Deterrence at Distance: Air Power and Conventional Deterrence in the Emerging Global Environment

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Abstract: Successful deterrence offers the compelling promise of strategic effect with minimal recourse to the application of hard force. With Western actors eager to retain global influence despite resource constraints and a diversifying threat, this article seeks to examine the role of air power in achieving strategic deterrence through conventional means. Squadron Leader Patton explores deterrence theory, identifies the role of air power in the evolution of deterrence concepts and considers the influence of air power on modern actors, including the challenges presented by hybrid warfare and anti-access strategies.

Introduction

> 'Defence and protection start with deterrence, which has long been, and remains, at the heart of the UK's national security policy…We will use the full spectrum of our capabilities to deter adversaries and to deny them opportunities to attack us.'[1]
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> - National Security Strategy and Strategic Defence and Security Review 2015

The 2015 National Security Strategy asserts Britain's enduring intent to pursue a role as a figure of political and economic influence in the world, and presents deterrence as an integral component of defence policy. Such aspirations reflect the economic realities of a small yet ambitious nation: potentially cheap in blood and lost treasure, deterrence offers the compelling promise of strategic influence with minimal recourse to the application of hard power. This approach appears all the more appealing in light of emerging global trends, with fundamentalist-driven instability and a resurgent Russia offering little succour to the resource-constrained strategist. These developments, alongside the rising nuclear capabilities of North Korea, have placed western deterrent capabilities into sharp focus. Away from direct threats to national sovereignty, the inherent limitations of a nuclear deterrent to nuclear proliferation have been reaffirmed, and the requirement for flexible conventional deterrent capabilities have been emphasised.

As the hard edge of such strategies, Britain's armed forces are integral to its deterrent ambitions. However, after more than a decade of intensive counter-insurgency and stabilisation operations in the Middle East, UK military capability has become heavily tailored towards meeting the demands of recent conflicts. Air power has not been immune to this: the operational imperative has frequently shaped both procurement and the in-service development of air power capabilities. In the aftermath of the Afghanistan withdrawal, UK Defence faces a diversifying threat against a backdrop of global austerity, with demands for a rapid, flexible and global response capability despite limited resource placing a firm emphasis on air power and conventional deterrence. Accordingly, the ability of modern air power to deliver deterrent effect merits further examination.

This paper examines the extent to which air power can contribute to conventional deterrence in the emerging global environment. It begins by establishing a definition for conventional deterrence, before examining deterrence theory and the key concepts of capability, credibility and communication, and the challenge of rationality on deterrent actions. The relevance of air power in deterrence is then outlined, situating air power within deterrence activities and exploring its role in the evolution of modern deterrence concepts. This forms a baseline for discussion of future challenges to conventional deterrence, and air power's roles within such a capability. Air power's contribution to conventional deterrence is then examined to identify enduring themes for deterrence activity today, and to critically examine the challenges faced by the UK and her allies in conducting conventional deterrence in the modern world. This will initially focus on technology and deterrent capability, exploring the revolutionary potential demonstrated by air power during the 1991 Gulf War and its consequences for the subsequent

deterrence of Iraq. Finally, the implications for conventional air power's ability to deter modern actors are considered. It is contended that air power is fundamental to achieving global influence with limited resource. Advancing technology increases air power's ability to threaten at reduced risk and increased range, particularly when applied in concert with land and naval forces, but there are significant air power constraints and geopolitical frictions that limit the feasibility of translating such military threats into effective deterrent outcomes.

Conventional Deterrence

Although well explored in deterrence literature, it is worth outlining the fundamental concepts of deterrence and to identify key issues facing deterrence strategies. Freedman suggests that deterrence is an influence activity and a subset of coercion; it concerns the maintenance of inaction and the *status quo* through the generation of fear in an adversary.[2] More specifically, it is the art of threatening an actor – the 'deterree' - to dissuade them from a course of action they would otherwise wish to pursue through the manipulation of their cost-benefit analysis and decision-making processes. These threats may be targeted to a particular situation and actor – specific deterrence - or they may equally reflect stated policies, capabilities and behaviours intended to influence the routine decision-making of others, with this latter approach representing general deterrence. The effectiveness of either approach is tied to two fundamental principles. First, that deterrence can only succeed when an actor chooses to be deterred, rendering the objective nature of the threat secondary to its perception by the deterree. Moreover, that deterrent success is by its nature difficult to measure, as the desired inaction may be falsely attributed to effective deterrence when in fact wider or externally invisible forces are influencing the deterree.[3] It is also evident that the concept of conventional deterrence is tied to the capabilities of the threatening actor. For nuclear nations, the term inherently implies a degree of restraint and limited commitment, while for actors without access to nuclear capabilities, conventional deterrence represents the highest military threat available, although non-nuclear Weapons of Mass Destruction (WMD) complicate this consideration significantly.[4]

Capability

Capability lies at the heart of successful deterrence strategies - actors aim to influence those they would seek to deter by placing something of value under threat. In a military context, this reflects the ability to project hard power with sufficient range, precision, timeliness and destructive force to achieve a desired outcome, regardless of the countermeasure capabilities available to the deterree. In the absence of the destructive certainty of nuclear weapons, achieving deterrent outcomes with more conservative force is the central challenge for conventional deterrence strategies.[5] This is evident in both key sub-divisions of deterrent strategies: denial and punishment. Denial strategies seek to prevent an actor from realising the perceived benefits of their potential action, with such concepts often associated with defeating fielded forces in a military context. In contrast, punishment strategies seek to impose unacceptable costs upon an actor without necessarily denying an actor the specific benefit it is pursuing, epitomised by reprisal or pre-emptive strikes on strategic assets. Measured in raw capability and outcome alone, conventional force has traditionally reduced both the likelihood

of immediate military success and the impact of punitive action when compared with nuclear intervention, necessarily diminishing the gravity of associated threats.[6]

Credibility

The threat of military action, however capable, can therefore only deter if it is credible that such action could, and would, be brought to bear against a transgressor. As previously asserted, this assessment rests in the perception of the deterree and therefore renders the outward behaviours of the deterrer central to the success of such an approach.[7] Accordingly, proportionality is an important theme within credibility; here, the apparent readiness of leading nations to engage in limited wars offers renewed opportunities for conventional deterrence, where nuclear action would represent a disproportionate and non-credible response to most situations. However, more so than in the case of escalatory nuclear warfare, conventional deterrence exists within a continuum where military action may be feasible without major strategic disruption. Thus the relative employability of conventional capability comes at a cost: future credibility is shaped by both an actor's observable resolve and its performance once in action.[8]

Such credibility is inevitably staked to internal and international political cohesion and influence, with recent crises exposing the difficulties Western powers may face in exerting military power, not least with regard to casualty aversion in conflicts of choice.[9] Political frictions also present challenges for the timeliness of deterrent credibility, where would-be deterrers must have a demonstrable ability to achieve the threatened outcome before the deterree can take measures to mitigate the threat or to increase the risk to the deterrer. Inadequacies here may also afford the deterree time to implement *fait accompli* changes to the strategic landscape in their favour which may prove difficult to reverse, with enduring consequences for the credibility of the deterrer.[10]

Communication

The possession of the technical means and political resolve to act remains insufficient to deter if the threat is not clearly communicated to targets of deterrence. Accordingly, those seeking to deter must contend with fundamental issues surrounding the articulation of the threat itself: what are the criteria that will trigger a retaliatory response, and what will the nature and effect of that response be upon the transgressor? Such communication was scarcely straightforward even when confined to leading Cold War nations and with the relative clarity of assured destruction as a candidate outcome. The increasingly disparate and non-existential nature of security threats facing major nations in the post-Cold War environment therefore presents a significantly greater challenge for those seeking to practice conventional deterrence. Here, political posturing, international diplomacy and the risk of enduring strategic consequences from local and limited action can render hard lines of transgression difficult to draw. Moreover, diversifying interest areas risk diluting a deterrer's understanding of the strategic and cultural values of its candidate deterrees, increasing the challenges of messaging and targeting alike.[11]

The difficulties surrounding clear and effective threat communication are compounded by issues regarding the deterree's perception and interpretation of such messaging. Amidst the noise of international posturing and the strains of pre-conflict escalation on organisational behaviours, all but the most explicit threats may be misconstrued or underrepresented.[12] Indeed, prominent deterrence failures post-World War II, including Korea and the Falkland Islands, have occurred despite evident military capability to contest aggression. Ensuring the threat has been understood as intended thus forms a problematic yet central component of effective deterrence.[13]

Rationality

Even if the above three criteria are rigorously observed in the application of a deterrent threat, successful deterrence nevertheless requires the intended target to respond in the manner sought by the deterring party.[14] Here, imperfections in the perceptions of both the deterrer and deterree expose a deeper weakness in the practical application of deterrence regarding the rationality of actors. At the heart of deterrent threats is the concept that the deterree will make decisions based upon a cost-benefit analysis, and that such analysis can be manipulated by the deterrer. Successful manipulation thus depends upon a degree of awareness of both the values and logic of a target actor; imperfections in this awareness are inevitable, and it appears reasonable to assume that as an actor's appreciation of the deterree diminishes, so too does its potential for successful deterrence.[15]

Compounding this issue is the tendency for such threats to treat the deterree as a homogenous actor that is both capable of making, and willing to make, such cost-benefit decisions based on the interests of the state or organisation as a whole. Such homogeneity poorly reflects the organisational realities of even the most hierarchical state, but is increasingly unrepresentative of failing and non-state actors who may nevertheless form targets of deterrence. Difficulties in discerning the underlying values of key figures in such cases may increase the risk of unexpected responses in the deterree, particularly if these values reflect the intangible ideals of dogma, religion or pride. Such uncertainty may challenge the feasibility of deterrence strategies in cases where the deterrer is working to limited objectives amongst broader strategic interests.[16]

Air Power and Conventional Deterrence

Current Royal Air Force (RAF) doctrine defines air power as '[the use of] air capabilities to influence the behaviour of actors and the course of events'.[17] This definition places influence activities, including deterrence, at the heart of modern UK air power thinking. Such thought is not confined to current doctrine. Air power's deterrent capacity is directly reflected in American General Omar Bradley's assertion that '[a]irpower has become predominant, both as a deterrent to war and, in the eventuality of war, as the devastating force to destroy an enemy's potential and fatally undermine his will to wage war'.[18] The flagship air power attributes of speed and reach speak plainly to those previously identified core components of deterrent capability and credibility, particularly given the geographically disparate and rapidly evolving threats characteristic of recent Western focus areas.[19]

Deterrent capabilities are evident across the full spectrum of air power roles as defined within RAF doctrine. Of these, perhaps most directly associated is Attack, whose hard power capabilities underpin the explicit and implied deterrent threats within both punishment and denial strategies. Control of the Air enhances attack capabilities by providing freedom of action, while directly augmenting denial strategies through its defensive capabilities. Both functions are supported by Intelligence and Situational Awareness, which may support deterrent communications, particularly with regard to gaining insight into the behaviours of target actors. Finally, Air Mobility is central to the timely force projection and sustainment of air power and wider forces.

Evolution of Modern Concepts

The first significant steps in the evolution of modern concepts occurred after World War I, which served as a proving ground for air power in great power conflict. For many, air power's potential to reach beyond the surface battle, and to directly target strategic assets, offered an alluring antidote to the enormous materiel and human cost so evident in the war.

At the forefront of this emergent thinking was General Giulio Douhet. Central to Douhet's concepts was the utility of air power as an offensive weapon, capable of ending war quickly through the destructive might of strategic bombing.[20] This vision was not primarily as a deterrent capability; nevertheless, Douhet and others' understanding of strategic bombing in the interwar years underpin many of the enduring concepts of deterrence. One such concept was the notion that a concentrated and determined bomber offensive would overwhelm any defensive capabilities available to an opponent, enshrined in Stanley Baldwin's assertion that 'the bomber will always get through'.[21] This was rooted within a deeper understanding that future wars would be total wars, in which firebombing and chemical attack on the civilian populace represented necessary and appropriate objectives. Appearing both unstoppable and devastating, it was assumed that such attacks would break the will of the civilian populace and that subsequent resistance at state-level would swiftly become unviable.[22]

The apparent threat posed by this capability initially underpinned lobbying for disarmament and the suppression of strategic bombing through arms control. However, the inherent challenges of assuring compliance amongst adversaries, and the perceived impact of an unforeseen first strike, soon led air power advocates to pursue credible deterrent capabilities, eschewing disarmament strategies. The significance of maintaining a relative capability advantage swiftly became evident, particularly against a backdrop of demonstrably rapid capability evolution. This was all the more so in light of the fact that no nation had yet developed the air power capability to deliver the mass devastating effect as theorised.[23]

Despite this gap in technical capability, interwar theories based on largely conventional force had identified many of the capstone issues to emerge within deterrence theory. Within a framework of expected total war, foremost was the imperative of targeting strategic centres in preference to fielded forces, placing countervalue strategies ahead of counterforce alternatives.

Directly supporting this objective was the concept and threat of using unstoppable destructive force to break a state's capacity to resist.[24] In this regard, the punctuation of such strategic posturing by World War II offered an important if ironic lesson, ably demonstrating the fallibility and consequences of imperfect deterrence.[25]

The bombing of Germany and Japan, culminating with atomic raids on the latter, demonstrated the massive firepower available to major powers, offering newfound credibility to deterrence in the post-World War II period. Air power remained at the heart of these developments, both in its classic role of bombing and the emergence of intercontinental missile warfare, fuelled by the exponential increases in capability offered by thermonuclear weapons. Despite increasing emphasis on nuclear deterrence as the Cold War intensified, conflict in Korea and Vietnam illustrated the continuing relevance of conventional power diplomacy and influence activity between major powers.[26] Deterrence took on a distinctly nuclear aspect after the Soviet Union's acquisition of atomic weapons in 1949, and this has obscured the utility of conventional deterrence during the period of the Cold War. Such deterrence activity was relatively limited, but examples can be found during the period, both of failure and success. Attempts at conventional deterrence failed in Korea (1950) and the Falklands (1982), although how vigorous those efforts were is open to debate. Conversely, British deterrence of Iraqi designs on Kuwait in 1961 through the vehicle of a defensive plan for the newly-independent Kuwait known as Operation *VANTAGE*, and the use of both the RAF and the Fleet Air Arm to deter Guatemalan ambitions against British Honduras/Belize in 1959, 1972 and 1975 have been heralded as success stories.[27] Perhaps most significantly in terms of recent examples of air power and conventional deterrence, the US-dominated build-up of forces in Saudi Arabia in 1990, Operation *DESERT SHIELD*, designed to deter Saddam Hussein from any temptation to extend his activities beyond the invasion of Kuwait, was heavily dependent upon air mobility, both to place forces in theatre early and, through air refuelling, to permit the despatch of combat aircraft from the United States to Saudi Arabia in short order.[28]

Equally, it is not hard to discover commentators questioning whether the Iraqi leader Abd Al-Karim Qasim[29] in fact intended to invade in 1961, or whether Saddam had any intention of extending military operations into Saudi Arabia – both of which illustrate the point that it is far easier to demonstrate when conventional deterrence failed, as opposed to when it succeeded.[30] Nonetheless, both relied heavily upon air power, offering a clear illustration of its integral role in any efforts to deliver conventional deterrent effect, and it is thus worth considering them briefly.

During Operation *VANTAGE*, offensive air assets were rapidly deployed from both regional bases and Germany to deter Iraqi ground and air threats, while air mobility assets deployed large numbers of reserve forces from deep rear locations. All were informed by air intelligence. With no invasion forthcoming, deterrence success could therefore be claimed, offering credibility to influence strategies dependent on rear basing and the responsive capabilities of air power. However, closer inspection exposes marked complexities and limitations here.

A stand-off presence proved too uncertain for the defence of a strategic interest, drawing Britain into a resource-intensive deployment that ultimately failed to project forces either within operational timelines or with sufficient capability to counter a determined response. The risks presented by the unexpected denial of overflight rights for transport aircraft added complexity.[31] Moreover, the causality between this posturing and Iraqi inaction remains decidedly unproven. Given these constraints, Britain's pursuit of air power-led deterrence in the region in subsequent years appeared to speak more strongly to the political appeal of apparent influence than the military capabilities underpinning it.

The US-led deterrence of Iraq in 1990 reprised many of these challenges, most prominently exposing the strategic difficulties of realising the deterrent capabilities of air power amidst intense geopolitical frictions. Here, US reluctance to react decisively to an uncertain threat, and its inability to secure a credible foothold, fatally undermined its deterrent messaging in terms of defending Kuwait; ultimately, deterrence failure proved the galvanising force that enabled more assertive coercive posturing. Following this failure, the military ability to underwrite such threats remained limited by the speed of projection of suitably equipped forces, highlighting a key vulnerability to the deterrence of opponents less patient than Saddam. Moreover, despite the robust influence activity that ensued, military threats failed to compel an Iraqi withdrawal, leaving the deterrence of an Iraqi invasion of Saudi Arabia as the sole and uncertain successful influence outcome.

Technology, Air Power and Conventional Deterrence

> We should also consider the potential of non-nuclear weapons to strengthen deterrence. Advancing military technologies that merge the capabilities of information systems with precision-guided weaponry and real-time targeting and other new weapons systems may provide a supplement or alternative to the nuclear arsenals of the Cold War.[32]
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> - US, Report of the National Defense Panel, December 1997

The end of the Cold War and the decisive victory of the US and its allies in Iraq in 1991 had profound consequences for Western military thinking. During Operation *DESERT STORM*, capabilities developed to counter the Soviet threat had been dramatically brought to bear against the very equipment that had shaped European security concerns, with profound results. This striking battlefield performance appeared to vindicate concepts of the previous decade regarding the rising ability of conventional capabilities to influence the balance of power amongst nuclear nations. These concepts, clearly evident in the 1997 US Defense Panel Report, continue to shape Western defence thinking and procurement; the consequences of such developments for air power within strategies of deterrence are worth exploration.[33]

The transformational potential of these pronounced technological advances for military security fuelled declarations amongst senior strategists that a Revolution in Military Affairs (RMA) had taken place. Such theories asserted that rapid developments in the technical capabilities and associated operational concepts of a military power could combine

synergistically to produce a discontinuous, order of magnitude increase in military potential.[34] From the outset, RMA concepts were staked to concepts of strategic balance and deterrence: the potential for sophisticated sensors and precision-guided Western munitions to subdue a Soviet armoured advance was a significant concern to Soviet strategist Marshal Ogarkov in the 1980s.[35]

The deterrence potential of conventional force thus held new prominence in the aftermath of the Gulf War, underpinned by two key principles.[36] Firstly, it was recognised that the destructive power of conventional US capabilities appeared to be approaching the effects sought by limited nuclear strikes without the nuclear stigma. Secondly, the end of the Cold War allowed increased resource and focus to be dedicated to regional instability in areas of strategic interest, given the reduced emphasis on great power nuclear stand-off. It was evident that nuclear deterrence in the limited conflicts foreseen in President Bush's 'New World Order' offered at best limited plausibility, rendering conventional force central to credible threats.[37]

The Appeal of Revolutionary Air Power

Prominent in the Gulf War, air power appeared immediately central to these ideals. Now de-coupled from wider Cold War forces, candidate intervention areas had increased, while pressure to reduce the footprint of the armed forces had also risen in line with aspirations for a Cold War peace dividend.[38] Such competing principles suggested that ground forces were increasingly unlikely to be present in credible volume at the outset of a regional crisis; moreover, *DESERT SHIELD* had reaffirmed the major challenges associated with the timely projection of forces sufficient to deter or confront a significant military power.[39] Taken together, the credibility of early threats was therefore increasingly staked to the force projection capabilities of air power, particularly in regions beyond the littoral. Offering the ability to intervene without a significant deployed footprint, air power appeared a prominent tool for hard power diplomacy.[40]

At the heart of such promise were the dramatic increases in information warfare capabilities displayed during the Gulf War. Here, advances in satellite technologies offered enhanced intelligence capacity, largely immune to the political restrictions and military threats that had stymied earlier air reconnaissance. These and wider communication developments offered two key deterrent benefits. The first concerned improvements in early warning, increasing the likelihood of detecting undesirable behaviours in time to issue deterrent threats, with particular potential to stymie the *fait accompli* often sought by weaker actors.[41] Moreover, these developments offered further enhancements in targeting, dynamic re-tasking and battle damage assessment. All such capabilities offered clear force multiplying benefits, decreasing the force size required to achieve a given effect and thus increasing the feasibility of bringing such a force to bear. These developments held direct consequences for deterrent credibility.[42]

Beyond credibility, *DESERT STORM* also shed new light on deterrent capability, where the apparent step change in military potential was nowhere more tangible than for the *attack*

elements of air power. Here, the effects were most apparent on the battlefields of Kuwait itself, with air power significantly depleting Iraqi fielded forces in advance of the coalition ground invasion and accelerating the advance once underway. Separately, the rise in prominence of stealth aircraft and stand-off munitions appeared to have dramatically increased the viability of conventional munitions delivery into the strategic heart of an adversary's territory. Here, advances in precision-guidance also demonstrated that such munitions were increasingly likely to strike their target. Taken together, such developments offered a marked increase in the probability of mission success for a given force size, enhancing the potency of threats and further re-enforcing the concept of technology as a force multiplier.[43]

In addition to information and attack, the proven ability of the US and its allies to secure control of the air also shaped the future of air power within deterrence. Iraqi air defences had been largely suppressed within hours, enabling the air campaign to be conducted almost at will and with minimal casualties. This freedom had been obtained without inflicting catastrophic losses upon the Iraqi air force: of Saddam's 700 air force aircraft, only 35 were downed through air engagement.[44] Accordingly, tactical deterrence success underpinned much of the freedom of manoeuvre enjoyed by the coalition; Hussein seemingly preferred to tolerate the impact of unopposed Western air power rather than risk his air assets in combat. This apparent reluctance to expose assets critical to Iraq and Saddam's security over a less than existential threat holds clear consequences for future deterrence, in which mid-tier powers may face a stark choice when confronting modern air forces: whether to expose highly-valued air assets in a bid to raise the risk of engagement beyond thresholds acceptable to the deterrer, or to accept the consequences of operating without control of the air. The performance of air power in this campaign offered tangible evidence to inform such risk-reward estimates.[45]

Overall, *DESERT STORM* offered compelling evidence of the potency of air power, particularly when applied in concert with land forces. Here, capabilities proven in Kuwait offered clear evidence of the military effects modern technology could achieve on the battlefield. With the ability to deny an adversary a quick win and force attritional warfare cited as 'the bedrock of conventional deterrence', this development has important consequences for RMA-led deterrence in isolation.[46] However, *DESERT STORM* also enabled RMA advocates to identify significant potential within deterrent punishment strategies. In this regard, by suggesting the ability to strike strategic targets without credible opposition, the employment of air power against Iraq appeared to vindicate the promise of strategic bombing as envisioned by the early theorists. Indeed, the influence of Douhet is clearly evident within US Colonel John Warden's 5-ring system of strategic targeting that informed attacks against Iraqi power and command and control systems.[47] When coupled to the notion that such strikes could be conducted at minimal loss to both the deterrer's forces and non-combatants, these developments appeared to fuel confidence of success at minimal risk. Diminishing the barriers to intervention, this appeared to increase the deterrent credibility of high-technology powers in cases of marginal or peripheral commitment.[48]

Enduring Barriers to Conventional Deterrence

Despite the undeniably significant air power capabilities within the RMA narrative, its status within deterrence is not without grounds for questioning. Indeed, many limitations are evident in the very campaign that showcased such capabilities. One key limitation remains the ability to identify effective deterrence in action, with both *VANTAGE* and *DESERT SHIELD* suffering from unsatisfactory and inconclusive evidence regarding the influence of Western actions on Iraqi intentions. It appears unlikely that developments in information capabilities will remove the Clausewitzian fog sufficiently to provide deterrent practitioners with proof of intent, much less with the motives underlying apparent changes in strategy. Accordingly, the risk remains that deterrence practitioners may draw inaccurate conclusions about the success of their strategies, with attendant consequences for subsequent deterrent attempts.[49]

Secondly, there is room for doubt regarding the ability of these emergent munitions and delivery methods to achieve the capabilities claimed of them. Many have questioned the credibility of extrapolating military outcomes in Iraq to wider deterrence scenarios: advanced capabilities were employed against an inexpert opponent operating the hardware it had been designed to counter, in an uncluttered and sparsely populated environment, in favourable weather and with the support of a broad coalition. Such favourable conditions are unlikely to offer a reliable benchmark for future engagements, with the confused battle lines, allegiances and target sets of Syria exposing the potential complexities facing current strategists. Moreover, deterrence failed even in the Iraqi case despite such conditions and deterree acknowledgement of the threat of high technology.[50]

In addition to issues with the military performance of high technology, the validity of deterrence strategies staked to their success are also worthy of consideration, specifically with regard to punishment strategies. Of particular note is the ability of air power to target or destabilise enemy leadership, and to achieve deterrence through threats of the same. Despite the evident appeal of victory without major military confrontation, there remain fundamental flaws in the practical pursuit of such aims. Leaders can prove hard to locate and harder to strike, with little guarantee of a meaningful or desired change in a regime's action even following successful targeting. Similarly, there remains little evidence that air power is an effective tool to undermine regime support through punishment strikes on key infrastructure. Civilians have repeatedly withstood substantial bombardment and degraded circumstances without being driven to rebellion, while nations pursuing the delivery of even limited strikes of this nature invite accusations of targeting the innocent. These difficulties are likely to introduce doubt in the deterrer and encourage optimism in the deterree, with such forces inevitably weakening the strength of related deterrent threats.[51]

Beyond deterrence by punishment, the promise of precision strike has also created further challenges for nations sensitive to public opinion. Indeed, the media narrative of *DESERT STORM*

itself fostered impressions of weapon accuracy and military potency such that civilian casualties and friendly losses could seemingly be held to a negligible minimum. But mistakes and malfunctions are inevitable, and thus even the best weapons will miss, or accurately strike the wrong location. Moreover, while high technology can reduce human exposure on the battlefield, either through by multiplying the potency of smaller forces or through unmanned platforms, losses remain all but impossible to rule out. Accordingly, casualty sensitivity, whether non-combatant or friendly force oriented, creates an exploitable weakness in the deterrer. As deterrence outcomes rest in the calculus of the deterree, even a perception of such vulnerabilities may drive deterrence failure; Saddam's perception of US vulnerability prior to *DESERT STORM* is a powerful example.[52]

Such exploitable weaknesses extend beyond casualty sensitivity, however, including a significant issue surrounding deterrent communication. Here, threatening actors may be reluctant to overtly state the capabilities of new or newly combined technologies, in conflict with the imperative to ensure the deterree accurately understands the threat and consequences of non-compliance. In consequence, the deterrer may face the unpalatable option of disclosing sensitive detail about offensive capabilities and targeting if the deterrent threat is to be adequately communicated. All such disclosures increase the opportunity for the deterree to take action to negate the deterrent outcome sought.[53]

A final consideration in this area concerns the sustainability of deterrent threats. Technological developments have greatly increased the potency of small force packages, and have in parallel improved the force projection and stand-off capabilities available to military planners. However, a theme of rising unit cost and diminishing overall force size has accompanied these developments, leaving fewer assets available to meet the disparate demands they are faced with.[54] Such constraints are significant for enduring deterrence: in seeking to preserve the *status quo*, the war fighting capability of the deterree will likely remain undisturbed unless impaired by wider diplomatic activity. In consequence, while the *status quo* may be permanently unacceptable and a singular priority for the deterree, major actors may be unable to deter consistently amidst competing and changing priorities. Over time, therefore, deterrence may fail, with any such failure threatening significant consequences for an actor's subsequent deterrent credibility.[55]

RMA Air Power in Action: Conventional Deterrence After *DESERT STORM*

There is much promise apparent in the deterrent capability of sophisticated air power, and yet much to weaken its viability amidst real world frictions. This inherent conflict exposes an interesting dilemma for leading nations. Advanced capabilities may sufficiently lower the perceived risk of engagement and increase the feasibility of mission success so as to tempt such nations to issue deterrent threats against lower priority concerns. Given the identified barriers to successful deterrence, it is therefore credible that such attempts may fail to deter, staking an actor's credibility to intervention. Thus, the deterrent promise of such capabilities may in fact be a destabilising influence.[56]

In order to understand how the technological advances evidenced in *DESERT STORM* shaped the employment of air power within conventional deterrence, it is useful to briefly examine deterrence in the years that followed this engagement. This principle reflects the concept of *graduated* deterrence, whereby future credibility can be re-enforced through a determined response to unheeded threats.[57] A logical entry point for such an investigation concerns the deterrence of Iraq itself: roundly defeated yet with its senior leadership intact, few nations could so assuredly be taken as understanding the potential military outcomes underpinning US-led threats. However, in spite of this apparent clarity, Iraq proved willing to test US resolve within two months of the ceasefire of *DESERT STORM*, with a study by Harvey and James identifying six major coercive interactions between US-led forces and Iraq between 1991 and 2003.[58] Deterrent air power was at the heart of these US responses from the outset, but despite this prominence, the ensuing deterrent attempts offer a cautionary example of the potency of air power when applied in isolation.

Efforts to deter Iraq formally re-commenced in April 1991 with the establishment of a No Fly Zone (NFZ) above the 36th parallel, intended to protect Kurds in Northern Iraq in accordance with UNSCR 688. However, within seven days of this resolution, Iraq had defied the threat of air power, conducting attacks on Kurdish forces within this NFZ. Critically, deterrent success even in this early case appears to have been achieved only following the emphasis of US commitment through the deployment of 500 troops into the region. Moreover, the deterrent efficiency of air power in Iraq deteriorated steadily beyond this point. Little more than a year later, US resolve was again tested in response to Iraqi aircraft strafing civilians in Southern Iraq. Responding with a further NFZ south of the 32nd parallel, deterrence proved insufficient to curb Iraqi transgressions on this occasion. Here, US-led forces resorted to three punitive air strikes against Iraq, securing temporary compliance.[59]

Perhaps underpinned by air power's promise of influence at low risk to friendly forces, the US increasingly resorted to such coercive strikes to re-enforce deterrent messaging as Iraqi-US relations deteriorated. Notably, the escalatory deterrent posturing of Operation *VIGILANT WARRIOR* in 1994 did appear to achieve deterrent success without recourse to action, albeit with air power embedded within a substantial land and naval response. However, Operations *DESERT STRIKE* in 1996, and *DESERT FOX* in 1998 both repeated the pattern of deterrence underpinned by coercive strike, with the return to war in 2003 epitomising the collapse of deterrence despite the presence of a capable air power threat. Thus, of the six deterrent interactions identified by Harvey and James, only two can claim deterrent success without combat intervention, with both achieved within a combined arms response.[60]

There are key challenges evident in the above employment of deterrent air power. First in this regard is that the employment of air power in isolation may be interpreted as a sign of limited commitment, weakening deterrent credibility and rendering it increasingly vulnerable to marginal or deniable violations by the deterree. Moreover, such probing transgressions may be perceived quite differently amongst international stakeholders, increasing the

likelihood of discord surrounding forceful intervention. Within a coalition, therefore, this presents the lead deterrer with a stark choice of risking deterrent credibility through inaction, or deterrent capability through diminished coalition cohesion and support. Given the increasing significance of coalitions to legitimacy and freedom of action, this carries significant consequences for protracted deterrence: repeated transgressions are likely in a determined actor, with Iraq demonstrating the corrosive potential for such iterations on international consensus. Recognising Saddam as a difficult but nonetheless potentially deterrable actor, the historical record in Iraq suggests caution in the ability of air power to successfully deter even in the presence of high technology.[61]

Air Power in the Emerging Global Environment

> The Allies' conventional forces…make indispensable contributions to deterrence of a broad range of threats. … By their nature, they can be employed in a flexible fashion. … [They] must be able to successfully conduct and sustain a range of operations for *collective defence and crisis response*, including at strategic distance.[62]
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> North Atlantic Treaties Organisation (NATO)
> - Deterrence and Defence Posture Review 2012

Much of the previous discussion has centred on the ability of air power to provide influence in conflicts of choice and limited commitment. Indeed, given the nuclear capabilities of leading nations, it is perhaps logical that conventional deterrence would feature most prominently in consideration of matters of less than existential interest to these actors. Nevertheless, the influence of conventional capabilities is not confined to such activities, with NATO's 2012 assertion attracting new significance in light of Russian resurgence in the Ukraine and the rising prominence of non-state and irrational actors in international affairs. Accordingly, the deterrent influence of air power at these extremes of deterrence will now be considered.

Deterring Nuclear Powers

The potential to deter a nuclear-capable actor with conventional force is necessarily shaped by the feasibility of using such force to credibly threaten that actor's strategic interests. In this regard, developments in conventional firepower have yet to match the destructive force of nuclear munitions, with the most powerful conventional Western weapon remaining an order of magnitude less powerful than its lowest nuclear equivalent.[63] Accordingly, the conventional deterrence of nuclear actors has traditionally focused on achieving the strategic *effect* of nuclear munitions. Here, much of the argument has centred on whether the fusion of sophisticated precision delivery and advanced intelligence-led targeting methods has enabled conventional firepower to achieve the same disabling military effect previously demanded of nuclear munitions.[64]

Precision strike at extreme range represents an integral component of such strategies. Already leading in this field, the US is vigorously pursuing further enhancements, notably including the Conventional Prompt Global Strike (CPGS) concept. Seeking to strike a target

anywhere on the globe within an hour, this concept would offer the US the ability to threaten and attack high-value targets in distant and contested areas with little warning in most cases. Against certain target sets, therefore, CPGS could narrow the boundary in achievable effects between conventional and nuclear capabilities, a point emphasised by the consideration of conventionally-tipped ballistic missiles within this program. Re-visiting the promise of RMA precision strike, such a capability may suggest renewed credibility in punishment techniques, particularly for decapitation strikes against transiently exposed leaders. Moreover, at the extreme, CPGS hints at the potential for conventional precision munitions to hold the strategic arsenals of an adversary at threat, such that a nuclear retaliatory response would be denied. Promising global influence without forward presence or the stigma of nuclear warfare, the appeal is immediately evident.[65]

However, while CPGS suggests the ability to reduce the division between nuclear and conventional deterrent threats, a number of key problems remain unsolved, foremost of which are issues of perception within the deterree. Here, a perceived conventional first strike threat to a nation's nuclear capability may in fact prove de-stabilising, encouraging a pre-emptive nuclear response in the deterree. Indeed, Russian President Dmitri Medvedev's 2009 assertion that '[it] is unacceptable to compensate nuclear reductions by developing strategic systems which are equipped with conventional weapons' speak plainly to such concerns.[66] The issue of de-stabilisation is also compounded by ambiguity concerning both the nature of the warhead and the target given the ballistic and hypersonic delivery vehicles required to meet the proposed one-hour response time. Here, actors may be uncertain as to whether they are being targeted, and moreover, whether they are under nuclear attack. When coupled to significant time pressure, the potential for inadvertent escalation fuelled by misunderstanding is significant. Conversely, deterree threat perception may also be supressed given the inability of conventional weapons to inflict violence and suffering on the scale of nuclear weapons. Both diminished threat perceptions and the potential for escalation beyond the conventional threshold therefore suggest hard limits to the deterrent potential of conventional weapons against nuclear powers.[67]

Russia and Hybrid Warfare

The above constraints expose difficulties in deterring the core interests of nuclear actors through conventional threats. Nevertheless, these issues need not negate the potential for the conventional deterrence of major actors over more peripheral interests, accepting that such strategies must accommodate the asymmetric and evolving responses evident in candidate deterrees. Here, the basic threat of rapid escalation holds without the prospective CPGS capability: Russia has long held the use of tactical nuclear weapons as a 'de-escalatory' mitigation to the inferiority of its own conventional forces.[68] Indeed, the presence of such a lowered threshold for nuclear response was clearly evident in Russian President Vladimir Putin's rhetoric to NATO during the Ukraine crisis.[69] This posturing presents a significant challenge to Western deterrence, as their ability to threaten and deliver more severe outcomes than could be inflicted in return – the principle of *escalation dominance* – is less assured. This issue

is exacerbated in matters of reduced or asymmetric commitment in the deterrer, where the escalatory risks may encourage inaction or *self-deterrence*.[70]

Self-deterrence is a key concern for NATO credibility in the face of Russian expansionism, with the challenges of asymmetric commitment and asymmetric tactics amply evidenced in the current Ukraine crisis. Here, Russia appears to be pursuing a newly reprised variant of hybrid warfare, exploiting unmarked and irregular forces to achieve State interests while maintaining plausible deniability. Such an approach has evidently challenged Western commitment beyond the boundaries of NATO, and holds greater concern for deterrent posturing at NATO's Eastern extremes, particularly regarding the Baltic States. With Russian speakers representing more than a quarter of the population of Latvia and Estonia, the potential for Russian intervention on the pretext of protecting Russian speakers cannot readily be dismissed.[71]

US concern and commitment on this matter are both evidenced in President Obama's assertion that NATO will ensure that the Baltic States 'will never lose [their independence] again', firmly staking NATO credibility to its continued defence of the region.[72] Notably, air power has been prominent in NATO's ensuing escalation of its presence in this area: 2015 has seen marked increases to the air defence, intelligence gathering and early warning capabilities deployed in support of Baltic air policing alongside a wider tripling of the NATO Response Force.[73] These capabilities tangibly re-assert NATO's commitment to Baltic defence, and in consequence offer direct military and deterrent utility. However, this combination of elevated NATO posturing and Russian hybrid manoeuvring heightens the risk of escalation, placing renewed emphasis on credible deterrent posturing if stability is to endure. Assuming large-scale conflict in defence of the Baltics would test US and NATO resolve to its limits, great care is required to reduce the necessity for such an intervention.[74]

In a bid to confine and contain any required intervention to credible levels, RAND analysts have recently examined options to deter Russian expansionism in the Baltics. Their wargaming analysis offers undeniable cause for concern: repeated simulations of a Russian invasion of the Baltics resulted in Russian forces reaching the capitals of Estonia and Latvia within 60 hours. Here, the challenges facing Western defenders as identified by RAND continue to reflect those observed in the preceding Iraqi case studies: a robust forward presence is expensive and politically difficult, yet absent this presence, the challenges of rapidly deploying armoured brigades are profound. Therefore, RAND's proposed mitigation centres upon a strategy to deny Russia rapid territorial gains, identifying limited credibility in deterrence by punishment given the likely requirement to target mainland Russia. Notably, this strategy places a clear emphasis on air-land integration, utilising air power to support the deployment and manoeuvre of mobile and light forces while offsetting the firepower shortcomings of such forces against Russian-sponsored armour.[75]

China and Issues of Anti-Access

Beyond Russia, developments in Chinese doctrine have also sought to circumvent US dominance in long-range precision strike. Here, despite US CPGS rhetoric, China has maintained

a policy of 'no first use' as regards their nuclear arsenal, seeking instead to challenge US influence in the Asia-Pacific through Anti-Access/Area-Denial (A2/AD) strategies.[76] These capabilities seek to deter the intervention of external actors by raising the costs of close-in intervention to intolerable levels. In so doing, they seek to force such actors to operate at ranges that limit their sensor, targeting and delivery options, reducing their ability to disrupt Chinese intent. The emerging development of the Chinese DF-21D anti-shipping missile epitomises these trends, with a potential capability to strike aircraft carriers at ranges in excess of 1,000 miles.[77] Such and similar capabilities would extend the radius of operational hazard for high-value assets in particular, complicating the challenge of force projection and diminishing the operational capacity available to potential adversaries in areas of Chinese interest.[78] Moreover, China has also identified the necessity of disrupting US satellites, with the successful interception of its own weather satellite in 2007 demonstrating China's capabilities in this area.[79]

As a direct challenge to regional influence, Chinese A2/AD capabilities present a significant problem to Western deterrent threats in isolation. However, of wider concern is the ready availability of this concept, if not the absolute capability, to a broadening actor base, particularly as basic technologies proliferate. Increasingly, therefore, the conventional deterrent credibility of Western actors is staked to a demonstrable ability to project influence in such contested environments, and to operate in the renewed fog of information denial.[80] In consequence, the US has been at the centre of developments focused on negating these challenges, with the resulting concepts, including the Joint Operational Access Concept (JOAC), repeatedly emphasising a focus on service jointery more recently evident within RAND's Russian deterrent recommendations. However, particularly evident in the JOAC is an emphasis on *cross-domain synergy*, which recognises profound barriers to achieving lasting dominance in any given domain. Accordingly, this concept calls for sophisticated capabilities to be developed in each domain, fused with a high degree of service interoperability – both human and technical - to maximise the military effects achievable during temporary periods of military advantage. In other words, the solution to the proliferation of advanced technologies is a combined services approach underpinned by cutting edge technologies.[81]

With seemingly few military alternatives, there remain a number of problems inherent in this approach to the A2/AD problem. Perhaps foremost remains the enduring challenge of deterrence by punishment, given the JOAC emphasis on strategic strike to disrupt lines of communication and disable long-range offensive capabilities.[82] The inherent limits of this approach have been previously explored; however, they are likely to be particularly keenly felt in the China case in light of the complexities of conflict escalation and the challenge of extreme-range targeting against an opponent known to employ concealment and underground operations. Moreover, JOAC's emphasis on cutting-edge technology and interoperability is also likely to drive cost and exacerbate issues of diminishing force size, challenging both sustained forward presence and the ability to deter concurrent but

geographically separated threats.[83] All such forces challenge deterrent communication and perceptions of credibility.[84]

Held at range and with a ready path to escalatory conflict, the US could face deeply unpalatable choices should China employ a hybrid or plausibly deniable 'quick win' approach to advance its interests. Allied to the challenges concerning the deterrence of Russia, clear bounds are evident within the utility of air power as a tool for the conventional deterrence of nuclear actors. Success appears most likely within a joint approach intended to deny these actors quick gains away from their core interests, with more profound challenges to deter action in pursuit of their strategic concerns. Here, the risk of conflict escalation is significant, posing fundamental credibility problems given that any such threat would require escalation to be perceived as tolerable for the deterrer.

Deterring Non-Nuclear Actors

With substantial limits to the influence of conventional air power on nuclear actors, the ability of air power to deter non-nuclear states is also worthy of consideration, particularly those states at or nearing the transition to nuclear power status. Here, conventional force is particularly relevant given Western determination to limit this proliferation despite the profound barriers they face to pre-emptive nuclear intervention. Encouragingly, therefore, there is evidence to underpin conventional threats of this nature, with one study suggesting that determined states are capable of employing air power to significantly disrupt such programmes. Here, the greatest likelihood of success appears during development, where both infrastructure and national understanding remains limited; Israeli strikes against nascent Iraqi and Syrian sites in 1981 and 2007 respectively appear to have successfully delayed nuclear development through both direct technical, and indirect political effects.[85]

However, with deterrent capability feasible, deterrent credibility is presented as a prominent issue for such strategies. North Korea is a leading example, with recent US estimates identifying the state as likely to possess a fledgling if unproven ICBM capability in defiance of US appeals.[86] Echoing the strategies of Russia and China, North Korea's ability to avoid conventional intervention also appears in part based on an ability to deny the US escalation dominance; North Korean artillery has long held the ability to place the South, and Seoul in particular, under conventional and chemical threat. Readily concealed and rapidly deployable, this capability would be an extremely complicated threat to negate, raising the risk of initial US intervention markedly. Moreover, the North's bilateral relationship with China would doubtless complicate a wider or sustained US response. Such forces fundamentally weaken the credibility of deterrent threats.[87]

The challenges of North Korean deterrence also emphasise that deterrence is difficult to achieve where a deterrer's commitment is less than absolute and a credible counter-deterrent capability exists. In consequence, strategies to raise the cost of intervention are of clear interest to states at risk of Western intervention. Saddam Hussein's 1991 strikes on Israel, and

subsequently, Iranian efforts to assert its A2/AD capability in the Straits of Hormuz would appear to epitomise such counter-deterrence strategies.[88]

The difficulties of achieving deterrence with limited commitment are evident throughout the above examples, carrying a firm cautionary note for strategies seeking to apply air power in this way. However, a notable counter-example would seem to be offered by the 2011 Libya campaign. Here, Western air power working in concert with indigenous and Special Forces successfully toppled the Qadhafi regime. Consequentially, this campaign may suggest a degree of credibility in low footprint punishment and decapitation strategies that have often appeared impracticable as deterrent threats. Unfortunately, the ability to use this military success to enhance the validity of subsequent deterrent threats already appears limited: in Syria, the Assad regime has successfully defied repeated US deterrent threats surrounding the Syrian employment of chemical weapons. It appears that very specific conditions in both international consensus and the escalatory capacity of the deterree are required for deterrence to be practicable.[89]

Finally, it is useful to briefly consider the deterrent prospects of air power against non-state actors, an issue that epitomises the challenges of protecting national interests at range in the face of uncertain and disparate threats. Here, the diversity of this subset poses a particular challenge to the measurement of success, leaving deterrence most apparent as an issue in the wake of visible failures. This carries particular consequences for punishment strategies, where the lack of targetable hierarchy and infrastructure significantly limits the prospect of translating retaliatory military action into political success. Such strategies are further weakened by the risk of feeding a narrative that pits a determined few against Western hegemons, rendering punishment threats difficult to communicate or enact.[90]

However, with inaction risking undermining the credibility of a State's deterrent posture against these actors, the appeal of denial and limited reprisal capabilities remains evident. In this regard, unmanned platforms acting as both sensor and shooter would seem to represent the epitome of intervention at low commitment. Here, if the limited range, legal and state overflight constraints surrounding such platforms can be overcome, they are likely to be able to raise both the risk and complexity of non-state actor operations significantly, lending limited credibility to denial approaches. However, effective deterrence, rather than pure military intervention, requires the deterree to understand that they are threatened and moreover, what behaviour is intended to be deterred. Both are greatly complicated by dislocations in cultural paradigms and limited opportunities for deterrent dialogue. Given such limitations and the determination common to non-state actors, doubt must remain as to whether these challenges can be translated from organisational disruption into denial and deterrence.[91]

Conclusion

From its earliest employment, air power has been identified as a means of achieving strategic influence with reduced human commitment. Successive developments have edged military

capability closer to realising this conceptual promise, epitomised by the rise of nuclear warfare. However, this transition has not negated the desire of nations to exploit conventional force to deter other actors. With reductions in resource traditionally exceeding contractions in Western ambitions, air power has increasingly been presented as a means to retain global influence amidst declining forward presence.

Britain's desire to pursue such ideals was evident within Operation *VANTAGE*, with air power at the heart of Britain's deterrent response. Nearly 30 years later, *DESERT SHIELD* was similarly reliant upon air power, yet the results are difficult to define absolutely. Both case studies demonstrate significant practical limitations within conventional deterrence strategies, with the difficulties of deploying high-volume forces at appropriate speed prominent in these examples. However, compellence failure in 1991 resulted in the dramatic demonstration of new potency in the military capabilities of air power. These developments suggested the increasing feasibility of exerting influence at range, with fewer assets and at lower risk to coalition forces and civilians. Such capabilities represented a compelling antidote to the diversifying challenges facing Western interests in the post-Cold War landscape, particularly in light of the force reductions sought by these powers. Within this, the ability of air power to support fielded forces added tangible weight to denial strategies, with less certainty surrounding the resurgent concept of punishment through conventional strategic strike. However, many barriers stymying the translation of military capability into effective deterrent threats remained despite this progress. Both Western faith in the promise of air power, and the limitations of conventional deterrence in practice are apparent in US-led efforts to influence Iraq in the following decade.

Iraq may offer only a limited foundation from which to explore modern conventional deterrence. Nevertheless, the identified themes hold enduring relevance in the emerging global environment. Here, US desire to retain competitive advantage through sophisticated technology is plainly evident, with CPGS epitomising the potential for air power to influence through long-range precision strike. However, Russian nuclear rhetoric, hybrid warfare and the A2/AD strategies of China appear credible methods to raise the cost and complexity of Western intervention beyond tolerable levels, exposing limits to the conventional deterrence of such actor's core interests. Moreover, these responses identify a fundamental challenge to air power-led deterrence strategies that is apparent at all levels: sophisticated capabilities cannot be used as a singular substitute for commitment, with Western will to risk life and political capital remaining essential to effective deterrence. In this regard, North Korea, Iran and Syria all lend weight to the argument that where Western commitment is low, threatened actors are likely to be able to employ counter-deterrence strategies to offset even marked disadvantages in military capability.

Acknowledging such limitations, the ability of modern conventional air power to threaten the strategic interests of global actors would seem difficult to challenge. Indeed, developments in air power may be approaching ever closer to the capabilities foreseen by the early air power

theorists. Given the resource constraints facing Western strategists, the substantial force projection and force multiplication capabilities of air power are therefore likely to ensure that it remains a central element within Western deterrent threats. However, significant barriers will continue to challenge the translation of these military threats into successful deterrence outcomes, rendering conventional deterrence an inherently fallible practice. Despite an evident focus on advancing capability, strategies to enhance observable Western commitment may prove more fundamental to achieving deterrent success.

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