Introduction

The contemporary global security agenda is dominated by issues where technology is seen as central: the so-called 'Revolution in military affairs', the future of nuclear weapons, the proliferation of conventional and nuclear weapons globally, their prospective use in terror attacks, 'cyber-terrorism' and so the list goes on. One such case where consideration of technology comes to the fore in relation to security is ballistic missile defence in the United States. Ballistic missile defence (or BMD) is a weapons system intended to protect America from nuclear missile attack by shooting down incoming intercontinental ballistic missiles (ICBMs). This current concept has had previous incarnations as the anti-ballistic missile programmes of the 1960s, the Strategic Defense or ('Star Wars') Initiative of the 1980s and National Missile Defense in the 1990s.

Under the leadership of President George W. Bush, missile defence underwent a resurgence in its fortunes in the United States. The fledgling elements of a system were put in place with several interceptor missiles deployed in silos at two separate locations – Fort Greely, Alaska and Vandenberg airbase in California – since late 2004. Missile defence attracted consistent support from the Bush administration, ostensibly justified by concerns over ballistic missile and nuclear weapons proliferation particularly in relation to 'rogue states' such as North Korea and Iran. Of concern to many outside the USA, however, is the fact that BMD is predicated upon a particular variant of strategic thought that assumes the efficacy of defensive technology for the post-Cold War era, as distinct from traditional theories of deterrence which generally tended to downplay the role of defences. This has engendered a considerable amount of debate over the intentions behind this system, its potential impact on the nuclear arsenals of other states such as Russia and China, and its

consequent implications for global security.[1] More recently the potential extension of BMD to Eastern Europe has sparked fears of a 'New Cold War' between the USA and Russia.

This latest phase of debate over missile defence represents only the most recent chapter in a catalogue of contentious efforts to provide America with a shield against nuclear missiles. Throughout its history, missile defence has remained highly controversial owing to the nature of its aims and the technical challenges it faces, challenges that persist up to the present day. ICBMs, the proposed targets of the current BMD system, travel at a speed of 7km per second and are routinely designed to deploy a range of countermeasures capable of overcoming defences. The contentious nature of the system is further assured by the fact that missile defence is extremely costly: BMD has consistently remained the single biggest defence technology programme in budgetary terms, around $7–8 billion per annum since 2001, rising to just over $10 billion in 2006, no mean feat given that the 'War on Terror' became the more prominent priority of the Bush administration.[2] Yet even with this significant outlay no one is sure that missile defence will work, and a significant proportion of the American scientific community believe that it won't. The poor test and evaluation record of missile defence to date ensures that doubts persist over the ability of proposed technologies to deal both with countermeasures deployed during the 'mid-course' of an ICBM's flight (the proposed format for the currently deployed interceptors),[3] and with the initial velocity and trajectory of nuclear missiles during their 'boost-phase'.[4] The head of the Pentagon's Missile Defense

[1] See Keir A. Lieber and Daryl G. Press, 'The End of MAD? The Nuclear Dimension of US Primacy', *International Security*, 30:4 (2006) pp. 7–44.

[2] Congressional Budget Office, *The Long-Term Implications of Current Defense Plans and Alternatives: Detailed Update for Fiscal Year 2006* (2006), www.cbo.gov/showdoc.cfm?index=7004&sequence=0&from=7 [last accessed 7 March 2007].

[3] See 'Countermeasures': Excerpts from a Report by the Union of Concerned Scientists and the Massachusetts Institute of Technology Security Studies Program, www.armscontrol.org/subject/md/?print [last accessed 7 March 2007]; see also Lisbeth Gronlund, David Wright and Stephen Young, 'An Assessment of the Intercept Test Program of the Ground-based Midcourse National Missile Defense System', *Defense and Security Analysis*, 18:3 (2002) pp. 239–60.

[4] David K. Barton, Roger Falcone, Daniel Kleppner *et al.*, 'Report of the American Physical Society Group on Boost-Phase Intercept Systems for National Missile Defense: Scientific and Technical Issues', pp. xxi–xxii, www.aps.org/

Agency (MDA), General Henry 'Trey' Obering, admitted in 2006 that the recently deployed ground-based system only has a 'better-than-zero-chance' of stopping an incoming missile warhead;[5] even today, few would confidently rate the prospects for missile defence any higher than this.

In this sense BMD is a perfect example of investment in technology in pursuit of security. The very nature of technological development – and its limits – in terms of achieving security is in question in this defence programme. As a recent commentary notes, 'Missile defence is a fait accompli. Yet it remains technically immature, poorly evaluated, largely untried and extremely controversial.'[6] The way technology is represented and articulated in its promotion is therefore of critical importance. Missile defence not only represents the ongoing struggle to come to terms with the more deadly applications of nuclear physics, it also deals – quite literally – in the finer points of 'rocket science'. The aim of this book, therefore, is to help account for American persistence with this highly contentious initiative. It does so by concentrating on the narratives of technological development and understandings of technology employed in the advocacy of ballistic missile defence since the concept was first proposed in the post-World War II era. By drawing on previous work in the field of Critical Security Studies, and by combining the Critical Theory of the Frankfurt School (on the issue of technology) and Antonio Gramsci (on the strategic use of language), the book aims to show how proponents of missile defence have consistently articulated and reiterated two pervasive 'common sense' understandings of technology that parallel and invoke broader socio-cultural narratives of technological development. The first assumes technological innovation as a particularly American trait that can be used to overcome even the monumental technical challenges

public_affairs/popa/reports/nmd03.cfm [last accessed 7 March 2007]; also published in special issue of *Review of Modern Physics*, 76, S1 (2004).

[5] A spokesman for the MDA later sought to clarify that the statement was made on the more positive basis that 'we [previously] had nothing, i.e. zero chance, and now we have the means to defend ourselves'. Quotes from Wade Boese, 'Missile Defense Aims to Hit Target in '06', *Arms Control Today*, September 2004, www.armscontrol.org/act/2005_09/MissileDefenseAims.asp?print [last accessed 20 January 2009]. Obering's comment was picked up by Ann Scott Tyson, 'US Missile Defense being Expanded, General Says', *Washington Post*, 22 July 2005, p. A10.

[6] Aaron Karp and Regina Karp, 'Preface: From Strategy to Domestic Debate', *Contemporary Security Policy*, 26:3 (2005) pp. v–vi, p. v.

presented by missile defence – what some have termed the search for a 'technological fix'. The second understanding of technology in missile defence advocacy presents technology (specifically contemporary proliferation of nuclear and ballistic missile technology) as a largely autonomous source of insecurity to the United States, one that is beyond control, invalidates Cold War theories of deterrence and thereby necessitates that missile defence form a priority of the American defence infrastructure.

These understandings, as explored in chapter 1, have analogous counterparts identified (and expounded) in critical theories of technology and, moreover, it is argued in chapter 2 that these understandings are homologous with a particularly 'American' experience of technology that runs from the establishment of the US state to the present day. Focusing on these two countervailing understandings of technology as an organising frame, Parts Two, Three and Four examine the occurrence of these two conceptions historically in the three 'great debates' over American missile defence: the anti-ballistic missile (ABM) controversy in the late 1960s; the Strategic Defense Initiative (SDI) of the 1980s; and contemporary BMD. The advantage of this structure is that it allows for comparison and evaluation of the concrete manifestations of these understandings over time, and the manner in which they have been combined at various points in the promotion of missile defence. Hence chapter 3 examines the extent to which an optimistic conception of technological development pervaded early arguments for ABM systems, whilst chapter 4 evidences a sub-current of fear that future US security policy would be determined by a technologically superior Soviet Union. This countervailing narrative, it is argued, is represented most prominently in the rhetoric of bomber, missile and ABM 'gaps', Robert McNamara's 'action–reaction' thesis and, most prominently, American reactions to the launch of *Sputnik*.

Similarly, Part Three traces a similar pattern in relation to the Strategic Defense Initiative of the 1980s. On the one hand, the promotion of strategic defence in the speeches of the Reagan administration and the writings of SDI proponents more broadly invoked and rearticulated America's technological heritage to defend the viability of missile defence, and elevated the notion of a 'technological fix'; on the other, SDI proponents also exploited fears of technological constraints as evidenced in the arguments of groups such as the 'Committee on the Present Danger' and 'Team-B', as well as in the

Reagan administration's co-optation of the language of technological fears as employed by the anti-nuclear movement.

Part Four undertakes a complementary reading in relation to contemporary BMD. Analysing recent arguments for BMD, chapter 7 indicates how technology is, in one sense, understood simply as an instrument we use to 'make life better', and missile defence should be no exception to this logic. Yet, as chapter 8 illustrates, BMD is simultaneously justified on the basis of an alternative understanding of technology, most evident in BMD proponents' discussion of nuclear proliferation, which connotes helplessness in the face of inevitable technological advance and is founded on the notion that technological development is increasingly moving beyond human control.

The overall aim of the book is to point to the fundamental operation of understandings of technology as a form of 'common sense' (understood in the Gramscian sense) used in the legitimation of missile defence. In Gramsci's definition, common sense refers to a conception that is fragmentary, incoherent and thus, potentially, contradictory.[7] The approach taken here is thus to piece together the fragments of both instrumental and substantive understandings of technology in missile defence advocacy and then, ultimately, to illustrate how they work together to form a contradictory whole. The central contention of this volume, then, is this: common sense understandings of technology (as both a uniquely American solution to security problems *and* a source of global insecurity in terms of the spread of weapons technology) have been consistently employed by missile defence advocates to insulate a problematic system from criticism. These discursive articulations serve to legitimate and naturalise a range of other practices – spending patterns, the assignment and distribution of defence contracts, research and institutional arrangements, testing and technical development procedures. Ultimately they help legitimate BMD itself, a programme which, it can be argued, makes little real contribution to enhancing American or global security in the twenty-first century but which favours sectional political and industrial interests in the short term and helps to sustain America's immense defence infrastructure in the post-Cold War era. Moreover, in the process, this articulation of

[7] Antonio Gramsci, *Selections from the Prison Notebooks*, ed. and trans. by Quintin Hoare and Geoffrey Nowell Smith (London: Lawrence and Wishart, 1973) p. 419.

American technological common sense also constitutes ideas about identity, threats, technology and security in very specific ways.

This book thus claims an important contribution to the study of security in its theoretical approach, methodological rigour and empirical analysis. In a general sense it adds to work utilising social theory to enhance our understanding of the political practice of nuclear security,[8] contributing an original and theoretically informed approach to a case that has been relatively under-theorised in security studies.[9] More specifically, the argument is made that Critical Security Studies,[10] by drawing on its philosophical groundings in Frankfurt School and Gramscian theory, still has much to contribute to the study of 'real world', 'traditional' security issues such as nuclear security. As Bradley Klein noted some time ago, 'Having paid too much attention to weapons for decades, there is now a danger of not paying enough attention.'[11] As the nuclear arsenals of the Cold War continue to atrophy, and 'new' initiatives are put forward in their stead, we would do well to ensure that embedded dynamics of strategy and militarisation do not continue to dominate our thinking. As is illustrated here, the philosophical-theoretical resources that underpin Critical Security Studies can contribute substantially in 'helping to nail the half-truths and distortions by which governments perpetuate the national security state' and 'help ensure the continuation of human society after the nuclear revolution'.[12] They can do so, though, by deepening our understanding of how these 'half-truths and distortions' continue to hold sway, particularly in humanity's continuing effort to come to terms

[8] See Simon Dalby, *Creating the Second Cold War: the Discourse of Politics* (London: Pinter, 1990); Bradley S. Klein, *Strategic Studies and World Order* (Cambridge: Cambridge University Press, 1994).

[9] Exceptions include: Ernest J. Yanarella, *The Missile Defense Controversy: Technology in Search of a Mission* (Lexington, KY: University Press of Kentucky, 2002), on ABM, although this is mainly historical in focus; Edward Reiss, *The Strategic Defense Initiative* (Cambridge: Cambridge University Press, 1992), on SDI; and Natalie Bormann, *National Missile Defense and the Politics of US Identity* (Manchester: Manchester University Press, 2008) on missile defence under Bill Clinton and George W. Bush as theorised from a poststructuralist perspective.

[10] Referring specifically here to the variant espoused by Richard Wyn Jones in his *Security, Strategy and Critical Theory* (London: Lynne Rienner, 1999).

[11] Klein, *Strategic Studies and World Order*, p. 5.

[12] Richard Wyn Jones, 'The Nuclear Revolution' in Alex Danchev (ed.) *Fin de Siècle: the Meaning of the Twentieth Century* (London: I. B. Taurus, 1995) p. 106.

with the nuclear revolution itself as is manifested in projects such as missile defence. The insight proffered here into the construction of the case for American missile defence thus constitutes a new, critical understanding of missile defence advocacy. In this sense the argument remains true to the spirit of immanent critique in Max Horkheimer's sense that immanent confronts 'the existent, in its historical context, with the claim of its conceptual principles, in order to criticize the relation between the two and thus transcend them'.[13]

[13] Max Horkheimer, *Eclipse of Reason* (New York: Seabury Press, 1974) pp. 182–3.

PART ONE

Technology, security and culture

1 *Critical theory, security and technology*

The impact of technology on warfare has been a constant consideration of strategists running from Sun Tzu through to Clausewitz, increasing to such a degree by the twentieth century that the British strategist J. F. C Fuller declared that 'Tools, or weapons, if only the right ones can be discovered, form 99% of victory.'[1] The advent of the 'nuclear revolution' only served to heighten the salience of this question of technology for the makers of modern nuclear strategy such as Bernard Brodie and Thomas Schelling, and the unprecedented destructive power of nuclear weapons spurred the emergence of the cognate discipline of security studies.[2] In short, the question of technology's role and impact has traditionally been seen as central within both strategic thought and security studies.

The orientation of the argument made here is somewhat counter-intuitive in this light. It begins from the premise that though strategic and security studies have devoted significant space to the consideration of (weapons) technology, they have actually been remarkably unreflective on the relationship between technology and security in spite of the amount of research devoted to this issue. This assertion is based on the fact that even accounts which place technology and technological change at their heart reduce the role these factors play to a series of familiar dichotomies: capabilities versus intentions; 'push' versus 'pull' factors in military technological development; manpower versus matériel; and,

[1] J. F. C. Fuller, *Armament and History: a Study of the Influence of Armament on History from the Dawn of Classical Warfare to the Second World War* (London: Eyre and Spottiswoode, 1946) p. vi. On the general theme see Martin Van Creveld, *Technology and War: From 2000 BC to the Present* (New York: The Free Press, 1989); Peter Paret (ed.) *Makers of Modern Strategy: From Machiavelli to the Nuclear Age* (Oxford: Clarendon Press, 1986).

[2] See John Baylis and John Garnett (eds.) *Makers of Nuclear Strategy* (London: Pinter, 1991) on Brodie's and Schelling's roles as 'makers' of modern nuclear strategy in terms both of their influence on policy and as founding fathers of strategic studies.

most fundamentally, whether technology determines the nature of international security or vice versa.[3] Technology itself constitutes a relatively discrete, well-defined and unproblematic variable within such debates,[4] perpetuating the acceptance of technology as a 'natural' part of strategic discourse.[5] There has, however, been little reflection on this acceptance *itself* as a phenomenon. As Judith Reppy points out:

> It is ironic that political theorists, apparently ignorant of the extensive literature in the fields of economics and the sociology of science on technological change, have been willing to accept a 'black box' explanation of these processes, processes that are in reality deeply dependent on social institutions and government policy.[6]

Such black-boxing is not the sole preserve of political theory. Security studies has likewise been charged with an understanding of technology that 'has been confused, crude and unreflective' as a result of the fact that 'strategists have paid almost no heed to work in the fields of the history of science and technology'.[7] Traditional security studies, in short, stands accused of maintaining a particularly emaciated conception of technology even though it ostensibly prioritises the relationship between technology and security.

If this is indeed the case, it begs the question of how the ways in which technology and technological development have traditionally been conceptualised impact upon the theory and practice of security. In this spirit, the argument undertaken here attempts to illustrate how understandings of technology inform a particular policy and vision of American nuclear security, namely ballistic missile defence (BMD). The approach it takes originates in a more general concern (alluded to above) with the relationship between security, technology and culture

[3] See, for example, Barry Buzan and Eric Herring, *The Arms Dynamic in World Politics* (London: Lynne Rienner, 1998).
[4] As argued by Bradley S. Klein, *Strategic Studies and World Order* (Cambridge: Cambridge University Press, 1994) p. 21.
[5] Indeed Barry Buzan has argued that strategic studies should be thought of as the study of the military-technological variable in International Relations – see Barry Buzan, *An Introduction to Strategic Studies: Military Technology and International Relations* (Basingstoke: Macmillan, 1987).
[6] Judith Reppy, 'The Technological Imperative in Strategic Thought', *Journal of Peace Research*, 27:1 (1990) pp. 101–6, p. 105.
[7] Richard Wyn Jones, *Security, Strategy and Critical Theory* (London: Lynne Rienner, 1999) p. 133.