2.2 STRATEGY: MILITARY PLANNING UNDER CONDITIONS OF UNCERTAINTY, COMPLEXITY AND RISK

John Stone, Kings College London

Introduction

The purpose of this paper is to provide an insight into the roles that uncertainty, complexity and risk-taking play in military planning. In doing so it is intended to facilitate the identification of issues of potential significance to decision-makers involved in the planning of mega urban transport projects.

Military planning in its widest sense encompasses a very great range of activities, many of which are conceptually indistinct from other (civilian) forms of planning. Equipment and facilities must be budgeted for, acquired, maintained and finally disposed of. Personnel must be recruited, trained, fed, accommodated and ultimately pensioned off. In managing all these activities – along with many others of similar kind – militaries engage in planning activities that are essentially no different from those undertaken by large civilian enterprises. In one important respect, however, military planning differs significantly from its civilian counterparts. This difference is associated with the unique function of armed forces, which is war-fighting. It is with this particular aspect of military planning – what is normally termed the *strategic* aspect – that this essay is concerned.

War occurs when we resort to force in an effort to achieve our political ends. The function of strategy is to provide the instrumental link between military means and political ends. In other words, it is concerned with the processes by which force is used to generate political effects. Strategy can therefore be considered a form of planning, and it is sometimes defined in just such terms. Indeed for US Admiral J.C. Wylie, strategy is precisely a 'plan of action designed in order to achieve some end' (Wylie, 1967).

But if strategy involves planning, it is nevertheless of a rather particular kind. It can be distinguished from other forms of planning by the fact that it is conducted with a sentient adversary in mind. Whilst sending astronauts to the moon was undoubtedly a very demanding undertaking, NASA planners did not have to worry that the moon was inhabited by hostile Selenites who would endeavour to frustrate their efforts by violent means. Strategists, on the other hand, must make their plans in anticipation of a hostile enemy response and with a view to making that response as harmless and ineffective as possible. As Lawrence Freedman recently put it, strategists are always

> *"... thinking about the choices available to others and how their own endeavours might be thwarted, frustrated or even reinforced. It is this interdependence of choice that provides the essence of strategy and diverts it from being mere long-term planning or the mechanical connection of available means to set ends* (Freedman, 2006: 9).

In what follows I want to show how 'interdependence of choice' exposes military planning to the effects of uncertainty and complexity. The forms that this uncertainty and complexity take are many and varied but I propose to focus on two important

ones: uncertainty as to enemy motivations and intentions; and the complexity associated with military organisations and their operations. Together, their influence ensures that military plans always embody a considerable degree of risk.

I propose to elaborate on these points in two ways. First, I show how the effects of uncertainty, complexity and risk on military planning were accommodated by Carl von Clausewitz in his seminal work, *Vom Kriege* (*On War*) which was published posthumously in 1832. Clausewitz was the first military theorist to address such matters systematically, and much subsequent work in the field has been little more than a reformulation or amplification of his original ideas. In an essay written to accompany the 1976 translation of *On War*, Bernard Brodie described it as 'not simply the greatest but the only truly great book on war' and I find no reason to revise this verdict thirty years later (Brodie, 1993: 58). Clausewitz therefore deserves a section of his own in this paper. In subsequent sections, I borrow certain concepts from Clausewitz to illuminate some important ways in which the risks associated with military planning under conditions of uncertainty and complexity have been addressed. By surveying the two centuries or so between the French Revolution and the present day, it is possible to show how efforts to manage this risk have varied across different political and technological contexts, and to venture some generic conclusions in this regard (Stone, 2004: 408-427).

Clausewitz

The enduring value of Clausewitz's analysis stems in no small part from his rejection of the prevailing mode of theorising warfare during his own lifetime (1780–1831). The efforts of his contemporaries were typically influenced by an Enlightenment concern with the search for timeless principles that underpinned human behaviour. The conduct of war, no less than any other area of human endeavour, was believed to be subject to a set of principles which, once they had been clearly identified, would provide a 'blueprint' for the optimum conduct of warfare, thereby removing it from the reach of uncertainty Gat (2001: 39). To this end, military theorists sought to distil the principles of war from numerous instances of historical practice by searching for regularities amongst the exploits of Great Generals. Clausewitz disparaged his contemporaries' efforts to generalise from observations of historical military practice which, he argued, constituted mere surface manifestations of more fundamental forces at play. As such, any theory built on them would rest on ephemeral, historically contingent, premises. For his part, Clausewitz believed that it was possible to derive a universal theory of war only by first identifying war's fundamental dynamics. Having done so it would then be possible to construct theory via a process of deductive logic shorn of unwarranted assumptions. History remained important to the process, Clausewitz being adamant that logic should not lead theory in directions that were contradicted by historical practice. Thus history's role was to provide a 'reality check' on the formation of theory rather than to furnish it with building blocks *per se*. It is this concern with logical extrapolation from fundamental premises, guided by (but not wholly dependent on) historical observation, which lends Clausewitz's theory of war its lasting relevance.

Clausewitz began constructing his own theory from the premise that if we resort to force in pursuit of a political aim, we must expect our adversary to reciprocate in an effort to deny us what we want (Clausewitz, 2004: 1-9). The surest way to achieve our political goal is thus to destroy our enemy's armed forces. Until we have done this, he will remain able to contest matters and perhaps even destroy

our armed forces. To shrink from the goal of destruction – on humanitarian or other such grounds – is to render oneself vulnerable to an enemy who feels bound by no such inhibitions. In short, therefore, whatever the political rationale for war might be, the focus of war planning must always be the destruction of the enemy's armed forces. To attempt anything less is to court defeat.

Having deduced how war ought (logically speaking) to be conducted, Clausewitz proceeded to explain why historical practice typically involves a significant departure from what Azar Gat has more recently termed the 'imperative of destruction' (Gat, 2001: 202). Here Clausewitz emphasised the important point that an effective strategy is one that generates desirable political effects without incurring disproportionate costs in terms of damage suffered and military effort expended. Indeed, without some degree of proportionality between costs and benefits, it would be impossible to conceive of war as a rational tool of policy. From this wider perspective, therefore, the challenge posed to war planners is actually to identify and apply the *minimum* amount of force necessary to make our opponent give in. Granted, if both we and our enemy are completely committed to achieving our political aims then hostilities will end only when one of us has been rendered defenceless, and planning must proceed accordingly. But, if our enemy is less than completely committed to his political aims, reason dictates that we should endeavour to win through a correspondingly reduced military effort. Under such conditions we might plan to inflict a relatively modest degree of destruction – or perhaps even just threaten to do so – in the expectation that our adversary will thereby cut his losses and accede defeat. This is what Clausewitz meant when he famously described war as the continuation of politics by other means.

In practice, therefore, wider political considerations mean that war planning tends to be predicated on our expectation of what an adversary is most likely to do – rather than the most dangerous thing he could theoretically do – in response to our own actions. But because we can never be entirely certain about what an enemy's response will actually be, we must accept some risk as we endeavour to chart a course between the twin dangers of applying too much, and too little, force. As Clausewitz himself put it:

> *"In this manner, he who undertakes War is brought back again into a middle course, in which he acts to a certain extent upon the principle of only applying so much force and aiming at such an object in War as is just sufficient for the attainment of its political object. To make this principle practicable he must renounce every absolute necessity of a result, and throw out of the calculation remote contingencies"* (Clausewitz, 2004: 649).

A second reason why the historical practice of war falls short of what is logically necessary derives from the fact that military operations can never be perfectly controlled. Those involved in the direction and conduct of war must frequently make vital decisions based on partial information, and under conditions in which they are both tired and frightened. Clausewitz famously used the term 'friction' for the collection of influences that inhere in military organisations and their operations. Together, they conspire to reduce the efficiency of armed forces by continuously bringing them into contact with the influence of chance.

> *"The military machine, the Army and all belonging to it, is in fact simple, and appears on this account easy to manage. But let us reflect that no part of it is in*

one piece, that it is composed entirely of individuals, each of which keeps up its own friction in all directions... This enormous [collective] friction, which is not concentrated, as in mechanics, at a few points, is therefore everywhere brought into contact with chance, and thus incidents take place upon which it was impossible to calculate, their chief origin being chance" (*Ibid.*, 59).

The weather can turn bad, equipment can fail, personnel can get lost, and a host of other events can occur that are the result of chance. A practical consequence of this is that effective war plans tend to be relatively simple affairs, which make prudent allowance for the intrusion of misfortune into events. More complex plans, which demand a high degree of co-ordination, and make limited provision for the influence of chance, are generally too fragile to survive the demanding conditions associated with warfare. This in turn suggests that war plans should not be too ambitious in what they aim to achieve. A balance therefore needs to be struck between what is desirable and what the imperfect nature of the military instrument makes possible.

Clausewitz, therefore, is valuable for present purposes because he explains why logical necessity provides no sure guide to the formulation of war plans. On the contrary, strategy should be understood as an activity that is attended by risks that must be balanced against each other. In this respect, the fact that war planning is conducted by intensely hierarchical and non-democratic organisations does not absolve the process from dialectical influences. On the contrary, war plans are very much the emergent property of various competing considerations that must be weighed in the balance. To apply too little force is to risk leaving oneself vulnerable to damaging counter-attack: to apply too much is to risk unleashing levels of violence whose effects dwarf any political benefits. In addition, one must also factor in the feasibility of ambitious, and therefore, complex plans in the light of friction's malign influence on military operations. In what follows I develop these insights in relation to the historical practice of war planning, beginning with what is sometimes termed the era of 'traditional' strategy.

Traditional strategy

The character of warfare during the years between Clausewitz's death and the end of the Second World War was profoundly influenced by Eric Hobsbawm's 'two revolutions'. In combination, the French Revolution and its Industrial counterpart dramatically changed both the political ends for which wars were fought and the military means with which they were conducted. The French Revolution introduced deep ideological divisions into international politics, which were initially expressed in the form of contending nationalist movements and subsequently in the struggle between totalitarianism and democracy. As a result, war came to be understood as something that was fought for the highest political stakes: the survival of one's very way of life. For its part, the Industrial Revolution led to dramatic increases in the destructive potential of weapons. And since notions of victory were couched in existential terms, it followed that the full scope of that destructive potential would automatically be unleashed once war broke out, producing violence of unprecedented scale and scope.

The effect of these developments on strategy was to remove uncertainty as to enemy intentions (which could reliably be regarded as extreme), whilst encouraging increasingly ambitious, complex, and thus risky, war plans designed to destroy the enemy and render him harmless as rapidly as possible – preferably in a single decisive

battle. Only if rapid victory was achieved could one reasonably hope to prevail at bearable cost. A good example of this line of thought is the 'Schlieffen Plan' which dictated German operations during the opening stages of the First World War. The plan called for large German forces to make a rapid, highly choreographed, enveloping manoeuvre against the northern flank of the French army as soon as possible after the beginning of hostilities. The manoeuvre was intended to result in the wholesale destruction of the French within six weeks, whereupon German forces would be hurried eastwards to meet an anticipated offensive by Russia, which was allied with France. By such means Germany hoped to pre-empt a simultaneous and extremely costly struggle against two strong opponents (Ritter, 1978). But it was always a gamble, and indeed was recognised as such. Mobilising and directing an army of millions was – to say the least – a complex affair. This complexity rendered operations highly vulnerable to the disruptive effects of friction, and thus risky in the extreme. Indeed, once the plan was executed events quickly conspired to slow the pace of the offensive and to undermine its co-ordination. Units failed to comply with ambitious advance rates, and cohesion broke down due to poor communications. Seizing the opportunity this afforded, the French promptly counter-attacked and all hope of a rapid German victory evaporated. Instead, the ensuing war evolved into a long attritional struggle which drew remorselessly on the resources of the belligerents, virtually bankrupting France and Britain and toppling the German, Austrian and Russian empires.

In the aftermath of the war, strategists looked for new ways of achieving the kind of rapid, conclusive victory that had been denied the Germans in 1914. In their search they turned to mechanisation – an emerging technology of the interwar period – in a bid to boost the efficiency of military operations. It was realised that the large conscript armies of 1914 had been cumbersome instruments, highly vulnerable to the effects of friction and thus very difficult to use in a decisive manner. In their stead, interwar strategists proposed the introduction of smaller mechanised forces, manned by professional soldiers. Such forces, it was considered, would be less affected by the effects of friction due to their relatively small size and the competence of their personnel. In combination with their superior mobility, this would allow them to mount devastating blows against enemy forces which were larger but which laboured under a much greater burden of friction. The British strategists J.F.C. Fuller famously proposed that tank forces be employed in such a manner as to strike deep behind enemy lines, producing disorder and despondency along the way and thereby 'paralysing' enemy resistance rather than physically destroying it. More ambitiously, he also argued that aircraft be used to mount attacks directly against cities, thereby destroying the entire enemy nation's will to fight. Under such circumstances war, he considered, might be brought very rapidly to a decisive conclusion at relatively little cost to the victor – and indeed the defeated (Fuller, 1923).

In practice, such new concepts proved important during the Second World War but were not in themselves decisive. Marauding tanks were certainly a danger, but not one without antidotes in the form of mines, anti-tank guns and tanks of one's own. Aircraft certainly bombed cities with damaging effect but found it difficult to achieve overwhelming levels of destruction in the face of interceptor aircraft and anti-aircraft artillery. Night raids were a partial answer here, but flying by night also hugely exacerbated the baleful effects of friction on aircraft navigation and bombing accuracy. What this all meant was that unless one deliberately picked on technologically deficient opponents, such as Germany did against Poland in 1939, war remained a gamble. One might succeed in destroying the enemy sufficiently rapidly

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and comprehensively to prevent him recovering from the initial shock and fighting back: on the other hand, one might not. Hitler's *Blitzkrieg* against France was just such a gamble that paid off; his subsequent air offensive against Britain did not. Attacking a country as large and powerful as the Soviet Union was risky in the extreme and ultimately lost the Second World War for Germany. Technology, therefore, offered no effective way of removing the element of risk embodied in war plans. Victory at bearable cost continued to demand a great deal of good fortune in the face of a well-equipped opponent. This was, moreover, a lesson that would be lent even greater weight by the introduction of nuclear weapons in 1945.

Nuclear strategy

It is often considered that the advent of the nuclear age led to radical changes in the character of military planning. Certainly the destructive power of nuclear weapons generated great interest in preventing another world war from breaking out, and the contribution of armed forces was quickly understood to be crucial in this regard. Indeed as early as 1946 Bernard Brodie was arguing that:

> *"Thus far the chief purpose of our military establishment has been to win wars. From now on its chief purpose must be to avert them. It can have almost no other useful purpose"* (Brodie, 1946: 76).

Brodie's words marked the beginning of a new intellectual enterprise aimed at determining exactly how force could best be used to avert war. One result was a vast academic literature exploring the manner in which nuclear threats might be used to deter Soviet aggression, by demonstrating that the risks associated with war far outweighed any possible gains (see Freedman, 1989).

As far as the US military itself was concerned, however, strategy continued along traditional lines. The assumption made was that the ability to destroy one's enemy in time of war represented the best way of ensuring that war would not break out in the first place. So long as the USA possessed both an adequate supply of nuclear weapons, along with the will to use them, the Soviets would have nothing to gain from war and would therefore refrain from attacking the USA.

Unfortunately for US war planners, however, their task was not simply to devise military responses that would deter a direct attack on their home territory. As a superpower, the USA had acquired global interests that were also perceived to require protection from Soviet aggression. The nagging doubt was that Moscow might not believe the USA would unleash its nuclear arsenal against the Soviet Union in response to an attack on (say) Western Europe or the Middle East. If a nuclear attack on the Soviet Union could be expected to bring down devastating retaliation on the USA, the latter might be deterred from intervening in such a 'local' war. Under such conditions, the US nuclear deterrent was said to lack credibility, and a key challenge for strategists was to devise concepts for the use of nuclear weapons that would boost this credibility.

The military response to this problem was to devise plans for a pre-emptive blow against the Soviet Union. The idea was that in a crisis situation, when there were compelling grounds for believing that the Soviet Union was about to attack, the USA would itself launch a massive strike designed to destroy the Soviet armed forces and urban-industrial centres. The resulting death and destruction would, it was hoped, paralyse whatever was left of the Soviet state or at least reduce its retaliatory blow to

more manageable levels. But planning a nuclear offensive of this magnitude was an extremely complex undertaking. Hundreds of bombers were each required to fly thousands of miles, meeting up with refuelling aircraft along the way. Their flight paths also had to be circuitous in order to keep them a safe distance away from targets that would be subject to nuclear attack by other aircraft. Ideally, all nuclear weapons should be delivered simultaneously in a highly choreographed operation. Given the complexities involved, however, it was inevitable that friction would intervene and disrupt such plans. One fundamental problem in this regard was that wind speeds would be far from constant over such long distances, and would impose unpredictable variations on flight times to targets. The chances of the US Air Force dealing a highly co-ordinated knock-out blow against the Soviet Union were therefore slight indeed. In 1961, amidst tensions over Berlin, the prospects for a more tightly defined pre-emptive strike against Soviet nuclear forces alone were considered. An advantage with such an attack would that it would require relatively few bombers, would be less complex to plan and would therefore be less susceptible to the disruptive effects of friction. Despite the putative benefits of such an approach, however, it attracted little support in the crisis-ridden atmosphere of 1961. The issues that compelled recognition were that things would still go wrong, and that the consequences of even minor disruptions to the plan might well be awful. Thus as Fred Kaplan has observed, 'the most determined American officials, who had firmly believed in the counterforce strategy in theory, did not even contemplate taking the awesome risk of executing the strategy in practice (Kaplan, 1983: 291-306).

The failure of traditional war planners to identify how to defeat the Soviet Union without undue risk to the United States of America (USA) left the credibility problem unresolved. The challenge was taken up by civilian academics whose views on strategy were often very different from those held by the military. One of the most imaginative of this new group was Thomas Schelling whose ideas shook the very idea of war planning to its foundations. Schelling famously argued that the credibility of nuclear threats did not rest solely on the ability of war planners to yield painless results in the event of war. Indeed, part of their credibility derived from the *imperfect* nature of planning as a determinant of future actions and consequences. The USA might plan to bomb Russia in the event of an attack on Western Europe, and might declare as much to the world at large. Under such circumstances, the efficacy of the threat would reside not simply in Moscow's reading of Washington's determination to make good on its promises. It would also reside in the prospect that events might take a turn of their own; that in crisis conditions the USA might find itself acting in unplanned and unanticipated ways. In short, nobody could be entirely certain what would happen if Russia invaded Western Europe. What was the source of this uncertainty? asked Schelling.

> *"It must come from somewhere outside the threatener's control. Whether we call it 'chance,' accident, third-party influence, imperfection in the machinery of decision, or just processes that we do not entirely understand, it is an ingredient in the situation that neither we nor the party we threaten can entirely control"*
> (Schelling, 1963: 188).

In other words, the influence of friction effectively ensured that 'there is no such thing as a "firm" plan, intention or policy' (*Ibid*., 202). This meant that otherwise marginally credible threats might still therefore prove to be effective deterrents because of the way in which they left 'something to chance'. And even if there were only a small

chance of the USA (inadvertently or otherwise) initiating nuclear war in response to Soviet aggression, the awful consequences of such an eventuality might well be sufficient to dissuade the Soviets from running the risk in the first place.

Thus although more traditional minds might encounter the limits of nuclear planning with a sense of frustration and anxiety, for Schelling it was an important virtue of such plans that they might well fail under pressure with unpredictable consequences for all involved. But it was a virtue that was always likely to recommend itself to academics such as Schelling rather than to those more directly concerned with defending the West against Soviet aggression. Politicians were never likely to be comfortable with the notion that security rested on the prospect of events getting out of control during an international crisis (Williams, 1991: 130-131). On the contrary, their instinct was to maintain as much control as possible over events in which the use of nuclear weapons was implicated, and subsequent efforts to develop a credible nuclear strategy tended to reflect this.

If the threat of an unrestrained attack on the Soviet Union lacked credibility, then the answer was deemed to lie not in 'the threat that leaves something to chance' but in the subordination of war plans to more intrusive political control, which would permit a more deliberate and restrained use of nuclear weapons. Attacks aimed against the armed forces and political leadership of the Soviet Union might, for example, reduce the degree of damage that could be inflicted on the USA in a retaliatory strike. Alternatively, it might prove preferable to strike Soviet armed forces but refrain from actually attacking the leadership, thereby rendering it hostage to its own future behaviour. This might induce the Soviets to avoid retaliating against US cities with their remaining nuclear weapons, and thereby help the USA to terminate the war on favourable terms. More to the point, if everybody could be persuaded that this *might* be the end result in the event of war, then the US threat to use nuclear weapons in the event of a Soviet attack against Europe would appear more credible, and deterrence would be strengthened (see Gray and Payne, 1980: 14-27).

The heroic assumptions built into such plans barely require bringing out. Why would the US president feel more able to initiate nuclear war than had been the case during the early 1960s? Exactly how vulnerable were the enemy's armed forces and leadership to attack? How rationally would political leaders react to *any* attack on their countries? Would command and control systems survive to permit the kind of deliberate operations envisaged over a possibly protracted period of time? In short, there was ample room for scepticism about the ability to exert meaningful control over the conduct of nuclear war, and every reason to believe that clever plans would rapidly break down leading to an unrestrained exchange of weapons. Ultimately, credible plans for fighting nuclear war relied on the chance that things could be kept under political control just as much as Schelling's position relied on the chance that events would escape it (see Howard, 1981: 3-17).

Indeed, by the closing stages of the cold war Schelling's analysis was looking more convincing than ever. Despite considerable efforts to the contrary, planning had not usurped the salient position played by chance in the constitution of credible nuclear threats. It was a situation which led Lawrence Freedman to conclude his survey of nuclear strategy as follows:

"The position we have reached is one where stability depends on something that is more the antithesis of strategy than its apotheosis – on threats that things will get out of hand, that we might act irrationally, that possibly through

inadvertence we could set in motion a process that in its development and conclusion would be beyond human control and comprehension.

This threat is credible because it is clear that if there were a major breakdown in East-West relations in Europe, and fighting began, there would be great confusion with plans drawn up before a war soon overtaken by events and nobody able to promise victory. Those who have responsibility for unleashing nuclear arsenals live by the motto that if they ever had to do so they would have failed. Remarkably, up to now they have succeeded. C'est magnifique, mais ce n'est pas la stratégie" (Freedman, 1989: 433).

Limited conventional war

If the prospects for imposing political restraint on the conduct of nuclear war always looked slim, it did not necessarily follow that conflict below the nuclear threshold would be equally uncontrollable. From the 1950s onwards it had been frequently suggested that local acts of communist-inspired aggression might better be countered by conventional, rather than nuclear, force. Strategic theorists such as William Kaufmann argued that the answer to the credibility problems of the US nuclear deterrent lay in meeting limited conventional attacks with a proportionately limited conventional response. The strategic aim in such cases would not be to render one's enemy completely defenceless, but merely to place him in a situation where the pursuit of his political objectives would be disproportionately costly in military terms.

"The basic assumption for this kind of conflict [claimed Kaufmann] is the assumption of a calculating individual with a multiplicity of values, aware of cost and risk as well as of advantage" (Kaufmann, 1956: 117).

It was reasoned that a rational aggressor of this sort, faced with the prospect that the risks of continuing the war outweighed the benefits, would choose to desist.

During the 1960s the use of conventional forces in such a restrained manner held considerable appeal in Washington. The Johnson Administration was casting around for strategies with which to tackle the North-Vietnamese backed insurgency against its southern neighbour. Johnson was determined to meet the challenge in South East Asia but was also keenly aware of the risks associated with a major military intervention. It was clearly within the scope of US military power to destroy North Vietnam. On the other hand, he believed that a military effort of this magnitude risked precipitating Chinese entry into the war. China had, after all, intervened in the Korean War in 1950 in response to US troops approaching its borders. Thus, equally determined to support South Vietnam, and to prevent a widening of the war, Johnson opted for a strategy based on a carefully measured application of force designed to coerce Hanoi into a negotiated peace. US ground forces were deployed into South Vietnam in order to tackle the communist insurgency and stabilise the situation in the South. US air power was employed to carry the war into the North proper. Its mission was not to destroy Hanoi's means of resistance outright, but rather to inflict damage of sufficient magnitude to persuade the North that it was in its best interest to terminate its support for the insurgency and reach a negotiated settlement. In such a manner Johnson hoped to navigate his way between the twin risks of not doing enough to prevent the fall of South Vietnam, and of doing too much, thereby precipitating a larger war with China. He gambled, and by 1968 it was clear that he had lost.

US defeat in Vietnam led to much soul-searching as to what had gone wrong. One conspicuous casualty of the search for explanations was the notion that military operations should be subjected to political restraint. Vietnam was held up as a clear example of what happened when the armed forces were prevented from going all out to destroy the opposition. They were left vulnerable to the opposition's own plans, which did not include a comparable element of restraint, and were themselves defeated in consequence. In other words, Johnson's determination to avoid war with China led him to accept unwarranted military risks in Vietnam.

In point of fact, the US experience in Indo-China did not definitively refute the validity of politicised strategies. The problem lay less in the basic conception than in its application to the specific case of North Vietnam. In so far as it had one, Washington's understanding of Hanoi was of a strategic actor amenable to making the kind of means-ends calculations described by Kaufmann, and which could therefore be coerced through the use of force into accommodating USA wishes. Washington's error lay in profoundly underestimating the degree of commitment which the North brought to the project of national re-unification and independence. These were goals that the Vietnamese had already been struggling for decades to achieve and for which they would stop at nothing. A less committed adversary might have been coerced by US airpower and frustrated by US ground forces, but not Hanoi (Blight and Lang, 2005: 42-57). Under such conditions, nothing less than the complete destruction of North Vietnam could have produced victory for the USA.

It did not necessarily follow from this that the politically restrained use of force for coercive purposes was always doomed to failure. What did follow was that it was important to understand a good deal about the enemy's motivations for fighting and how strongly they were held. Against a highly motivated enemy, a coercive strategy was unlikely to succeed. Conversely, against an adversary less committed to its political goals, it might work. From this perspective, the USA lost in Vietnam because its strategy was inappropriate rather than because it was inherently flawed. But it is only in recent years that the full extent of Washington's failure to understand its enemy has become apparent. In the immediate wake of the war, such considerations tended to be swept aside, and Vietnam was seen a vindicating the warning given by Clausewitz almost a century and a half previously. To use anything less than the maximum possible force in an effort to make one's enemy defenceless is to run an unnecessary risk of defeat.

The Weinberger Doctrine

The 'imperative of destruction' would thereafter make itself keenly felt as the USA revised its approach to strategy in the wake of Vietnam. An important development in this regard was the so-called Weinberger Doctrine that was promulgated under President Reagan's defence secretary Caspar Weinberger (Weinberger, 1984). The Doctrine was intended to provide a source of guidance on the application of force in what was expected to be a highly uncertain future. This was the time of the 'second cold war', when the Soviet Union and its allies were thought to be on the move and likely to present 'threats ranging in intensity from isolated terrorist acts, to guerrilla action, to full-scale military confrontation.' As the Reagan Administration saw it, the problem under such conditions was to chart an acceptable path between the risks associated with refusing to intervene in crisis situations, and the equally unacceptable risks of getting drawn in to new Vietnam-style 'quagmires'.

As a solution to this particular challenge, the Weinberger Doctrine was less than successful in many respects, although a discussion of the problems need not detain us here. Of relevance to present purposes is the importance that was attached to the goal of making one's enemy defenceless in war. The Doctrine counselled, *inter alia*, that armed forces should be introduced into a situation only if the vital interests of the USA or its allies were under threat, and that in such circumstances forces should be committed 'with the clear intention of winning.' Typically for documents of its type, the vital term 'winning' was left undefined. Nevertheless, the application of Clausewitzian theory allows us to infer what was meant by the term in this context. If force is to be committed when vital interests are at stake, it follows that its application should be unrestrained by broader political considerations. Under such circumstances there would be nothing to gain (and much to lose) by practising voluntary restraint. In the absence of such restraint, military activity logically tends towards making one's enemy defenceless (and harmless) by destroying his means of resistance. Thus what was not said – but strongly implied – by the Weinberger Doctrine was that armed force should only be employed under situations in which the enemy's means of resistance could be decisively destroyed. By resolving to act only when it absolutely had to, and then in a manner calculated to render the opposition defenceless, the USA sought to reduce the uncertainties – and therefore the risks – associated with using force to meet communist aggression.

Gulf War 1991

It is not always the fate of such doctrinal pronouncements to survive contact with the complexities of the real world and, as Michael Handel has shown, the USA certainly conducted a number of military interventions on subsequent occasions whose parameters deviated from Weinberger's principles (Handel, 1996: 185-203). On the other hand, Iraq's invasion of Kuwait in 1990 provided an almost ideal case for the use of force from the perspective of the Weinberger Doctrine. The invasion clearly constituted a serious threat to both the vital interests of the USA and its allies. Saddam's occupation of Kuwait left him in control of almost two thirds of the world's oil supply. President George Bush Senior was at pains to point out that in committing US forces to action he was motivated by a matter of principle: that acts of aggression ought not to go unanswered in the new post-cold war order. But if this were the case, then the issue of access to oil certainly did nothing to undermine the decision for war.

Moreover, the general character of the politico-military situation readily leant itself to resolution by exactly the robust approach to the application of force which the Weinberger doctrine demanded. It is true that some early plans for the use of airpower against Iraq echoed the kind of coercive concepts that had shaped operations in Vietnam. One such idea was to commence:

> *" with demonstrative attacks against high value targets ... [and then] escalate as required until all significant targets are destroyed…. This strategy allows time and opportunity for Hussein to re-evaluate his situation and back out while there is something to save"* (USGPO, 1993: 25).

Such concepts were quickly rejected, however, in favour of a more direct approach to the problem. Saddam was not to be coerced into leaving Kuwait. Rather, he was to be rapidly and comprehensively denied the ability to hold onto it. In other words, the liberation of Kuwait was understood to demand a war plan designed to destroy the

Iraqi armed forces. Chairman of the Joint Chiefs of Staff Colin Powell described the basic plan for dealing with the Iraqi army as follows: 'First we're going to cut it off, and then we're going to kill it (Powell with Persico, 1995: 509-510).' And in the event this is largely what happened.

The offensive began with intensive air-strikes designed to paralyse the Iraqi regime and render it incapable of maintaining control over its armed forces. Attention then shifted to those forces themselves, a large proportion of which were relatively easy to come to grips with. In order to fend off a US-led attack, they were deployed in static defensive positions along the border with Saudi Arabia. This left them vulnerable to a violent bombing campaign, followed by a swift ground assault which, in true *Blitzkrieg* style, punched through the western flank of the Iraqi defences and pushed deep behind them. In consequence, Iraq was rapidly deprived of the ability to defend itself. Although some important elements of Saddam's armed forces escaped, he was left in no position to hold onto Kuwait.

The spectacular nature of the victory in the Gulf encouraged the view that the USA had found its way again after an unfortunate detour into the dangerous terrain of limited war during the 1960s. The risks associated with the conduct of war had to be kept down to a minimum, but the way to achieve this was not to exercise political restraint over the use of force in the hope that one's enemy would co-operate and observe comparable limits. To do so left too much resting on enemy intentions and motivations, about which one could never be entirely certain. Far better, therefore, to defeat him as rapidly and as comprehensively as possible, thereby denying him the ability to inflict damage on friendly forces whatever his plans in this regard might have been. In this respect, these developments can be characterised as a return to a far more traditional approach to strategy of the type practised during the early twentieth century.

In certain other respects, too, US strategy manifested some very traditional characteristics. Most importantly for present purposes, the planning and preparation for 'Desert Storm' was complex in the extreme. The decisive defeat of Iraq was considered to require very powerful, and thus very large, armed forces whose operations were potentially vulnerable to the effects of friction (see Schwarzkopf with Petre, 1992). That this vulnerability did not manifest itself in any particularly calamitous fashion was probably the result of two key factors. Firstly, the quality of Iraqi resistance was so poor as to barely impinge on the action of US forces. In other words, friction could be tolerated because the inefficiencies it produced barely mattered when the opposition was essentially a passive set of targets. Secondly, much of the latest technology that the USA deployed in theatre performed very well. In particular, the application of advanced information technologies to military tasks (in the form of the Global Positioning System, 'smart' bombs, advanced radars and a host of other innovations) had produced important efficiency gains. These in turn ensured that large and potentially cumbersome forces operated with much less friction than would otherwise have been the case. With the help of these new technologies, movement could be co-ordinated and controlled with relative ease. Targets could be acquired and accurate fire could be directed against them with great rapidity. And all this activity could be sustained through the efficient distribution of what often amounted to scarce logistic resources.

These were relatively new capabilities, and as such remained virtually unique to the US armed forces. Certainly, the Iraqis possessed nothing comparable and therefore operated under a much greater burden of friction, despite the fact that their defensive plans were far simpler than the carefully orchestrated Coalition offensive.

Moreover, much the same situation pertained the world over. In the light of 1991, it became obvious that no other state, or coalition of states, could match the performance advantage that the USA enjoyed as a result of its lead in the application of information technology to warfare. What this suggested to many strategic commentators was that carefully directed investment in information technologies would ensure that the USA continued to enjoy a decisive level of advantage over any adversary it faced. Without the effects of friction to retard them, US armed forces would be capable of destroying the opposition so rapidly and comprehensively as to preclude the possibility of their striking back in any significant way (see Owens with Offley, 2001). The maintenance of a sufficiently great technological lead would, in other words, permit the USA to pursue the traditional strategic goal of rendering its enemies defenceless by destroying their armed forces whilst exposing itself to minimal risk in the process. Not surprisingly, this vision of future warfare proved alluring, to say the least, and quickly came to command official support as a result. Indeed, in current Department of Defence parlance, the appropriate exploitation of information technologies is now expected to help 'transform' the US military into 'a smaller, more lethal, and nimble force capable of swiftly defeating an adversary' (Office of the Secretary of Defence, 2003: 23).

By the beginning of the twenty-first century, therefore, US efforts to ameliorate the risks associated with the effects of uncertainty and complexity in warfare had turned full circle. The journey had begun from the starting point that war planning should focus on the destruction of the enemy's means of resistance, and had now finally returned there. A salient difference associated with the current state of affairs, however, is that the end of the cold war has left the USA with easily the most technologically advanced armed forces in the world. In theory at least, therefore, US war planners are now well-placed to render their adversaries defenceless very rapidly indeed given the much lower burden of friction under which their own armed forces must operate. This current situation leads us to the question of whether the USA has now 'solved' the problems associated with the influence of uncertainty and complexity in warfare.

Iraq again

Optimistic forecasts notwithstanding, current difficulties in Iraq suggest that the USA has not succeeded in solving the challenges associated with uncertainty and complexity in warfare. In their efforts to manage risk, the USA (along with its coalition partners) have succeeded only in shifting that risk into different areas of concern.

Having fulfilled the terms of the UN mandate in 1991 by liberating Kuwait, the USA remained content to address the continuing threat posed by Saddam Hussein in two principal ways. Iraq was deterred from committing further acts of aggression by the continuing presence of Western forces in the Gulf region, along with their occasional use on a punitive basis. In addition, an intrusive inspection regime was put in place in order to prevent Saddam from acquiring weapons of mass destruction. Crucially, Saddam was considered to be a known quantity: his intentions may have been malign but his motivation was undermined by the conditional willingness of the West to use force in order to keep him in his place. The language of force was, indeed, one that Saddam could understand and respect. Thus the risks that his continued presence in the region posed were considered to be minimal.

But in 2001 the attacks on the World Trade Centre and the Pentagon radically changed the risk assessment in relation to Iraq. In the wake of the attacks, the possibility that Saddam might offer support to international terrorists and perhaps be in a position to supply them with weapons of mass destruction led to a hardening of hearts and a determination to replace him with somebody more positively disposed towards the West. Prime Minister Tony Blair attempted to justify his support for preventive war against Iraq in terms of threats and risks as follows:

"it is the threat that is the issue ... I feel so passionately that we are in mortal danger of mistaking the nature of the new world order in which we live ... September 11th did not create the threat Saddam posed. But it altered crucially the balance of risk" (Dombrowski and Payne, 2006: 118).

After 2001, therefore, the risks associated with leaving Saddam in power were considered greater than those associated with toppling him from power. This of course meant fighting a major war, because toppling Saddam demanded that his regime must first be rendered defenceless by destroying the Iraqi armed forces. Nevertheless, the risks associated with such a war were understood to be relatively small given the crushing level of technological superiority enjoyed by the USA.

In part at least, these beliefs were borne out. The initial operations in 2003 rapidly destroyed the regular Iraqi resistance, and the collapse of Saddam's regime followed thereafter. But then, what had initially seemed like a triumph for the decisive use of force quickly transformed itself into a dangerous new situation as coalition forces attempted to consolidate their position in Iraq. The insurgency that sprang up in the wake of Saddam's fall from power proved extremely dangerous and very much more difficult to manage than had been Saddam himself. Whereas Saddam had been a known quantity who respected the threat posed by Western force, the insurgents have proved far more difficult to tackle effectively.

True to form, US planners responded to the insurgency by drawing up operations designed to 'destroy' the opposition (see Alwyn-Foster, 2005: 2-15). Any lesser effort, it was believed, would merely hand advantages to the enemy, thereby increasing the risk to friendly forces. In this respect it is unfortunate that the US technological advantage has proved to be of far less relevance than it was during the initial stages of the war. Whereas US forces had been able to identify and destroy their regular Iraqi counterparts with great facility, they have subsequently found it much more difficult to identify insurgents operating amongst the population at large, and to target them without causing disproportionate levels of collateral damage in the process. Moreover, the requirement to operate in urban environments has heightened the dangers associated with ambush and booby traps. Urban operations of this kind have, in short, proved far more vulnerable to the effects of friction than are the open fields (or desert) in which the US armed forces prefer to operate. Indeed the casualty figures bear out the fact that such operations are far more risky for US forces than was the fighting that preceded Saddam's downfall. The total number of US soldiers killed in action during the period of so-called 'major combat operations' during March and April 2003 amounted to 138. During the period since it has risen to 3100 (www.globalsecurity.org/military/ops/iraq_casualties.htm, 2007). Clearly, therefore, in their efforts to rid themselves of a perceived risk, in the form of Saddam Hussein, the USA and its coalition partners have succeeded in creating an entirely new set of risks. The complexity associated with urban operations brings with it the prospect of steadily mounting casualties. On the other hand, to leave Iraq without the means of

providing for its own security would be to risk the country falling into a state of civil war and ungovernability, thereby providing a more hospitable base for international terrorists than Saddam's Iraq ever did. If there exists a viable course of action between these two unfortunate extremes, it probably lies in a fundamental rethink of the principles by which the USA plans its military operations. More specifically, planning should revolve around the goal of coercing the insurgents into negotiations over the future of Iraq, rather than simply endeavouring to destroy them. This would involve a rather more restrained use of force than has hitherto been felt appropriate, and would therefore expose coalition troops to the risk that the insurgents might simply choose to take advantage of such restraint to hit back even harder. What this, in turn, suggests is a requirement for a much more accurate picture of who the insurgents are and what they hope to achieve through violence. Without such a picture, it will prove extremely difficult for the coalition to tailor its use of force in such a manner as to coerce the insurgents into renouncing the more extreme elements of their political programmes whilst signalling a willingness to compromise over the rest.

Summary

War is risky, not least because its conduct is beset by the influence of uncertainty as to enemy intentions, and the influence of complexity that renders operations vulnerable to the retarding effects of friction. Traditionally speaking, strategists have endeavoured to manage these risks by seeking to render their adversary defenceless (and thus harmless) at the earliest opportunity, thus making his motivations and intentions irrelevant to the planning process. Efforts to achieve such ambitious goals in the face of friction have led to great emphasis being placed on exploiting technology to improve the efficiency with which force can be applied relative to that of the enemy. In practice, however, any net efficiency gains have rarely been sufficient to ensure that victory could be achieved so rapidly and comprehensively as to preclude the enemy from striking back to damaging effect. In this regard the massive destructive potential of nuclear weapons created a serious challenge for war planners, as the likely costs associated with warfare now seemed to dwarf any possible political gains.

For those who were not content to view such a state of affairs as signalling the end of strategy, a possible answer lay in war plans designed to coerce an enemy into submission via the restrained application of force, rather than attempting to destroy his means of resistance outright. Such an approach, it was reasoned, might permit the pursuit of limited political objectives without both sides being destroyed in the process. In the event, the concept resisted any convincing application to nuclear warfare, although it proved more promising in relation to conventional operations. The challenge with this approach was that it exposed friendly forces to the risk that one's adversary would not co-operate in the exercise of restraint, although a sound knowledge of the enemy's intentions and motivations should ameliorate such risks. Crucially, however, this was not something that the USA possessed when it went to war with North Vietnam and ultimately came to grief. In consequence, notions of restraint and coercion were abandoned by US war planners, who returned to the position that the application of force should always aim at making one's enemy defenceless as rapidly as possible. In this they were encouraged by the end of the cold war, which left their armed forces far more technologically advanced – and correspondingly less vulnerable to the influence of friction – than any potential adversary.

What the post-cold war strategic environment has shown, however, is that even a crushing technological advantage in itself provides no guarantee of risk-free victory. The current war in Iraq suggests that whilst the possession of a technological edge is extremely valuable, it is no substitute for a clear understanding of one's adversary. Ironically, the toppling of Saddam only served to replace him with a set of adversaries whose motivations and intentions are far less clear, and who present a far more complex threat than did Saddam's regular forces. Technology is a valuable aid to the defeat of an insurgency, but it seems unlikely that victory in Iraq (if it comes at all) will be achieved via efforts to make the insurgents completely defenceless. On the contrary, they will have to be coerced into making a negotiated settlement. This in turn will demand a clear sense of the insurgents' various intentions and motivations so that force can be applied in a sufficiently restrained manner so as to leave open the possibility of negotiation without rendering coalition forces unduly vulnerable in the process. It remains to be seen how well US war planners will respond to this challenge.

Insights for urban transport planners

Most obviously perhaps, the risk that complexity generates is probably a generic issue across planning activities. Reading across from military strategy suggests that urban transport planners need to strike the same sort of balance between modesty and ambition as do war planners. On the one hand, incremental 'fiddling' with transport infrastructure may preclude the catastrophic failure of plans, but may never succeed in resolving really major problems. On the other hand, really sweeping and ambitious plans, that hold out some prospect of decisively resolving creaking infrastructure problems, may well carry a significant risk of failing catastrophically when attempts are made to implement them. It is probably the case that pushing the technological state of the art is as risky in civilian as in military planning.

If commonalities in relation to complexity and risk are readily apparent, those in terms of the political and adversarial content of planning may bear further investigation. In the introduction to this paper it was suggested that the requirement to anticipate and pre-empt adversarial behaviour is a distinguishing feature of military strategy. On reflection, it may well be that this distinction is one of degree rather than of kind. Mega projects, courtesy of their size and multiple impacts, are – somewhat like wars – likely to attract the attention of numerous stakeholder groups, who will all wish to see their differing interests expressed in the planning process. Since it will not be possible to accommodate all such interests to an equal degree, there is scope for conflict as well as collaboration in the setting of planning priorities. Under such circumstances, the question of whose interests are most fully met will depend on the pressures that each group can bring to bear in support of its position, along with the extent to which they are willing to accommodate the interests of others. Outright physical resistance by (say) environmental protesters will only be the most extreme expression of a struggle that is more typically carried out with words rather than actions, but that is a struggle nonetheless. Whilst it would certainly be inaccurate and unhelpful to impose too much of the military-strategic model onto urban planning practises, it might nevertheless be productive to consider further how conflicting interests can be managed by planners. Prior consultation with as many potential stakeholder groups as possible would seem to be one way of reducing the uncertainties surrounding the reception of mega projects. Such consultation would presumably help planners reconcile the technical characteristics of their projects with

the various viewpoints expressed by stakeholder groups, thereby reducing the risk of subsequently encountering serious opposition.

What this seems to suggest is that urban planning – like war – might usefully be considered a continuation of politics by other means. Just as the application of force in war is subordinated to a broader set of political considerations, so it may be that the technical content of urban planning projects is influenced by the political context of its implementation. This in turn suggests that the criteria by which urban planning is measured should transcend an overly narrow focus on time and budget. In much the same manner that military efficiency is only really meaningful in relation to the political effects that it is intended to generate, so too might the benchmarks of successful urban planning need to incorporate political as well as technical considerations.

References

Alwyn-Foster, Brigadier Nigel (2005) 'Changing the army for counterinsurgency operations', *Military Review* (November–December), pp. 2–15.

Blight, James G. and Lang, Janet M. (2005) *The Fog of War: Lessons from the Life of Robert S. McNamara*. Oxford: Rowman & Littlefield, pp. 42–57.

Brodie, Bernard (1946) *The Absolute Weapon*. NY: Harcourt Brace, p. 76.

Brodie, Bernard (1993) 'The continuing relevance of *On War*', in Carl von Clausewitz, *On War* (ed. and tr. Michael Howard and Peter Paret). London: Everyman, p. 58.

Director, Office of the Secretary of Defense (2003) Force Transformation , *Military Transformation: A Strategic Approach*. Washington, DC:, p. 23.

Dombrowski, Peter and Payne, Rodger A. (2006) 'The emerging consensus for preventive war', *Survival* (Summer) **48**(**2**): 118.

Fuller, J.F.C. (1923) *The Reformation of War*. London: Hutchinson.

Freedman, Lawrence (1989) *The Evolution of Nuclear Strategy*, 2nd edn. London: Macmillan, in association with the International Institute for Strategic Studies.

Freedman, Lawrence (2006) 'The Transformation of Strategic Affairs', *Adelphi Paper 379*, Abingdon: Routledge, for the International Institute for Strategic Studies, p. 9.

Gat, Azar (2001) *A History of Military Thought: From the Enlightenment to the Cold War*. Oxford: Oxford University Press, p. 39.

Gray, Colin S. and Payne, Keith (1980) 'Victory Is Possible', *Foreign Policy* (Summer) **39**: 14–27.

Handel, Michael I. (1996) *Masters of War: Classical Strategic Thought*, 2nd rev. edn. London: Frank Cass, pp. 185–203.

Howard, Michael E. (1981) 'On fighting a nuclear war', *International Security* (Spring) **4**(**4**): 3–17.

Kaplan, Fred (1983) *The Wizards of Armageddon*. Stanford, California: Stanford University Press, pp. 291–306.

Kaufmann, William W. (1956) 'Limited War', in *Military Policy and National Security* (ed. William W. Kaufmann). Princeton, NJ: Princeton University Press, p. 117.

Owens, Admiral Bill, with Ed Offley (2001) *Lifting the Fog of War*. London: Johns Hopkins.

Powell, Colin L., with Joseph E. Persico (1995) *A Soldier's Way: An Autobiography*. London: Hutchinson, pp. 509–510.

Ritter, Gerhard (1978) *The Schlieffen Plan: Critique of a Myth* (tr. Andrew and Eva Wilson). London: Wolff.

Schelling, Thomas C. (1963) *The Strategy of Conflict*. NY: Oxford University Press, p. 188.

Stone, John (2004) 'Politics, technology and the revolution in military affairs', *Journal of Strategic Studies* (September) **27**(**3**): 408–427.

Schwarzkopf, General H. Norman with Peter Petre (1992) *It Doesn't Take a Hero*. NY: Bantam Press.

USGPO (1993) Cited in *Gulf War Air Power Survey*, Volume II: *Operations and Effects and Effectiveness*. Washington, DC: p. 25.

von Clausewitz, Carl (2004) *On War* (tr. Colonel J.J. Graham). NY: Barnes & Noble, pp. 1–19.

Wylie, Rear Admiral J.C. (1967) *Military Strategy: A General Theory of Power Control*. New Brunswick, NJ: Rutgers University Press, p. 13.

Williams, Phil (1991) 'Thomas Schelling', in *Makers of Nuclear Strategy* (eds John Baylis & John Garnet). London: Pinter, pp. 130–131.

Weinberger, Caspar (1984) 'The Uses of Military Power', Remarks Prepared for Delivery by the Hon. W. Weinberger, Secretary of Defense, to the National Press Club, Washington, DC, Wednesday, 28 Novemberhttp://www.pbs.org/wgbh/pages/frontline/shows/military/force/weinberger.html

www.globalsecurity.org/military/ops/iraq_casualties.htm, accessed 1 January 2007.