combination of technical opportunities is possible today if we are able to grasp them.

Distributed Manoeuvre aims to describe a tactical system that is able to overcome the strength of the tactical defensive in a way, and at a speed, that promises to be useful to strategists. It harnesses the strengths of professional militaries, robust hierarchical organisations, and modern communications and weapons technologies to provide an offensive model that does not rest on mass, and which is applicable across the array of threats from low-technology militias to the fully equipped militaries of peer competitors.

If there has ever been a Revolution in Military Affairs the changes we are experiencing today do not comprise one. If anything, Blitzkrieg represented a revolution—making the offensive dominant—with the changes to military technology since the mid 1980s representing a Counter-Revolution in Military Affairs, returning the ascendancy to the tactical defensive. This paper argues that the same technological opportunities, properly combined and implemented by good soldiers, can produce a refresh of Blitzkrieg—a Counter-Counter-Revolution in Military Affairs.

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Our 21st-century public institutions were created with an 18th-century notion of technology. With no national communication infrastructure, we built cities as silos, each operating within a geographical proximity of its own as an autonomous, distinct unit, though they were tasked with essentially the same mandate. Things have changed. Cities can now work together to pool resources and share best practices. Action item: Share open source technology with a sister city or change procurement rules to make it easier to redeploy civic tech. 5. tap into the community's capacity. This 1996 DSB Summer Study on Tactics and Technology for 21st Century Military Superiority was tasked to identify how to make rapidly deployable forces more potent. Distributed-Force Concepts for Rapid Deployment Operations: Report of the DSB Panel on Analysis and Modeling" MGen Jasper Welch, USAF (RET), (Panel Chairperson) | "Task Force Griffin Final Briefing Report, September 1996" | RADC Analysis Center, Fort Leavenworth KS | "Analytical Support to the Defense Science Board - Tactics and Technology for 21st Century Military Superiority" | John Matsumura, Randall. Strategic AIR campaigns with conventional major offensive or